Request for an Incidental Harassment Authorization
Under the Marine Mammal Protection Act
For the

UniSea G1 Dock Replacement Project

UniSea, Inc.

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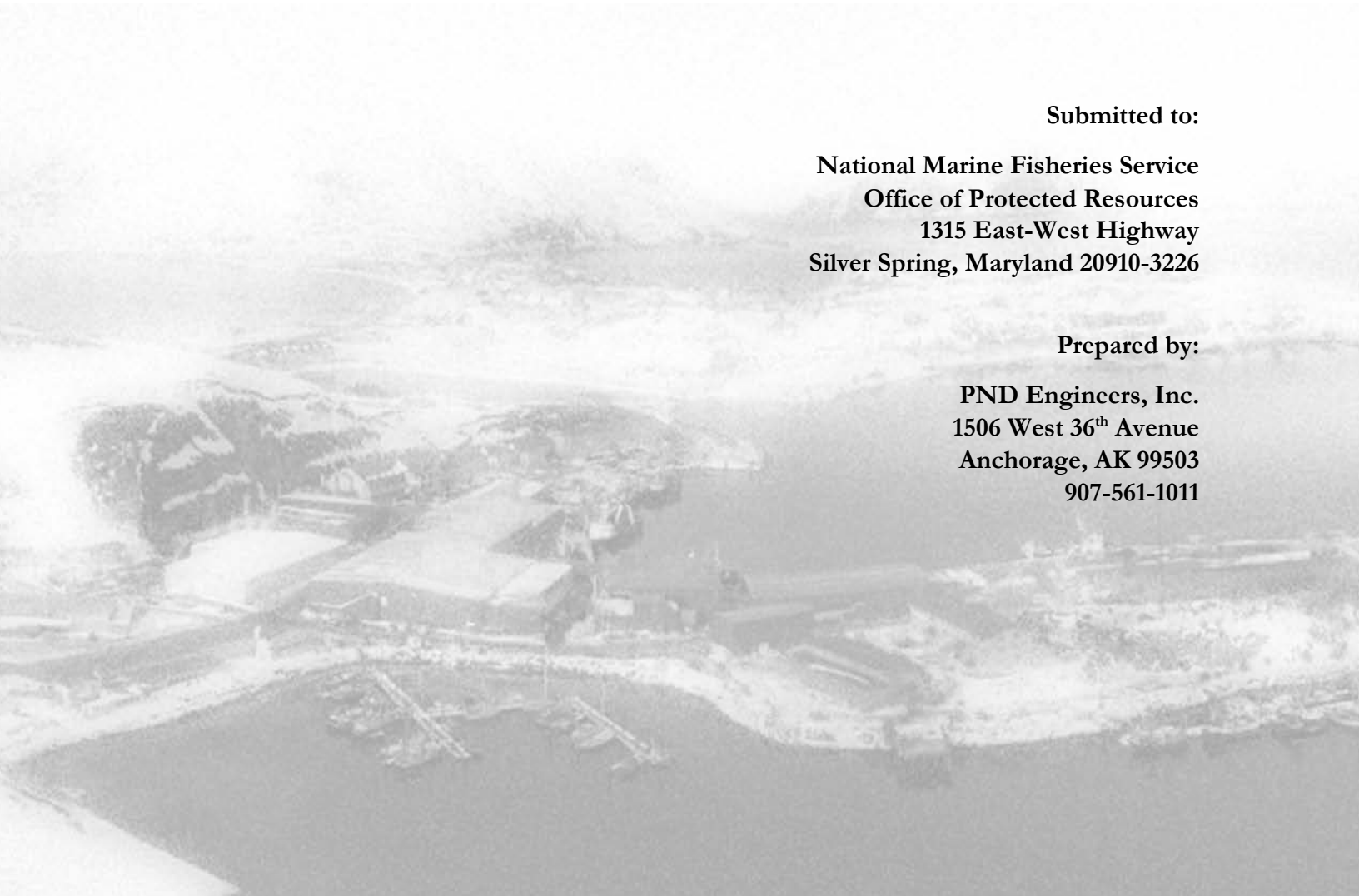

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
APDES	Alaska Pollutant Discharge Elimination System
APE	American Piledriving Equipment, Inc.
BMP	best management practice
CFR	Code of Federal Regulations
CWA	Clean Water Act
dB	decibel
DPS	distinct population segment
EHW	Explosive Handling Wharf
ESA	Endangered Species Act
FRP	fiber-reinforced polymer
GPS	global positioning system
HPSI	Hydraulic Power Systems, Inc.
HTL	high tide line
Hz	hertz
ICE	International Construction Equipment, Inc.
IHA	Incidental Harassment Authorization
MHW	mean high water
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OCSP™	OPEN CELL SHEET PILE™
PND	PND Engineers, Inc.
POC	plan of cooperation

PTS	permanent threshold shift
RMS	root mean square
SPL	sound pressure level
TTS	temporary threshold shift
UniSea	UniSea, Inc.
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

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1 Description of the Activity

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

1.1 Introduction

UniSea, Inc. (UniSea) proposes to replace its existing G1 Dock located in Unalaska, which is currently partially condemned. As part of UniSea's only marine facility in Alaska, the G1 dock plays an important role in the existing seafood processing facility in Iliuliuk Harbor, Unalaska. The UniSea processing facility has the capacity to process more than 2.5 million pounds of fish per day. The adjacent G2 facility is "one of the most efficient, highest volume Pollock processing facilities in the world" (AIRA, 2009).

The proposed project will occur in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) 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 under certain situations. Section 101 (a) (5)(D) allows for the issuance of an Incidental Harassment Authorization (IHA), provided an activity results in negligible impacts to marine mammals and would not adversely affect subsistence use of these animals.

The project's timing along with the duration of pile removal and installation activities may result in marine mammals protected under the MMPA being exposed to sound levels above the Level B harassment threshold.

Figure 1. *Project location.*

1.2 Project Purpose and Need

Currently, the G1 Dock is partially unusable as a large portion of the dock is condemned due to corrosion and damage to the existing steel piles. The dock is a primary facility that supports activities occurring in the nearby fish processing facilities. The UniSea processing plant is nearing plant capacity limits at a time when product quality must increase. In order to remain competitive in the crab and fish processing market through increased product quality, UniSea needs to increase productivity and shorten handling time. This means improving the processing plant including moving processing facilities nearer to the dock. The most practicable location for a new processing plant is near the upland edge of the dock. This will allow for safe movement of raw product from the fishing vessels and a short trip to the processing plant. Due to the limited space available upland, the new processing plant will need to be placed at the shoreline and possibly encroach onto the dock. Additionally, UniSea will be utilizing fish pumps at this facility which further necessitates close proximity of the processing building due to limited pumping distances. For these reasons, a pile-supported structure would not be suitable and a continuation of the fill dock design is necessary.

1.3 Project Description

UniSea proposes to replace the existing G1 Dock with an 80 foot by 400 foot OPEN CELL SHEET PILE™ (OCSP™) dock. The OCSP dock will be constructed of PS31 flat sheet piles (web thickness of 0.5 inches and width between interlocks of 19.69 inches). In addition to replacing the existing pile-supported G1 Dock, the project would include installation of the following:

- Approximately fifty (50) 24-inch diameter fiber-reinforced polymer (FRP) composite fender piles;
- Approximately nine (9) 24-inch diameter steel support piles along the dock face and for crab brailer support;
- One (1) 24-inch diameter steel plug/closure pile to retain fill between the existing and new sheet pile cells at the north end of the project;
- Seawater intake sheet pile (PS31 flat sheet piles) structure approximately 90 foot by 85 foot, access ramp, and armor rock erosion protection (3,400 cubic yards of rock fill and 400 cubic yards of armor rock);
- Four (4) 50 foot steel catwalks with intermediate supports of two (2) 18-inch diameter steel piles each, four (4) piles total;
- Two (2) dolphins which include five (5) 24-inch diameter steel support piles each and two (2) 24-inch diameter steel fender pin piles each, fourteen (14) piles total.

The anticipated project quantities are shown in Table 1.

In-water and over-water construction of Phase 1 (all sheet pile installation and some pipe pile installation) is planned to occur between approximately February 1, 2016 and October 31, 2016. Phase 2 (remaining pipe pile installation) is planned to occur between approximately November 1, 2016 and December 1, 2017. It is possible that work could be completed within one year; however if it is not, UniSea will renew the existing application to include the additional time.

The existing structure will be demolished by removing the concrete deck, steel superstructure, and all attached appurtenances/structures, and extracting the existing steel support piles with a vibratory hammer. Starting at the existing G2 sheet pile dock, the sheet pile of the new dock will be installed in winter 2016. After

completion of a few cells, the cells will be incrementally filled with clean material as the work progresses with bulldozers, wheel loaders, and compaction equipment. After all of the sheet piles are installed and the bulkhead is backfilled, concrete surfacing, fender piles, mooring cleats, and other appurtenances will be installed.

Utilities will be installed as necessary. All process waste water and storm water from the G1 dock will be processed through the facility treatment system. The facility storm water APDES permit and associated stormwater pollution plan will be updated to reflect the changed conditions of the facilities.

As described above, the proposed project requires the removal and installation of various types and sizes of piles with the use of a vibratory hammer, impact hammer, and drilling equipment. These activities have the potential to result in Level B harassment (behavioral disruption) only, as a monitoring plan will be implemented to reduce the potential for exposure to Level A harassment (harassment resulting in injury). The rest of the in-water components of the project are provided here for completeness.

Table 1. *Anticipated Project Quantities.*

ITEM	BELOW MHW (ELEVATION = 3.4)	BELOW HTL (ELEVATION = 4.7)	TOTAL
PROPOSED SURFACE AREA OF DOCK (ACRES)	-	1.05	1.05
PROPOSED SHOT ROCK FILL (CUBIC YARDS)	22,400	24,200	34,500
PROPOSED ARMOR ROCK (CUBIC YARDS)	365	375	400
PROPOSED PILES TO BE REMOVED (EACH)	73 (Steel) 72 (Timber)	73 (Steel) 72 (Timber)	73 (Steel) 72 (Timber)
PROPOSED PILES TO BE ADDED (EACH)	24 (24" Steel) 4 (18" Steel) 50 (24" FRP)	24 (24" Steel) 4 (18" Steel) 50 (24" FRP)	24 (24" Steel) 4 (18" Steel) 50 (24" FRP)
ESTIMATED TEMPORARY PILES (EACH)	180 (18" Steel)	180 (18" Steel)	180 (18" Steel)
PROPOSED SHEET PILE (EACH)	887	887	887

1.3.1 Construction Sequence

UniSea proposes to use the following general constructing sequence, subject to adjustment by the construction contractor's means and methods:

- Demolition of the existing dock and removal of any existing riprap/obstructions.
- Installation of the new sheet pile bulkhead dock and sheet pile seawater intake structure.
- Installation of temporary utilities and fendering to provide functional seafood processing capability for the 2016/17 season (Oct 2016 – May 2017).
- Installation of dock face fender piles.
- Installation of dolphin support piles and caps
- Installation of fender support/pin piles and miscellaneous support piles (including catwalk and dock face support piles).
- Installation of pre-assembled fender systems (energy absorbers, sleeve piles, steel framing, and fender panels).
- Installation and removal of temporary support piles for Contractor's template structures.
- Installation of electrical, water, and storm drainage utilities.
- Installation of concrete dock surfacing and concrete utilidor.

Each element is further described below:

1.3.1.1 Demolition of Existing Dock

Demolition of the existing dock and removal of any existing riprap/obstructions will be performed with track excavators, loaders, cranes, barges, cutting equipment, a vibratory hammer (for pile extraction), and labor forces. The existing dock (consisting of steel support piles, steel superstructure, and concrete deck) will be completely removed for construction of the new dock.

Vibratory pile removal will generally consist of clamping the "jaws" of the vibratory hammer to the pile to be removed, extracting the pile (with vibratory hammer turned on) to the point where the pile is temporarily secured and removal can be completed with crane line rigging. The pile is then completely removed from the water by hoisting with crane line rigging and placing on the ground or deck of the barge.

The contractor will be required to dispose of (or salvage) demolished items in accordance with all federal, state, and local regulations. Dewatering will not be required as all extraction will take place from the existing dock, from shore, and/or from a work barge.

1.3.1.2 Sheet Pile Bulkhead Dock

The new sheet pile bulkhead dock and seawater intake structure will be installed utilizing a crane and vibratory hammer. It is anticipated that the largest size vibratory hammer used for the project will be an APE 200-6 (eccentric moment of 6,600 inch-pounds) or comparable vibratory hammer from another manufacturer such as ICE or HPSI (Figure 2 below shows an HPSI 300, eccentric moment of 3,000 inch-pounds, being used for sheet pile installation on another OCSP dock project in Dutch Harbor, AK). After all the piles of several sheet pile cells have been installed, clean rock fill will be placed within the sheet pile cells from the shore. This process will continue sequentially until all of the sheet pile cells are installed and backfilled.

Figure 2. *Installing sheet piles with a vibratory hammer.*

1.3.1.3 Dock Face Fender Piles

Fiber-reinforced polymer (FRP) composite fender piles will be installed along the face of the new sheet pile dock, fastened to the face at the top, and cut to elevation. Initial driving of the fender pile will be done with a vibratory or impact hammer, and final seating of the pile into the shallow bedrock will be done with an impact hammer.

Figure 3. *FRP composite fender pile ready to be driven down.*

1.3.1.4 Dolphin Support Piles

Dolphin support piles will be installed and cut to elevation for installation of a structural steel cap. The support piles will be driven and seated into shallow bedrock with an impact hammer. After the piles have been firmly seated into the bedrock, drilling equipment will be used to drill a shaft in the bedrock (down the center of the pipe pile) for installation of rock anchors. The rock anchors will consist of a high-strength steel rod grouted into the drilled shaft and tensioned against bearing plates inside the pile. Rock anchors are required in shallow bedrock conditions for the piles to resist tensile loads from vessel mooring and berthing.

Figure 4. *Dolphin support piles being driven with an impact hammer.*

1.3.1.5 Fender Support Piles and Fender Systems

Fender support/pin piles will be installed and cut to elevation. The fender support/pin piles will either be installed in a socket drilled into the shallow bedrock (driven with an impact hammer and possibly a vibratory hammer down into the socket), by the down-the-hole drilling technique (described in Section 1.3.1.6 below), or with a rock anchor system (described in Section 1.3.1.4 above). The rock socket technique involves drilling a socket either slightly larger or slightly smaller than the outside diameter of the pile. If the socket is drilled larger than the outside diameter of the pile, then the annulus space between the rock and pile wall will be grouted to create a bond. If the socket is drilled smaller than the outside diameter of the pile, then the pile will be driven down into the rock with an impact hammer to the required depth and/or bearing capacity.

Pre-assembled fender systems (energy absorbers, sleeve piles, steel framing, and fender panels) will be lifted and installed onto fender support piles via crane.

1.3.1.6 Miscellaneous Support Piles

Miscellaneous support piles (including catwalk and dock face support piles) will be installed and cut to elevation. Installation methods for the miscellaneous support piles will be similar to the fender support piles (see Section 1.3.1.5 above). A description of the down-the-hole drilling method is provided below.

Down-the-hole drilling is a technique that uses a rotary drill bit that is impacted when hard material is encountered. The pounding action takes place where the drill bit encounters the resistant material underground rather than at the surface, as would be the case for impact or vibratory pile driving. Down-the-hole drilling is considered a pulsed noise source due to periodic impacts from the drill below ground level. The piling is fit over the drill with the drill head extending beneath the pile. As the drill advances downward, so does the pile. When the proper depth is achieved, the drill is retracted and the piling is left in place. This method eliminates high-energy sounds associated with traditional pile driving methods. A likely explanation for this much lower underwater noise level is that all of the impact is taking place below the substrate rather than at the top of the piling as it does with impact and vibratory pile driving, thus limiting transmission of noise through the water column.

1.3.1.7 Temporary Support Piles

Temporary support piles for the Contractor's pile driving template structures will be installed to aid with construction and removed after the permanent sheet piles or support piles have been installed. Refer to Figures 2 and 4 (above) for photos showing temporary support piles and templates being used during pile installation. Temporary support piles will likely be steel H-piles (18-inch or smaller) or steel round piles (18-inch diameter or smaller). The sheet pile structures consist of fourteen (14) cells, and there are two (2) dolphin and two (2) catwalk support structures. It is estimated that upwards of ten (10) temporary support piles will be used per cell for the sheet pile structures (face of cell and two tailwalls), and upwards of eight (8) piles per dolphin and catwalk support location. (While an estimated number of temporary piles has been provided, the actual number will be determined by the Contractor's means and methods, and a Contractor is yet to be selected for the project.) Installation methods for the temporary support piles will be similar to the fender support piles (described in 1.3.1.5 above). A description of the down-the-hole drilling method is provided in Section 1.3.1.6 above.

1.3.1.8 Utilidor and Dock Surfacing

The concrete dock surfacing and concrete utilidor will be installed using forms and reinforcement steel. This work will take place at or near the surface of the dock and will be above water.

1.3.1.9 Utilities

Temporary utilities (and fendering, as needed) will be installed to provide functional seafood processing capability for the 2016/17 season (Oct 2016 – May 2017). Typical utility installation equipment such as track excavators, wheel loaders, and compaction equipment will be used.

Permanent electrical, water, and storm drainage utilities will be installed with typical utility installation equipment similar to the temporary utilities. All storm water (and any other waste water) from the dock will be processed through the facility treatment system via piping in the utilidor.

2 Dates, Duration, and Region of Activity

The date(s) and duration of such activity and the specific geographical region where it will occur.

2.1 Dates

In-water construction is estimated to take place between March 1, 2016 and March 1, 2017.

2.2 Duration

Duration estimates for active pile installation/removal required for the project elements are as follows:

- Daily Construction Window: In the summer months (April – September), 12-hr work days in daylight will likely be used. In winter months (October – March), shorter 8-hr to 10-hr work days in daylight will likely be achievable. Work windows could be extended or shortened based upon available sunlight. The daily construction window for pile driving or removal will begin no sooner than 15 minutes after sunrise to allow for initial marine mammal monitoring to take place, and will end 30 minutes before sunset to allow for post-construction marine mammal monitoring.
- Vibratory Pile Removal: Vibratory pile removal will take 10 minutes or less per pile over a duration of 30 days. Total estimated driving time for 75 piles is 13 hours.
- Vibratory Pile Driving (Sheet Pile): Vibratory pile driving of sheet pile will take 5 minutes or less per pile over a duration of 90 days. Total estimated driving time for 890 sheet piles is 75 hours.
- Vibratory Pile Driving (Support Piles): Vibratory pile driving of support piles will take 10 minutes or less per pile over a duration of 30 days (concurrent with impact pile driving). Total estimated driving time for 64 piles is 11 hours.
- Impact Pile Driving: Impact pile driving of dolphin and other support piles will take 30 minutes or less per pile over a duration of 60 days. Total estimated driving time for 78 piles is 39 hours.
- Drilling: Drilling for installation of dolphin and other support piles will take 6 hours or less per pile over a duration of 50 days (concurrent with impact pile driving). Total estimated drilling time for 24 piles is 144 hours.

The driving times indicated above reflect the duration that a pile hammer is actively driving/removing a pile and producing noise levels that may cause exposure to an animal. However, driving/removal effort on individuals piles will be separated by several minutes while the equipment is positioned and setup for the next pile, creating a longer driving/removal period during which sound is produced intermittently on a regular and frequent basis over a period of several hours. Periods of intermittent pile driving/removal activity are expected to occur during approximately 50% of the total estimated duration of 180 days (2,160 hours for 12-hour work days). These periods of intermittent driving/removal activity are used for practical purposes as the basis of the exposure estimate calculated in Section 6.1 since animals detected within the safety radii anytime during the driving/removal period will be reported as an exposure. The remaining 50% of the project duration will be spent on activities that provide distinct periods of time without noise from pile driving or drilling such as installing templating and bracing, moving equipment, threading sheet piles, pulling piles, etc.

As a point of clarification, impact and vibratory driving are not anticipated to occur at the same time (i.e., only one method of driving will be used at a given time since, typically, only one crane will be on-site for the project). The references above to vibratory driving (for support piles) and drilling being conducted

concurrently with impact driving relate to the estimated maximum durations for each method and are not intended to imply that more than one hammer will be operating at a given time.

2.3 Region of Activity

The UniSea Dock is located in Iliuliuk Harbor in the City of Unalaska, on Amaknak Island. Iliuliuk Harbor is located between Captains Bay and Iliuliuk Bay, which is adjacent to Dutch Harbor. The dock is located in Sections 3 and 10, Township 72 South, Range 118 West, of the Seward Meridian. This is UniSea's only marine facility in Alaska. The adjoining uplands are owned by UniSea and contain fish processing facilities.

West of the project is the Robert Storrs Small Boat Harbor, a facility comprised of 71 slips for vessels up to 60 feet. These facilities are owned and operated by the City of Unalaska. Beyond the South Channel Bridge, located to the south of the project, is the Carl E. Moses (CEM) Boat Harbor. The CEM Boat Harbor is also owned and operated by the City of Unalaska. The CEM is comprised of 52 slips for vessels up to 150 feet in length. The seafood processing facility for Alyeska Seafoods, Inc., one of several other seafood processors within the Unalaska area, is on the opposite side of Iliuliuk Harbor. In addition to their upland processing facilities, Alyeska Seafoods, Inc. also has marine docking facilities. Figure 5 shows the project location as well as other facilities within the vicinity.

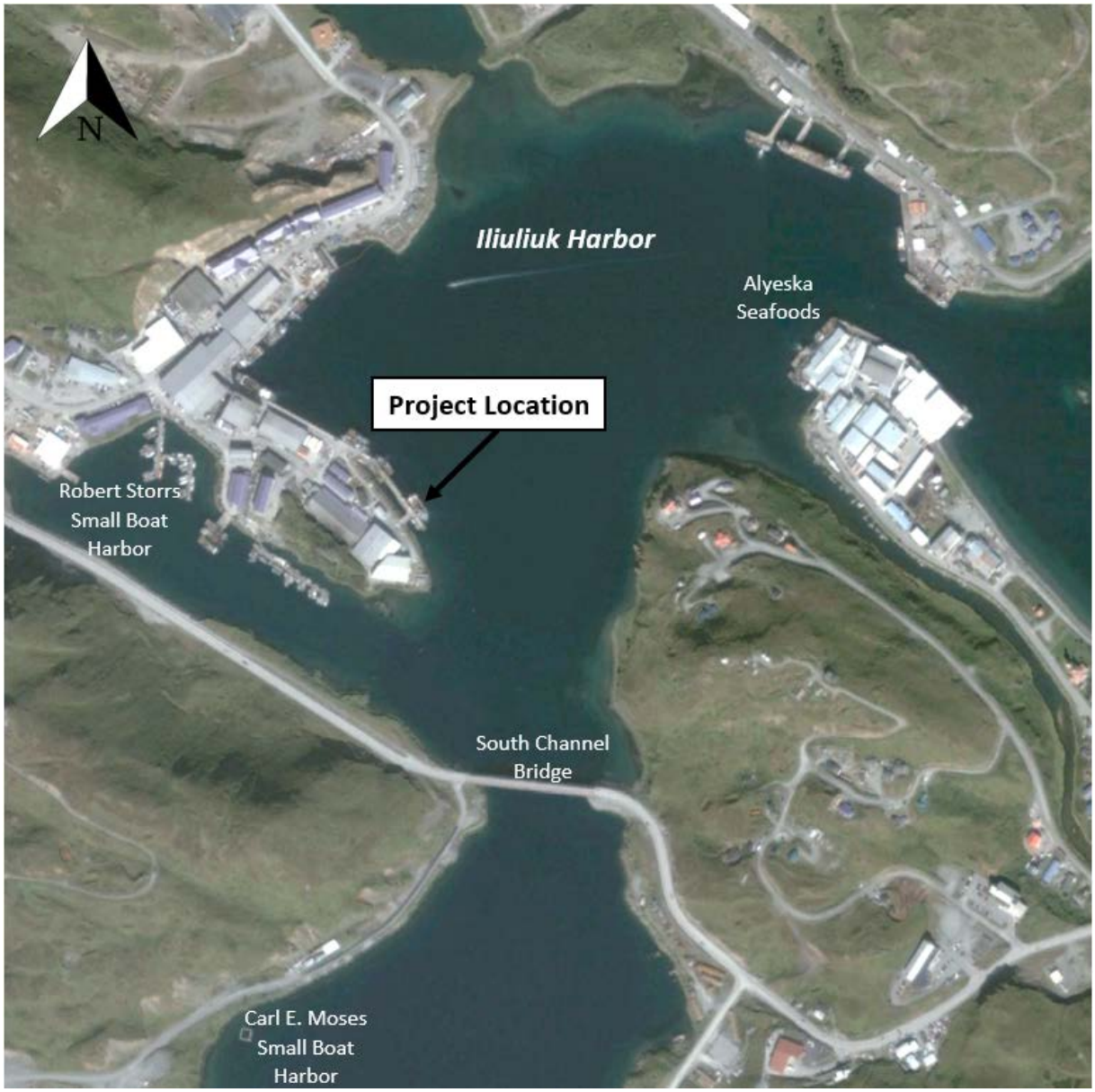

Figure 5. *Vicinity map of project area.*

3 Species and Number of Marine Mammals in the Area

The species and numbers of marine mammals likely to be found within the activity area.

Several marine mammal species, subspecies, or distinct population segments (DPSs) known distribution ranges include the portion of Iliuliuk Bay in which the proposed project will occur. The species are listed in Table 2, along with their stock or population, their occurrence in the project area, and their estimated abundance.

Although the proposed project occurs within the range of several marine mammal species, it is highly unlikely that the majority of these species will be observed in the project area due to the shallow depths, narrow entrances and high volume of vessel traffic in and around Iliuliuk Harbor. Due to this, the Steller sea lion and the harbor seal, both of which are pinnipeds, are the only species within NMFS jurisdiction that are commonly observed in the proposed project area. Sightings of cetaceans and other marine mammals within Iliuliuk Harbor are extremely rare, and therefore, no further descriptions of any of the cetacean or other marine mammals are included in the IHA application. Descriptions of the Steller sea lion and the harbor seal, which are the species of concern for this IHA application, are included in Section 4.

Table 2. *Species with ranges extending into the project site.*

Species	Population/Stock	MMPA Status	ESA Status	Occurrence In/Near Project Area	Seasonality	Abundance
Baird's beaked whale (*Berardius bairdii*)	Alaska	Protected	-	Unknown	Summer, Fall	Unknown
Blue whale (*Balaenoptera musculus*)	Eastern North Pacific	Depleted	Endangered	Rare	Summer	1,647
Dall's porpoise (*Phocoenoides dalli*)	Alaska	Protected	-	Rare	Year round	Unknown
Fin whale (*Balaenoptera physalus*)	Northeast Pacific	Depleted	Endangered	Rare	Spring, Summer	1,214
Gray whale (*Eschrichtius robustus*)	Eastern North Pacific	Protected	Delisted 1994	Rare	Summer, Early Fall	19,126
Harbor porpoise (*Phocoena phocoena*)	Bering Sea	Protected	-	Rare	Year round	40,039
Harbor seal (*Phoca vitulina richardsi*)	Aleutian Islands	Protected	-	Common	Year round	3,579
Humpback whale (*Megaptera novaeangliae*)	Western North Pacific	Depleted	Endangered	Rare	Year round	938
Killer whale (*Orcinus orca*)	Eastern North Pacific Alaska Resident	Protected	-	Rare	Summer, Fall	656
Killer whale (*Orcinus orca*)	Gulf of Alaska, Aleutian Islands, and Bering Sea Transient	Protected	-	Rare	Year round	587
Minke whale (*Balaenoptera acutorostrata)*	Alaska	Protected	-	Rare	Year round	Unknown
Northern fur seal (*Callorhinus ursinus*)	Eastern Pacific	Depleted	-	Rare	Summer, Early Fall	541,317
North Pacific right whale (*Eubalaena japonica*)	Eastern	Depleted	Endangered	Rare	Spring, Summer	25.7
Pacific white sided dolphin (*Lagenorhynchus obliquidens*)	North Pacific	Protected	-	Rare	Year round	26,880 (estimated)
Ribbon seal (*Histriophoca fasciata*)	Alaska	Protected	-	Rare	Unknown	Unknown
Sperm whale (*Physeter macrocephalus*)	North Pacific	Depleted	Endangered	Rare	Summer	Unknown
Stejneger's beaked whale (*Mesoplodon densirostris*)	Alaska	Protected	-	Rare	Rare	Unknown
Steller sea lion (*Eumetopias jubatus*)	Western Distinct Population Segment	Depleted	Endangered	Unknown	Year round	45,659

(Allen and Angliss, 2014)

4 Status and Description of Affected Species or Stocks

A description of the status and distribution, including seasonal distribution (when applicable), of the affected species or stocks of marine mammals likely to be affected by such activities.

4.1 Steller Sea Lion (*Eumetopias jubatus*)

Steller sea lions are the largest eared seal, with males weighing an average of 566 kg and females weighing an average of 263 kg. Their range extends around the North Pacific Ocean rim, with most sea lions occupying either rookeries or haulouts, depending on the season. Male sea lions are more likely to disperse beyond their typical habitat, but this primarily occurs after the breeding season (NMFS, 2008). Sea lions eat a variety of fish and cephalopods, but have been known to also prey on a variety of seals.

Steller sea lions occur in two Distinct Population Segments (DPSs) in Alaska: An eastern U.S. DPS which includes animals east of Cape Suckling, Alaska (144°W), that was recently delisted under the ESA, and a western U.S. DPS listed as endangered, including sea lions at and west of Cape Suckling (including Unalaska Island and associated project area on Amaknak Island) (62 CFR 30772, 1997; Allen and Angliss, 2010). The centers of abundance and distribution are located in the Gulf of Alaska and Aleutian Islands. Members of this species are not known to migrate, but individuals disperse widely outside of the breeding season (late May to early July). At sea, Steller sea lions commonly occur near the 656 foot (200 meter) depth contour, but have been seen from near shore to well beyond the continental shelf (Kajimura and Loughlin, 1988). Steller sea lions are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods including walleye pollock (*Theragra chalcogramma*), Atka mackerel (Pleurogrammus monopterygius), Pacific herring (*Clupea pallasi*), capelin (*Mallotus villosus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific cod (*Gadus macrocephalus*), and salmon (*Oncorhynchus* spp.) (Pitcher, 1981; Merrick et al., 1997). On rare occasions, Steller sea lions prey on seals, and possibly sea otter pups.

About three-fourths of all Steller sea lions haul out on and pup in U.S. territory (Marine Mammal Commission, 2000). Pups are born from late May through early July, with peak birthing during the second or third week of June. Females stay with their pups for about 9 days before initiating routine foraging trips to sea. Females mate 11 to 14 days after giving birth with implantation occurring 3-4 months later in late September or early October. Weaning is not narrowly defined as it is for most other pinniped species, but probably takes place gradually during winter and spring prior to the breeding season.

The population size of the western U.S. DPS declined by about 75 percent between 1976 and 1990, and is currently estimated at over 41,000 animals (Allen and Angliss, 2010). Factors contributing to the decline of the stock include incidental take in fisheries, illegal and legal shooting, predation or certain diseases, climate change, and contaminants. Counts of non-pup Steller sea lions at trend sites for the western U.S. DPS increased 5.5 percent from 2000 to 2002, and at a similar rate between 2002 and 2004. These were the first region-wide increases for the western U.S. stock since standardized surveys began in the 1970s. Although some trend sites were not surveyed in both 2006 and 2007, available data indicated that the size of the adult and juvenile portion of the western Steller sea lion population throughout much of its range (Cape St. Elias to Tanaga Island, 145°-178° W) in Alaska remained largely unchanged between 2004 (N=23,107) and 2007 (N=23, 118) (Fritz et al., 2008a). Results of the most recent aerial survey conducted in 2008 (Fritz et al., 2008b) confirmed that the recent (2004-2008) overall trend in the western population of adult and juvenile Steller sea lions in Alaska is stable or possibly declining slightly (Allen and Angliss, 2010).

4.1.1 Steller Sea Lion Hearing Ability

Steller sea lions hearing sensitivity is similar to that of other otariids. Steller sea lions aerial hearing ability ranges from approximately 0.25-30 kHz; however, their hearing is most sensitive to noise from 5-14.1 kHz (Muslow and Reichmuth, 2010). Underwater, Steller sea lion best hearing ranges from 1-16 kHz, with higher hearing thresholds, indicating poor sensitivity, below 1 kHz and above 16 kHz (Kastelein et al., 2005).

4.1.2 Steller Sea Lion (*Eumetopias jubatus*) Critical Habitat

Sea lion rookeries in Alaska are located in the Pribilof Islands, on Amak Island north of the Alaska Peninsula, throughout the Aleutian Islands and western Gulf of Alaska to Prince William Sound, and on several islands in southeastern Alaska. Haul-outs and rookery sites are numerous throughout the breeding range, and those located in the region of the project area are shown on Figure 6. The project area occurs within critical habitat for three major haul-outs and one rookery; NMFS defines Steller sea lion critical habitat by a 20-nautical mile (nm) radius (straight line distance) encircling a major haul-out or rookery. The two haul-outs (Old Man Rocks, Unalaska/Cape Sedanka) within the 20-nm radius are located between approximately 15 and 20nm (straight line distance) from the project area. The Akutan/Lava Reef haul-out is located approximately 22 nm from the project site. The closest rookery is Akutan/Cape Morgan, which is about 20 nm from the project area using straight line distance over the mountains. Recent usage data from all of these sites is presented in Table 3 below.

In addition to major haul-outs and rookeries, three special foraging areas in Alaska have also been designated critical habitat for Steller sea lions, including the Bogoslof area on the Bering Sea shelf, the Seguam Pass area in the central Aleutian Islands, and the Shelikof Strait area near Kodiak Island (62 CFR 30772, 1997). There are no special foraging areas within the project area.

Table 3. *2008 Summer Steller sea lion count.*

Site Name	Adults and Juveniles	Rookery
Akutan/Cape Morgan	1131	yes
Akutan/Reef-Lava	128	no
Old Man Rocks	89	no
Unalaska/Cape Sedanka	0	no

(Fritz et al., 2008a)

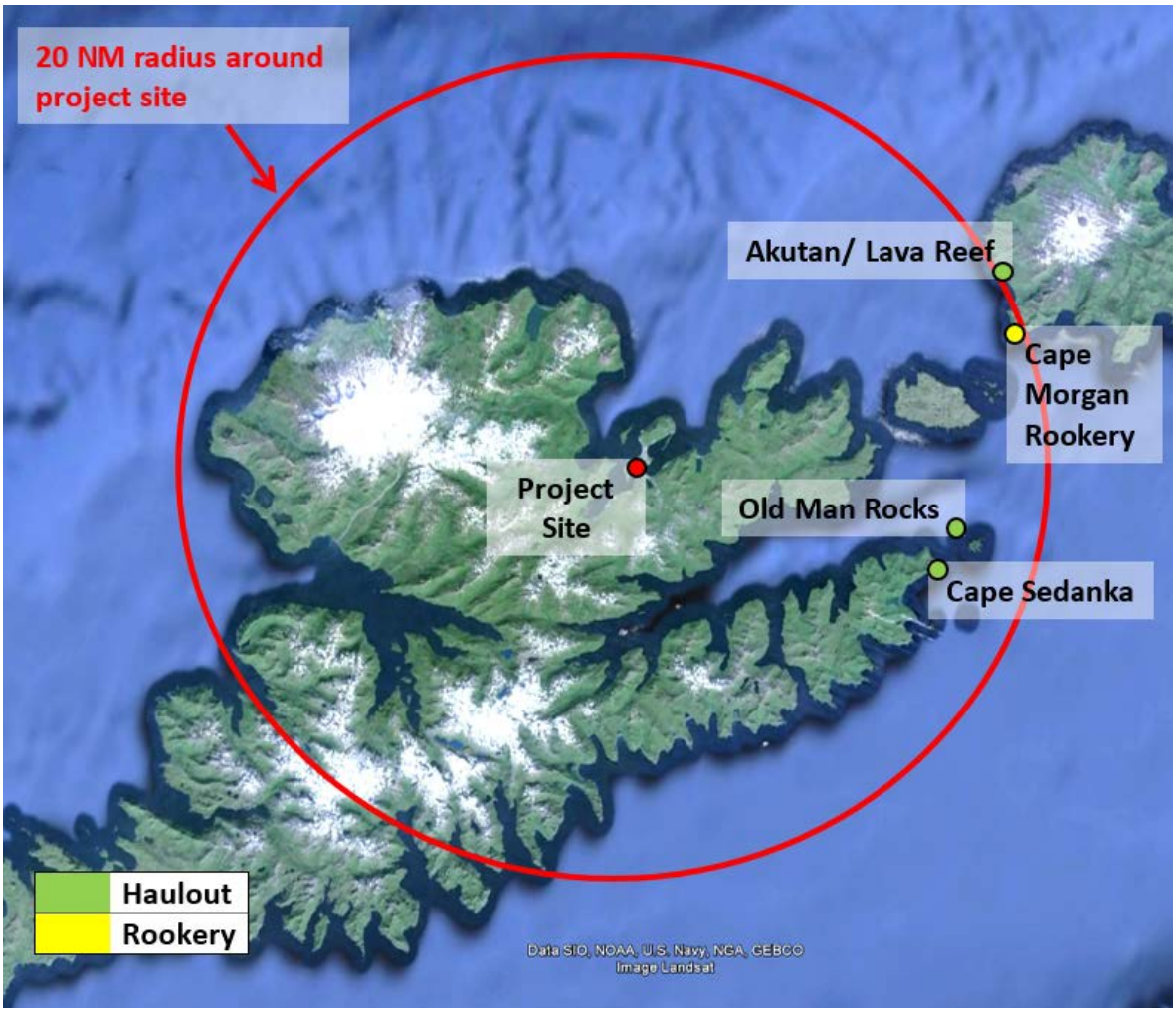

Figure 6. *Nearby Steller sea lion haulouts and rookery.*

4.2 Harbor Seals (*Phoca vitulina richardsi*)

Harbor seals are an earless seal covered with hair. They are often considered a "true seal" because of these traits. Adult males can grow up to 180 kg and typically reach the age of 26. Adult females typically reach the age of 35 and can grow up to 145 kg (Sease, 1992; Kinkhart et al., 2008). In the pacific, their range extends from Baja California to the Aleutians and North to Cape Newman and the Pribilof Islands (Allen and Angliss, 2014). Food sources for harbor seals include fishes and small cephalopods (Pitcher and Galkins, 1979).

Harbor seals often inhabit nearshore coastal waters, but they have been found up to 100 km from the shore. Harbor seal movement is highly variable, with no seasonal patterns identified. They commonly dive to depths that are less than 20 meters but are capable of reaching depths of up to 500 meters. Up to 44% of their time is spent hauled out, with most hauling out occurring during the summer (Pitcher and Galkins, 1979; Kinkhart et al., 2008). Harbor seals haulout in groups of 30 or less, but have been known to rarely haulout in numbers of several hundred (Sease, 1992). There are no defined haulout locations for harbor seals similar to those for sea lions and other pinnipeds, as harbor seals will haulout where conditions are preferable to rest, give birth,

and/or molt (Sease, 1992). Common haulout locations include reefs; sand and gravel beaches; sand and mud bars; and glacial, pan, and sea ice (Kinkhart et al., 2008). Pupping, weaning, and molting often coincide with the summer haul out. The weaning process is completed by July, while molting can take up to 6 months (Sease, 1992). Harbor seals commonly eat walleye pollock (*Theragra chalcogramma*), octopus (*Octopus* spp.), capelin (*Mallotus villosus*), herring (*Clupea pallasii*), and pacific cod (*Gadus macrocephalus*). Pups usually eat small fishes (Pitcher and Galkins, 1979). Killer whales (*Orcinus orca*) are the primary predator of harbor seals (Kinkhart et al., 2008).

Twelve stocks of harbor seals have been identified by NMFS (Allen and Angliss, 2014). The Aleutians Islands stock, which has the largest extent, occurs within the project area (Small et al., 2008). The most recent survey estimated the abundance of harbor seals within this stock at 3,579 individuals (Allen and Angliss, 2014). Very little information is known about the Aleutian stock due to the limited amount of surveys that have been completed in the primarily remote Aleutian Islands. The population trend of harbor seals occurring within this stock is unknown (Allen and Angliss, 2014); however, harbor seals are not currently listed as threatened or endangered under the ESA or considered depleted under the MMPA.

4.2.1 Harbor Seal Hearing Ability

Outwardly, phocids like harbor seals, lack pinna, the outer ear portion that consists of folds of skin that is common with many animals. The portion of the ear canal that is visible is "long, narrow and filled with cerumen and hairs" (Kastak and Schusterman, 1998). This canal is closed by muscular attachments when seals are underwater (Kastak and Schusterman, 1998). The hearing range of harbor seals extends above 60 kHz (Jacobs and Terhune, 2002), with the best sensitivity occurring at 11 kHz according to Schusterman (1975). Harbor seals are more sensitive to lower frequency sounds (Schusterman, 1975).

4.3 Survey information

Approximately 21 Steller sea lion surveys were completed in Iliuliuk Harbor by the U.S. Army Corps of Engineers (USACE) from November through March of 2003 through 2013 (Table 4; Figure 7) to coincide with surveys of overwintering Steller's eider. These surveys noted the presence of sea lions in the area, rather than providing an accurate estimate on the number of sea lions regularly in the harbor. The surveys found an average of 0.71 Steller sea lions in the harbor per survey. A maximum of 10 Steller sea lions were seen in a survey within Iliuliuk Harbor (sector 23). Surveys from areas within the projected zone of influence, further discussed in Sections 5.2.2 and 5.2.3, are bolded in Table 4.

Steller sea lion surveys took place by UniSea personnel from January 1, 2014 to December, 31, 2014 and covered an area located within 300 feet of the dock rather than the entire harbor. Very few Steller sea lions were observed in this area of the site, although 10 were observed during the month of March 2014.

UniSea personnel have surveyed the project area on a near daily basis beginning in January 2015 for Steller sea lions and Northern sea otters. The amount of survey periods per day varied from one to three survey periods per day. These surveys took place from the corner of the G2 dock to the G1 dock, from Iliuliuk River to the G1 Dock, from the corner of the South Channel Bridge to the G1 dock, and within the entrance to the Robert Storrs Small Boat Harbor (Figure 8). Many of the sightings of Steller sea lions occurred within the observation area from the corner of the G2 dock to the G1 dock, with as many as 8 Steller sea lions seen in one observation period during February 2015. Based on accounts from UniSea personnel, Steller sea lions are sighted more often when fishing boats are docked at the project site. It is expected that operations at the G2

dock and facilities will continue as usual during construction on the G1 dock, so it is likely that sea lions and harbor seals could be attracted to the harbor during portions of the construction activities.

Beginning in April 2015, UniSea personnel began conducting their surveys at the site under the direction of an ecological consultant. The consultation visited the site every month to ensure that data was gathered consistently and comprehensively. Observers monitored for a variety of marine mammals, including Steller sea lions, whales, and harbor seals. Both stationary and roving observations within a 1000 meter radius of the site took place in the area shown in Figure 9. A combination of two of the stationary observation points were surveyed each day for 15 minutes at each point. The roving route was checked once per day over a time span of 15 minutes. The roving route covered areas between the docks that were too difficult to see from the stationary points. The survey recorded the type of species observed, the number of species observed, the primary activity of the species, and any applicable notes. From April 25, 2015 through October 21, 2015, 115 sea otters, 262 Steller sea lions, and 33 harbor seals were observed within Iliuliuk Harbor.

Table 4. Summary of 2003-2013 Steller sea lion surveys.

Sector #	TOTAL	No. Surveys	Mean per Survey	Maximum	km of coast	Mean per km
1	0	21	0.00	0	0.85	0.00
2a	28	21	1.3	19	1.84	0.71
2b	21	21	1	4	1.26	0.79
3	8	21	0.38	3	0.87	0.44
4	9	21	0.43	5	0.88	0.49
5	**17**	**21**	**0.81**	**8**	**2.79**	**0.29**
6	**1**	**21**	**0.05**	**1**	**0.60**	**0.08**
7a	0	21	0	0	0.33	0.00
7b	184	21	8.78	55	0.28	31.36
8a	13	21	0.62	13	0.28	2.21
8b	17	21	0.81	17	0.49	1.65
9	51	21	2.43	17	0.63	3.86
10	24	21	1.14	11	0.78	1.46
11	3	21	0.14	1	0.54	0.26
12	1	21	0.05	1	0.82	0.06
13a	0	21	0	0	0.49	0.00
13b	0	21	0	0	0.67	0.00
13c	0	21	0	0	0.92	0.00
14	0	21	0	0	1.33	0.00
15	0	21	0	0	0.91	0.00
16	5	21	0.24	1	3.07	0.08
17	1	21	0.05	1	0.83	0.06
18	6	21	0.29	2	0.71	0.41
19	5	21	0.24	2	1.11	0.22
20a	1	21	0.05	1	1.32	0.04
20b	3	21	0.14	2	1.54	0.09
20c	14	21	0.67	10	1.23	0.54
21	0	21	0	0	0.77	0.00
22	3	21	0.14	3	0.74	0.19
23	**15**	**21**	**0.71**	**10**	**2.20**	**0.32**
23a	**3**	**21**	**0.14**	**1**	**1.30**	**0.11**
Total					31.08	

Data from surveys conducted by USACE. The proposed project is located in sector 23. Sectors 5, 6, 22, and 23a are within the zone of influence (bolded above).

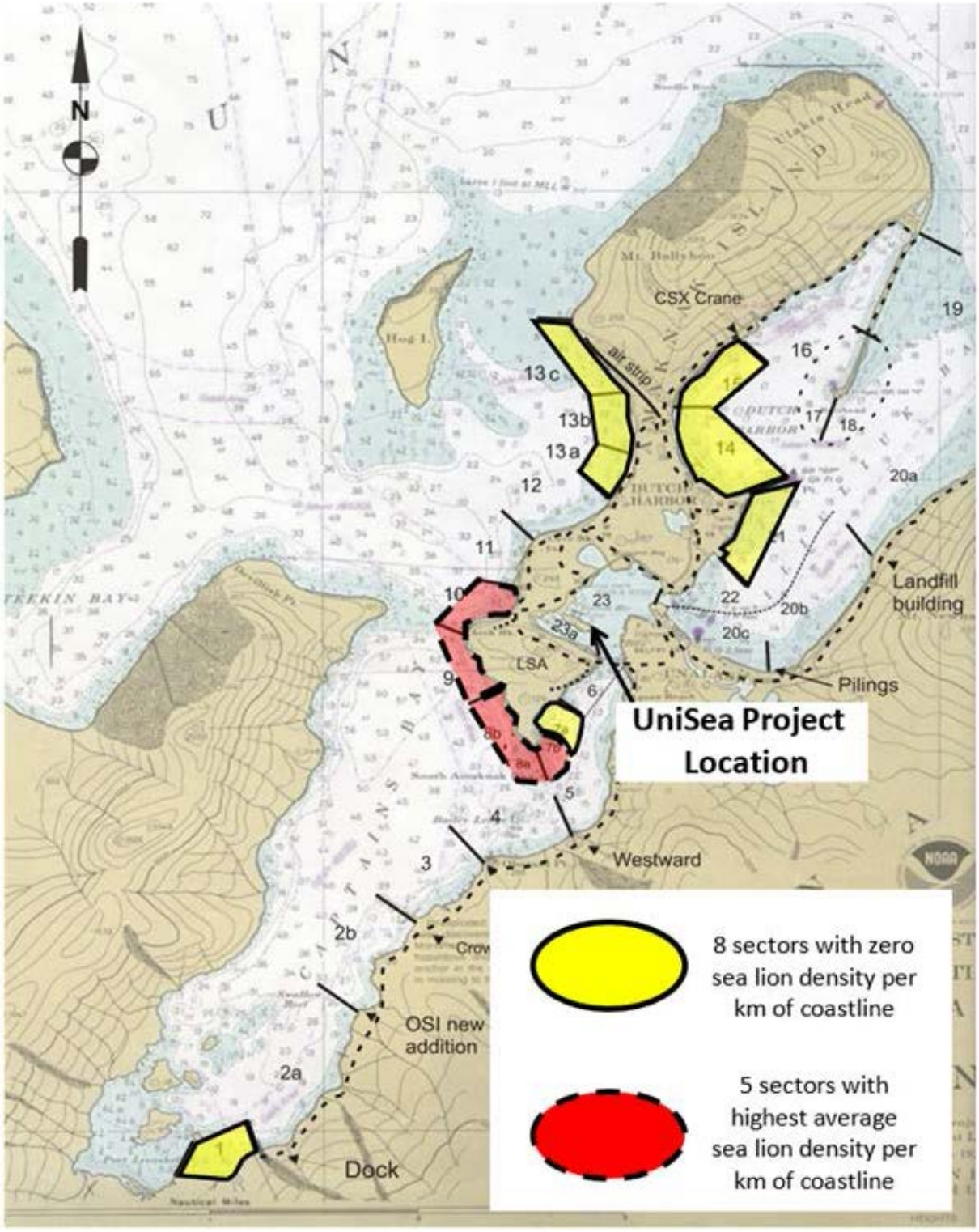

Figure 7. *Steller sea lion 2003-2013 survey sectors.*

Figure 8. *UniSea observation area.*

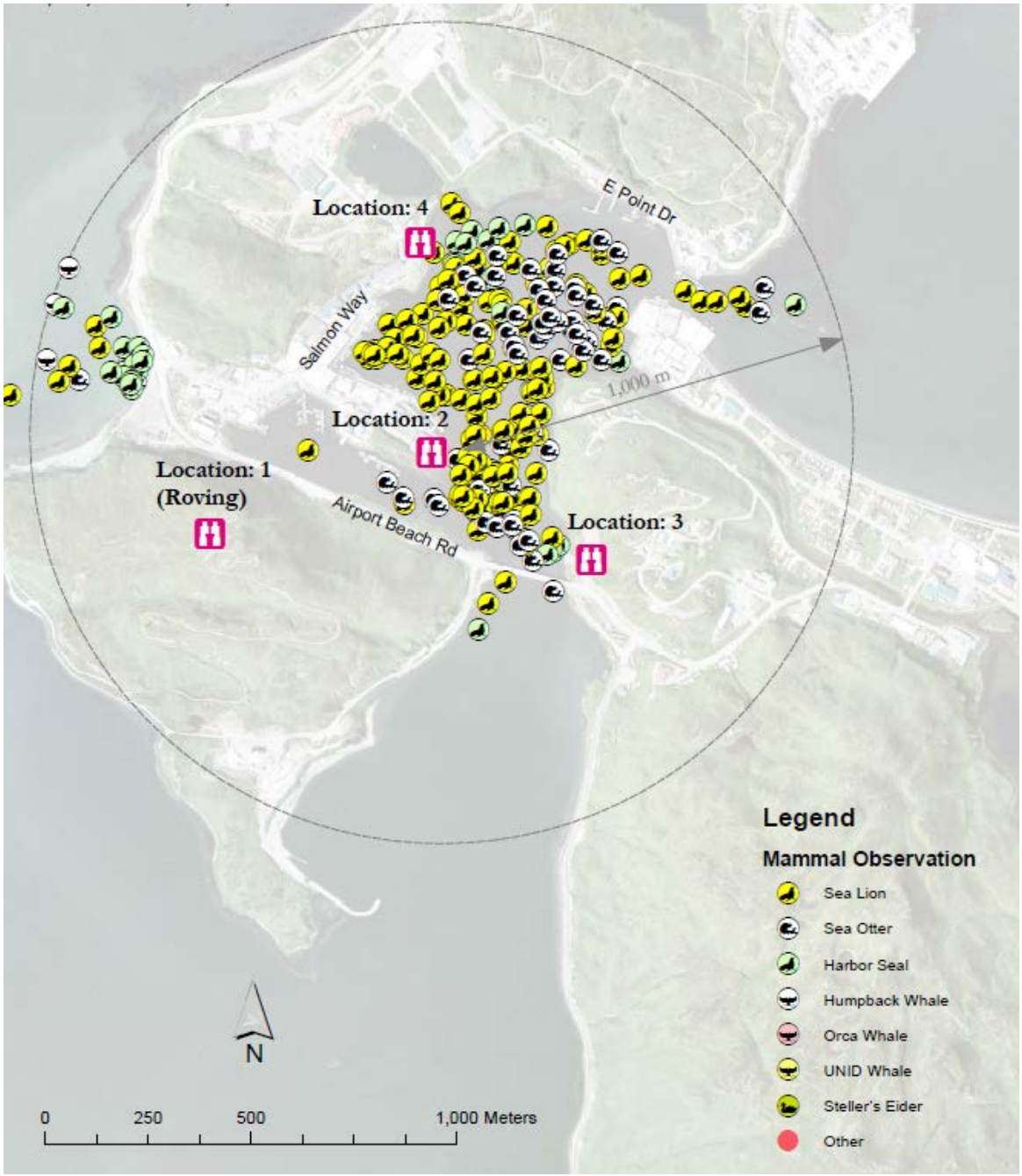

Figure 9. *Survey points and observations from April 26, 2015 through September 14, 2015.*

5 Type of Incidental Take Authorization Requested

The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury, and/or death) and the method of incidental taking.

5.1 Incidental Take Authorization Request

Under Section 101 (a)(5)(D) of the MMPA, UniSea requests an IHA for takes by behavioral harassment (Level B harassment) during pile driving operations associated with the construction of the proposed project. UniSea requests an IHA for incidental take of marine mammals described within this application for 1 year, to be issued in January 2016, but with an effective date of March 1, 2016. If further work is required at the end of that time to complete the proposed project, UniSea will ask NMFS for a renewal.

The activities outlined in Section 1 have the potential to take marine mammals by Level B harassment. Take will potentially result from the noise created by the impact and vibratory pile driving required for the removal and installation of various types of piles.

5.2 Method of Incidental Taking

This project will require the removal of a total of approximately seventy-three (73) 16-inch steel piles and seventy-two (72) 16-inch timber piles (timber piles are anticipated to be removed without the aid of a vibratory hammer). The project will also require the installation of the following quantities of piles below HTL:

- Twenty-four (24) 24-inch steel piles
- Four (4) 18-inch steel piles
- Fifty (50) 24-inch fiber reinforced polymer composite piles
- Eight hundred eighty-seven (887) steel sheet piles
- Approximately ten (10) temporary steel support piles per cell (total of 14 cells) for the sheet pile structures, and approximately eight (8) temporary steel support piles per dolphin and catwalk support location (2 locations each). Temporary support piles will also be removed after installation of permanent piles.

The removal and installation of these piles will temporarily increase the underwater and airborne noise within the project area. This increase in noise has the potential to result in the Level B harassment of marine mammals which may be present in the vicinity of the project during construction. Level A harassment is not expected to occur as a result of the proposed project, and the marine mammal monitoring protocols further described in the marine mammal monitoring plan in Appendix E will reduce the potential for exposure to levels of underwater and terrestrial noise above the threshold established by NMFS.

The thresholds for exposure to airborne and underwater noise for pinnipeds established by NMFS for Level A Harassment (injury) and Level B Harassment (behavioral disturbance) are:

- Level B Harassment of Steller sea lions due to airborne noise: 100 dB re: 20 µPa;
- Level B Harassment of harbor seals due to airborne noise: 90 dB re: 20 µPa;
- Level B Harassment due to underwater noise: 120 dB re: 1 µPa for vibratory pile driving;
- Level B Harassment due to underwater noise: 160 dB re: 1 µPa for impact pile driving;
- Level A Harassment due to underwater noise: 190 dB re: 1 µPa.

A Level A harassment zone of exclusion (190 dB) will be incorporated into the project to minimize the potential for Level A harassment of pinnipeds. If any pinniped(s) enter the zone of exclusion, all pile driving will shut down immediately, until the animal has voluntarily left the zone of exclusion. Additionally, any pinnipeds observed within the Level B harassment zone of influence (airborne: 90 and 100 dB; underwater: 120 and 160 dB) will be recorded as a take. The zone of exclusion and the zone of influence as well as the anticipated noise levels that are expected to result from the construction of this project are described below in sections 5.2.2 and 5.2.3.

5.2.1 Underwater Background Noise

On March 16, 2015, PND Engineers, Inc., (PND) visited Iliuliuk Harbor in Unalaska to collect underwater sound levels in the vicinity of the UniSea Dock for G1 Dock Replacement Project.

All hydroacoustic data were collected from the existing UniSea Dock or some distance offshore using an aluminum work skiff. The measurements took place at various distances from the dock in depths ranging from 1 meter (3.3 feet) to 10 meters (33 feet).

Underwater sound levels were recorded using an omni-directional CR1 hydrophone with -198 dB (re: 1V/µPa) transducer sensitivity over a frequency range from 10 Hz to 20 kHz. The voltage from the hydrophone was amplified using VP2000 preamplifier manufactured by RESON (Model EC6081 – Figure 10). The signals from the preamplifier were fed into ST1400ENV Sound Level Monitor (SLM) manufactured by Sound Technology, Inc. (Figure 11). The VP2000 preamplifier offers low-noise performance and allows the measurements at frequency below 1Hz. The SLM measures the un-weighted peak sound pressure levels over short periods (less than 10 milliseconds), as well as slow averaged (1,000 milliseconds exponential average) and fast averaged (125 milliseconds exponential average) Sound Pressure Levels (SPL). The ST1400ENV SLM has a frequency response of +/- 1 dB from 10 Hz to 48 kHz over anticipated measurement range of 120 to 220 dB linear peak re: 1 µPa. The capacitance of the CR1 hydrophone is documented during factory calibration and remains fixed as long as the cable is not altered. The CR1 hydrophone sensitivity is accurate to +/-2 dB, based on measurements made at the Naval Warfare Center Acoustic Test Facility.

All recording stations were categorized as either "drift" or "fixed". For drift stations, the vessel was allowed to move with currents and wind with all engines turned off. The crew avoided unnecessary movements and activities in the vessel to minimize noise artifacts. Positions for the drifting stations were recorded using a handheld GPS receiver. Figure 11 shows the instrumentation during data collection for drifting station in the vicinity of the existing UniSea dock. At the fixed locations the hydrophone was lowered from the existing dock face to the desired depth (Figure 12).

All collected data were backed up at the end of each day to a portable hard drive. All pertinent information (i.e., weather, tide, vessel activities, etc.) for the duration of each data file was documented in field logs.

Ambient underwater sound levels were collected for a minimum of 10 minutes for each location. In post-processing, the background sound levels were determined by root mean square averaging of 10 minutes of recorded data ($RMS_{10\ min}$). The values of sound pressure levels (SPL) shown below (Table 6) do not represent individual transient sound, but rather an average of existing background levels.

Sound level recordings for the majority of the drifting station locations were conducted on March 16 during calm weather; however data collected on March 17 and 18 was affected by strong winds, two to three foot

waves, and rain. These environmental conditions cause the hydrophone's cable to strum, which generates artificial noise in a narrow range of frequency between 0 to about 50 Hz.

The average SPL values were calculated over two frequency ranges: the entire frequency band ("broad band SPL" from 0 Hz – 24.5 kHz) as well as over specified background frequency range (from 75 Hz – 20 kHz) using pinniped criteria described in a NMFS 2012 guidance document on data collection methods for background noise (NMFS 2012). The guidance presented in the document recommends eliminating frequencies below the range of functional hearing of marine mammals (Table 5).

Figure 12 shows the sound pressure levels (SPL), both covering entire frequency (0 Hz – 24.5 kHz) as well as the pinniped hearing frequency band (75 Hz to 20 kHz). As presented in Figure 8, the ambient pinniped frequency (75Hz – 20kHz) SPL varied from 110.5 dB $RMS_{10\ min}$ recorded at Captains Bay to 131.3 dB $RMS_{10\ min}$ recorded immediately in front of existing UniSea Dock. The average of all sound levels recorded during this survey was 119 dB $RMS_{10\ min}$ (75 Hz-20 kHz). The map of color-coded sound pressure levels for every monitoring location is presented in Figure 13. Measurements taken while drifting are indicated with a color-coded line showing the area traversed during the drift. Measurements taken from fixed positions are indicated by a color-coded dot. This indicates that Iliuliuk Harbor is a noisy body of water. Anthropogenic (industrial) underwater sounds were easily detectable in all recorded data. These sounds originated from vessel traffic, adjacent processing facilities, vehicle traffic, and machinery. A variety of unidentified periodic mechanical sounds from unknown sources dominated in some recorded data. These sounds were characterized as noise from engines, motors and pumps. Under the South Channel Bridge, 0.5 miles southeast from UniSea Dock, vehicle traffic sounds were found to transmit via concrete columns into the water column. Vessel propulsion and mechanical sounds dominated in recorded sound pressure levels in close proximity to the docks. The lowest sound levels were recorded south from South Channel Bridge in the northern side of the Captains Bay.

Table 5. *Low and high limits for characterizing underwater background sound relevant to marine mammals.*

Functional hearing group	f-low	f-high
Low-frequency cetaceans	7 Hz	20 kHz
Mid-frequency cetaceans	150 Hz	20 kHz
High-frequency cetaceans	200 Hz	20 kHz
Pinnipeds	75 Hz	20 kHz

(NMFS, 2012).

Table 6. UniSea Dock underwater background noise monitoring data.

Site	Date	Time Start	Time End	Depth of Hydrophone (meters)	Ambient Noise Recording Period (minutes)	Averaged Spectrum Power Over Entire (0Hz-24.5kHz) Frequency (dB RMS)	Averaged Spectrum Power 75Hz-20kHz Frequency (dB RMS)	Conditions
U1	3/16/2015	13:32	13:42	10	10	134.1	125.8	Measuring from boat. 5-10 mph wind, small waves. Slight strumming on cable, due to drifting. 7 vessels loading/unloading at the dock
U2	3/16/2015	13:52	14:02	10	10	133.2	120.3	Measuring from boat. 5-10 mph wind, small waves. Slight strumming on cable, due to drifting.
U2-5	3/16/2015	14:11	14:21	5	10	146.7	120.1	Measuring from boat. 5-10 mph wind, small waves. Slight strumming on cable, due to drifting. Change depth to 5 meters.
U2-1	3/16/2015	14:38	14:48	1	10	132.5	119.6	Measuring from boat. 5-10 mph wind, small waves. Slight strumming on cable, due to drifting. Change depth to 1 meters.
U3	3/16/2015	15:01	15:11	3	10	138.8	122.4	Measuring from boat. Shallow depth. Slight strumming on cable, due to drifting. Large vessel "Cape Caution" moving from dock.
U6	3/16/2015	15:16	15:26	10	10	139.4	110.5	Measuring from boat. Under the bridge. Calm. Cloudy. Slight strumming on cable, due to drifting. Higher noise levels when drifting under the bridge.
U12	3/16/2015	15:32	15:42	10	10	119.8	111.1	Measuring from boat inside Captains Bay. Calm. Cloudy.
U8	3/16/2015	15:51	16:00	1	9	119.7	112.9	Measuring from boat inside Captains Bay. Shallow water. Calm. Cloudy.
U5	3/17/2015	14:43	14:53	5	10	137.5	122.6	Measuring from dock. Windy, Rain. Vessel "Cape Caution" moored 300 ft from site.
U9	3/17/2015	15:06	15:16	5	10	137.5	131.3	Measuring from dock between two moored vessels. Windy, Rain.
U7	3/18/2015	14:05	14:15	5	10	146.8	114.2	Measuring from boat. Calm. Wind increasing toward the middle of file. Rain/Snow.
U10	3/18/2015	14:52	15:02	10	10	145.4	124.9	Measuring from boat. Windy. Small waves can be heard breaking on skiff. Hydrophone is strumming. Drifted to the dock.
U4	3/18/2015	15:06	15:17	10	10	135.7	116.8	Measuring from boat. Windy. Small waves can be heard breaking on skiff.

Figure 10. *RESON Preamplifier - VP2000.*

Figure 11. *Sound level monitor – ST1400ENV during data collection at drifting station.*

Figure 12. *Underwater sound recording from existing UniSea Dock.*

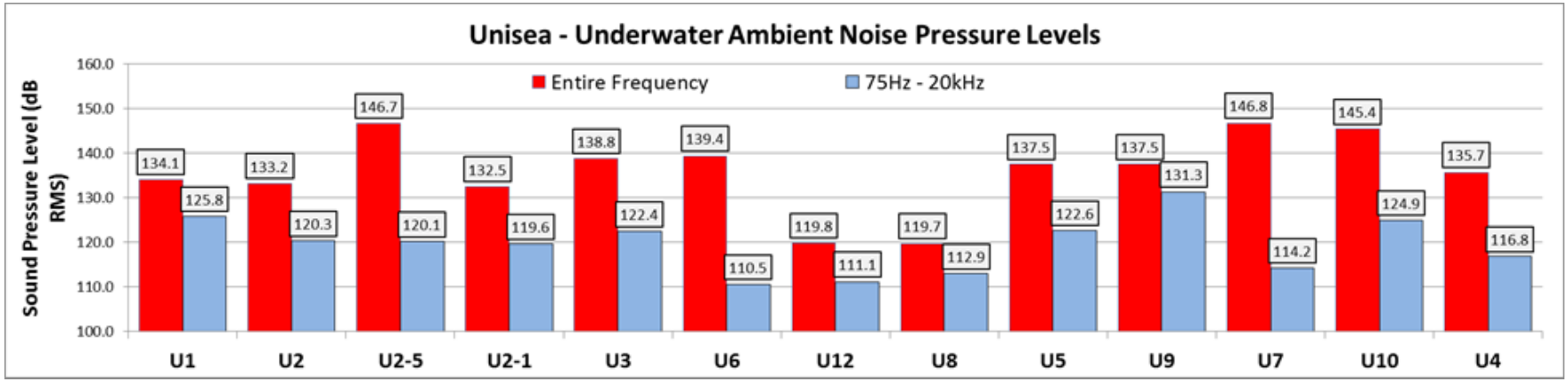

Figure 13. *UniSea background sound pressure levels.*

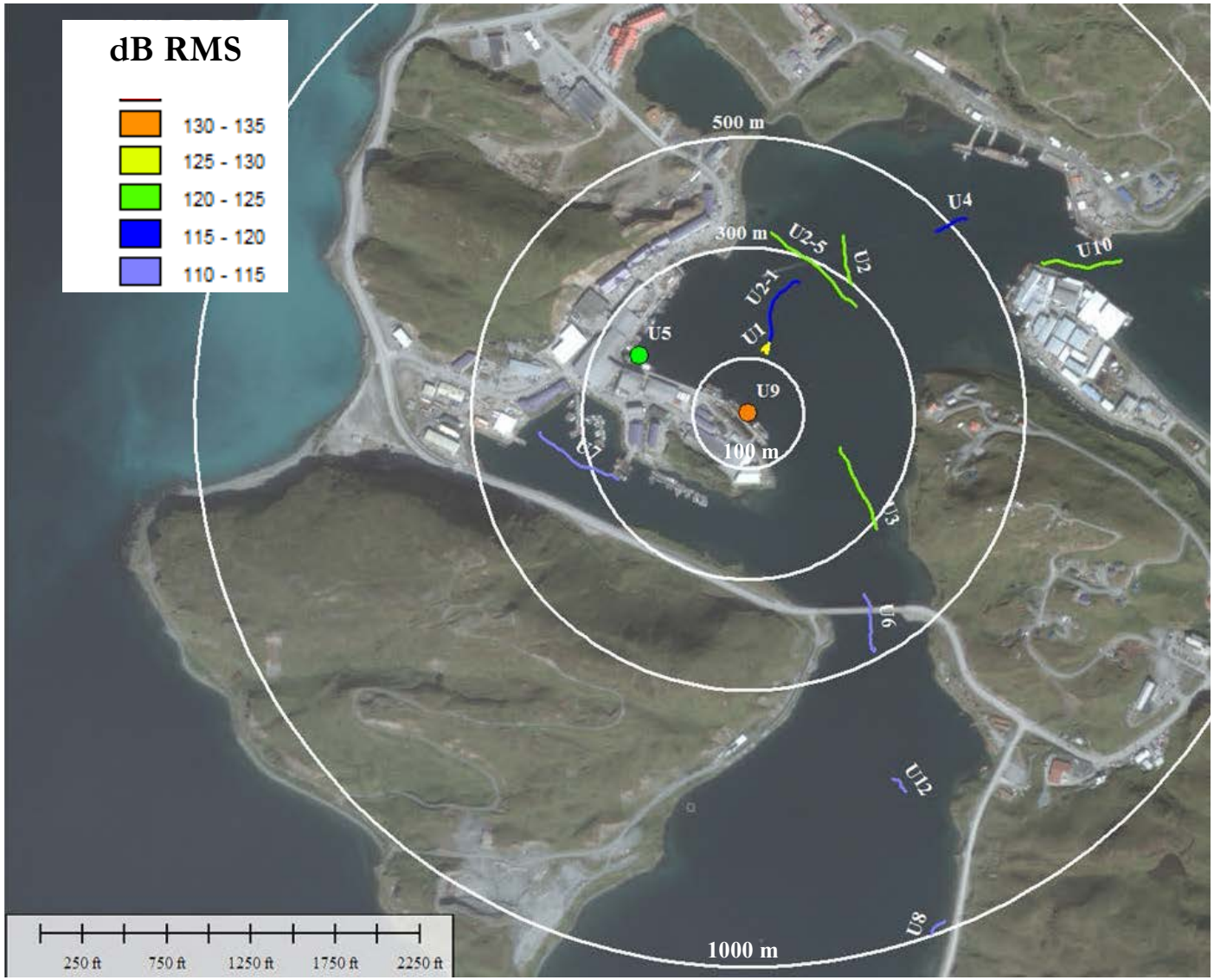

Figure 14. *Map of background noise levels at various distances from the dock*

5.2.2 Underwater Noise

During the installation of piles, the project has the potential to increase underwater noise levels. This could result in disturbance to pinnipeds that occur within the zone of exclusion or zone of influence. A formula for calculating the practical spreading loss was used to determine the zones in which pinnipeds have the potential to face disturbance. The formula for calculating practical spreading loss is:

$$TL = 15 \log(R_1/R_2)$$

where:

TL = Transmission loss (dB)
R_1 = Range of the sound pressure level (m)
R_2 = Distance from the source of the initial measurement (m)

The installation of steel sheet piles using a vibratory hammer can result in underwater noise levels reaching 165 dB $_{RMS}$ at 10 meters (Caltrans, 2012). Underwater noise levels during the vibratory removal and installation of a 24-inch steel pile can reach 163 dB $_{RMS}$ at 10 meters (Illingworth & Rodkin, 2013). Underwater noise levels during the impact pile driving of a 24-inch steel pile can reach 184 dB $_{RMS}$ at 10 meters (Illingworth & Rodkin, 2013). Down-the-hole drilling methods generate pulses with a maximum sound source level of 165 dB (re: 1 µPa at 1m) at 200 Hz (URS, 2011). Based on a project similar to the proposed action, the zone of exclusion (Level B harassment for pulsed noise sources) for the down-the-hole drill is estimated to be 3 meters (URS, 2011). The proposed zones of influence and exclusion for the down-the-hole drill extend 10 meters from the drilling locations (see Appendix B).

Using data from the Naval Base Kitsap at Bangor Trident Support Facilities Explosive Handling Wharf (EHW-2) Project (Illingworth & Rodkin, 2013) along with the practical spreading loss equation, it has been determined that the Level A Harassment underwater zone of exclusion for pinnipeds would extend out 10 meters from the proposed project site during all pile removal and installation activities. Based on noise attenuation analysis, the Level B Harassment underwater zone of influence would extend out to 10,000 meters during vibratory pile driving and 7,400 meters during vibratory pile removal. The Level B harassment underwater zone of influence during impact pile driving would extend out to 500 meters during impact pile driving activities. The proposed project will shut down when any pinnipeds come within a 10-meter radius of pile driving activities in order to protect pinnipeds from potential harm caused by noise. All pinnipeds that come within the *effective* zone of influence for vibratory pile driving, vibratory pile removal, and impact pile driving activities will be recorded as takes. The effective zones of influence are adjusted for land features within Iliuliuk Harbor (see figures in Appendix B).

5.2.3 Airborne Noise

During the installation of piles, the project has the potential to increase airborne noise levels. This could result in disturbance to pinnipeds at the surface of the water or hauled out along the shoreline of the harbor. A formula for calculating the spherical spreading loss was used to determine the levels at which airborne noise could result in disturbance (NFEC, 2010).

The formula for calculating spherical spreading loss is:

$$TL = 20\log r$$

where:

TL = Transmission loss (dB)

r = Distance from source to receiver (m)

*Spherical spreading results in a 6 dB decrease in sound pressure level per doubling of distance.

Vibratory removal and installation of a 24-inch steel pile can result in airborne sound levels up to 100 dB $L_{eq/RMS}$ at 22 meters (Illingworth & Rodkin, 2013). Illingworth & Rodkin recorded sound levels of 100 dB $L_{eq/RMS}$ (Level B airborne threshold for pinnipeds) from the installation of 24-inch impact driven steel piles at 26 meters during the EHW-2 Project (2013). Using data from the EHW-2 project (Illingworth & Rodkin, 2013) along with the spherical spreading loss formula, it has been determined that the Level B Harassment airborne zone of influence for pinnipeds would extend out 30 meters from the proposed project site during the installation of 24-inch steel pile. Unfortunately, no data was found for the airborne sound levels expected from the installation of steel sheet piles or 18-inch steel piles. Sound levels from the installation of steel sheet piles and 18-inch steel piles are likely to be within a similar range as the sound levels mentioned above, but will most certainly be within the underwater zone of influence. Since this area is located entirely within the underwater zone of influence, the pinnipeds that come within this area will already be recorded as a take based on Level B harassment threshold for underwater noise.

Table 7. *Zones of Exclusion and Influence.*

Source	Zone of Exclusion (m)	Zone of Influence (m) *
Underwater		
Vibratory Pile Installation	10	10,000
Vibratory Pile Removal	10	7,400
Impact Pile Installation	10	500
Drilling for Pile Installation	10	10
Airborne		
All Pile Removal/Installation	N/A	30

** Zones of Influence adjusted for land features (see figures in Appendix B).*

6 Number of Marine Mammals that May Be Affected

By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in Section 5, and the number of times such takings by each type of taking are likely to occur.

6.1 Estimated Exposures

The number of marine mammals that may be exposed to Level B harassment thresholds is calculated by estimating the likelihood of a marine mammal being present within a zone of influence during active pile removal/driving. Expected marine mammal presence is determined by past observations and general abundance near the proposed project area during construction.

The following equations were used to determine the exposure estimate and number of marine mammals exposed to sound levels associated with Level B Harassment using the 2015 survey data:

$$Observation\ Rate\ (OR) = \frac{No.\ of\ animals\ observed}{Hours\ of\ observation} \quad \text{(Equation 6-1)}$$

$$Exposure\ Rate\ (XR) = \mu_{OR} + CI_{95} \quad \text{(Equation 6-2)}$$

where: $\mu_{OR} = Average\ of\ Monthly\ Observation\ Rates$
$CI_{95} = 95\%\ Confidence\ Interval\ (Normal\ Distribution)$

$$Estimated\ Exposures = XR \times Duration\ (hours) \quad \text{(Equation 6-3)}$$

For calculation of the **Exposure Rate**, the upper bound of the 95% Confidence Interval (above the average monthly **Observation Rate)** is used to account for variability of the small data set. A **Duration** for pile driving/removal activities when noise is actually being generated from a vibratory or impact hammer (including temporary piles for templating and soft-start procedures) of approximately 50% of the total estimated duration of 180 days (2,160 hours for 12-hour work days) is considered to be reasonable for the purpose of exposure estimate. The other 50% of the time during pile driving/removal activities is spent installing templating and bracing, moving equipment, threading sheet piles, pulling piles, etc. without noise being generated from a hammer.

Refer to Appendix G for statistical analysis of the observation data from the 2015 surveys and calculation of estimated exposures.

6.2 Steller Sea Lion

Based upon the estimated zones of influence discussed in Section 5.2.2 and surveys completed by UniSea from January 2015 through October 2015, the following exposure estimate was calculated:

μ_{OR} = 1.219 animals/hour
CI_{95} = 0.798 animals/hour
XR = 2.016 animals/hour

Estimated Exposures = 2.016 animals/hour * 1,080 hours = 2,177 exposures

Therefore, UniSea is requesting authorization for Level B harassment take of **2,177** Steller sea lions. The minimum population estimate of the western DPS of the Steller sea lion is 45,659 (Allen and Angliss 2014). The total potential take requested is 4.8% of the western DPS of the Steller sea lion.

6.3 Harbor Seal

Based upon the estimated zones of influence discussed in Section 5.2.2 as well as and surveys completed by UniSea from April 2015 through October 2015, the following exposure estimate was calculated:

μ_{OR} = 0.171 animals/hour
CI_{95} = 0.185 animals/hour
XR = 0.356 animals/hour

Estimated Exposures = 0.356 animals/hour * 1,080 hours = 385 exposures

Therefore, UniSea is requesting authorization for Level B harassment take of **385** harbor seals. The minimum population estimate of the Aleutian Islands stock of the harbor seal is 3,313 (Allen and Angliss 2014). The total potential take requested is 11.6% of the Aleutian Islands stock of the harbor seal.

7 Anticipated Impact on Species or Stocks

The anticipated impact of the activity to the species or stock of marine mammal.

The proposed project has the potential to impact marine mammals, primarily Steller sea lions and harbor seals, by increasing noise in Iliuliuk Harbor to a level above the Level B harassment threshold. The applicant will use heavy equipment to drive piles and face sheets into the sea bottom, and to compact the fill material, which would cause airborne noise and underwater noise. The project also has the potential to increase the likelihood of vessel interactions with marine mammals.

7.1 Noise

Increases in noise levels from in-water activities like pile driving can reduce a marine mammal's capability to hear other noises, like background noise and noise created by their prey and predators (Southall et al., 2007). Marine mammals can also experience changes in sensitivity to sounds after exposure to intense sounds for long periods of time. These changes, called threshold shifts, can occur on a temporary or permanent level, depending on the intensity of the sound and length of time to which the animal is exposed to the sound. Typically temporary threshold shifts (TTS) include impacts to middle-ear muscular activity, increased blood flow, and general auditory fatigue (Southall et al., 2007). At the TTS level, the animals don't experience a permanent change in hearing sensitivity and exhibit no signs of physical injury. A permanent threshold shift (PTS) would occur if the animal subjected to the increased sound level did not return to pre-exposure conditions within an order of weeks or if the animal exhibited physical injuries (Southall et al., 2007).

Pinnipeds are sensitive to underwater and airborne noise. Recent studies have shown that even moderate levels of underwater noise can cause a temporary loss in hearing sensitivity in some marine mammals (Kastak et al., 2005). The proposed project will have the possibility to result in the Level B harassment of pinnipeds due to increases in noise levels associated with pile removal and installation. Level B harassment is temporary in nature, and the impacts associated with the potential harassment resulting from this project will be temporary. Mitigation measures discussed in section 11, such as soft start procedures and bubble curtains, will be incorporated into the project to prevent the Level A harassment, or PTS, of pinnipeds.

7.2 Vessel Interactions

Iliuliuk Harbor is an industrial area, with two fish processing facilities that both have marine docks, a nearby small boat harbor, and other docking facilities. Local fishermen also use docks along the Lower Iliuliuk River for their small fishing boats, and must use the harbor to access the river docks. The proposed project has the potential to temporarily increase vessels using Iliuliuk Harbor, should the contractor choose to use a barge and crane to install piles instead of conducting operations from the existing facilities. Since the existing fish processing facilities must remain in operation while construction of the proposed project takes place, working from a barge located within the harbor may allow for more space for the users of the site. The increase in the likelihood of vessel interactions will be temporary and occur only during construction. The new G1 dock is not likely to result in a permanent increase in vessel traffic. Vessel traffic will remain at the same level it was prior to the existing structure becoming condemned.

8 Anticipated Impact on Subsistence

The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

Subsistence hunting and fishing is an important part of the history and culture of Unalaska Island for thousands of years. Sea lions and harbor seals have been of particular importance to the Unangan people that have inhabited Unalaska since the pre-contact period. Historically, hunting during the winter occurred in Unalaska Bay. In other seasons, hunting occurred at Bishop Point, Winslow Island, Unalga Island, Beaver Point, and point between those areas (Haynes and Mishler, 1991).

There are no relevant subsistence uses of marine mammals implicated by the proposed project. Iliuliuk Harbor is not likely to be used for subsistence hunting or fishing due to its industrial nature. Several fish processing facilities are located along the shoreline of the harbor. The nearby Lower Iliuliuk River is used for fishing by a variety of locals. There is sufficient distance between the proposed project and the Lower Iliuliuk River that there is little to no potential that fish entering the river will be impacted.

8.1 Steller Sea Lion Subsistence Hunting in Unalaska

In 2008, the most recent year for published Alaska Department of Fish and Game (ADF&G) reports on subsistence harvests, 28.6% of native households in Unalaska used sea lions (Wolfe et al., 2009). The amount of individuals harvested in Unalaska has decreased from 1994 through 2008 (Table 8). Data from most communities that previously participated in Steller sea lion harvests, including Unalaska, is no longer being collected as of 2009.

Table 8. *Estimated Steller sea lion harvest in Unalaska from 1994-2008.*

Year	Estimated Harvest (in Individuals)	Estimated Pounds
1994	54	3003
1995	37	2094
1996	20	1137
1997	27	1485
1998	13	713
2000	34	1920
2001	38	2117
2002	14	800
2003	14	800
2004	29	1600
2005	30	1680
2006	9	504
2007	11	605
2008	0	0

(Wolfe, et al., 2009)

8.2 Harbor Seal Subsistence Hunting in Unalaska

A harvest of harbor seals did not occur in Unalaska in 2008 (Wolfe et al., 2009). The last recorded harvest resulted in the harvest of 11 harbor seals. The harvest numbers have been decreasing since recording started in 1994. As of 2009, data from most communities that previously participated in harbor seal harvests, including Unalaska, is no longer being collected.

Table 9. *Estimated harbor seal harvest in Unalaska from 1994-2008.*

Year	Estimated Harvest (in Individuals)	Estimated Pounds
1994	54	3003
1995	37	2094
1996	20	1137
1997	27	1485
1998	13	713
2000	34	1920
2001	38	2117
2002	14	800
2003	14	800
2004	29	1600
2005	30	1680
2006	9	504
2007	11	605
2008	0	0

(Wolfe, et al., 2009)

8.3 Impact on Subsistence Hunting

The proposed project will not result in the death or serious injury of any marine mammal. The project has the potential to expose pinnipeds to sound levels above the Level B harassment threshold is anticipated to result from the proposed project. The project is likely to result only in short-term, temporary impacts to pinnipeds. The proposed project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes.

9 Anticipated Impact on Habitat

The anticipated impact of the activity upon the habitat of the marine mammal populations and the likelihood of restoration of the affected habitat.

9.1 Animal Avoidance or Abandonment

The anticipated increase in noise levels from the removal and installation of piles that will occur with this project could cause animals to avoid the area during pile installation activities. The primary reason that animals would leave the project area would be due to elevated noise levels. The background noise levels within the project area are already elevated above the Level B harassment level, but pile driving has the potential to increase noise levels even higher as discussed in Sections 5.2.2 and 5.2.3.

While it is possible that pinnipeds may avoid the project area during pile driving, they are not likely to abandon the site altogether. Nearby fish processing operations often attract pinnipeds and other marine mammals to Iliuliuk Harbor due to the availability of prey. It is also not uncommon for commercial, subsistence, and sport fishermen to clean fish out of their nets within the marine waters around Unalaska. Due to this site being both a frequently used commercial fishing dock and a fish processing facility, pinnipeds are likely to return to the project site after construction activities are finished.

9.2 Impacts to Physical Habitat

Approximately 1.05 acres of intertidal habitat will be filled as a result of the proposed project. The intertidal habitat is commonly used by marine mammals, like Northern sea otters, and sea birds, like Steller's eiders. The habitat that is used by pinnipeds does not typically include the project fill area, although Steller sea lions and harbor seals have been known to chase fish below the dock and forage on fishing boats that are docked at the facility. The intertidal habitat of the project site was surveyed in 2005 by Pentec Environmental (now Hart Crowser). In their draft report, Pentec noted that the substrate in the areas adjacent to the shoreline was made up of a "narrow portion of riprap that quickly grades to larger cobbles and rock," while deeper areas were made up of areas of gravel and cobble interspersed among shell-covered silty-sand (Pentec, 2005). Kelp, rockweed, mussels, and urchins were found within the shallow, intertidal areas (0 to -10 feet). In the subtidal areas (-10 to -20 feet), plumose anemones, sculpins, and several crab species were seen. Shell debris with mussels and clams, sea cucumbers, urchins, and algae were found within -30 feet waters. Beyond -30 feet, tubeworms, nudibranchs, and marine snails were common. No eelgrass or dense kelp beds were found to be in the surveyed area.

With the exception of the 1.05 acres of intertidal habitat that will be filled by the installation of the sheet pile bulkhead dock, no long-term permanent impacts are expected to occur as a result of this project. To mitigate the loss of intertidal habitat, UniSea will remove marine debris from a beach within the vicinity of the project (Appendix F). The removal of this debris will improve the intertidal habitat and reduce the risk of entanglement for marine mammals that occur within the vicinity of the project.

Sediment quality in Iliuliuk Harbor was found to be impaired by the Alaska Department of Environmental Conservation (ADEC) in the 2010 report on total maximum daily loads of petroleum hydrocarbons in Iliuliuk Harbor (ADEC, 2010). The report found that the Iliuliuk Harbor was among the most impacted areas within the areas reported in Unalaska, with contamination more likely to occur around active docks. Dredging is not

proposed as part of this project. Very minimal sediment may enter the water column during pile removal, but it is not expected to exacerbate existing sediment or water quality issues.

The proposed project also has very minimal potential to impair the water quality in Iliuliuk Harbor. The coastline waters of the harbor were identified as impacted during a 2006 assessment by ADEC (ADEC, 2010). The potential sources of this contamination include several nearby contaminated sites as well as many industrial sources that currently operate within the harbor area. For this project, only clean fill will be placed below HTL. With the exception of armor stone that is required for slope stability, fill in each cell will be placed after the installation of the sheet piles. The sheet piles will act as a silt curtain, keeping sediment contained behind each cell. The proposed project will incorporate best management practices and minimization measures to prevent any deleterious impacts to water and sediment quality within Iliuliuk Harbor. The existing facilities are required to comply with ADEC regulations for water quality.

10 Anticipated Impact of Loss or Modification of Habitat

The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.

The proposed project is not likely to result in the loss or modification of Steller sea lion or harbor seal habitat. Steller sea lion critical habitat is unlikely to be impacted by this project, as approximately 10 miles of rough, mountainous terrain occurs between the project site and the closest haulouts – Cape Sedanka and Old Man Rocks. No significant foraging areas for Steller sea lions will be impacted by this project. Foraging and dispersal habitat for Steller sea lions will be temporarily impact by the increase in underwater and airborne noise. Steller sea lions currently forage in close proximity to fishing boats within Iliuliuk Harbor. The project will result in temporary impact to the foraging and dispersal habitat, but it is not anticipated that the project will result in permanent impacts. There will be no loss in permanent habitat for Steller sea lions or harbor seals as a result of this project.

11 Mitigation Measures

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

11.1 All Construction Activities

The proposed project avoids impacts as much as practicable, but impacts could not be avoided entirely as this project is dependent on maritime access by nature. The proposed project replaces two existing dilapidated marine structures. Dock components added as part of this modification were minimized to the extent possible to provide a safe and functional dock without causing interference with adjacent facilities and navigation. Several alternatives were considered for this project, but none provided the same level of protection from vessel impacts, low maintenance costs, and new upland space that is essential for the existing facility.

The following measures will be incorporated by the applicant in order to minimize potential impacts:

- Fill placed in the tidelands will be clean blasted rock with relatively few fines to reduce impacts to turbidity and/or sedimentation.
- Fill will be placed after the installation of the sheet piles is completed for each cell. The sheet piles will the fill and act as a silt curtain and contain rocks and sediment.
- The dock will be maintained in a manner that does not introduce any pollutants or debris into the harbor or cause a migration barrier for fish.
- Storm water drainage from the surface of the dock will be captured, combined and treated with the facility's existing process water treatment system.
- Fuels, lubricants, and other hazardous substances will not be stored below the ordinary high water mark.
- Properly sized equipment will be used.
- Oil booms will be readily available for containment should any releases occur.
- The contractor will check for leaks regularly on any equipment, hoses, and fuel storage that occur at the project site.
- All chemicals and petroleum products will be properly stored to prevent spills.
- No petroleum products, cement, chemicals, or other deleterious materials will be allowed to enter surface waters.

11.2 Pile Driving and Removal Activities

UniSea has established shutdown zones (zone of exclusion) to delineate areas in which marine mammals may be exposed to injurious underwater sound levels due to pile driving. Marine mammal monitoring will also occur in areas beyond the shutdown zone, called "zones of influence," where sound pressure levels may cause harassment. The shutdown zone (zone of exclusion) and zone of influence are shown in Appendix B.

11.2.1 Shutdown Zones and Zone of Influence

- During impact pile driving and vibratory pile driving/removal, the shutdown zone, or zone of exclusion, shall include all areas where the underwater SPLs are anticipated to equal the Level A (injury) harassment criteria for pinnipeds (190 dB isopleth). The shutdown zone encompasses a radius 10 meters around the pile being driven/removed

- During impact pile driving, the zone of influence shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level B harassment criteria for marine mammals during impact pile driving (160 dB isopleth).
- During vibratory pile driving and removal, the zone of influence shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level B harassment criteria for marine mammals during vibratory pile driving (120 dB isopleth).
- The shutdown zone and zone of influence will be monitored throughout the time required to drive or remove a pile. If a marine mammal enters the zone of influence, an exposure will be recorded and animal behaviors documented. However, the pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone.
- If a marine mammal approaches or enters the shutdown zone, all pile driving/removal activities associated will immediately be halted.
- Under certain construction circumstances where initiating the shutdown and clearance procedures would result in an imminent concern for human safety, the shutdown provision may be waived at the discretion of the construction foreman. A pile may be deemed "dangerous" if the implementation of the shutdown procedures would: 1) constitute a significant hazard to the personnel installing/removing the pile, or 2) create a risk of the pile slipping from the cradle during shutdown procedures due to the angle of installation/removal. The construction foreman would be required to coordinate with the monitoring coordinator at the start of each construction day to identify in advance the piles which may meet these criteria. In the event that shutdown procedures were waived for any piles for reasons (1) or (2) above, UniSea would be notified on the same day of the event, and a written justification would be provided by the construction foreman documenting the necessity for waiving shutdown procedures.

11.2.2 Shutdown Zone (In-water construction activities not involving a pile driving hammer):

- During in-water construction activities not involving a pile driver, but having the potential to affect marine mammals, in order to prevent injury to these species from their physical interaction with construction equipment, a shutdown zone of 10 meters (33 feet) will be monitored to ensure that marine mammals are not present in this zone.
- These activities could include, but are not limited to: (1) the positioning of the pile on the substrate via a crane (i.e., "stabbing" the pile), (2) the removal of the pile from the water column/substrate via a crane (i.e. "deadpull"), or (3) the placement of sound attenuation devices around the piles.

11.2.3 Marine Mammal Monitoring

Trained observers will be on site before, during and after all pile driving activities. The observers will be authorized to shut down activity if pinnipeds are observed approaching or within 10 meters (zone of exclusion) of any pile driving activities (Section 11.2.5). This area has been determined to be a shutdown zone, as animals that enter this area are likely to be exposed to Level A harassment – the area in which high noise levels may cause injury.

Observers will follow observer protocols, meet training requirements, fill out data forms and report findings in accordance with protocols reviewed and approved by NMFS. A detailed monitoring plan is found in Appendix E.

11.2.4 Proposed Shutdown and Monitoring Zones

The proposed zone of exclusion (190 dB) and zones of influence (160 and 120 dB; Section 5.2.2) will be monitored before, during, and after all in-water construction activity. If pinnipeds are observed approaching or within the zone of exclusion, shutdown procedures will be implemented to prevent a Level A exposure. If pinnipeds are observed within the zones of influence, the sighting will be documented as a Level B take. If the number of pinnipeds exposed to 160 and 120 dB approaches the number of takes allowed by the IHA, UniSea will notify NMFS and seek further consultation. If any marine mammal species is encountered that is not authorized by the IHA and are likely to be exposed to sound pressure levels greater than or equal to the zones of influence, then UniSea will shut down in-water activity to avoid take of those species and consult with NMFS.

11.2.5 Clearing the Zone of Exclusion

Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, the observer will clear the zone of exclusion (10 meters) for a period of 15 minutes. Clearing the zone of exclusion means a marine mammal has not been observed within the zone of exclusion for that 15 minute period. If a marine mammal is observed within the Zone of Exclusion, a soft-start (11.2.6 Soft Start Procedures) cannot proceed until the marine mammal has left the zone of exclusion or has not been observed for 15 minutes.

11.2.6 Soft Start Procedures

Soft start procedures will be used prior to pile removal, pile installation, and in-water fill placement to allow marine mammals to leave the area prior to exposure to maximum noise levels. For vibratory hammers, the soft start technique will initiate noise from the hammer for 15 seconds at a reduced energy level, followed by 1-minute waiting period and repeat the procedure two additional times. For impact hammers, the soft start technique will initiate three strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would also be repeated two additional times (Anchorage Fish and Wildlife Field Office 2012).

11.2.7 Shutdown Procedures

A shutdown will occur when pile driving is suspended. Shutdown procedures will be implemented if a pinniped is observed in or approaching the zone of exclusion (190 dB). Activity will cease until the observer is confident that the pinniped is clear of the zone of exclusion: The animal will be considered clear if:

- It has been observed leaving the exclusion zone; or
- It has not been seen in the exclusion zone for 15 minutes.

11.3 Vessel Interactions

To minimize impacts from vessels interactions with marine mammals, the crews aboard the project vessels will follow NMFS's marine mammal viewing guidelines and regulations as practicable (https://alaskafisheries.noaa.gov/protectedresources/mmv/guide.htm).

11.4 Compensatory Habitat Mitigation

UniSea has applied for a permit for the proposed G1 Dock Replacement Project under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act from the USACE. To receive that permit, UniSea must comply with current regulations which require applicants to compensate for losses to aquatic resources. The USACE has previously issued permits to UniSea for its dock facilities in Iliuliuk Harbor. The most recent modification to the existing structure authorized the replacement of the existing G1 Dock with an 80-ft by 400-ft OPEN CELL SHEET PILE™ (OCSP™) dock. UniSea submitted a payment of $20,000 to

the Alaska Sea Life Center (Seward, AK) to meet the mitigation requirements of the previous permit for the loss of 0.80 acres of intertidal habitat. To mitigate the loss of an additional 0.25 acres intertidal habitat that will result from the construction of the proposed project, UniSea will remove approximately marine debris from approximately 0.50 acres of beach areas within the vicinity of the project (figure in Appendix D). The removal of this debris will improve intertidal habitat and reduce the risk of entanglement for marine mammals that occur within the vicinity of the project.

12 Arctic Subsistence Uses, Plan of Cooperation

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, you must submit either a plan of cooperation (POC) or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses.

This section is not applicable to the proposed project. The project will take place on Unalaska Island, which is located in waters south of the 60° North latitude. No activities will take place in or near a traditional Arctic subsistence hunting area.

13 Monitoring and Reporting Plans

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

13.1 Monitoring Plan

Monitoring measures for the potential impacts the project could have on marine mammals are discussed briefly in Section 11.2.3 above and at depth in the Marine Mammal Monitoring Plan (Appendix E).

13.2 Reporting

The procedures for reporting are listed below and also in the Marine Mammal Monitoring Plan (Appendix E).

13.2.1 Annual Report

A comprehensive annual marine mammal monitoring report documenting marine mammal observations will be submitted to NMFS at the end of the in-water work season. The draft comprehensive marine mammal monitoring report will be submitted to NMFS within 90 calendar days of the end of the in-water work period. The report will include marine mammal observations (pre-activity, during-activity, and post-activity) during pile driving days. A final comprehensive report will be prepared and submitted to NMFS within 30 calendar days following resolution of comments on the draft report from NMFS.

The reports shall include at a minimum:

- General data:
  - Date and time of activity
  - Water conditions (e.g., sea-state, tidal state)
  - Weather conditions (e.g., percent cover, percent glare, visibility)
- Specific pile driving data:
  - Description of the pile driving activity being conducted (pile locations, pile size and type), and times (onset and completion) when pile driving occurs.
  - The construction contractor and/or marine mammal monitoring staff will coordinate to ensure that pile driving times and strike counts are accurately recorded. The duration of soft start procedures (impact only) should be noted as separate from the full power driving duration.
  - Description of in-water construction activity not involving pile driving (location, type of activity, onset and completion times)
  - Detailed description of the sound attenuation system, including design specifications. Details of any issues associated with bubble curtain deployment or any functional checks conducted on the system should be recorded on a daily or per pile basis.
- Pre-activity observational survey-specific data:
  - Dates and time survey is initiated and terminated
  - Description of any observable marine mammals and their behavior in the immediate area during monitoring

    - Times when pile driving or other in-water construction is delayed due to presence of marine mammals within shutdown zones.
- During-activity observational survey-specific data:
    - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding the monitoring zones, including the following:
        - Distance from animal to pile driving sound source.
        - Reason why/why not shutdown implemented.
        - If a shutdown was implemented, behavioral reactions noted and if they occurred before or after implementation of the shutdown.
        - If a shutdown was implemented, the distance from animal to sound source at the time of the shutdown.
        - Behavioral reactions noted during soft starts and if they occurred before or after implementation of the soft start.
        - Distance to the animal from the sound source during soft start.
- Post-activity observational survey-specific data:
    - Results, which include the detections and behavioral reactions of marine mammals, the species and numbers observed, sighting rates and distances,
    - Refined exposure estimate based on the number of marine mammals observed. This may be reported as a rate of take (number of marine mammals per hour or per day), or using some other appropriate metric.

14 Coordinating Research to Reduce and Evaluate Incidental Take

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

The data recorded during marine mammal monitoring for the proposed project will be provided to NMFS in monitoring reports. These reports will provide information on the usage of the site by Steller sea lions and harbor seals in an area with very limited information. In addition, monitoring that is currently ongoing will be provided to NMFS for comparison of pre-project and during-project behaviors of pinnipeds. The monitoring data will inform NMFS and future permit applicants about the behavior and adaptability of pinnipeds for future projects of a similar nature.

15 Conclusion

For the reasons described in this document, UniSea has determined that the proposed project is likely to result in the Level B harassment of small numbers of Steller sea lions and harbor seals. This project has implemented impact minimization measures, including a marine mammal monitoring plan, to reduce the potential for Level A harassment.

While the Level B harassment has the potential to result in minor behavioral effects to any marine mammals present during pile driving activities, based on the analysis presented in this document, these temporary effects will have a negligible effect on the stocks of marine mammals described in this document or their habitats.

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Appendix A. Background Noise Survey Equipment Specifications

CETACEAN RESEARCH TECHNOLOGY

HYDROPHONE SPECIFICATIONS

Model Number	C55	C55RS	C304XR	C75
Linear Frequency Range (±3dB) [kHz]	0.020 – 44	0.020 – 50 & 124 – 250+	0.012 – 1000	0.011 – 85
Useable Frequency Range (+3/-12dB) [kHz]	0.009 – 100	0.009 – 77 & 96 – 250+	0.005 – 2000+	0.003 – 230
Transducer Sensitivity [dB, re 1V/µPa]	-185	-200	-201	-206
Preamplifier Gain [dB]	20	20	20	20
Effective Sensitivity* [dB, re 1V/µPa]	-165	-180	-181	-186
SPL Equiv. Noise at 1kHz [dB, re 1µPa/√Hz]	46 (*Sea State Zero*)	61	≈63	57
Power Requirement [Vdc]	5 to 32	5 to 32	5 to 32	5 to 32
RMS Overload Acoustic Pressure [dB, re 1µPa]	169 to 186	184 to 201	185 to 202	190 to 207
Maximum Operating Depth† [m]	460	460	460	250
Operating Temperature Range [ºC]	-40 to 60	-40 to 60	-40 to 60	-40 to 85
Output Impedance [Ω]	10	10	10	10
Dimensions [mm]	119L x (25 to 16) dia.	119L x (25 to 16) dia.	83L x 32W x (25 to 6)T	101L x (25 to 18) dia.
Integral Connector‡	Subconn MCBH3MSS	Subconn MCBH3MSS	Subconn MCBH3MSS	Subconn MCBH3MSS
Base Price [US dollars]	Please Contact Us	crtinfo [at]	cetaceanresearch dot com	206-297-1310

* Add preamplifier gain to transducer sensitivity to get effective hydrophone sensitivity. † Append "-1k" to model number for depth rating >1000m. ‡ Connectors are rated to a depth of 7000m; see below for mating connector and cables. Calibrated frequency response measurements can be performed for an additional fee.

Directionality:
The C304XR is very directional at high frequencies (e.g., 15° solid angle at 200 kHz, -3dB). This is also true of the C55, but its directionality will be focused in a plane rather than in a dipole pattern. All hydrophones are omnidirectional below 10kHz. The C75 is omnidirectional.

Battery/Connector Box:
Battery boxes are rated NEMA-4X water resistant. Signal connection is through a water-tight, BNC connector with gold center contact. The hydrophones are powered by one or two 9V batteries (not included) or an optional long-life, rechargeable, external power supply.

Standard Signal Output	Female BNC connector
Battery Life [hours]	>20
Box Dimensions [mm]	98 long x 64 wide x 40 high
Price [US dollars]	Contact us: crtinfo [at] cetaceanresearch dot com or 206-297-1310

Mating Connector & Cable:

Connector molded to 15m of cable
Connector molded to 30m of cable
Connector molded to 50m of cable
Connector molded to custom length

Additional Options:

Headphone Amplifier w/Adapter Cable
Inline High-Pass Filter Module
170kHz Isolation Transformer
Water Resistant External Power Supply
Custom orders not listed above

Selected Accessories (many more items available):

Zoom *H1* Flash Recorder
TASCAM *US-122MKII* 24-bit/96kHz USB Interface
Crate *TX-15* portable speaker
Roland *Quad Capture* 24-bit/192kHz USB Interface
Fostex *FR-2* 24-bit/192kHz Flash Recorder

Hydrophones *not in stock* will ship within 6 weeks of the receipt of payment. Add 2 weeks to delivery time for custom orders. Acceptable payment includes: check or money order made out in US funds and drawn on a US bank; VISA, MasterCard, Discover or American Express cards; or money wire transfers. There is an added fee for foreign wire transfers. Qualifying nonprofit organizations may receive discounts.

All hydrophones carry a 90-day limited warranty. Extended warranties are available. Units will either be repaired or replaced at the discretion of Cetacean Research Technology. Misuse or damage to the connectors or cable voids the warranty.

Prices are for advance payment only (cash discounts are available) and subject to change without notice. All sales are final.

4728 12th Avenue NE - Seattle, Washington 98105 USA
Telephone: 206-297-1310 E-mail: crtinfo [at] cetaceanresearch dot com Website: www.cetaceanresearch.com

CETACEAN RESEARCH TECHNOLOGY

HYDROPHONE SPECIFICATIONS

Model Number	CR1	CR2	CR3
Linear Frequency Range (±3dB) [kHz]	0.0002† – 48	0.002† – 28	0.0004† – 77
Useable Frequency Range (+3/-12dB) [kHz]	0.00005† – 68	0.0004† – 60	0.0001† – 240
Sensitivity [dB, re 1V/µPa]	-198‡	-214	-210‡
SPL Equiv. Noise at 1kHz [dB, re 1µPa/√Hz]	38 (< *Sea State Zero*)	68	57
Maximum Operating Depth [m]	100	460	250
Operating Temperature Range [ºC]	-25 to 60‡	-40 to 70	-40 to 90‡
Capacitance [nF]	10	0.82	4.0
Dimensions [mm]	73L x 32 dia.	56L x 14 dia.	50L x 18 dia.
Coaxial Cable Length [m]	15	10	15
Directionality	Omni below 10kHz	Omni below 10kHz	Omnidirectional
Base Price [US dollars]	Please contact us	crtinfo [at] cetaceanresearch dot com	206-297-1310

† Requires a preamplifier with 100MΩ input impedance, such as VP2000. If a preamplifier with 1MΩ input impedance is used, such as PC200, then the low frequency -3dB point will be increased by a factor of 100 (e.g. 2Hz instead of 0.02Hz). ‡ Hydrophone is spot calibrated at the factory; calibration is guaranteed between -5C and 30C. Calibrated frequency response measurements can be performed for an additional fee.

Additional Options and Selected Accessories (many more items available):

Terminate cable with BNC connector
Additional cable length
ART *USB Dual Pre* Preamp with USB
Crate *TX15* portable speaker

Sound Technology *PC200* 2-ch Preamplifier
Reson *VP2000* Preamplifier
Sound Technology *ST219-192* DAQ
ST1400ENV Mobile Data Recorder & SLM

Hydrophones not in stock will ship within 6 weeks of the receipt of payment. Add 2 weeks to delivery time for custom orders. Acceptable payment includes: check or money order made out in US funds and drawn on a US bank; VISA, MasterCard, Discover or American Express cards; or money wire transfers. There is an added fee for foreign wire transfers. Qualifying nonprofit organizations may receive discounts.

All hydrophones carry a 90-day limited warranty. Extended warranties are available. Units will either be repaired or replaced at the discretion of Cetacean Research Technology. Misuse or damage to the connectors or cable voids the warranty.

Prices are for *advance payment only* (cash discounts are available) and subject to change without notice. **All sales are final**.

4728 12th Avenue NE - Seattle, Washington 98105 USA
Telephone: 206-297-1310 E-mail: crtinfo [at] cetaceanresearch dot com Website: www.cetaceanresearch.com

CETACEAN RESEARCH TECHNOLOGY
4728 12TH AVENUE NE SEATTLE, WASHINGTON 98105-4402 (206) 297-1310
CRTINFO@CETRESTEC.COM WWW.CETRESTEC.COM

Certification of Sensor Technology, Ltd. Reference Hydrophone

Sensitivity values provided by Sensor Technology, Ltd. are accurate to ±2dB, based on measurements made at the Naval Undersea Warfare Center's (NUWC) Acoustic Test Facility (ATF) in Keyport, Washington.

All model CR1 hydrophones sold by Cetacean Research Technology are spot calibrated at the Sensor Technology, Ltd. test facility in Collingwood, Ontario, Canada. Sensor Technology uses one specific reference hydrophone to measure the single frequency sensitivity of all other hydrophones at their facility. This measurement is made at 46Hz.

On two occasions, Cetacean Research Technology has compared the Sensor Technology sensitivity measurements of a CR1 hydrophone with those made at NUWC. The NUWC ATF has a measurement accuracy of ±2dB in the range of 20Hz to 50Hz. Comparison of sensitivity measurements of the two CR1 hydrophones agreed within these measurement accuracy constraints. Specific data are shown below.

Hydrophone Serial Number	Sensor Technology Measured Sensitivity [dB, re. 1V/µP]	NUWC ATF Measured Sensitivity [dB, re. 1V/µP]	Difference (ST - NUWC) [dB]
07200-12	-196.6	-197.9	1.3
09126-14	-198.2	-198.2	0.0

The above referenced comparisons are an indirect measurement of the accuracy of the Sensor Technology reference hydrophone. Based on these measurements, and the reported measurement accuracy of the NUWC ATF, Cetacean Research Technology can certify that the sensitivity measurements provided by Sensor Technology, Ltd. are accurate to ±2dB. It should be noted that the Sensor Technology measurements may be more accurate than ±2dB, but this cannot be verified due to the accuracy limits of the Navy's calibration facility.

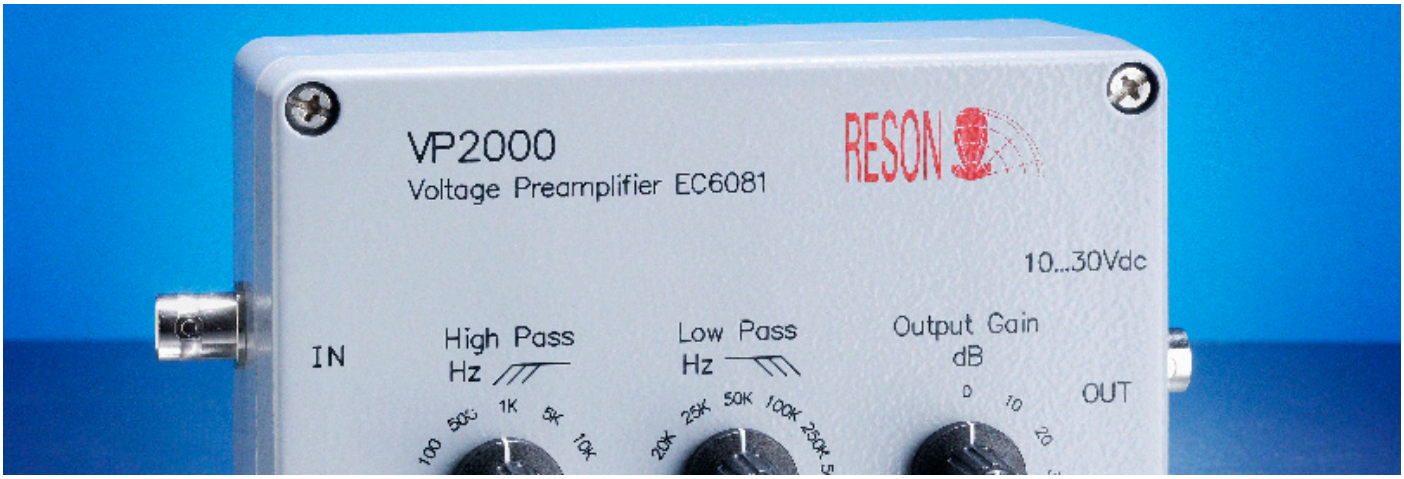
Joseph R. Olson, President

Cetacean Research Technology
(a trade name of CetResTec, Inc.)

17 January 2014

EC6081

VP2000 Voltage preamplifier



EC6081

- **1Hz to 1MHz bandwidth**
- **Gain selection From 0 to 50dB**
- **Options of 12 high-pass filters and 12 low-pass filters**
- **Excellent low-noise characteristic**

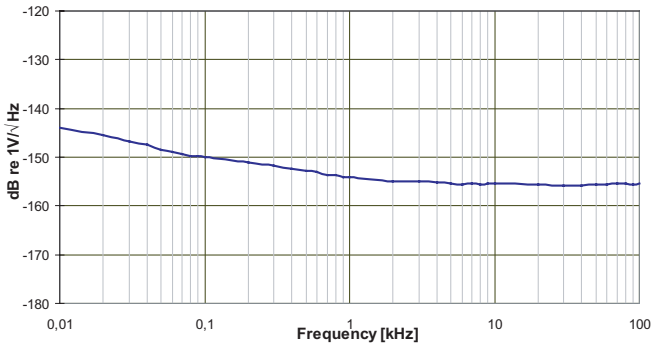
The VP2000 is a 1MHz bandwidth voltage preamplifier designed for uses in conjunction with piezoelectric hydrophones.
VP2000 offers excellent low-noise performance over the entire frequency range; gain selections in 6 levels from 0 to 50dB.
A range of 12 high-pass and 12 low-pass filters are available, - these allow ideal band pass filter settings.
The VP2000 has a high input impedance which allow the measurements at frequencies below 1Hz with even very small hydrophones sensor capacities.

TECHNICAL SPECIFICATIONS	
Input:	
Impedance:	>100M-Ohm´s
Max. level:	2.4Vrms at 12V supply
Output:	
Impedance:	10Ohm//100µF
Max. level:	2.4Vrms at 12Vdc 5.4Vrms at 24V supply
Max. load:	10nF (100m cable)
Gain:	
Gain settings, 6 steps dB:	0–10–20–30–40-50
Bandwidth	
Frequency range with 20dB gain:	-3dB 0.5Hz to 0.5MHz -6dB 1MHz)
Noise:	
Power spectrumdensity noise	20nV/√Hz (at 1kHz)
Hi-Pass Filters: -3dB @ Hz (6dB/oct):	1-10-50-100-500-1k-5k 10k-25k-50k-100k-250k
Lo-Pass Filters: -3dB @ Hz (6dB/oct):	1k-5k-10k-20k-25k-50k 100k-250-500k-750-1M
Power supply:	12Vdc (min. 10Vdc, max. 30Vdc)
Voltage nominal:	15mA @ 12Vdc
Current quiescent:	20mA @ 24Vdc
Enclosure case, dimensions:	125, 80, 60mm. (l w, h) (Splash proof aluminum box)
Accessory included:	Supply cable TL8088 for laboratory. Vdc supply.
Accessory available:	See page 2

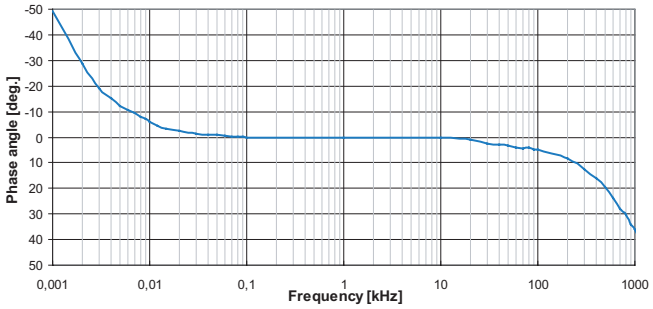
EC6081

VP2000 Voltage preamplifier

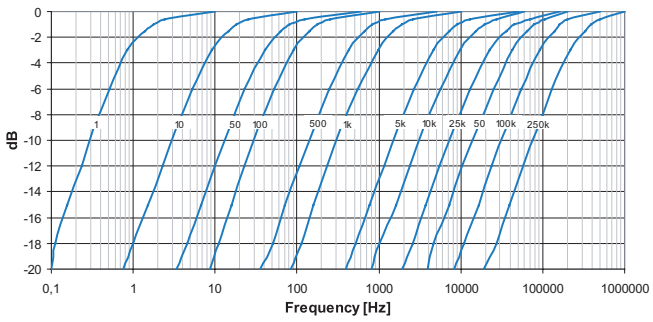
Noise power density spectrum re input
Input load 1nF, gain 0dB, 1Hz filter



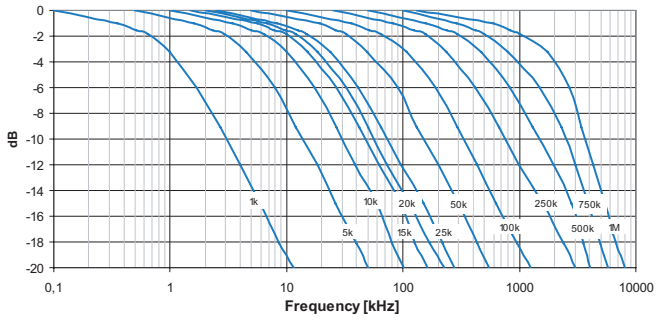
Phase shift
With 1 Hz filter at 0dB and 0dB gain



High Pass filter characteristics



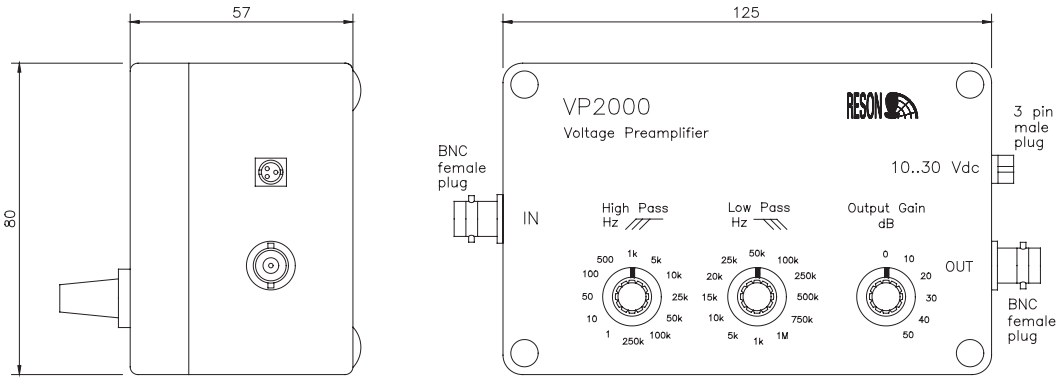
Low Pass filter characteristics



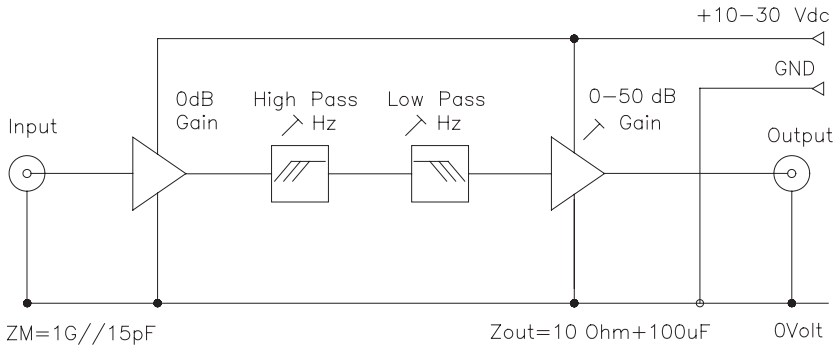
EC6081

VP2000 Voltage preamplifier

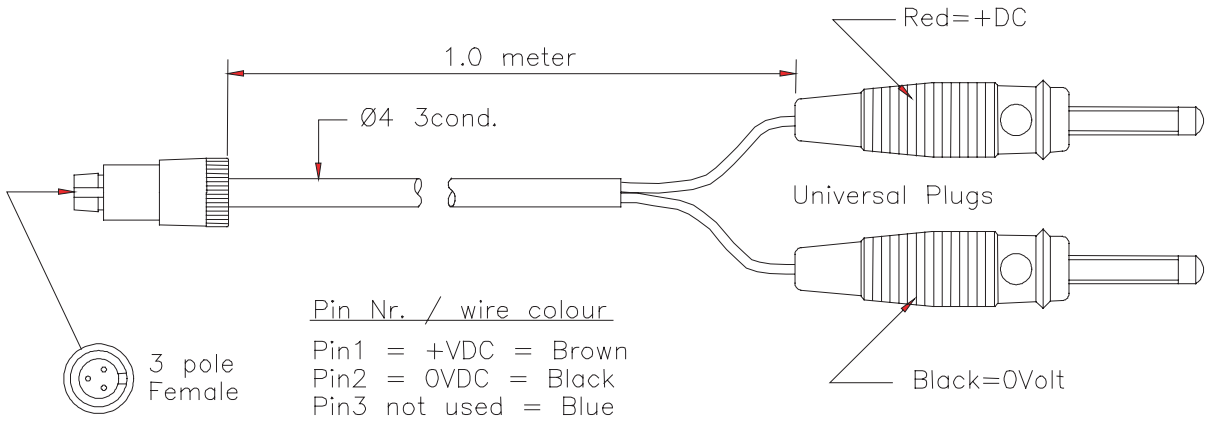
Outline dimensions and layout



Functional Block Diagram



TL 8088 Supply Cable



RESON A/S
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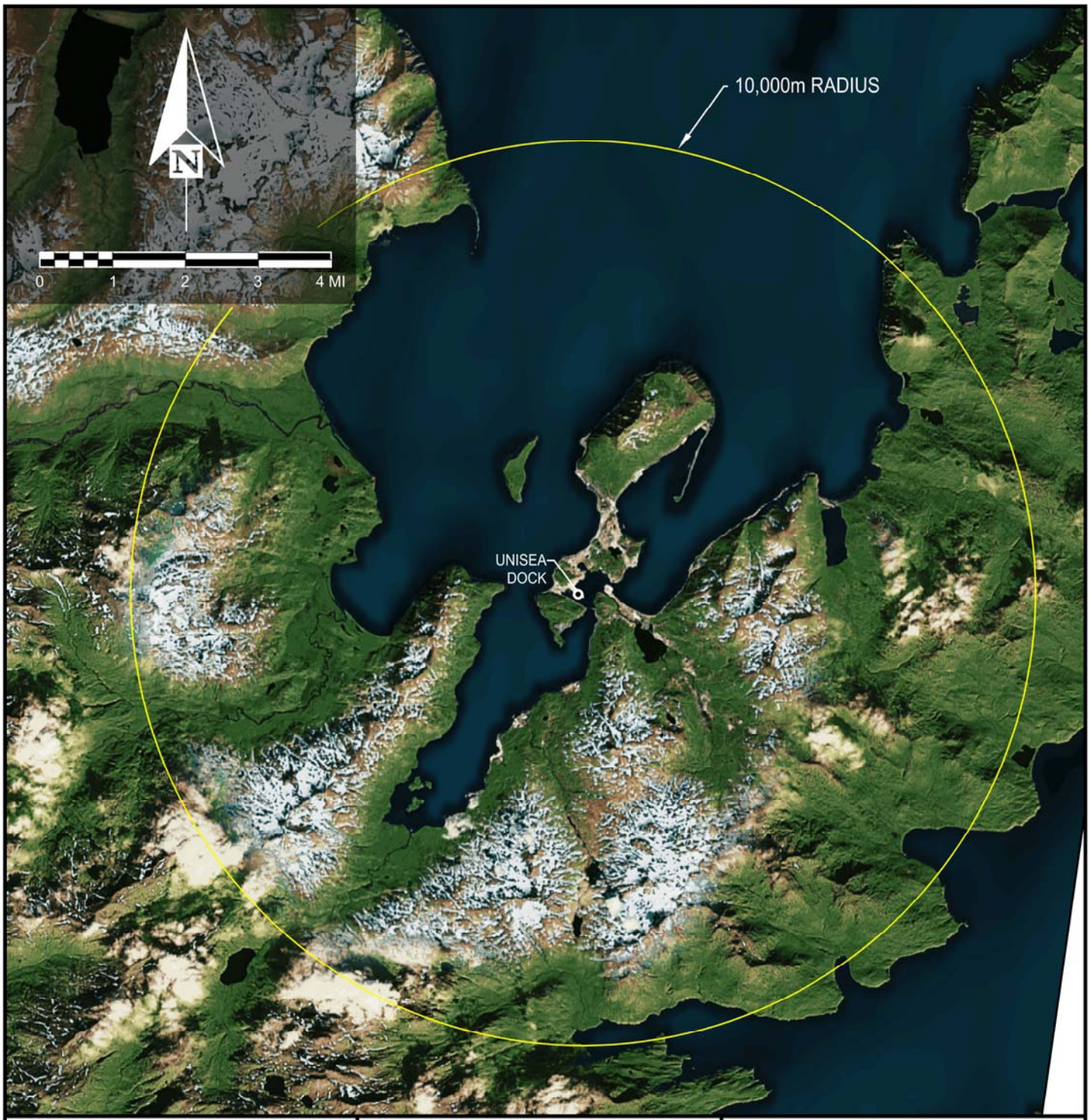
E-mail: info@reson.it

Version: B135 060123 / A4

Appendix B. Zone of Influence and Zone of Exclusion Figures



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
VIBRATORY DRIVING

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015 SHEET **1** of **1**

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
VIBRATORY REMOVAL

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE VIBRATORY DRIVING AND REMOVAL

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
IMPACT DRIVING

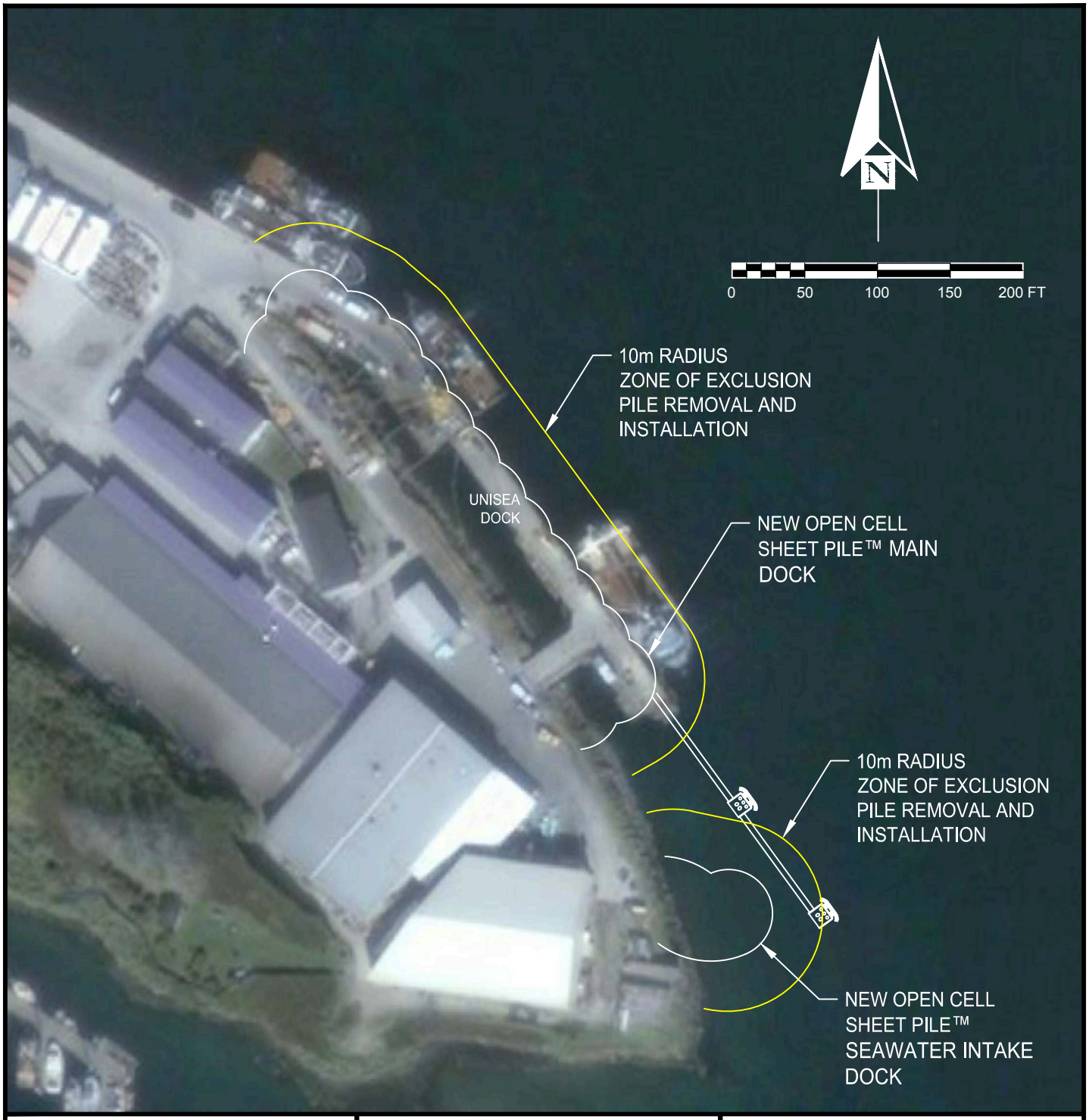
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

SEPT 2015 SHEET **1** of **1**



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF EXCLUSION PILE REMOVAL AND INSTALLATION

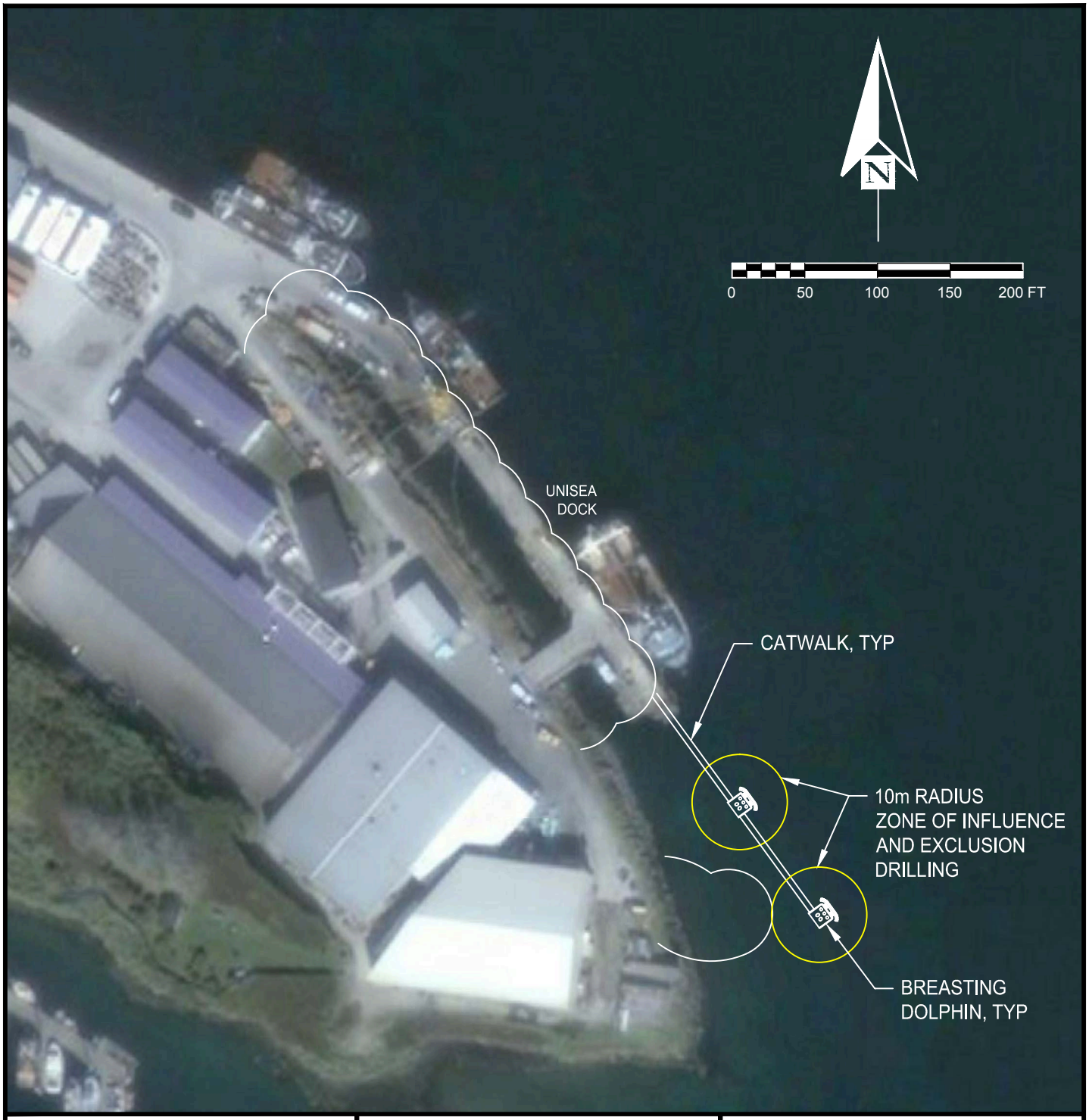
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE AND EXCLUSION DRILLING

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

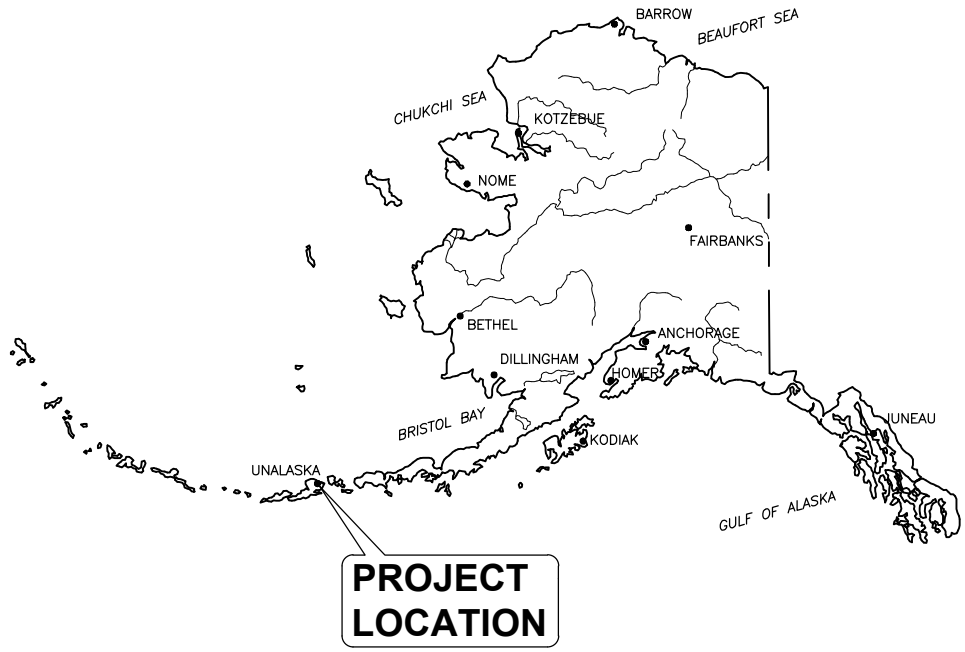
UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

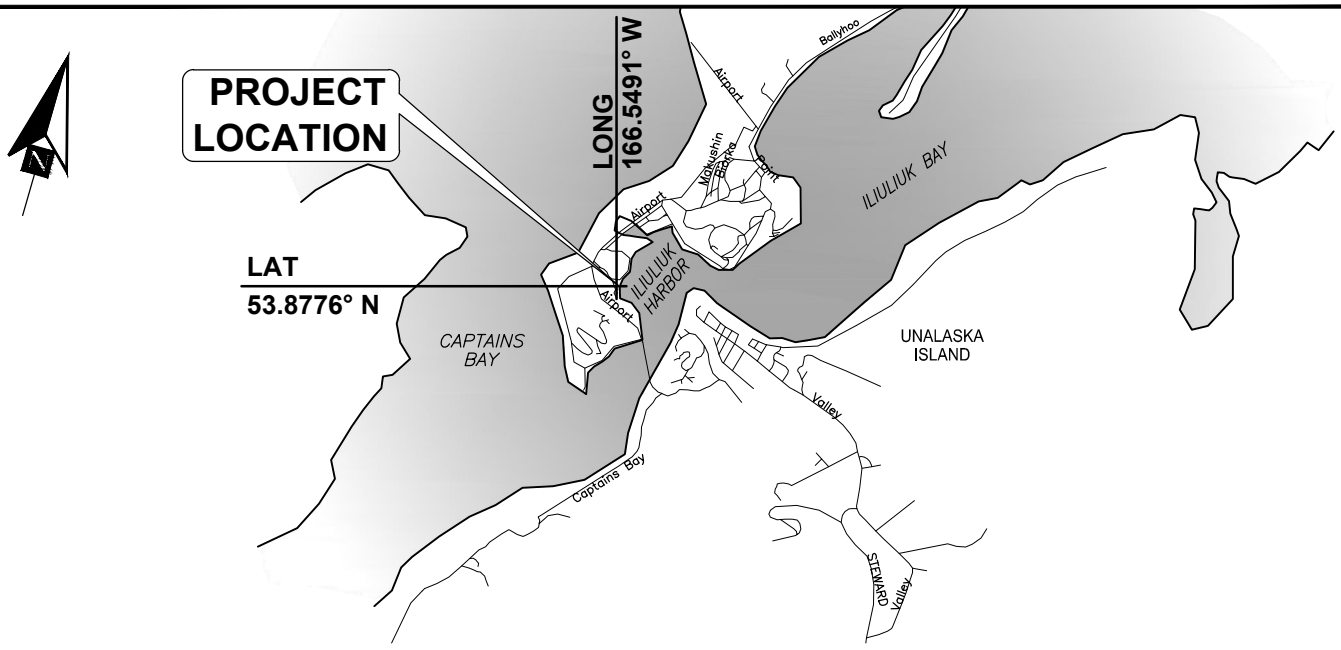
AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

Appendix C. Project Permit Drawings



STATE OF ALASKA



UNALASKA VICINITY MAP

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

VICINITY MAP AND PROJECT LOCATION

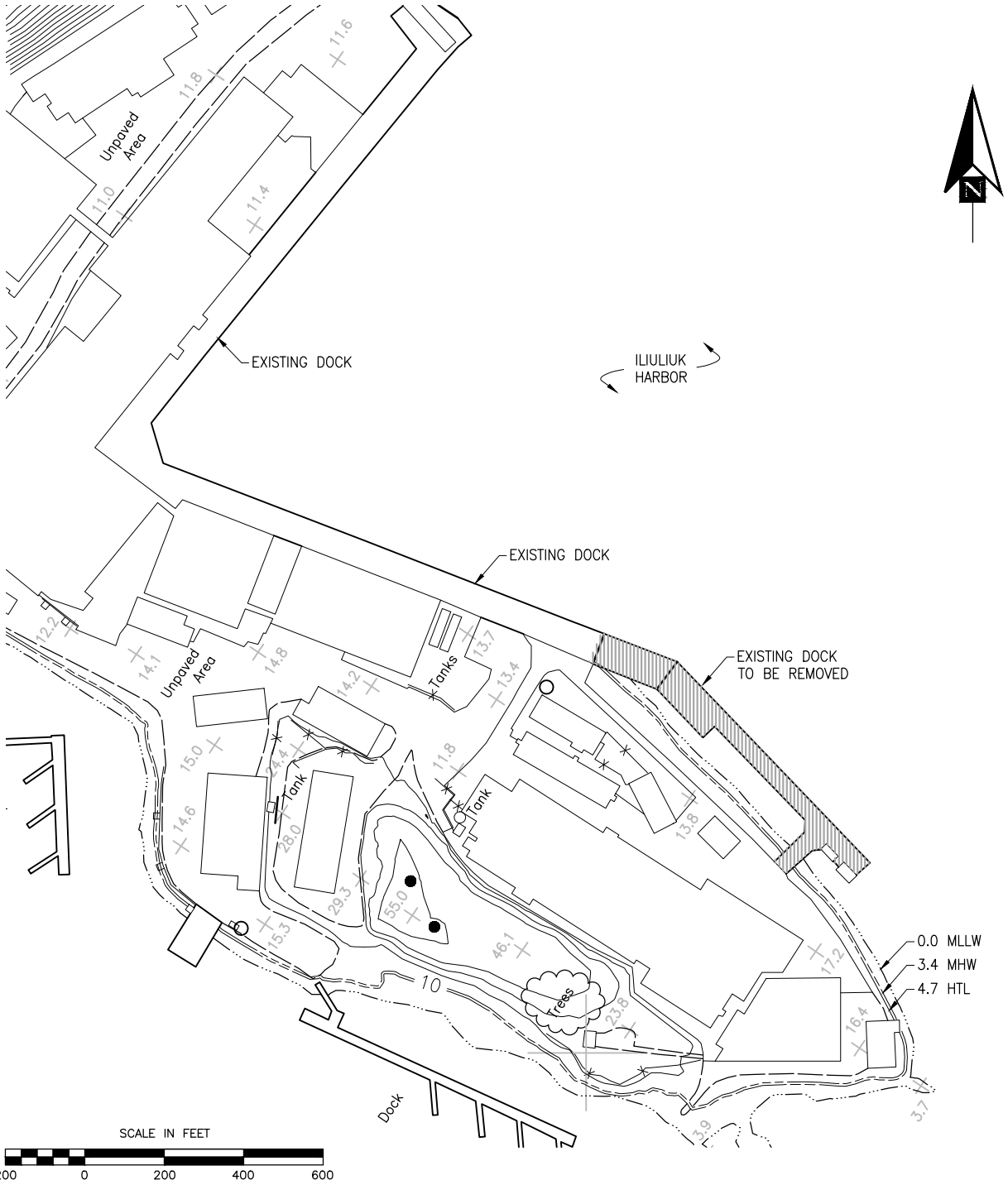
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **1** of **9**



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

LOCATION

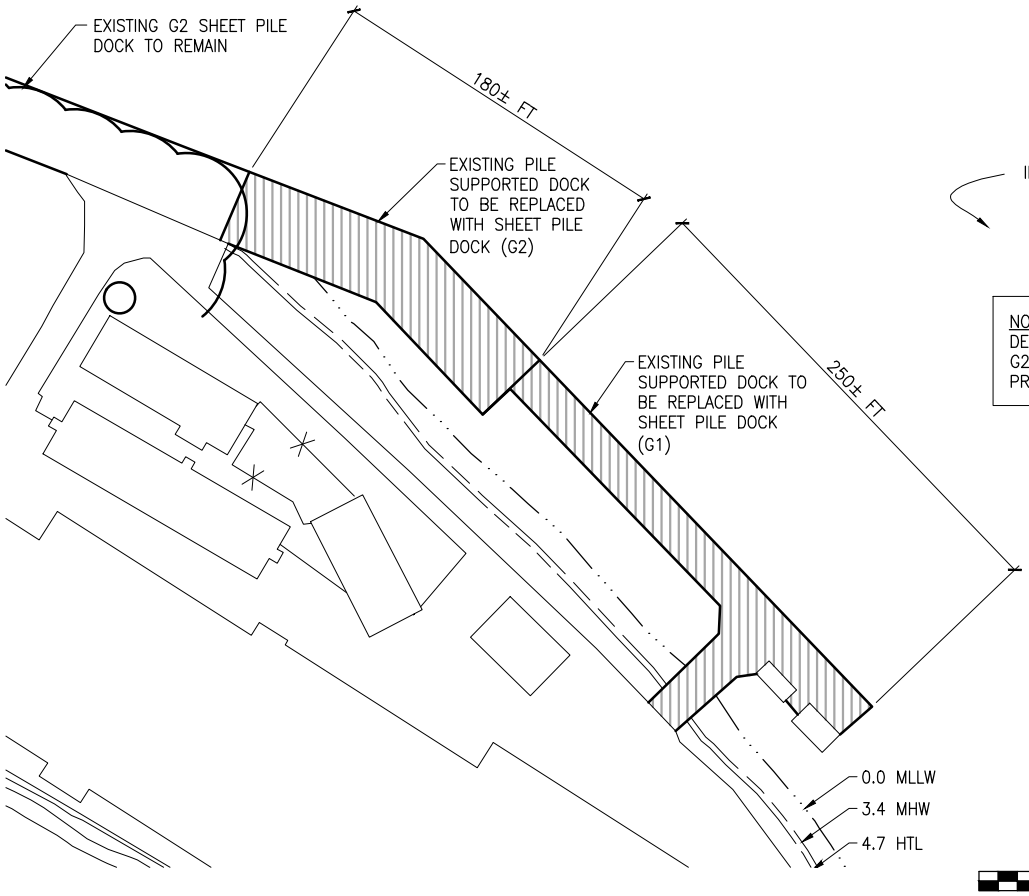
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **2** of **9**



ILIULIUK HARBOR

NOTE:
DEMOLITION OF EXISTING G1 & G2 PILE SUPPORTED DOCKS PREVIOUSLY PERMITTED.

SCALE IN FEET

50 0 50 100 150

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

PLAN VIEW EXISTING

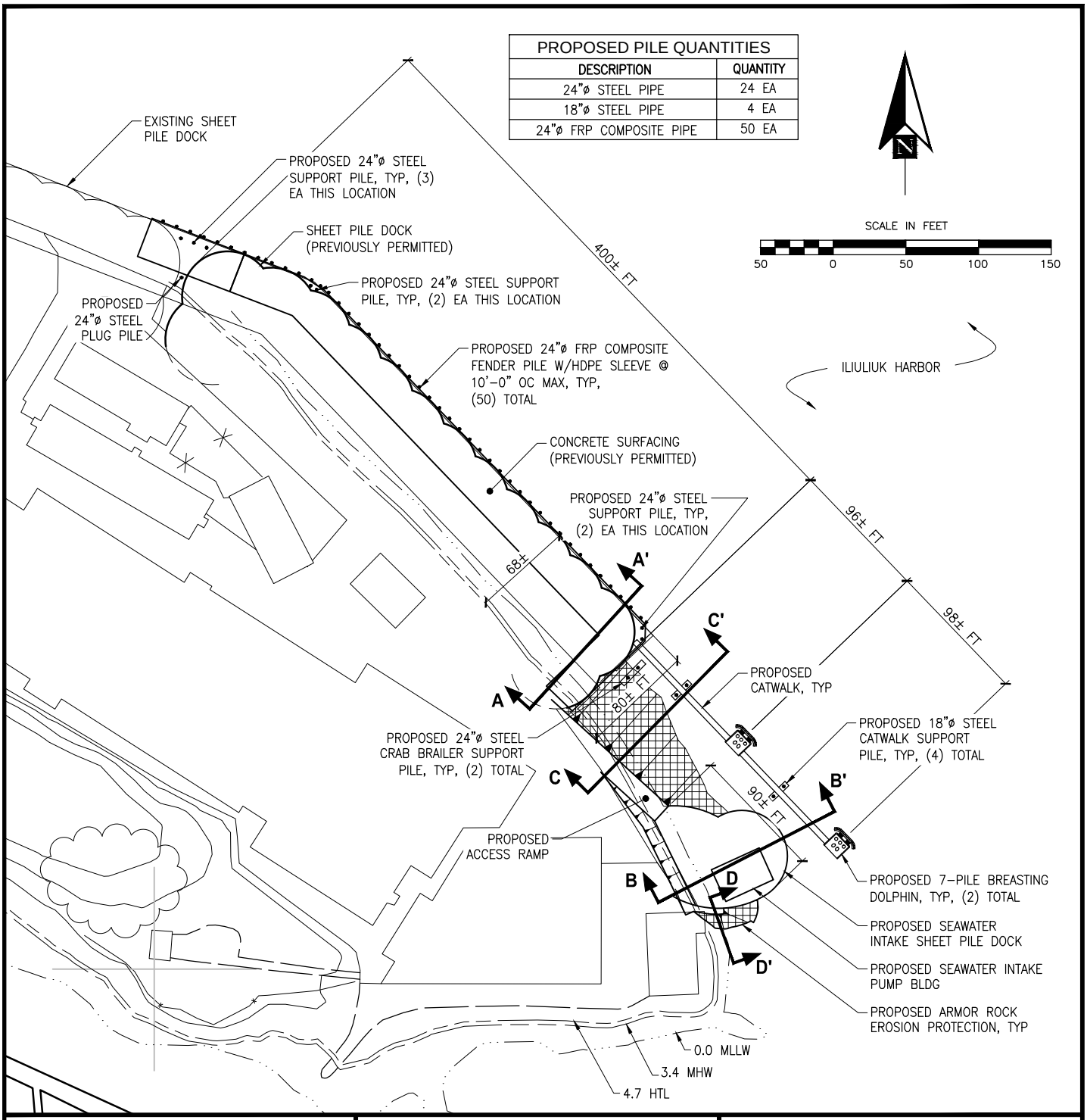
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **3** of **9**



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

PLAN VIEW PROPOSED

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

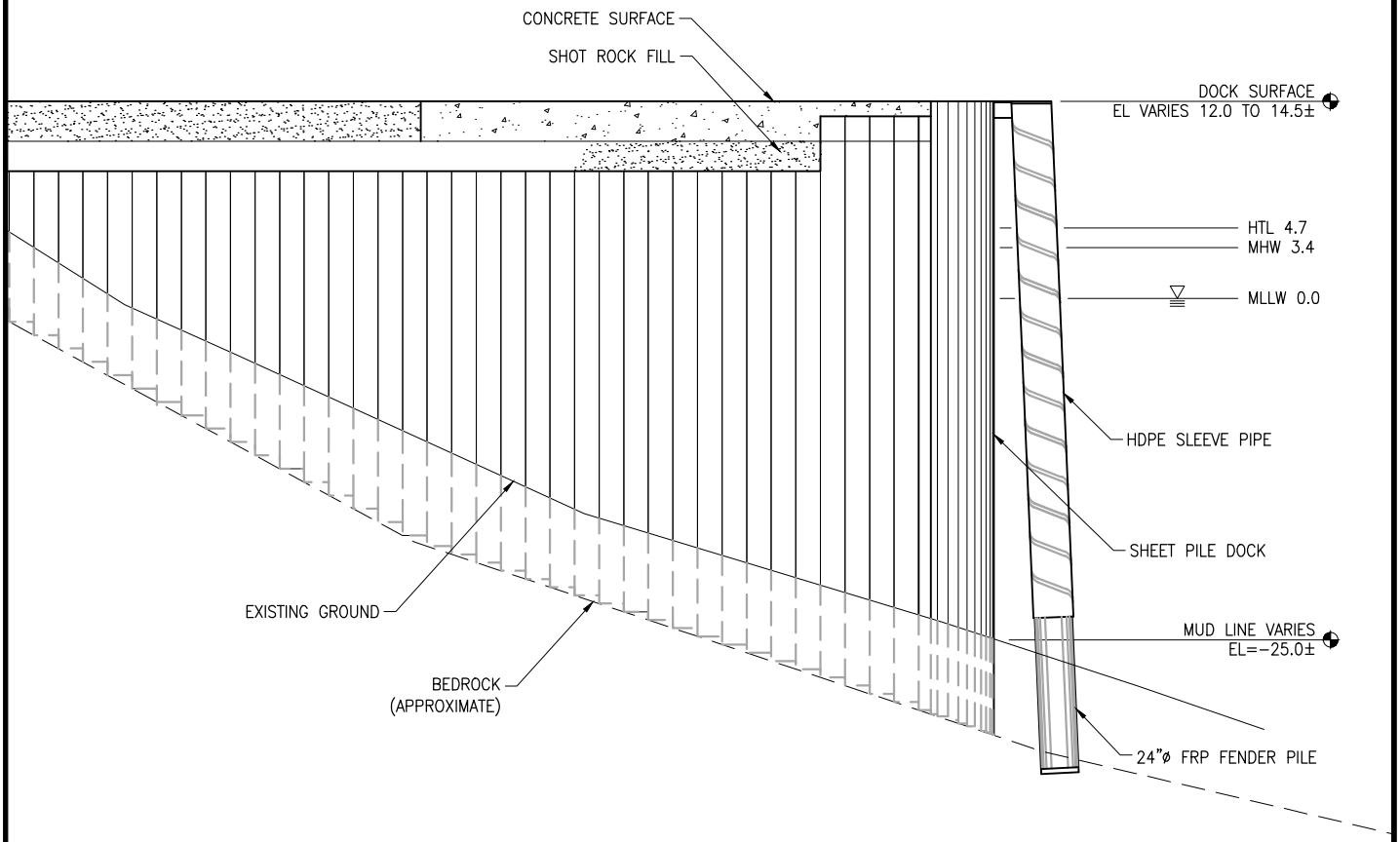
POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **4** of **9**

ESTIMATED QUANTITIES	
DESCRIPTION	QUANTITY
SHOT ROCK FILL BELOW MHW	19,300 CY
SHOT ROCK FILL BELOW HTL	21,000 CY
TOTAL SHOT ROCK FILL	31,100 CY
FOOTPRINT AREA BELOW HTL	0.8 ACRES

NOTE:
FILL AND AREA QUANTITIES FOR MAIN OPEN CELL SHEET PILE DOCK WERE PREVIOUSLY PERMITTED.



SHEET PILE DOCK SECTION A-A'

NTS

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

TYPICAL SECTION SHEET PILE FILL DOCK

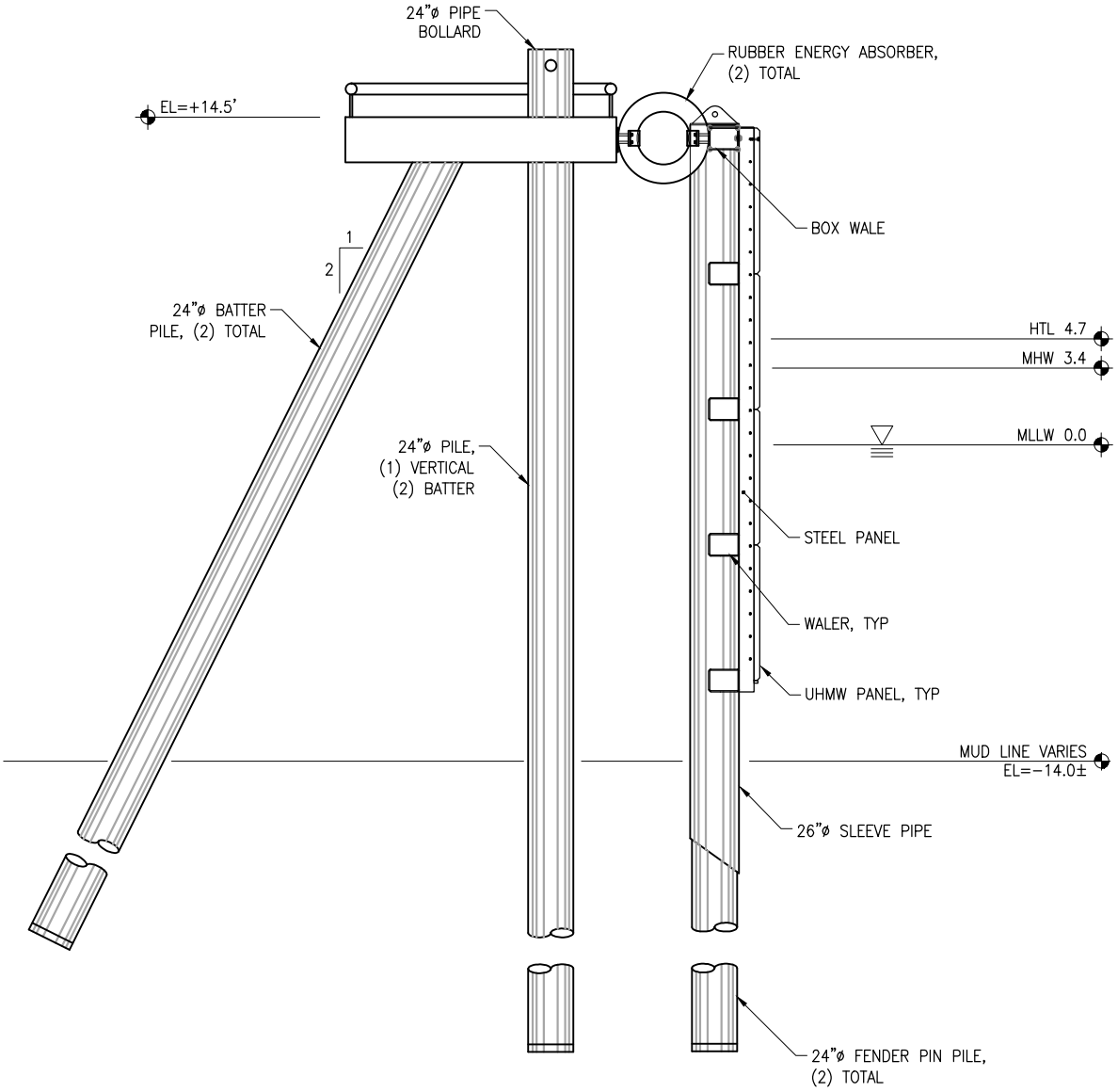
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA−1988−735−M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **5** of **9**



BREASTING DOLPHIN ELEVATION

NTS

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

BREASTING DOLPHIN

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

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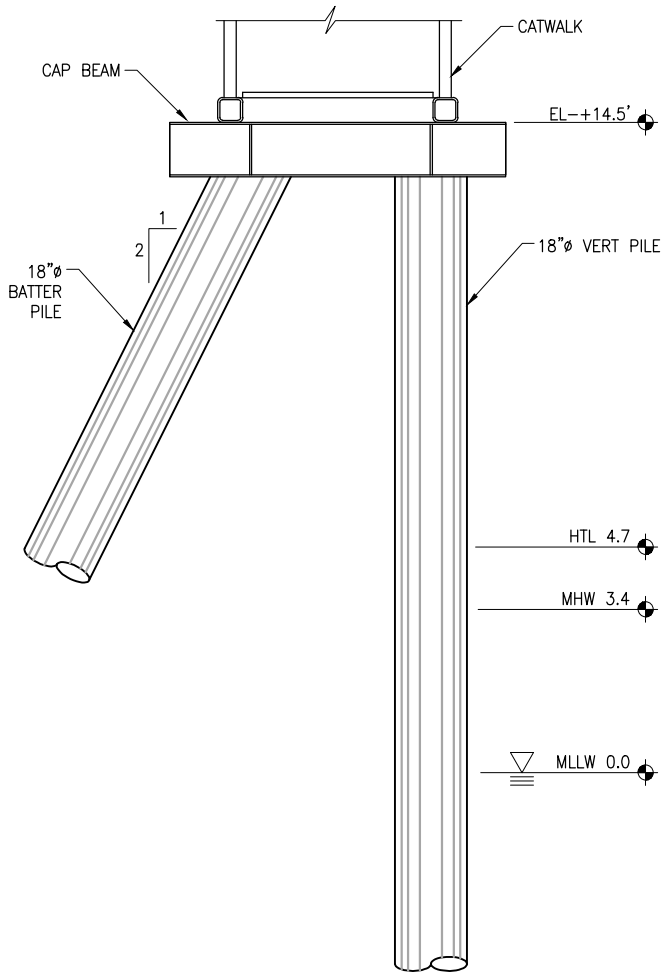
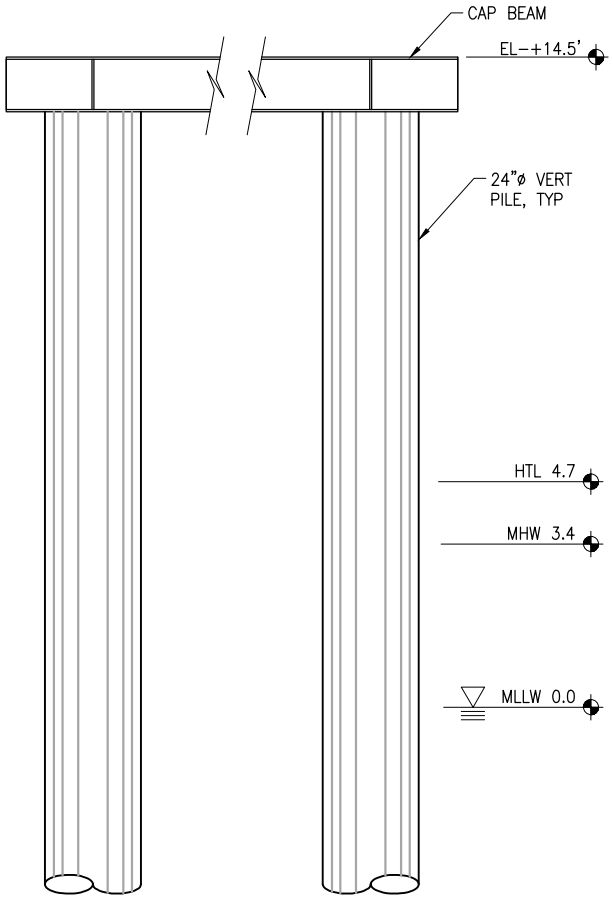


CATWALK SUPPORT ELEVATION
NTS



CRAB BRAILER SUPPORT ELEVATION
NTS

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

CATWALK & CRAB BRAILER SUPPORT BENTS

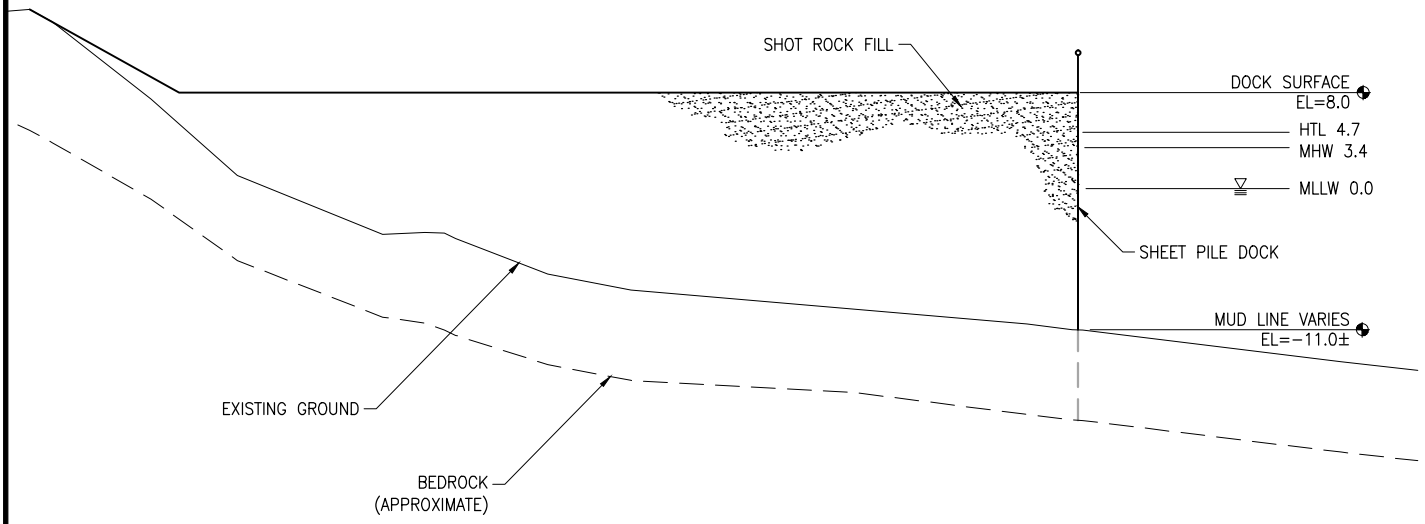
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

PROPOSED ESTIMATED QUANTITIES	
DESCRIPTION	QUANTITY
SHOT ROCK FILL BELOW MHW	3,100 CY
SHOT ROCK FILL BELOW HTL	3,200 CY
TOTAL SHOT ROCK FILL	3,400 CY
ARMOR ROCK BELOW MHW	365 CY
ARMOR ROCK BELOW HTL	375 CY
TOTAL ARMOR ROCK	400 CY
FOOTPRINT AREA BELOW HTL	0.25 ACRES



SEAWATER INTAKE DOCK SECTION B-B'

NTS

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

SEAWATER INTAKE DOCK SECTION

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

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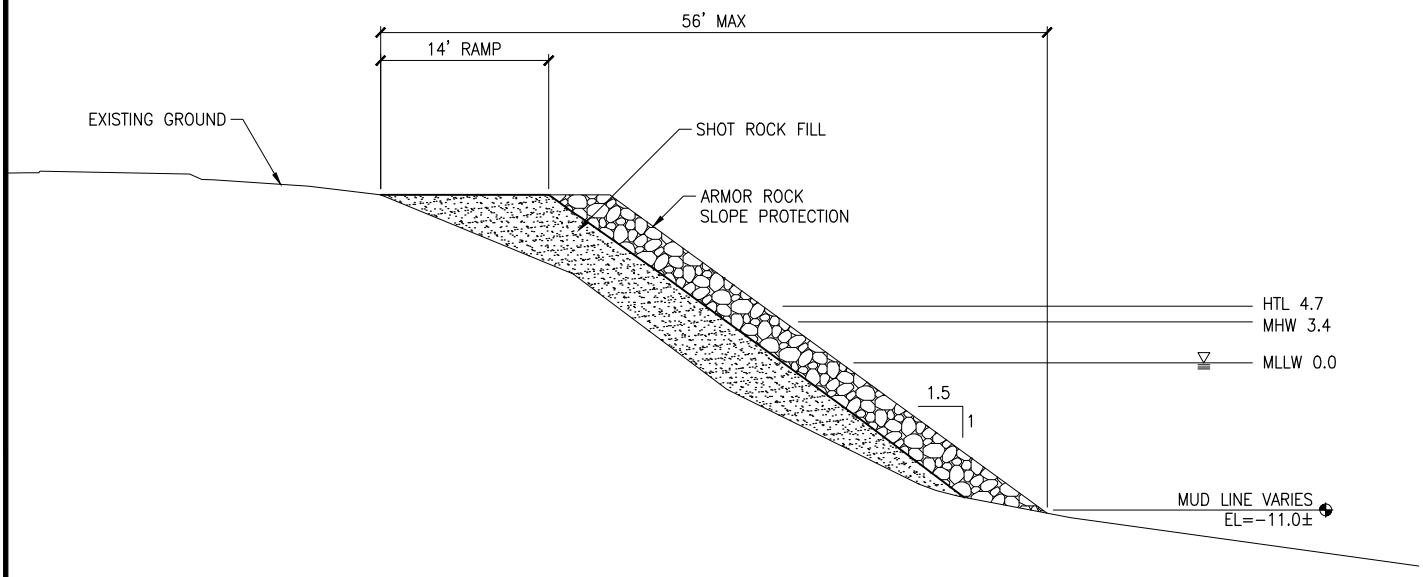
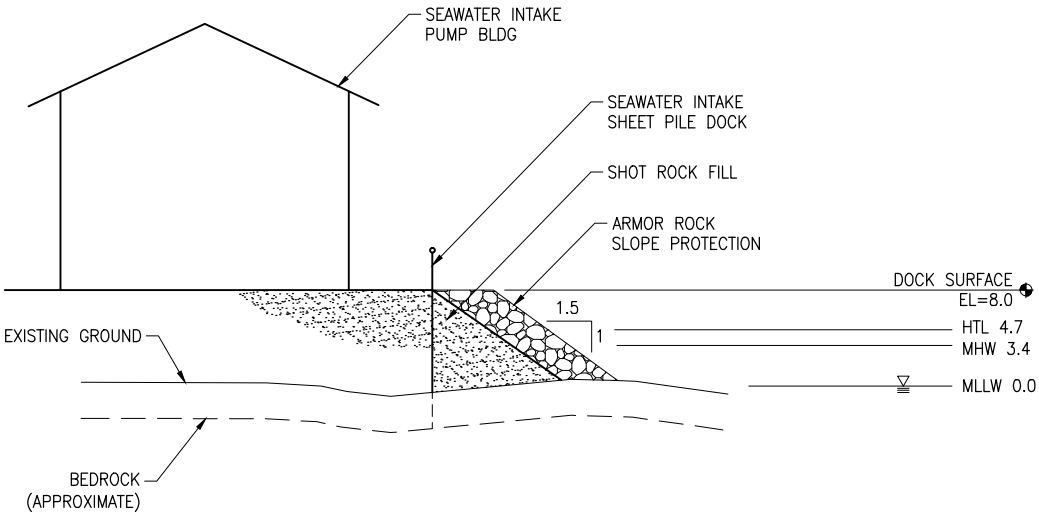


RAMP SECTION C-C'

NTS



SLOPE PROTECTION SECTION D-D'

NTS

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

RAMP & SLOPE PROTECTION SECTIONS

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

FEBRUARY 2015 SHEET **9** of **9**

Appendix D. Marine Debris Mitigation Project Figure

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

PROPOSED MITIGATION PROJECT LOCATION

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015


07/21/2015 16:42


07/21/2015 16:45


07/21/2015 16:43


07/21/2015 16:52


07/21/2015 16:51


07/21/2015 16:49

Appendix E. Marine Mammal Monitoring Plan

Marine Mammal Monitoring Plan

UniSea G1 Dock Replacement Project

UniSea, Inc.

December 2, 2015

Submitted to:

National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway
Silver Spring, Maryland 20910-3226

Prepared by:

PND Engineers, Inc.
1506 West 36th Avenue
Anchorage, AK 99503
907-561-1011

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1 Introduction

The purpose of this marine mammal monitoring plan is to provide a protocol for marine mammal monitoring during the proposed UniSea, Inc. (UniSea) G1 Dock replacement project in Iliuliuk Harbor, Unalaska. This plan was developed to support the Incidental Harassment Authorization (IHA) document for MMPA permitting. The IHA document provides a more in-depth discussion on the calculations for the project.

A marine mammal monitoring program will be implemented at the start of construction and will follow the protocols outlined in the marine mammal monitoring plan. The primary goals of the monitoring program are:

- To monitor the proposed shutdown and monitoring zones (190, 160 and 120 dB), estimate the number of marine mammals exposed to the 190, 160 and 120 dB established thresholds, and document responses;
- To minimize impacts to the marine mammal species present in the project area by implementing mitigation measures including monitoring of the shutdown and monitoring zones, clearing the zones and shutdown procedures; and
- Collect data on the occurrence of marine mammal species in the project area and any impacts from the project.

2 Project Description

UniSea proposes to replace its existing G1 Dock located in Unalaska, which is currently partially condemned. As part of UniSea's only marine facility, the G1 dock plays an important role in the existing seafood processing facility in Iliuliuk Harbor, Unalaska. The UniSea processing facility has the capacity to process more than 2.5 million pounds of fish per day. The adjacent G2 facility is "one of the most efficient, highest volume Pollock processing facilities in the world" (AIRA, 2009).

The proposed project will occur in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) 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 under certain situations. Section 101 (a) (5)(D) allows for the issuance of an Incidental Harassment Authorization (IHA), provided an activity results in negligible impacts to marine mammals and would not adversely affect subsistence use of these animals.

The project's timing along with the duration of pile removal and installation activities may result in marine mammals protected under the MMPA being exposed to sound levels above the Level B harassment threshold.

UniSea proposes to replace the existing G1 Dock with an 80 foot by 400 foot OPEN CELL SHEET PILE™ (OCSP™) dock. The OCSP dock will be constructed of PS31 flat sheet piles (web thickness of 0.5 inches and width between interlocks of 19.69 inches). In addition to replacing the existing pile-supported G1 Dock, the project would include installation of the following:

- Approximately fifty (50) 24-inch diameter fiber-reinforced polymer (FRP) composite fender piles;
- Approximately nine (9) 24-inch diameter steel support piles along the dock face and for crab brailer support;
- One (1) 24-inch diameter steel plug/closure pile to retain fill between the existing and new sheet pile cells at the north end of the project;

- Seawater intake sheet pile (PS31 flat sheet piles) structure approximately 90 foot by 85 foot, access ramp, and armor rock erosion protection (3,400 cubic yards of rock fill and 400 cubic yards of armor rock);
- Four (4) 50 foot steel catwalks with intermediate supports of two (2) 18-inch diameter steel piles each, four (4) piles total;
- Two (2) dolphins which include five (5) 24-inch diameter steel support piles each and two (2) 24-inch diameter steel fender pin piles each, fourteen (14) piles total.

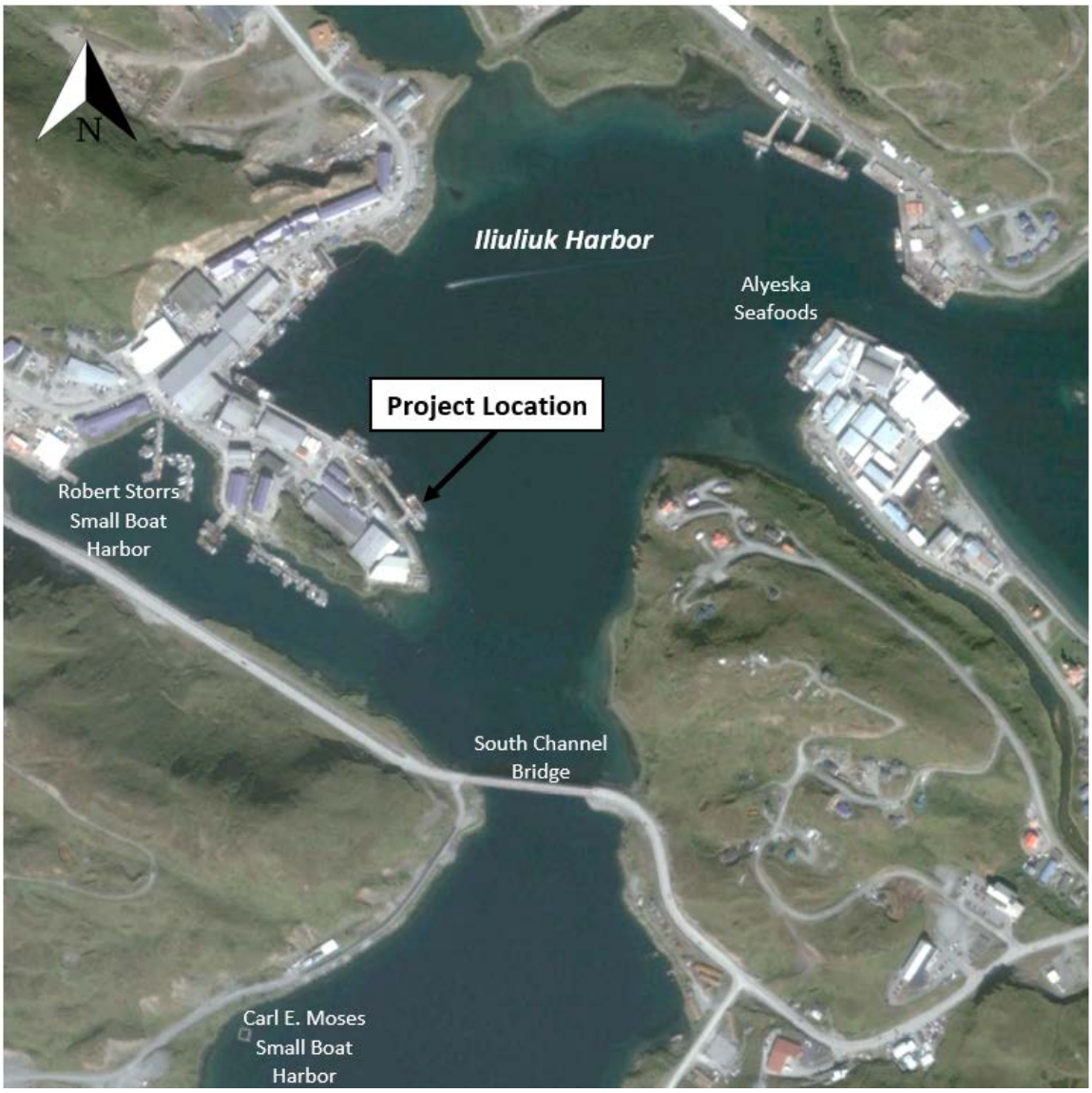


Figure 1. Project location.

3 Methods

Land-based trained observers will be located on site before, during, and after in-water construction activity at sites appropriate for monitoring marine mammals within and approaching the shutdown and monitoring zones (Section 3.4).

During observation periods, observers will continuously scan the area for marine mammals using binoculars and the naked-eye during daylight hours. Observers will work a maximum of four consecutive hours followed by an observer rotation or a 30-minute break. Observers will collect data including but not limited to environmental conditions (*e.g.*, sea state, precipitation, glare, etc.), marine mammal sightings (e.g., species, numbers, location, behavior, responses to construction activity, etc.), construction activity at the time of sighting, and number of marine mammal exposures to the safety monitoring zones (Section 3.4). Observers will follow observer protocols, meet training requirements, fill out data forms, and report findings in accordance with protocols reviewed and approved by NMFS.

Observers will implement mitigation measures including monitoring of the proposed shutdown zone and zone of influence, clearing of the zones and shutdown procedures. They will be in continuous contact with the construction personnel via two-way radio. A cellular phone will be use as back-up communications and for safety purposes.

3.1 Observer Qualifications

Monitoring will be conducted by qualified, trained marine mammal observers (hereafter, "observer"). In order for marine mammal observers to be considered qualified, the following requirements must be met:

1. 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;
2. Experience and ability to conduct field observations and collect data according to assigned protocols;
3. Experience or training in the field identification of marine mammals, including the identification of behaviors, with ability to accurately identify marine mammals in Alaskan waters to species;
4. Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations;
5. Writing skills sufficient to prepare a report of observations; and
6. 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.

3.2 Data Collection

Observers will use a NMFS-approved Marine Mammal Sighting Form (Appendix A) which will be completed by each observer for each survey day. Marine Mammal Sighting Forms will be used by observers to record the following:

- Date and time that pile driving begins or ends;
- Construction activities occurring during each sighting;
- Weather parameters (e.g. percent cover, percent glare, visibility);
- Water conditions (e.g. Tidal state [incoming (flood), slack (neither direction), or outgoing (ebb)], and sea state). The Beaufort Sea State Scale (Appendix C) will be used to determine sea-state.
- Species, numbers, and if possible, sex and age class of marine mammals;

- Marine mammal behavior patterns observed, including bearing from observer and direction of travel. Note concurrent pile driving activity;
- Specific focus should be paid to behavioral reactions just prior to, or during, soft-start (impact pile driving) and shutdown procedures;
- Distance from pile driving activities to marine mammals and distance from the marine mammal to the observation point;
- Record of whether an observation required the implementation of shutdown procedures and the duration each shutdown.
- Locations of all marine mammal observations;
- Other human activity in the area. Record the hull numbers of fishing vessels if possible.

3.3 Equipment

The following equipment will be required to conduct marine mammal monitoring:

- Hearing protection for observers within the airborne impact injury zone;
- Portable radios and headsets for the observers to communicate with the monitoring coordinator, construction contractor, and other observers;
- Access to phone (located in office), and the contact information for the other observers, monitoring coordinator, and NMFS point of contact;
- Green flags and red flags (one each, per observing location) as back-up for radio communication;
- Daily tide tables for the project area;
- Watch or Chronometer;
- Binoculars with built-in rangefinder or reticles – (quality 7 x 50 or better);
- Monitoring plan, IHA permit, and/or other relevant permit requirement specifications in sealed clear plastic cover;
- Notebook with pre-standardized monitoring Marine Mammal Observation Record forms on waterproof paper (e.g. Rite-in-the Rain);

3.4 Shutdown and Monitoring Zones

UniSea has established shutdown zones (zone of exclusion) to delineate areas in which marine mammals may be exposed to injurious underwater sound levels due to pile driving. Marine mammal monitoring will also occur in areas beyond the shutdown zone, called "zones of influence," where sound pressure levels may cause harassment. The shutdown zone (zone of exclusion) and zone of influence are shown in Appendix B.

3.4.1 Shutdown Zones and Zone of Influence

- During impact pile driving and vibratory pile driving/removal, the shutdown zone, or zone of exclusion, shall include all areas where the underwater SPLs are anticipated to equal the Level A (injury) harassment criteria for pinnipeds (190 dB isopleth). The shutdown zone encompasses a radius 10 meters around the pile being driven/removed.
- During impact pile driving, the zone of influence shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level B harassment criteria for marine mammals during impact pile driving (160 dB isopleth).

- During vibratory pile driving and removal, the zone of influence shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level B harassment criteria for marine mammals during vibratory pile driving (120 dB isopleth).
- The shutdown zone and zone of influence will be monitored throughout the time required to drive or remove a pile. If a marine mammal enters the zone of influence, an exposure will be recorded and animal behaviors documented. However, the pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone.
- If a marine mammal approaches or enters the shutdown zone, all pile driving/removal activities associated will immediately be halted.
- Under certain construction circumstances where initiating the shutdown and clearance procedures would result in an imminent concern for human safety, the shutdown provision may be waived at the discretion of the construction foreman. A pile may be deemed "dangerous" if the implementation of the shutdown procedures would: 1) constitute a significant hazard to the personnel installing/removing the pile, or 2) create a risk of the pile slipping from the cradle during shutdown procedures due to the angle of installation/removal. The construction foreman would be required to coordinate with the monitoring coordinator at the start of each construction day to identify in advance the piles which may meet these criteria. In the event that shutdown procedures were waived for any piles for reasons (1) or (2) above, UniSea would be notified on the same day of the event, and a written justification would be provided by the construction foreman documenting the necessity for waiving shutdown procedures.

3.4.2 Shutdown Zone (In-water construction activities not involving a pile driving hammer)

- During in-water construction activities not involving a pile driver, but having the potential to affect marine mammals, in order to prevent injury to these species from their physical interaction with construction equipment, a shutdown zone of 10 meters (33 feet) will be monitored to ensure that marine mammals are not present in this zone.
- These activities could include, but are not limited to: (1) the positioning of the pile on the substrate via a crane (i.e., "stabbing" the pile), (2) the removal of the pile from the water column/substrate via a crane (i.e. "deadpull"), or (3) the placement of sound attenuation devices around the piles.

3.5 Observer Monitoring Locations

In order to effectively monitor the shutdown zone (zone of exclusion) and the zone of influence, marine mammal observers will be positioned at the best practicable vantage points, taking into consideration security, safety, and space limitations, in order to properly monitor these zones. Observers will be stationed at locations that provide adequate visual coverage for the marine mammal shutdown zone and zone of influence.

One observer will be placed at a suitable location near the G1 dock in order to observe the shutdown zone for vibratory and impact pile driving, as described in Section 3.4.1, Shutdown Zone and Zone of Influence. This observer's monitoring will be primarily dedicated to observing the shutdown zone; however, this observer will also record all marine mammal sightings beyond the radius of the shutdown zone, provided it does not interfere with their effectiveness at carrying out the shutdown procedures. Additionally, one observer will be stationed on shore, and will be responsible for monitoring and recording data on any marine mammals that enter the zone of influence for vibratory and impact pile driving/removal activities, as described in detail in Section 3.4.1, Shutdown Zone and Zone of Influence.

Potential observation locations are depicted below in Figure 2.

Figure 2. Observer monitoring locations.

3.6 Proposed Monitoring Techniques

The proposed zones of exclusion (shutdown zone) and zones of influence (Table 1) were calculated using data from the Naval Base Kitsap at Bangor Trident Support Facility Explosive Handling Wharf (EHW-2)

Project (Illingworth and Rodkin, 2013) and the practical spreading loss equation. The observers will monitor the zone of exclusion (190 dB) and the zones of influence (160 dB and 120 dB) for the presence of pinnipeds (i.e., Steller sea lions or harbor seals). If pinnipeds are observed approaching or within the zone of exclusion, shutdown procedures (Section 3.4) will be implemented to prevent a Level A exposure. If pinnipeds are observed within the zones of influence, the sighting will be documented as a Level B exposure and reported to NMFS in the monthly reports for NMFS determination. If the number of Steller sea lion or harbor seal exposures approach the number of takes allowed by the IHA, UniSea will notify NMFS and seek further consultation. If any marine mammal species is encountered that is not authorized by the IHA and is likely to be exposed to sound pressure levels greater than or equal to the zones of influence (inside Iliuliuk Harbor), then UniSea will shut down in-water activity to avoid take of those species. Work will continue when the animal has voluntarily left the harbor.

Table 1. *Zones of Exclusion and Influence*

Source	Zone of Exclusion (m)	Zone of Influence (m) *
Underwater		
Vibratory Pile Installation	10	10,000
Vibratory Pile Removal	10	7,400
Impact Pile Installation	10	500
Drilling for Pile Installation	10	10
Airborne		
All Pile Removal/Installation	N/A	30

** Zones of Influence adjusted for land features (figures in Appendix B).*

3.6.1 Visual Survey Protocol – Pre-Activity Monitoring

- Prior to the start of pile driving/removal or other in-water construction activities, the shutdown zone will be monitored for 15 minutes to ensure that there are no marine mammals present. The following survey methodology will be implemented prior to commencing pile installation/removal or other in-water construction activities:
- Observers will survey the shutdown zone and zone of influence. They will ensure that no marine mammals are seen within the shutdown zone before pile-driving/removal or other in-water construction activities begin.
- If marine mammal(s) are present within or approaching the shutdown zone prior to pile driving/removal or other in-water construction activities, the survey will continue and the start of these activities will be delayed until the animal(s) leave the shutdown zone voluntarily and have been visually confirmed beyond the shutdown zone, or 15 minutes has elapsed without re-detection of the animal in the shutdown zone.
- If marine mammal(s) are not detected within the shutdown zone (i.e. the zone is deemed clear of marine mammals), the observers will raise a green flag and radio the monitoring coordinator/construction contractor that pile driving/removal or other in-water construction activities can commence.

- If marine mammal(s) are present within the zone of influence, pile driving/removal or other in-water construction activities would not need to be delayed, but observers would monitor and document, to the extent practical, the behavior of marine mammals that remain in the zone of influence.
- Marine Mammal Observation Record forms (Appendix A) will be used to document observations.
- Observers will use binoculars and the naked eye to search continuously for marine mammals.
- In case of fog or reduced visibility, observers must be able to see the entire shutdown zone, or pile driving/removal will not be initiated until visibility in these zones improves to acceptable levels.

3.6.2 Visual Survey Protocol – During Activity Monitoring

The shutdown zone and zone of influence will be monitored throughout the time required to install or remove a pile (including soft start procedures), or complete other in-water construction as described in Section 3.4.1. The following survey methodology will be implemented during pile driving/removal and other in-water construction activities:

- If a marine mammal is observed within or entering the zone of influence during pile driving/removal an exposure would be recorded and behaviors documented. However, that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone
- If an animal approaches or enters the shutdown zone:
  1. All pile installation/removal activities and other in-water construction activities will be halted.
  2. The observers shall immediately radio to alert the monitoring coordinator/construction contractor and raise a red flag.
  3. This action will require an immediate "all-stop" on pile operations.
- Under certain construction circumstances where initiating the shutdown and clearance procedures would result in an imminent concern for human safety the shutdown provision may be waived (see Section 3.4.1 for additional details).
- In the event of a shutdown, construction activities may resume only when the animal that was within, or was approaching, the shutdown zone has voluntarily left the shutdown zone and has been visually confirmed beyond the shutdown zone, or 15 minutes have passed without re-detection of the animal, and the zone is deemed clear of marine mammals. Observers will then raise a green flag and radio the monitoring coordinator/construction contractor that activities can re-commence;
- During an in-water construction delay, surveys will continue to be conducted.
- If marine mammals are detected outside the shutdown zone, the observers will continue to monitor these individuals and record their behavior, but pile driving and other in-water construction may proceed. Any marine mammals detected outside the shutdown zone after pile driving or other in-water construction activities are initiated shall likewise continue to be monitored and their behaviors recorded.
- Marine Mammal Observation Record forms (Appendix A) will be used to document observations.
- Observers will use binoculars and the naked eye to search continuously for marine mammals.
- In case of fog or reduced visibility, observers must be able to see the entire shutdown zone or pile driving/removal and in-water construction activities will not be initiated until visibility in the zone improves to acceptable levels.

3.6.3 Visual Survey Protocol – Post-Activity Monitoring

Monitoring of the shutdown and buffer zones will continue for 30 minutes following completion of pile installation activities. A post-monitoring period is not required for other in-water construction. These surveys

will record marine mammal observations, and will focus on observing and reporting unusual or abnormal behavior of marine mammals. Marine Mammal Observation Record forms (Appendix A) will be used to document observations. In general, the same protocols described in section 3.6.2 (Visual Survey Protocol – During Activity Monitoring) would apply. During these surveys, if any injured, sick, or dead marine mammals are observed procedures outlined in Section 4 should be following regarding notifying the appropriate authorities.

4 Interagency Notification

In the event that UniSea needs to modify terms of this monitoring plan, the NMFS representative will be promptly contacted for discussion of the requested modification. In addition, if UniSea finds an injured, sick, or dead marine mammal, UniSea will notify NMFS immediately. All of these marine mammal sightings will be called into the NMFS Stranding Hotline (1-800-853-1964) unless the marine mammal's condition is a direct result of the project, in which case additional notification should be made to Jordan Carduner (NMFS HQ) (301) 427-8483. UniSea will provide NMFS with the species or description of the animal(s), the condition of the animal (including carcass condition if the animal is dead), location, the date and time of first discovery, observed behaviors (if alive), and photo or video (if available).

Care should be taken in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In preservation of biological materials from a dead animal, the finder (i.e. marine mammal observer) has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

5 Reporting

5.1 Annual Report

A comprehensive annual marine mammal monitoring report documenting marine mammal observations will be submitted to NMFS at the end of the in-water work season. The draft comprehensive marine mammal monitoring report will be submitted to NMFS within 90 calendar days of the end of the in-water work period. The report will include marine mammal observations (pre-activity, during-activity, and post-activity) during pile driving days. A final comprehensive report will be prepared and submitted to NMFS within 30 calendar days following resolution of comments on the draft report from NMFS.

The reports shall include at a minimum:

- General data:
  - Date and time of activity
  - Water conditions (e.g., sea-state, tidal state)
  - Weather conditions (e.g., percent cover, percent glare, visibility)
- Specific pile driving data:
  - Description of the pile driving activity being conducted (pile locations, pile size and type), and times (onset and completion) when pile driving occurs.
  - The construction contractor and/or marine mammal monitoring staff will coordinate to ensure that pile driving times and strike counts are accurately recorded. The duration of soft start procedures (impact only) should be noted as separate from the full power driving duration.
  - Description of in-water construction activity not involving pile driving (location, type of activity, onset and completion times)

    - Detailed description of the sound attenuation system, including design specifications. Details of any issues associated with bubble curtain deployment or any functional checks conducted on the system should be recorded on a daily or per pile basis.
- Pre-activity observational survey-specific data:
    - Dates and time survey is initiated and terminated
    - Description of any observable marine mammals and their behavior in the immediate area during monitoring
    - Times when pile driving or other in-water construction is delayed due to presence of marine mammals within shutdown zones.
- During-activity observational survey-specific data:
    - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding the monitoring zones, including the following:
        - Distance from animal to pile driving sound source.
        - Reason why/why not shutdown implemented.
        - If a shutdown was implemented, behavioral reactions noted and if they occurred before or after implementation of the shutdown.
        - If a shutdown was implemented, the distance from animal to sound source at the time of the shutdown.
        - Behavioral reactions noted during soft starts and if they occurred before or after implementation of the soft start.
        - Distance to the animal from the sound source during soft start.
- Post-activity observational survey-specific data:
    - Results, which include the detections and behavioral reactions of marine mammals, the species and numbers observed, sighting rates and distances,
    - Refined exposure estimate based on the number of marine mammals observed. This may be reported as a rate of take (number of marine mammals per hour or per day), or using some other appropriate metric.

Appendix A. Marine Mammal Observation Record Forms

MARINE MAMMAL OBSERVATION RECORD FORM

Project Name: ______________________ Monitoring Location: ______________________ Page__________of__________

Date: ______________________ (Dock Location, Land Location, other) Time Effort Initiated:______________

Time Effort Completed:______________

SIGHTING DATA

Event Code	Sighting Number (1 or 1.1 if resight)	Time/Duration watching sighting (Start/End time if continuous)	WP # (every time a sighting is made)	Observer	Sighting Cue	Species	Dist/Dir to Animal (from Observer)	Dist to Pile between animal & pile)	# of Animals Group Size (min/max/best)	Relative Motion/and Behavior Code (see code sheet)	Const Type During Sighting	Mitigation used during sighting? (Y/N)	Mitigation Type?	Visibility	% Glare	Weather Condition	Sea State and Wave Ht	Swell Direction	Behavior Change/ Response to Activity/Comments
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: :					m or km	m or km		opening closing parallel none Behavior code: ________	PRE POST SSV SSI V I PC DP ST NONE		DE SD	B P M G E			Light Mod Heavy	N or S W or E	

Sighting #=chronological number of sightings, If resight of same animal, then 1.1, 1.2, etc. WP (Waypoint)=GPS recording of lat/long, time/date stamp. Critical for vessel observers.

Marine Mammal Observation Record – Sighting Codes

Behavior Codes

Code	Behavior	Definition
BR	Breaching	Leaps clear of water
CD	Change Direction	Suddenly changes direction of travel
CH	Chuff	Makes loud, forceful exhalation of air at surface
DI	Dive	Forward dives below surface
DE	Dead	Shows decomposition or is confirmed as dead by investigation
DS	Disorientation	An individual displaying multiple behaviors that have no clear direction or purpose
FI	Fight	Agonistic interactions between two or more individuals
FO	Foraging	Confirmed by food seen in mouth
MI	Milling	Moving slowly at surface, changing direction often, not moving in any particular direction
PL	Play	Behavior that does not seem to be directed towards a particular goal; may involve one, two or more individuals
PO	Porpoising	Moving rapidly with body breaking surface of water
SL	Slap	Vigorously slaps surface of water with body, flippers, tail etc.
SP	Spyhopping	Rises vertically in the water to "look" above the water
SW	Swimming	General progress in a direction. Note general direction of travel when last seen [Example: "SW (N)" for swimming north]
TR	Traveling	Traveling in an obvious direction. Note direction of travel when last seen [Example: "TR (N)" for traveling north]
UN	Unknown	Behavior of animal undetermined, does not fit into another behavior
Pinniped only		
EW	Enter Water (from haul out)	Enters water from a haul-out for no obvious reason
FL	Flush (from haul out)	Enters water in response to disturbance
HO	Haul out (from water)	Hauls out on land
RE	Resting	Resting onshore or on surface of water
LO	Look	Is upright in water "looking" in several directions or at a single focus
SI	Sink	Sinks out of sight below surface without obvious effort (usually from an upright position)
VO	Vocalizing	Animal emits barks, squeals, etc.
Cetacean only		
LG	Logging	Resting on surface of water with no obvious signs of movement

Marine Mammal Species

Code	Marine Mammal Species
HSEA	Harbor Seal
STSL	Steller Sea Lion
OTHR	Other

Event

Code	Activity Type
E ON	Effort On
E OFF	Effort Off
PRE	Pre Watch
POST	Post Watch
SSI	Soft start-impact
WC	Weather Condition/Change
S	Sighting
M-DE	Mitigation Delay
M-SD	Mitigation Shutdown

Construction Type

Code	Activity Type
SSI	Soft Start (Impact)
V	Vibratory Pile Driving (installation and extraction)
I	Impact Pile Driving
DP	Dead pull
ST	Stabbing
DR	Drilling
NONE	No Pile Driving
OTH	Other

Mitigation Codes

Code	Activity Type
DE	Delay onset of Pile Driving
SD	Shut down Pile Driving

Visibility

Code	Distance Visible
B	Bad (<0.5km)
P	Poor (0.5 – 1.5km)
M	Moderate (1.5 – 10km)
G	Good (10 - 15km)
E	Excellent (>15km)

Weather Conditions

Code	Weather Condition
S	Sunny
PC	Partly Cloudy
L	Light Rain
R	Steady Rain
F	Fog
OC	Overcast

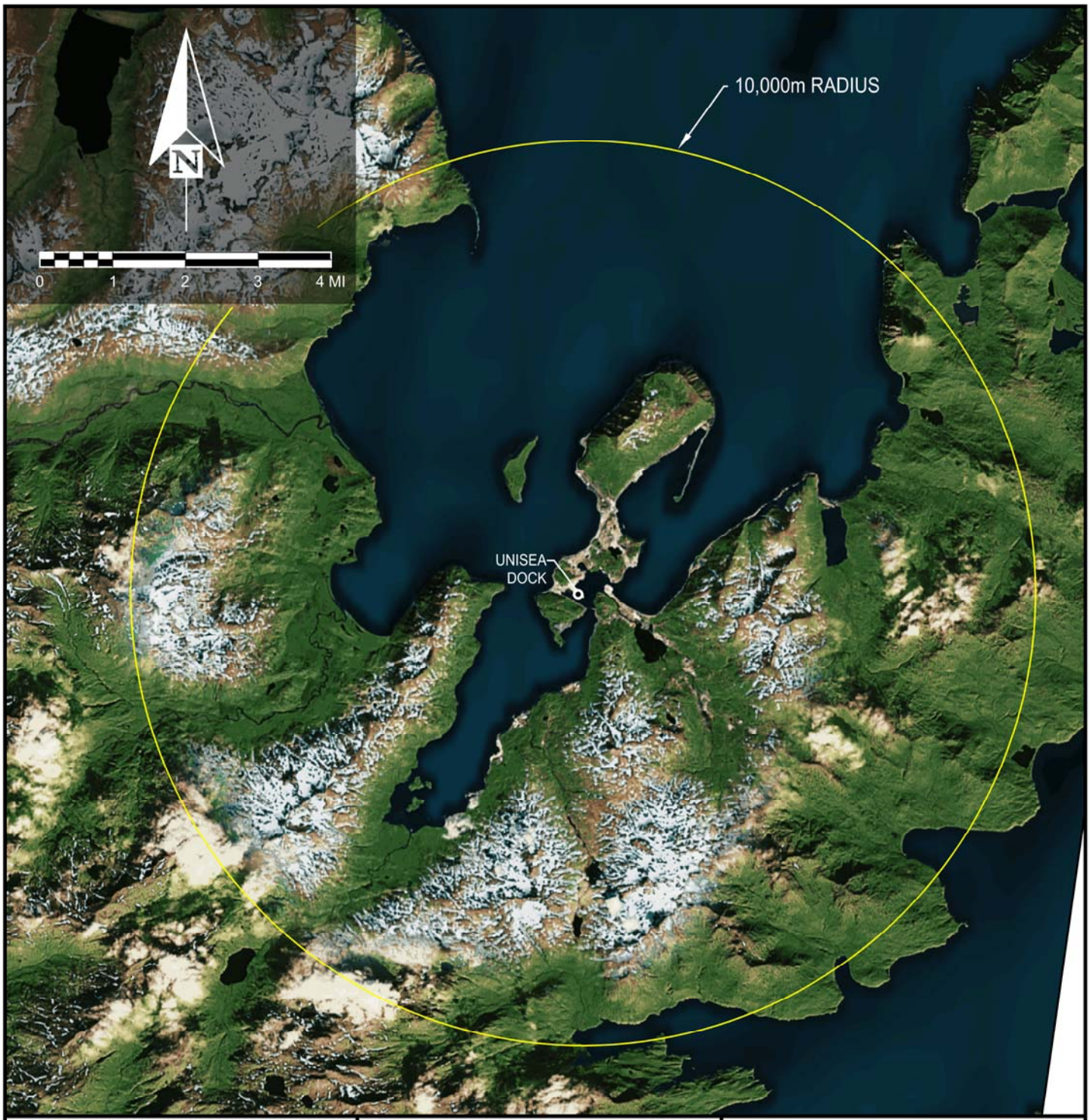
Glare: Percent glare should be the total glare of observers' area of responsibility. Determine if observer coverage is covering 90 degrees or 180 degrees and document daily. Then assess total glare for that area. This will provide needed information on what percentage of the field of view was poor due to glare.

Sea State and Wave Height: Use Beaufort Sea State Scale for Sea State Code located in Appendix C. This refers to the surface layer and whether it is glassy in appearance or full of white caps. In the open ocean, it also takes into account the wave height or swell, but in inland waters the wave height (swells) may never reach the levels that correspond to the correct surface white cap number. Therefore, include wave height for clarity.

Code	Wave Height
Light	0 – 3 ft
Moderate	4 – 6 ft
Heavy	>6 ft

Swell Direction: Swell direction should be where the swell is coming from (S for coming from the south). If possible, record direction relative to fixed location (pier). Choose this location at beginning of monitoring project.

Appendix B. Zone of Exclusion and Zone of Influence Figures



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
VIBRATORY DRIVING

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015 SHEET **1** of **1**

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
VIBRATORY REMOVAL

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE VIBRATORY DRIVING AND REMOVAL

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE
IMPACT DRIVING

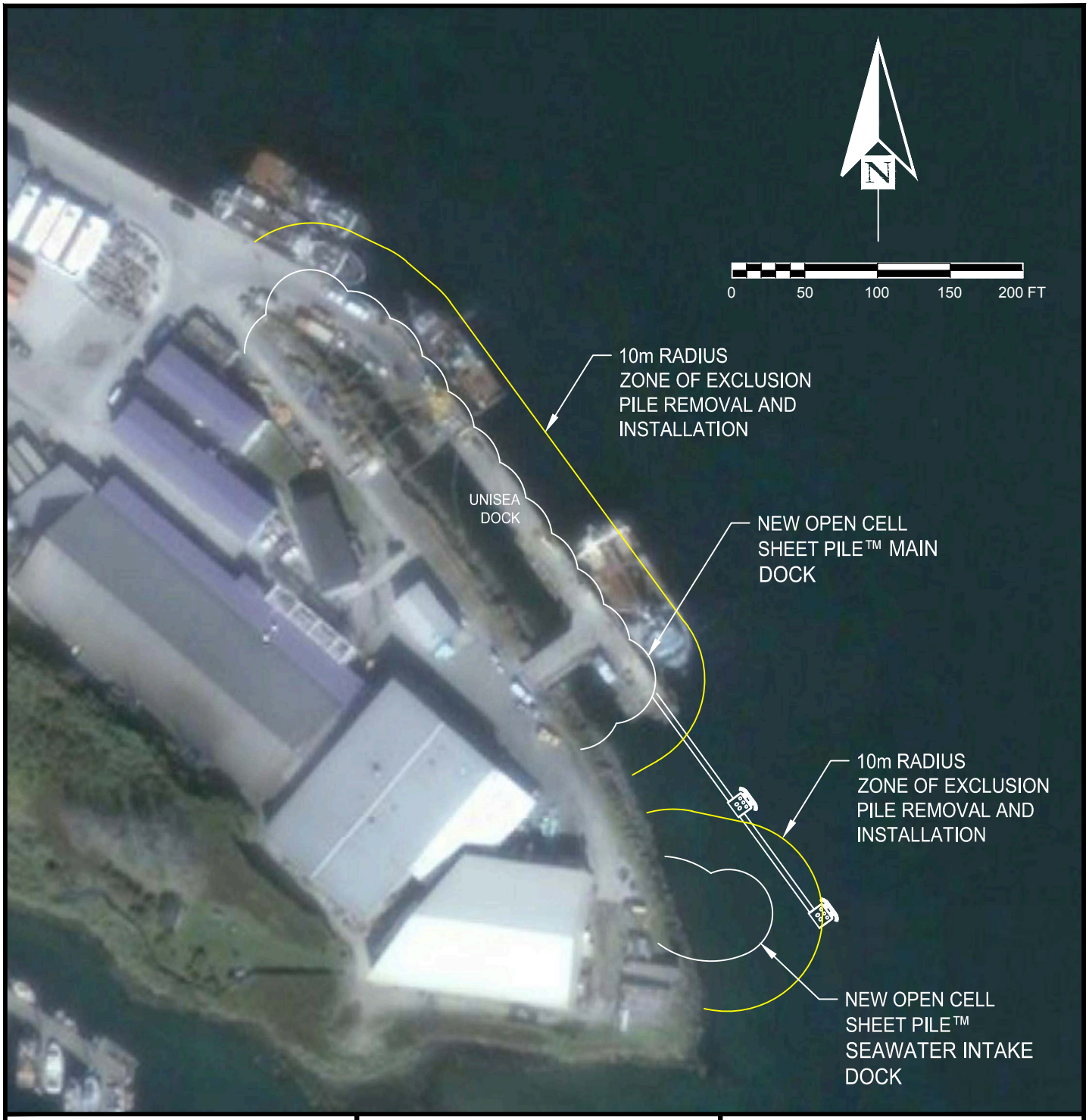
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

SEPT 2015 SHEET **1** of **1**



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF EXCLUSION PILE REMOVAL AND INSTALLATION

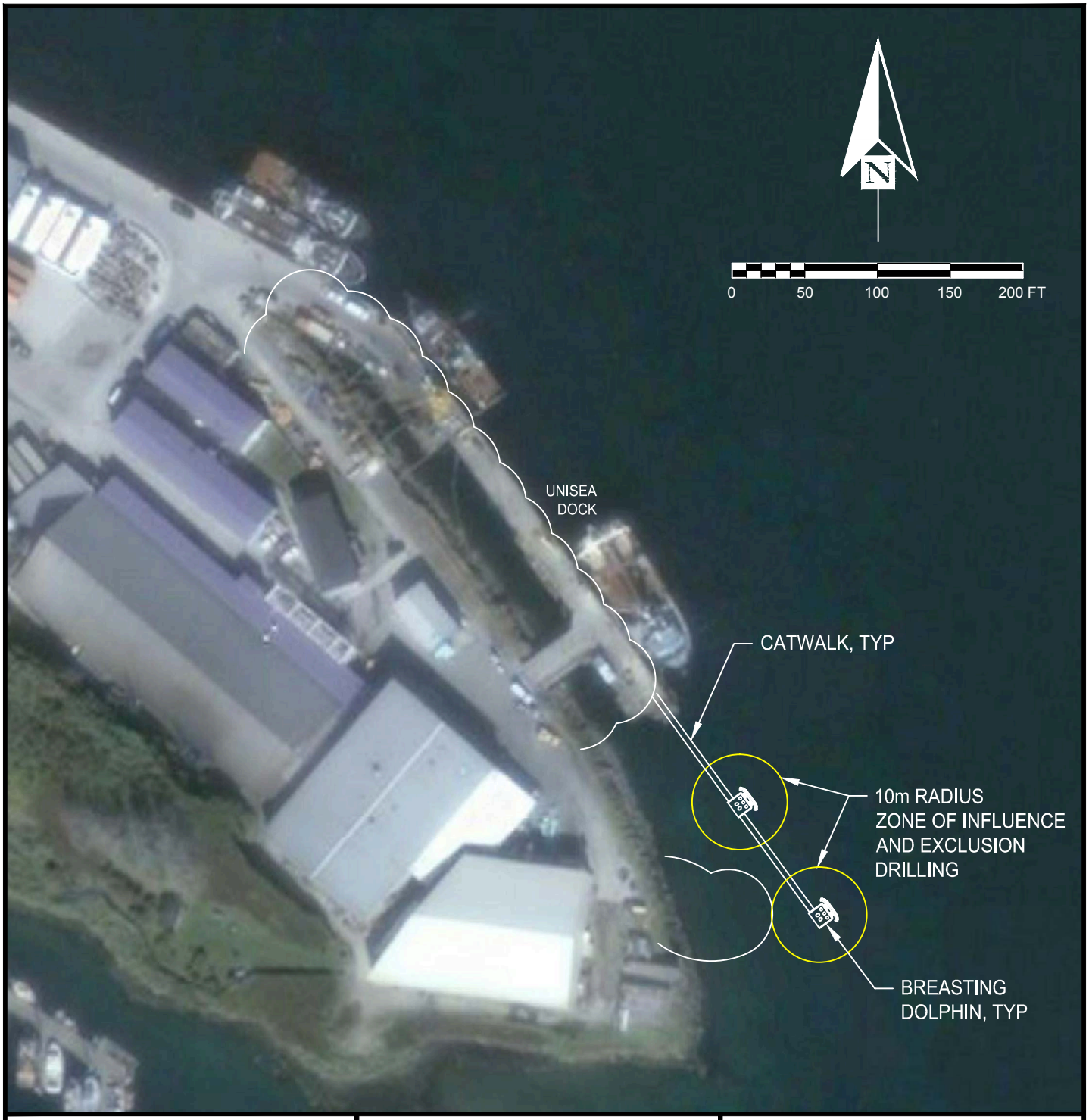
UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK ILIULIUK HARBOR

POA–1988–735–M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015



PURPOSE:
REPLACE EXISTING DOCK

DATUM: 0' MLLW

PROJECT LOCATION:
LAT: 53.8776° LONG: 166.5491°
SEC. 3 & 10, T73S, R118W, S.M.

ZONE OF INFLUENCE AND EXCLUSION DRILLING

UNISEA, INC.
88 SALMON WAY
DUTCH HARBOR, AK
99692

UNISEA DOCK
ILIULIUK HARBOR

POA-1988-735-M

AT: UNALASKA
IN: ILIULIUK HARBOR

MAY 2015

Appendix C. Beaufort Sea Scale

BEAUFORT SEA STATE SCALE

Beaufort Number (Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Height of Waves (Feet)	Photos indicating Beaufort Sea State
0	<1	Calm	Sea surface smooth and mirror like	0	
1	1-3	Light Air	Scaly ripples, no foam crests	0-1	
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	1-2	

Beaufort Number (Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Height of Waves (Feet)	Photos indicating Beaufort Sea State
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	2-3.5	
4	11-16	Moderate Breeze	Small waves, becoming longer, numerous whitecaps	1-4	
5	17-21	Fresh Breeze	Moderate waves, taking longer form, many whitecaps, some spray	4-8	

Beaufort Number (Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Height of Waves (Feet)	Photos indicating Beaufort Sea State
6	22-27	Strong Breeze	Larger waves, whitecaps common, more spray	8-13	
7	28-33	Near Gale	Sea heaps up, white foam streaks off breakers	13-19	
8	34-40	Gale	Moderately high, waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	18-25	

Beaufort Number (Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Height of Waves (Feet)	Photos indicating Beaufort Sea State
9	41-47	Strong Gale	High waves, sea begins to roll, dense streaks of foam, spray may reduce visibility	23-32	
10	48-55	Storm	Very high waves, with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	29-41	
11	56-63	Violent Storm	Exceptionally high waves, foam patches cover sea, visibility more reduced	37-52	

Beaufort Number (Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Height of Waves (Feet)	Photos indicating Beaufort Sea State
12	64+	Hurricane	Air filled with foam, sea completely white with driving spray, visibility greatly reduced	45+	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Appendix F. USFWS Section 7 Concurrence Letter

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Anchorage Fish and Wildlife Field Office
4700 BLM Road
Anchorage, Alaska 99507

In Reply Refer To:
FWS/AFES/AFWFO

May 19, 2015

EMAILED TO:
Jen Martin
Regulatory Specialist
U.S. Army Corps of Engineers
Alaska District, Regulatory Division Kenai Field Office
44669 Sterling Highway, Suite B
Soldotna, Alaska 99669

Re: Unalaska Iliuliuk Harbor dock replacement (Consultation #2015-0084)

Dear Ms. Martin:

Thank you for your request for consultation pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq., as amended; ESA), in regard to a Department of the Army permit application submitted by PND Engineers, Inc., on behalf of Unisea, Inc. related to a proposed dock replacement project for the GI 1 Dock within Iliuliuk Harbor in Unalaska, Alaska. The U.S. Army Corps of Engineers (Corps) proposes to modify an existing permit (pursuant with Secion 10 of the Rivers and Harbors Act of 1899 [33 U.S.C. 403]) for the G1 Dock Replacement project, for which a section 7 consultation was concluded by the U.S. Fish and Wildlife Service (Service; consultation #2007-0047). The Corps has requested concurrence with the determination that the modified permit authorizing proposed activities at the existing dock may affect, but is not likely to adversely affect some species and habitat protected under the ESA.

The proposed activities are to occur between February 01, 2016, and December 01, 2017. The existing permit (POA-1988-735-M5), issued October 26, 2011, authorized replacement of the pile-supported dock with an 80 foot (ft) x 400 ft OPEN CELL SHEET PILE™ dock. Modification to the existing permit would include the addition of the following:

1) Fifty 24-inch (in) fiber-reinforced polymer fender piles;
2) Nine 24-in steel piles for the crab brailer support;
3) a 90-ft by 85-ft sheet pile structure for seawater intake, access ramp and armor rock protection;
4) two 100-ft catwalks supported by a total of four 18-in steel piles;
5) two dolphins composed of seven piles each (five 24-in steel piles and two 24-in steel fender piles; a total of 14 piles).

The Corps has determined that the proposed authorization of this modification would have no effect on short-tailed albatross (*Phoebastria albatrus*, listed as endangered in 2000), and may affect, but is not likely to adversely affect, the northern sea otter (*Enhydra lutris kenyoni*, listed as threatened in 2005) or their critical habitat (federally designated in 2009), and the Alaska breeding population of Steller's eiders (*Polysticta stelleri*, listed as threatened in 1997). Potential adverse effects from the proposed action on listed species would primarily result from in-water and airborne noise from the applicant's use of heavy equipment driving piles and face-sheets into the sea bottom and compacting the fill material.

Short-tailed albatrosses are not expected in the vicinity of the action area, even though they are frequently observed offshore near Unalaska Island. Therefore, the Service anticipates no adverse effects to this endangered seabird. Steller's eiders occur in nearshore waters of Unalaska Island, may be in the action area during fall, winter, and spring, and may be adversely affected by noise during construction. Sea otters may be present in the action area at any time of year and noise disturbance is likely to adversely affect them. To address the potential for adverse effects to sea otters and Steller's eiders from noise disturbance, the Corps will require compliance with the Service's *Anchorage Fish and Wildlife Field Office Observer Protocols for Pile Driving, Dredging and Placement of Fill* (Observer Protocols; Service 2012). Should sea otters or Steller's eiders be sighted within 100 meters of the work site during vibratory pile driving, or within 300 meters of the work site during impact pile driving, activities will be curtailed until the animal(s) voluntarily leave the work area. Compliance with the Observer Protocols will minimize the risk of disturbance from construction activities to sea otters and Steller's eiders.

The action area is within critical habitat designated for the sea otter, however the footprint of the piles for the dock facility is extremely small, and the action area is considered low quality due to existing water pollution and extreme industrial use. The Service believes that the loss of critical habitat as a result of this proposed project is inconsequential to the survival and recovery of northern sea otters.

Because the proposed action is anticipated to have no adverse effects on short-tailed albatrosses, is not expected to have significant impacts to critical habitat for sea otters, and since avoidance measures will be employed to reduce potential harm from noise disturbance to otters and eiders during construction, the Service concurs with the Corps' determination that authorization of the dock replacement project is not likely to adversely affect listed species or their critical habitat. This letter relates only to federally listed or proposed species and/or designated or proposed critical habitat under our jurisdiction. It does not address species under the jurisdiction of National Marine Fisheries Service, or responsibilities under the Migratory Bird Treaty Act, Marine Mammal Protection Act, Clean Water Act, Fish and Wildlife Coordination Act, National Environmental Policy Act, Bald and Golden Eagle Protection Act, or other legislation.

In view of this, requirements of section 7 of the ESA have been satisfied. However, obligations under section 7 of the ESA must be reconsidered if new information reveals project impacts that may affect listed species or critical habitat in a manner not previously considered, if this action is subsequently modified in a manner which was not considered in this assessment, or if a new species is listed or critical habitat is determined that may be affected by the proposed action.

Thank you for your cooperation in meeting our joint responsibilities under the ESA. For more information or if you have any questions please contact Leah Kenney at 907-271-2440 or myself at 907-271-1467 and refer to consultation number 2015-0084.

Sincerely,

Ellen Lance
Chief, Ecological Services Branch

Literature Cited

[Service]U.S. Fish and Wildlife Service. 2012. Anchorage Fish and Wildlife Field Office Observer Protocols for Pile Driving, Dredging and Placement of Fill. Draft. August 7, 2012. 6 pp.

Appendix G. Calculations of Estimated Exposures

Statistical Analysis of Observations &
Calculation of Take Estimate

Month	Observations	SSL Obs.	HS Obs.	Hours Obs.	Obs. Rate (OR) SSL/hour	Obs. Rate (OR) HS/hour
November 2014	-	-	-	-	-	-
December	-	-	-	-	-	-
January 2015*	16	10	-	4.00	2.500	-
February*	37	37	-	9.25	4.000	-
March*	32	14	-	8.00	1.750	-
April	17	1	3	4.25	0.235	0.706
May	17	2	0	4.25	0.471	0.000
June	162	0	0	40.50	0.000	0.000
July	339	22	5	84.75	0.260	0.059
August	348	141	6	87.00	1.621	0.069
September	299	90	9	74.75	1.204	0.120
October	165	6	10	41.25	0.145	0.242
*UniSea only				**AVG Observation Rate (OR)**	1.219	0.171
				Norm 95% Confidence Interval (CI)	0.798	0.185
				95% CI XR	2.016	0.356

	Take Estimate	
Hours of Pile Driving	**SSL**	**HS**
1080	**2177**	**385**

P | N | D
ENGINEERS, INC.


UniSea