SUMMARY: This notice sets forth the schedule and proposed agenda of a forthcoming meeting of the Ocean Exploration Advisory Board (OEAB). OEAB members will discuss and provide advice on Federal ocean exploration programs, with a particular emphasis on National Oceanic and Atmospheric Administration (NOAA) Office of Ocean Exploration and Research (OER) activities, NOAA's response to the OEAB letter to NOAA Administrator Kathryn Sullivan on October 2, 2015, U.S. ocean exploration-related activities in the Arctic, and other matters as described in the agenda found on the OEAB Web site at *http://oeab.noaa.gov.*

Time and Dates: The announced meeting is scheduled for Wednesday, January 20, 2016 from 8:30 a.m.—5:45 p.m. EST, and Thursday, January 21, 2016 from 8:30 a.m.—1:30 p.m. EST.

ADDRESSES: The meeting will be held at SRI International, 450 8th Avenue SE., St. Petersburg, FL 33071

Status: The meeting will be open to public participation with a 15-minute public comment period on Wednesday, January 20, 2016 from 1:30 p.m. to 1:45 p.m. EST (please check the agenda on the Web site to confirm the time).

The OEAB expects that public statements at its meetings will not be repetitive of previously submitted verbal or written statements. In general, each individual or group making a verbal presentation will be limited to three minutes. The Designated Federal Officer must receive written comments by January 6, 2016 to provide sufficient time for OEAB review. Written comments received after January 6, 2016 will be distributed to the OEAB but may not be reviewed prior to the meeting date. Seats will be available on a first-come, first-served basis.

Special Accomodations: These meetings are physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to David McKinnie, Designated Federal Officer (see below) by January 6, 2016.

FOR FURTHER INFORMATION CONTACT: Mr. David McKinnie, Designated Federal Officer, Ocean Exploration Advisory Board, National Oceanic and Atmospheric Administration, 7600 Sand Point Way NE., Seattle, WA 98115, (206) 526–6950.

SUPPLEMENTARY INFORMATION: NOAA established the OEAB under the Federal Advisory Committee Act (FACA) and legislation that gives the agency statutory authority to operate an ocean exploration program and to coordinate a national program of ocean exploration. The OEAB advises NOAA leadership on strategic planning, exploration priorities, competitive ocean exploration grant programs and other matters as the NOAA Administrator requests.

OEAB members represent government agencies, the private sector, academic institutions, and not-for-profit institutions involved in all facets of ocean exploration—from advanced technology to citizen exploration.

In addition to advising NOAA leadership, NOAA expects the OEAB to help to define and develop a national program of ocean exploration—a network of stakeholders and partnerships advancing national priorities for ocean exploration.

Dated: December 17, 2015.

Jason Donaldson,

Chief Financial Officer, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration.

[FR Doc. 2015–32280 Filed 12–22–15; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE340

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Dock Replacement Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received a request from UniSea, Inc., for authorization to take marine mammals incidental to construction activities as part of a dock construction project at a commercial fish processing facility in Unalaska, AK. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to UniSea to incidentally take marine mammals, by Level B Harassment only, during the specified activity.

DATES: Comments and information must be received no later than January 22, 2016.

ADDRESSES: Comments on the application should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.Carduner@noaa.gov.*

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted for public viewing on the Internet at *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm* without change. All personal identifying information (*e.g.,* name, address), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible.

FOR FURTHER INFORMATION CONTACT: Jordan Carduner, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of UniSea's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.* In case of problems accessing these documents, please call the contact listed under **FOR FURTHER INFORMATION CONTACT**.

National Environmental Policy Act (NEPA)

NMFS is preparing an Environmental Assessment (EA) for the proposed issuance of an IHA, pursuant to NEPA, to determine whether or not this proposed activity may have significant direct, indirect and cumulative effects on the human environment. This analysis will be completed prior to the issuance or denial of this proposed IHA. We will review all comments submitted in response to this notice as we complete the NEPA process, prior to a final decision on the incidental take authorization request. The EA will be posted at *http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm* when it is finalized.

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (1) have a negligible impact on the species or stock(s), and (2) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death, or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS may authorize such incidental taking by harassment only, for periods of not more than one year, pursuant to requirements and conditions contained within an IHA. The establishment of these prescriptions requires notice and opportunity for public comment.

NMFS has defined ''negligible impact'' in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as any act of pursuit, torment, or annoyance which: has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

On June 10, 2015, we received a request from UniSea for authorization to take marine mammals incidental to pile driving and pile removal associated with construction of a commercial fishing dock in Iliuliuk Harbor, a small harbor in the Aleutian Islands. UniSea submitted revised versions of the request on September 28, 2015, and December 2, 2015. The latter of these was deemed adequate and complete. UniSea proposes to replace the existing dock with an 80 foot by 400 foot open cell sheet pile dock between March 1, 2016 and February 28, 2017.

The use of both vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Species with the expected potential to be present during all or a portion of the in-water work window include the Steller sea lion (*Eumetopias jubatus*) and harbor seal (*Phoca vitulina*). These species may occur year-round in Iliuliuk Harbor.

Description of the Specified Activity

Overview

UniSea's ''G1'' dock is located in the commercial fishing port of Iliuliuk Harbor in Unalaska, AK, and supports activities that occur in nearby fish processing facilities. The existing dock is being replaced because it is currently partially unusable, and because the company's plans for expansion necessitate a larger dock with increased capacity.

UniSea proposes to demolish the existing structure 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 then be installed. 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. Sound attenuation measures (*i.e.,* bubble curtain) will be used during all impact hammer operations. Note that throughout the remainder of this document the term ''pile driving'' refers to both pile driving and pile removal, except where specified.

Dates and Duration

UniSea plans to conduct all in-water construction work during the period from March 1, 2016 to February 28, 2017. The total construction time, including removal of old piles and construction of the new dock, is expected to take no more than 180 days. Durations are conservative, and the actual amount of time to install and remove piles may be less than estimated. In-water and over-water construction of Phase 1 (all sheet pile installation and some pipe pile installation) is planned to occur between approximately March 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 apply for a second IHA for any additional construction work that was not completed in the first year of the project.

In the summer months (May–August), 12 hour work days in daylight will likely be feasible given the extended daylight hours. In winter months (September–April), 8 hour to 10 hour work days in daylight will likely be achievable. The daily construction window for pile driving or removal will begin no sooner than 30 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.

Duration estimates for each of the pile installation and removal elements are described below:

- Vibratory Pile Removal: Vibratory pile removal will take 10 minutes or less per pile over a maximum duration of 30 days. Total maximum vibratory pile removal 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 maximum duration of 90 days. Total maximum 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 maximum duration of 30 days (concurrent with impact pile driving). Total maximum 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 maximum duration of 60 days. Total maximum 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 maximum duration of 50 days (concurrent with impact pile driving).

Total maximum drilling time for 24 piles is 144 hours.

The duration estimates provided above are considered generous enough to account for temporary support piles installed by the construction contractor for template structures to accommodate pile driving. Only one pile driver will be operating at any given time, and impact and vibratory driving are not anticipated to occur concurrently (*i.e.,* only one method of driving will be used at a given time).

Specific Geographic Region

The project location is in the eastern Aleutian Islands, west of mainland Alaska. The UniSea dock is located in Iliuliuk Harbor, a small harbor on an islet called Amaknak Island that is connected by a small bridge to the larger Unalaska Island. Iliuliuk Harbor is located between Captains Bay and Iliuliuk Bay, with Unalaska Bay to the north opening into the Bering Sea. Please see Figure 1 and Section 2 of UniSea's IHA application for detailed information about the specific geographic region.

Detailed Description of Activities

UniSea proposes to replace the ''G1'' dock mainly because the existing dock is partially unusable as a large portion of the dock is condemned due to corrosion and damage to existing steel piles. Additionally, the current UniSea processing plant is nearing capacity and the company plans to build new processing facilities that will ultimately be located at the shoreline and possibly encroach onto the new dock, necessitating a fill dock design rather than a pile-supported structure.

The proposed action includes the demolition and removal of the existing dock structure and the installation of a new 80 foot by 400 foot open cell sheet pile™ (OCSP ™) dock. 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. 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.

The construction process is described below; further detail on the process can be found in Section 1 of the IHA application. The number and type of piles and related construction equipment proposed for installation as part of the construction process are as follows (and are shown in Table 1):

- Approximately fifty 24-inch diameter fiber-reinforced polymer (FRP) composite fender piles;
- Approximately nine 24-inch diameter steel support piles along the dock face and for crab brailer support;
- One 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;
- Two dolphins, each includes: five 24-inch diameter steel support piles (10 total) and two 24-inch diameter steel fender pin piles (four total);
- Four 50 foot steel catwalks with intermediate supports of two 18-inch diameter steel piles each (four piles total); and
- 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).

TABLE 1—ANTICIPATED TYPES AND QUANTITIES OF CONSTRUCTION EQUIPMENT REQUIRING PILE DRIVING OR REMOVAL DURING PROPOSED CONSTRUCTION PROJECT

Item	Estimated number, size and type	Construction technique
Proposed piles to be removed	73 (steel)	Vibratory.
	72 (timber)	
Proposed piles to be installed	24 (24″ Steel)	Vibratory or Impact.
	4 (18″ Steel)	
	50 (24″ FRP)	
Estimated temporary piles to be installed	180 (18″ Steel)	Vibratory or Impact.
Proposed sheet piles	887	Vibratory.

The existing dock (consisting of steel support piles, steel superstructure, and concrete deck) will be completely removed for construction of the new G1 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 will then be completely removed from the water by hoisting with crane line rigging, and then placed on the ground or deck of a barge. In addition to vibratory pile removal, demolition of the existing dock and removal of existing riprap/obstructions will be performed with track excavators, loaders, cranes, barges, cutting equipment, 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. 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.

The new sheet pile bulkhead dock and seawater intake structure will then be installed utilizing a crane and vibratory hammer. UniSea anticipates that the largest vibratory hammer that may be used for the project will have an eccentric moment of 6,600 inch-pounds (''eccentric moment'' is one of two key factors in vibratory hammer performance—the other being engine power—and is responsible for creating enough amplitude to exceed the elastic range of the substrate). After all 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. See Figure 2 in the IHA application for a photo of sheet pile installation using a vibratory hammer.

Approximately 50 fiber-reinforced polymer (FRP) composite fender piles will then 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 FRP fender piles will be done with a vibratory or impact hammer, and final seating of the piles into the shallow bedrock will be done with an impact hammer. See Figure 3 in the IHA application for a photo of the FRP composite fender pile. Two dolphins, each with five 24-inch diameter steel support piles each and two 24-inch diameter steel fender pin 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. See Figure 4 in the IHA application for a photo of the dolphin support piles being driven 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.

Fender support/pin piles will then 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 below), or with a rock anchor system. Pre-assembled fender systems (energy absorbers, sleeve piles, steel framing, and fender panels) will be lifted and installed onto fender support piles via crane.

Miscellaneous support piles (including catwalk and dock face support piles) will then be installed and cut to elevation. Installation methods for the miscellaneous support piles will be similar to the fender support piles (described above). 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. Installation methods for the temporary support piles will be similar to those used for the fender support piles (described above). 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 14 cells, and there are two dolphin and two catwalk support structures. It is estimated that upwards of ten temporary support piles will be used per cell for the sheet pile structures, and upwards of eight piles per dolphin and catwalk support location (this represents a best estimate of the number of temporary piles that will be necessary based on previous projects, however the actual number will be determined by the contractor).

Down-the-hole drilling entails the use of 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. The piling is fit over the drill with the drill head extending beneath the pile, and 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 much of the high-energy sound associated with traditional pile driving methods. For the purposes of this proposed authorization we assume that fender support/pin piles, miscellaneous support piles (including catwalk and dock face support piles), and temporary support piles (for the contractor's pile driving template structures) would be installed using impact driving. However, if they are ultimately installed by down-the-hole drilling this would not change the total amount of effort, *i.e.* down-the-hole drilling would occur instead of, not in addition to, impact driving for installation of fender support/pin piles, miscellaneous support piles, and temporary support piles.

Additional construction work, such as concrete dock surfacing, will take place at or near the surface of the dock and will occur above water. Because this work is not expected to result in harassment of marine mammals, we do not summarize it here. Details of all planned construction work, and photos of many of the construction techniques described above, can be found in Section 1 of UniSea's IHA application.

Description of Marine Mammals in the Area of the Specified Activity

Marine waters near Unalaska Island support many species of marine mammals, including pinnipeds and cetaceans; however, the number of species regularly occurring near the project location is limited. There are three marine mammal species under NMFS' jurisdiction with recorded occurrence in Iliuliuk Harbor during the past 15 years, including one cetacean and two pinnipeds. Steller sea lions are the most common marine mammals in the project area and are part of the western Distinct Population Segment (DPS) that is listed as Endangered under the Endangered Species Act (ESA). Harbor seals (*Phoca vitulina*) may also occur in the project area, though less frequently and in lower abundance than Steller sea lions. The humpback whale (*Megaptera novaeangliae*), although seasonally abundant in Unalaska Bay, is not typically present in Iliuliuk Harbor. A single humpback whale was observed beneath the bridge that connects Amaknak Island and Unalaska Island, moving in the direction of Iliuliuk Harbor, in September 2015 (pers. comm., L. Baughman, PND Engineers, to J. Carduner, NMFS, Oct. 12, 2015); no other sightings of humpback whales in Iliuliuk Harbor have been recorded and no records are found in the literature. In the summer months, the majority of humpback whales from the central North Pacific stock are found in the feeding grounds of the Aleutian Islands, Bering Sea, Gulf of Alaska, and Southeast Alaska/northern British Columbia, with high densities of whales found in the eastern Aleutian Islands, including along the north side of Unalaska Island (Allen and Angliss 2014b). Despite their relatively high abundance in Unalaska Bay during summer months, their presence within Iliuliuk Harbor is sufficiently rare that we do not believe there is a reasonable likelihood of their occurrence in the project area during the period of validity for the proposed IHA. Thus we do not propose to authorize the incidental harassment of humpback whales as a result of the proposed project; as such, the humpback whale is not carried forward for further analysis beyond this section.

We have reviewed UniSea's detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Sections 3 and 4 of UniSea's application, rather than reprinting the information here. Please also refer to NMFS' Web site (*www.nmfs.noaa.gov/pr/species/mammals/*) for generalized species accounts.

Table 2 lists the marine mammal species with expected potential for occurrence in the vicinity of the project during the project timeframe and summarizes key information regarding stock status and abundance. Taxonomically, we follow Committee on Taxonomy (2015). Please see NMFS' Stock Assessment Reports (SAR), available at *www.nmfs.noaa.gov/pr/sars,* for more detailed accounts of these stocks' status and abundance. The harbor seal and Steller sea lion are addressed in the Alaska SARs (*e.g.,* Allen and Angliss, 2012, 2014).

In the species accounts provided here, we offer a brief introduction to the species and relevant stock as well as available information regarding population trends and threats, and describe any information regarding local occurrence.

TABLE 2—MARINE MAMMALS POTENTIALLY PRESENT IN THE VICINITY OF THE PROJECT LOCATION

Species	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV; N_{min}; most recent abundance survey)[2]	PBR[3]	Annual M/SI[4]	Relative occurrence in Iliuliuk Harbor; season of occurrence
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions):						
Steller sea lion	Western U.S.	E/D; N ...	55,422 (n/a; 48,676; 2008–11)[8].	292	234.7	common; year-round (greater abundance in summer).
Family Phocidae (earless seals):						
Harbor seal	Aleutian Islands.	-; N	3,579[5] (0.092; 3,313; 2004).	99	93.1	occasional; year-round.

[1] ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For killer whales, the abundance values represent direct counts of individually identifiable animals; therefore there is only a single abundance estimate with no associated CV. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species (or similar species) life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

[3] Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

[4] These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value.

[5] Abundance estimate for this stock is greater than ten years old and is therefore not considered current. We nevertheless present the most recent abundance estimate, as this represents the best available information for use in this document.

Steller Sea Lion

Steller sea lions are distributed mainly around the coasts to the outer continental shelf along the North Pacific rim from northern Hokkaido, Japan through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, southern coast of Alaska and south to California (Loughlin *et al.,* 1984). Based on distribution, population response, and phenotypic and genotypic data, two separate stocks of Steller sea lions are recognized within U. S. waters, with the population divided into western and eastern distinct population segments (DPS) at 144° W (Cape Suckling, Alaska) (Loughlin, 1997). The western DPS includes Steller sea lions that reside in the central and western Gulf of Alaska, Aleutian Islands, as well as those that inhabit the coastal waters and breed in Asia (*e.g.,* Japan and Russia). Only the western DPS is considered in this proposed authorization because the eastern DPS occurs outside the geographic area under consideration.

The species as a whole was ESA-listed as threatened in 1990 (55 FR 49204) because of significant declines in the population which may have been caused by nutritional stress due to competition with commercial fisheries, environmental change, disease, killer whale predation, incidental take, and shooting (illegal and legal). In 1997, the species was divided into two separate DPSs, as described above, and the western DPS was reclassified as endangered under the ESA because of its continued decline since the initial listing in 1990 (62 FR 24345).

The most recent comprehensive estimate of the abundance of the western DPS in Alaska is 55,422 individuals (both pups and non-pups), based on aerial surveys of non-pups conducted from 2008–2011 and estimates of total pup production (Allen and Angliss 2014a). This figure represents a marked decline from abundance estimates in the 1950s (N = 140,000) and 1970s (N = 110,000). Pup counts in the Western DPS in Alaska overall increased at 1.8 percent annually between 2000 and 2014; non-up counts increased at 2.2 percent annually over the same period (Fritz et al. 2015). However, survey data collected since 2000 indicate that the population decline continues in the central and western Aleutian Islands while populations east of Samalga Pass (~170° W) have increased (Allen and Angliss 2014a). Survival rates east of Samalga Pass have rebounded to nearly the same levels estimated for the 1970s, prior to the decline in abundance. In addition, population models indicate that natality among the increasing population east of Samalga Pass in the period 2000 – 2012 may not be significantly different from rates estimated for the 1970s. The proposed project location in Iliuliuk Harbor is approximately 220 km east of Samalga Pass.

Steller sea lions are the most abundant marine mammals in the project area. Data from the NOAA National Marine Mammal Laboratory (NMML) surveys of haulouts on Unalaska Island suggest the Steller sea lion haulouts nearest to the project location are at Priest Rock (on the east side of the entrance to Unalaska Bay, approximately 19 km from the project site), Cape Wislow (on the northwest side of the entrance to Unalaska Bay, approximately 19 km from the project site) and Bishop Point (west of Cape Wislow on the North side of Unalaska Island, approximately 27 km from the project site). Bishop Point appears to be the most actively utilized haulout of the three, with a mean of 193 individual sea lions observed over 36 separate surveys from 1960 to 2014, and more recent surveys (2004–2014) showing a mean of 225 individuals (all of these surveys were conducted in June or July when Steller sea lion abundance would typically be highest at haulouts in the Aleutians). Priest Rock survey data show a mean of 12 individuals observed since 1994, with higher totals recorded recently (107 individuals counted in 2014). Cape Wislow survey data show 60 individuals observed in 1989, with no sea lions observed at the site during the 20 surveys that have occurred there from 1990 to 2014.

Based on data from NMML breeding season surveys (conducted in June and July), the population of Steller sea lions in the eastern Aleutian Islands (from Unimak Island through Umnak Island, 163–169°W) has been increasing at 2–3% per year since 2000. Local abundance in the breeding season is generally higher overall than in the non-breeding season, with counts on land approximately twice as much as those observed in winter, as sea lions spend more time at sea feeding during the winter months. Most large males leave the Aleutian Islands and head north during the winter, feeding off the ice edge, thus adult females and juveniles make up the majority of the local population during the nonbreeding season (pers. comm. L. Fritz, NMML, to J. Carduner, NMFS, Oct. 8, 2015).

Steller sea lions are not known to haul out in the project area, though individuals are observed with regularity in the water within Iliuliuk Harbor. The number of sea lions in the immediate project area varies depending on the season and the on the presence of fishing vessels unloading their catch at the seafood processing facilities in the harbor. Sea lions are likely drawn to the project location by the abundant and predictable sources of food provided by commercial fishing vessels and fish processing facilities. Based on accounts from UniSea personnel, sea lions are sighted more often when fishing boats are docked at the project site and are often observed foraging near fishing boats that are docked at the UniSea facility, suggesting sea lions in the Iliuliuk Harbor area are habituated to the presence of fishing vessels and are likely conditioned to associating fishing boats with easy access to food.

Harbor Seal

Harbor seals range from Baja California north along the west coasts of Washington, Oregon, California, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands. They haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and occasionally fresh waters. They generally are nonmigratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Scheffer and Slipp 1944, Fisher 1952, Bigg 1969, 1981, Hastings et al. 2004).

In 2010, harbor seals in Alaska were partitioned into 12 separate stocks based largely on genetic structure (Allen and Angliss 2012). Only the Aleutian Islands stock is considered in this application because other stocks occur outside the geographic area under consideration. Distribution of the Aleutian Islands stock extends from Ugamak Island (southwest of Unimak Island in the Eastern Aleutians) west to Attu Island (the westernmost Aleutian Island in the U.S.). The abundance estimate for the Aleutian Islands stock is 3,579; however, this estimate is based on survey data that is over 10 years old. The current statewide abundance estimate for Alaskan harbor seals is 152,602 based on aerial survey data collected during 1998–2007 (Allen and Angliss 2012).

Surveying harbor seals in the Aleutian Islands is notoriously difficult as the islands are often blanketed with fog or high winds that limit aerial surveys to narrow windows of time. The logistics of surveying the entire length of the Aleutian Chain are also quite difficult with limited airports and limited access to fuel. As a result, available survey data for the Aleutian Islands harbor seal stock are extremely limited. The current population trend in the Aleutian Islands is unknown. Additionally, the haul-out patterns of harbor seals in the Aleutian Islands have not been studied, and there is no stock specific estimate of a survey correction factor.

Small *et al.* (2008) compared harbor seal counts from 106 Aleutian islands surveyed in 1977–1982 (8,601 seals) with counts from the same islands during a 1999 aerial survey (2,859 seals). Counts decreased at a majority of the islands surveyed. A 45% decline was estimated in the Eastern Aleutians (n = 35 islands), with overall estimates for the entire Aleutian Islands chain showing a 67% decline during the approximate 20-year period. Seal counts decreased at the majority of islands in each region, the number of islands with over 100 seals decreased ~70%, and the number of islands with no seals counted increased approximately 80%, indicating that harbor seal abundance throughout the Aleutian Islands was substantially lower in the late 1990s than in the 1970s and 1980s (Small *et al.* 2008).

Harbor seals are only occasionally seen in Iliuliuk Harbor. No pupping or haulout sites exist within the project area. The closest known harbor seal haulout to the G1 dock is located approximately 3 km away on the northern tip of Hog Island in Unalaska Bay; NMML survey data shows an average of ~11 seals observed at the site over the course of four surveys from 2008–2010. Surveys were conducted only in late July and August, thus seasonal information on abundance or distribution is not available. NMML survey data suggest there are at least six other harbor seal haulouts in and around Unalaska Bay that are further from the project site; the maximum number of seals observed at any of these haulouts has not exceeded 39 individuals at any one time.

Potential Effects of the Specified Activity on Marine Mammals

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals. The ‘‘Estimated Take by Incidental Harassment’’ section later in this document will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ‘‘Negligible Impact Analysis’’ section will include the analysis of how this specific activity will impact marine mammals and will consider the content of this section, the ‘‘Estimated Take by Incidental Harassment’’ section, the ‘‘Proposed Mitigation’’ section, and the ‘‘Anticipated Effects on Marine Mammal Habitat’’ section to draw conclusions regarding the likely impacts of this activity on the reproductive success or survivorship of individuals and from that on the affected marine mammal populations or stocks. In the following discussion, we provide general background information on sound and marine mammal hearing before considering potential effects to marine mammals from sound produced by the construction techniques proposed for use.

Description of Sound Sources

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds and attenuate (decrease) more rapidly in shallower water. Amplitude is the height of the sound pressure wave or the 'loudness' of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener's position. Note that all underwater sound levels in this document are referenced to a pressure of 1 μPa and all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse, and is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound. Ambient sound is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995), and the sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction). A number of sources contribute to ambient sound, including the following (Richardson *et al.,* 1995):

• Wind and waves: The complex interactions between wind and water surface, including processes such as breaking waves and wave-induced bubble oscillations and cavitation, are a main source of naturally occurring ambient noise for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Surf noise becomes important near shore, with measurements collected at a distance of 8.5 km from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.

• Precipitation: Sound from rain and hail impacting the water surface can become an important component of total noise at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times.

• Biological: Marine mammals can contribute significantly to ambient noise levels, as can some fish and shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz.

• Anthropogenic: Sources of ambient noise related to human activity include transportation (surface vessels and aircraft), dredging and construction, oil and gas drilling and production, seismic surveys, sonar, explosions, and ocean acoustic studies. Shipping noise typically dominates the total ambient noise for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly (Richardson *et al.,* 1995). Sound from identifiable anthropogenic sources other than the activity of interest (*e.g.,* a passing vessel) is sometimes termed background sound, as opposed to ambient sound.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

Known sound levels and frequency ranges associated with anthropogenic sources similar to those that would be used for this project are summarized in Table 3. Details of the source types are described in the following text.

TABLE 3—REPRESENTATIVE SOUND LEVELS OF ANTHROPOGENIC SOURCES

Sound source	Frequency range (Hz)	Underwater sound level	Reference
Vibratory driving of 72-in steel pipe pile	10–1,500	180 dB rms at 10 m	Reyff, 2007.
Impact driving of 36-in steel pipe pile	10–1,500	195 dB rms at 10 m	Laughlin, 2007.
Impact driving of 66-in cast-in-steel-shell (CISS) pile.	10–1,500	195 dB rms at 10 m	Reviewed in Hastings and Popper, 2005.

In-water construction activities associated with the project would include impact pile driving vibratory pile driving. The sounds produced by these activities fall into one of two general sound types: pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.,* (2007) for an in-depth discussion of these concepts.

Pulsed sound sources (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986; Harris, 1998; NIOSH, 1998; ISO, 2003; ANSI, 2005) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, down-the-hole drilling, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals, and exposure to sound can have deleterious effects. To appropriately assess these potential effects, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on measured or estimated hearing ranges on the basis of available behavioral data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. The lower and/or upper frequencies for some of these functional hearing groups have been modified from those designated by Southall *et al.* (2007). The functional groups and the associated frequencies are indicated below (note that these frequency ranges do not necessarily correspond to the range of best hearing, which varies by species):

- Low-frequency cetaceans (mysticetes): functional hearing is estimated to occur between approximately 7 Hz and 25 kHz (extended from 22 kHz; Watkins, 1986; Au *et al.,* 2006; Lucifredi and Stein, 2007; Ketten and Mountain, 2009; Tubelli *et al.,* 2012);
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): functional hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus;* now considered to include two members of the genus *Lagenorhynchus* on the basis of recent echolocation data and genetic data (May-Collado and Agnarsson, 2006; Kyhn *et al.* 2009, 2010; Tougaard *et al.* 2010): functional hearing is estimated to occur between approximately 200 Hz and 180 kHz; and
- Pinnipeds in water: functional hearing is estimated to occur between approximately 75 Hz to 100 kHz for Phocidae (true seals) and between 100 Hz and 48 kHz for Otariidae (eared seals), with the greatest sensitivity between approximately 700 Hz and 20 kHz. The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth *et al.,* 2013).

There are two marine mammal species (one otariid pinniped and one phocid pinniped) with expected potential to co-occur with UniSea construction activities. Please refer to Table 2.

Acoustic Effects, Underwater

Potential Effects of Pile Driving Sound—The effects of sounds from pile driving might result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007). The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. In addition, substrates that are soft (*e.g.,* sand) would absorb or attenuate the sound more readily than hard substrates (*e.g.,* rock) which may reflect the acoustic wave. Soft porous substrates would also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source.

In the absence of mitigation, impacts to marine species would be expected to result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.,* 2008). The type and severity of behavioral impacts are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973).

Hearing Impairment and Other Physical Effects—Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.,* 1999; Schlundt *et al.,* 2000; Finneran *et al.,* 2002, 2005). TS can be permanent (PTS), in which case the loss of hearing sensitivity is not recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Marine mammals depend on acoustic cues for vital biological functions, (*e.g.,* orientation, communication, finding prey, avoiding predators); thus, TTS may result in reduced fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which it occurs. TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Repeated sound exposure that leads to TTS could cause PTS. PTS constitutes injury, but TTS does not (Southall *et al.,* 2007). The following subsections discuss in somewhat more detail the possibilities of TTS, PTS, and non-auditory physical effects.

Temporary Threshold Shift—TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises, and a sound must be stronger in order to be heard. In terrestrial mammals, TTS can last from minutes or hours to days (in cases of strong TTS). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity in both terrestrial and marine mammals recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals, and none of the published data concern TTS elicited by exposure to multiple pulses of sound. Available data on TTS in marine mammals are summarized in Southall *et al.* (2007).

Given the available data, the received level of a single pulse (with no frequency weighting) might need to be approximately 186 dB re 1 μPa^2-s (*i.e.,* 186 dB sound exposure level [SEL] or approximately 221–226 dB p-p [peak]) in order to produce brief, mild TTS. Exposure to several strong pulses that each have received levels near 190 dB rms (175–180 dB SEL) might result in cumulative exposure of approximately 186 dB SEL and thus slight TTS in a small odontocete, assuming the TTS threshold is (to a first approximation) a function of the total received pulse energy.

The above TTS information for odontocetes is derived from studies on the bottlenose dolphin (*Tursiops truncatus*) and beluga whale (*Delphinapterus leucas*). There is no published TTS information for other species of cetaceans. However, preliminary evidence from a harbor porpoise exposed to pulsed sound suggests that its TTS threshold may have been lower (Lucke *et al.,* 2009). As summarized above, data that are now available imply that TTS is unlikely to occur unless odontocetes are exposed to pile driving pulses stronger than 180 dB re 1 μPa rms.

Permanent Threshold Shift—When PTS occurs, there is physical damage to the sound receptors in the ear. In severe cases, there can be total or partial deafness, while in other cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter, 1985). There is no specific evidence that exposure to pulses of sound can cause PTS in any marine mammal. However, given the possibility that mammals close to a sound source might incur TTS, there has been further speculation about the possibility that some individuals might incur PTS. Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage, but repeated or (in some cases) single exposures to a level well above that causing TTS onset might elicit PTS.

Relationships between TTS and PTS thresholds have not been studied in marine mammals but are assumed to be similar to those in humans and other terrestrial mammals. PTS might occur at a received sound level at least several decibels above that inducing mild TTS if the animal were exposed to strong sound pulses with rapid rise time. Based on data from terrestrial mammals, a precautionary assumption is that the PTS threshold for impulse sounds (such as pile driving pulses as received close to the source) is at least 6 dB higher than the TTS threshold on a peak-pressure basis and probably greater than 6 dB (Southall *et al.,* 2007). On an SEL basis, Southall *et al.* (2007) estimated that received levels would need to exceed the TTS threshold by at least 15 dB for there to be risk of PTS. Thus, for cetaceans, Southall *et al.* (2007) estimate that the PTS threshold might be an M-weighted SEL (for the sequence of received pulses) of approximately 198 dB re 1 μPa^2-s (15 dB higher than the TTS threshold for an impulse). Given the higher level of sound necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Measured source levels from impact pile driving can be as high as 214 dB rms. Although no marine mammals have been shown to experience TTS or PTS as a result of being exposed to pile driving activities, captive bottlenose dolphins and beluga whales exhibited changes in behavior when exposed to strong pulsed sounds (Finneran *et al.,* 2000, 2002, 2005). The animals tolerated high received levels of sound before exhibiting aversive behaviors. Experiments on a beluga whale showed that exposure to a single watergun impulse at a received level of 207 kPa (30 psi) p-p, which is equivalent to 228 dB p-p, resulted in a 7 and 6 dB TTS in the beluga whale at 0.4 and 30 kHz, respectively. Thresholds returned to within 2 dB of the pre-exposure level within four minutes of the exposure (Finneran *et al.,* 2002). Although the source level of pile driving from one hammer strike is expected to be much lower than the single watergun impulse cited here, animals being exposed for a prolonged period to repeated hammer strikes could receive more sound exposure in terms of SEL than from the single watergun impulse (estimated at 188 dB re 1 μPa^2-s) in the aforementioned experiment (Finneran *et al.,* 2002). However, in order for marine mammals to experience TTS or PTS, the animals have to be close enough to be exposed to high intensity sound levels for a prolonged period of time. Based on the best scientific information available, these SPLs are far below the thresholds that could cause TTS or the onset of PTS.

Non-auditory Physiological Effects—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007). Studies examining such effects are limited. In general, little is known about the potential for pile driving to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, would presumably be limited to short distances from the sound source and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. Marine mammals that show behavioral avoidance of pile driving, including some odontocetes and some pinnipeds, are especially unlikely to incur auditory impairment or non-auditory physical effects.

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007).

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, but also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007). Responses to continuous sound, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds.

With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): changing durations of surfacing and dives, number of blows per surfacing (cetaceans only), or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior; avoidance of areas where sound sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haul-outs or rookeries). Pinnipeds may increase the amount of time spent hauled out, possibly to avoid in-water disturbance (Thorson and Reyff, 2006).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

- Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with, a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. Chronic exposure to excessive, though not high-intensity, sound could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions. Masking can interfere with detection of acoustic signals such as communication calls, echolocation sounds, and environmental sounds important to marine mammals. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. If the coincident (masking) sound were man-made, it could be potentially harassing if it disrupted hearing-related behavior. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. Because sound generated from in-water pile driving is mostly concentrated at low frequency ranges, it may affect detection of communication calls and other potentially important natural sounds such as surf and prey sound. It may also affect communication signals when they occur near the sound band and thus reduce the communication space of animals (*e.g.,* Clark *et al.,* 2009) and cause increased stress levels (*e.g.,* Foote *et al.,* 2004; Holt *et al.,* 2009).

Masking has the potential to impact species at the population or community levels as well as at individual levels. Masking affects both senders and receivers of the signals and can potentially have long-term chronic effects on marine mammal species and populations. Recent research suggests that low frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, and that most of these increases are from distant shipping (Hildebrand, 2009). All anthropogenic sound sources, such as those from vessel traffic, pile driving, and dredging activities, contribute to the elevated ambient sound levels, thus intensifying masking.

The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources would likely be within the audible range of marine mammals present in the project area. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately fifteen minutes per pile. The probability for impact pile driving resulting from the proposed action to mask acoustic signals important to the behavior and survival of marine mammal species is likely to be negligible. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately one and a half hours per pile. It is possible that vibratory pile driving resulting from the proposed action may mask acoustic signals important to the behavior and survival of marine mammal species, but the short-term duration and limited affected area would result in insignificant impacts from masking.

Acoustic Effects, Airborne

Marine mammals that occur in the project area could be exposed to airborne sounds associated with pile driving that have the potential to cause harassment, depending on their distance from pile driving activities. Airborne sound could potentially affect pinnipeds that are either hauled out or are in the water but have their heads above water in the project area. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their habitat and move further from the source. Studies by Blackwell *et al.* (2004) and Moulton *et al.* (2005) indicate a tolerance or lack of response to unweighted airborne sounds as high as 112 dB peak and 96 dB rms.

Anticipated Effects on Habitat

The proposed activities at Iliuliuk Harbor would not result in permanent impacts to habitats used directly by marine mammals, such as haul-out sites, but may have potential short-term impacts to food sources such as forage fish and salmonids. There are no rookeries or haulout sites within the modeled zone of influence for impact or vibratory pile driving associated with the project, or ocean bottom structure of significant biological importance to marine mammals that may be present in the waters in the vicinity of the project area. The project location is characterized by several commercial fish processing facilities and experiences frequent vessel traffic because of these facilities, thus the area is already relatively industrialized and not a pristine habitat for sea lions or seals. As such, the main impact associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (*i.e.,* fish) near the project location, and minor impacts to the immediate substrate during installation and removal of piles during the dock construction project.

Effects on Potential Prey

Construction activities would produce both pulsed (*i.e.,* impact pile driving) and continuous (*i.e.,* vibratory pile driving and down-the-hole drilling) sounds. Fish react to sounds which are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001, 2002; Popper and Hastings, 2009) and are therefore not directly comparable with the proposed project. Sound pulses at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.,* 1992; Skalski *et al.,* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality. In general, impacts to marine mammal prey species from the proposed project are expected to be minor and temporary due to the relatively short timeframe of the proposed project, and the fact that Iliuliuk Harbor is not considered an important habitat for salmonids. The nearby Iliuliuk River supports salmon runs for at least four species of salmonids, however the harbor itself does not provide significant habitat for salmonids, and the proposed project is located far enough away from the lower Iliuliuk River that the potential that fish entering or leaving the river will be impacted is considered discountable. The most likely impact to fish from pile driving activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated.

Effects on Potential Foraging Habitat

The area likely impacted by the project is very small relative to the available habitat in Unalaska Bay. Avoidance by potential prey (*i.e.,* fish) of the immediate area due to the temporary loss of this foraging habitat is possible. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in Unalaska Bay and the nearby vicinity.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small area that would be affected, pile driving activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Thus, any impacts to marine mammal habitat are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence and an exclusion zone (see ''Estimated Take by Incidental Harassment''). These values were then used to develop mitigation measures for proposed pile driving activities. The exclusion zone effectively represents the mitigation zone that would be established around each pile to prevent Level A harassment to marine mammals, while the zones of influence (ZOI) provide estimates of the areas within which Level B harassment might occur for impact and vibratory pile driving. While the modeled ZOI and exclusion zone vary between the different types of installation methods, UniSea is proposing to establish mitigation zones for the maximum exclusion zone and ZOI for all pile driving and down-the-hole drilling conducted in support of the proposed project.

Monitoring and Shutdown for Pile Driving

The following measures would apply to UniSea's mitigation through the exclusion zone and zone of influence:

Exclusion Zone—For all pile driving activities, UniSea will establish an exclusion zone intended to contain the area in which SPLs equal or exceed the 190 dB rms acoustic injury criteria for pinnipeds. The purpose of the exclusion zone is to define an area within which shutdown of construction activity would occur upon sighting of a marine mammal within that area (or in anticipation of an animal entering the defined area), thus preventing potential injury of marine mammals. Modeled distances to the Level A harassment threshold are shown in Table 5. The greatest modeled distance to the Level A harassment threshold is 4.64 m (for impact pile driving); however, UniSea would implement a minimum 10 m radius exclusion zone for all pile driving and down-the-hole drilling activities. See Appendix B in the IHA application for figures showing the exclusion zones overlaid on satellite images of the project area.

Zone of Influence—The zone of influence refers to the area(s) in which SPLs equal or exceed 160 and 120 dB rms (for pulsed and non-pulsed continuous sound, respectively). ZOIs provide utility for monitoring that is conducted for mitigation purposes (*i.e.,* exclusion zone monitoring) by establishing monitoring protocols for areas adjacent to the exclusion zone. Monitoring of the ZOI enables observers to be aware of, and communicate about, the presence of marine mammals within the project area but outside the exclusion zone and thus prepare for potential shutdowns of activity should those marine mammals approach the exclusion zone. However, the primary purpose of ZOI monitoring is to allow documentation of incidents of Level B harassment; ZOI monitoring is discussed in greater detail later (see ''Proposed Monitoring and Reporting''). The modeled radial distances for ZOIs for impact and vibratory pile driving and removal (not taking into account landmasses which are expected to limit the actual ZOI radii) are shown in Table 5.

In order to document observed incidents of harassment, monitors will record all marine mammals observed within the modeled ZOI. Modeling was performed to estimate the ZOI for impact pile driving (the areas in which SPLs are expected to equal or exceed 160 dB rms during impact driving) and for vibratory pile driving (the areas in which SPLs are expected to equal or exceed 120 dB rms during vibratory driving and removal). Results of this modeling showed the ZOI for impact driving would extend to a radius of 500 m from the pile being driven, the ZOI for vibratory pile driving and down-the-hole drilling (if it occurs) would extend to a radius of 10,000 m from the pile being driven, and the ZOI for vibratory pile removal would extend to a radius of 7,400 m from the pile being removed. However, due to the geography of the project area, landmasses surround Iliuliuk Harbor are expected to limit the propagation of sound from construction activities such that the actual distances to the ZOI extent for vibratory and impact driving will be substantially smaller than those described above. Modeling results of the ensonified areas, taking into account the attenuation provided by landmasses, suggest the actual ZOI will extend to a maximum distance of 1,250 m from the G1 dock, at its furthest point (for vibratory driving). Due to this relatively small modeled ZOI, and due to the monitoring locations chosen by UniSea (see the Monitoring Plan for details), we expect that monitors will be able to observe the entire modeled ZOI for both impact and vibratory pile driving, and thus we expect data collected on incidents of Level B harassment to be relatively accurate. The modeled areas of the ZOIs for impact and vibratory driving, taking into account the attenuation provided by landmasses in attenuating sound from the construction project, are shown in Appendix B of UniSea's application.

Monitoring Protocols—Monitoring would be conducted before, during, and after pile driving activities. Observations of marine mammals outside the exclusion zone will not result in shutdown of construction operations, unless the animal approaches or enters the exclusion zone, at which point all pile driving activities will be halted. Monitoring will take place from fifteen minutes prior to initiation of pile driving or pile removal through thirty minutes post-completion of pile driving or removal activities. Pile driving and removal activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes. Please see the Marine Mammal Monitoring Plan (available at *www.nmfs.noaa.gov/pr/permits/incidental/*), for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained biologists, with the following minimum qualifications:

- 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;
- Experience and ability to conduct field observations and collect data according to assigned protocols;
- 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;
- Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations; and
- 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.

(2) Prior to the start of pile driving activity, the exclusion zone will be monitored for fifteen minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the exclusion zone clear of marine mammals; animals will be allowed to remain in the exclusion zone (*i.e.,* must leave of their own volition) and their behavior will be monitored and documented. The exclusion zone may only be declared clear, and pile driving started, when the entire exclusion zone is visible (*i.e.,* when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity would be halted.

(3) If a marine mammal approaches or enters the exclusion zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the exclusion zone or fifteen minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile.

Sound Attenuation Devices

Sound levels can be reduced during impact pile driving using sound attenuation devices. There are several types of sound attenuation devices including bubble curtains, cofferdams, and isolation casings (also called temporary noise attenuation piles [TNAP]), and cushion blocks. UniSea plans to use bubble curtains, which create a column of air bubbles rising around a pile from the substrate to the water surface. The air bubbles absorb and scatter sound waves emanating from the pile, thereby reducing the sound energy.

Bubble curtains may be confined or unconfined. An unconfined bubble curtain may consist of a ring seated on the substrate and emitting air bubbles from the bottom. An unconfined bubble curtain may also consist of a stacked system, that is, a series of multiple rings placed at the bottom and at various elevations around the pile. Stacked systems may be more effective than non-stacked systems in areas with high current and deep water (Oestman *et al.,* 2009). Confined bubble curtain contain the air bubbles within a flexible or rigid sleeve made from plastic, cloth, or pipe, and generally offer higher attenuation levels than unconfined curtains because they may physically block sound waves and they prevent air bubbles from migrating away from the pile. For this reason, the confined bubble curtain is commonly used in areas with high current velocity (Oestman *et al.,* 2009).

The literature presents a wide array of observed attenuation results for bubble curtains (*e.g.,* Oestman *et al.,* 2009; Coleman, 2011). Both environmental conditions and the characteristics of the sound attenuation device may influence the effectiveness of the device (Oestman *et al.* 2009). As a general rule, reductions of greater than 10 dB cannot be reliably predicted. The U.S. Navy Test Pile Program, conducted at Naval Base Kitsap-Bangor, reported a range of measured values for realized attenuation mostly within 6 to 12 dB (Illingworth & Rodkin, 2012).

Unconfined bubble curtains will be used during all impact pile driving associated with the proposed project. The bubble curtain used by UniSea may result in some noise reduction from impact pile driving; however, we are unable make any assumptions about the extent of the attenuation that may be provided by UniSea's bubble curtain, as sound source verification at pile driving projects using the proposed bubble curtain design has not occurred previously, and in situ recordings are not proposed for this particular project.

Soft Start

The use of a ''soft-start'' procedure is believed to provide additional protection to marine mammals by providing a warning and an opportunity to leave the area prior to the hammer operating at full capacity. 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. The actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in ''bouncing'' of the hammer as it strikes the pile, resulting in multiple ''strikes.'' Soft start for impact driving will be required at the beginning of each day's pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

We have carefully evaluated UniSea's proposed mitigation measures and considered their likely effectiveness relative to implementation of similar mitigation measures in previously issued IHAs to preliminarily determine whether they are likely to affect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

(1) The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;

(2) The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

(3) The practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

(1) Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

(2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).

(5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.

(6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of UniSea's proposed measures, we have preliminarily determined that the proposed mitigation measures provide the means of affecting the least practicable impact on marine mammal species or stocks and their habitat.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth ''requirements pertaining to the monitoring and reporting of such taking.'' The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Any monitoring requirement we prescribe should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within defined zones of effect (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

2. An increase in our understanding of how many marine mammals are likely to be exposed to stimuli that we associate with specific adverse effects, such as behavioral harassment or hearing threshold shifts;

3. An increase in our understanding of how marine mammals respond to stimuli expected to result in incidental take and how anticipated adverse effects on individuals may impact the population, stock, or species (specifically through effects on annual rates of recruitment or survival) through any of the following methods:

- Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict pertinent information, *e.g.,* received level, distance from source);
- Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict

pertinent information, *e.g.,* received level, distance from source); and

• Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli.

4. An increased knowledge of the affected species; or

5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

UniSea submitted a marine mammal monitoring plan as part of their IHA application (the monitoring plan can be viewed online at: *www.nmfs.noaa.gov/pr/permits/incidental/*). UniSea's proposed marine mammal monitoring plan was created with input from NMFS and was based on similar plans that have been successfully implemented by other action proponents under previous IHAs for pile driving projects. The plan may be modified or supplemented based on comments or new information received from the public during the public comment period.

Visual Marine Mammal Observations

UniSea will collect sighting data and will record behavioral responses to construction activities for marine mammal species observed in the project location during the period of activity. All marine mammal observers (MMOs) will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. UniSea will monitor the Exclusion Zone and Zone of Influence before, during, and after pile driving, with observers located at the best practicable vantage points. See Figure 2 in the Marine Mammal Monitoring Plan for the observer locations planned for use during construction. Based on our requirements, the Marine Mammal Monitoring Plan would implement the following procedures for pile driving:

• A dedicated monitoring coordinator will be on-site during all construction days. The monitoring coordinator will oversee marine mammal observers. The monitoring coordinator will serve as the liaison between the marine mammal monitoring staff and the construction contractor to assist in the distribution of information.

• MMOs would be located at the best vantage point(s) in order to properly observe the entire Exclusion Zone, and as much of the ZOI as possible. A minimum of two MMOs will be on duty during all pile driving activity, with one of these MMOs having full time responsibility for monitoring the Exclusion Zone.

• During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.

• If the Exclusion Zone is obscured by fog or poor lighting conditions, pile driving will not be initiated until the Exclusion Zone is clearly visible. Should such conditions arise while impact driving is underway, the activity would be halted.

• The Exclusion Zone and ZOI will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. MMOs will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and UniSea.

Data Collection

We require that observers use approved data forms. Among other pieces of information, UniSea will record detailed information about any implementation of shutdowns, including the distance of animals to the pile being driven, a description of specific actions that ensued, and resulting behavior of the animal, if any. In addition, UniSea will attempt to distinguish between the number of individual animals taken and the number of incidents of take, when possible. We require that, at a minimum, the following information be collected on sighting forms:

• Date and time that monitored activity begins or ends;

• Construction activities occurring during each observation period;

• Weather parameters (*e.g.,* percent cover, visibility);

• Water conditions (*e.g.,* sea state, tide state);

• Species, numbers, and (if possible) sex and age class of marine mammals;

• Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;

• Distance from pile driving activities to marine mammals and distance from marine mammal(s) to the observation point;

• Locations of all marine mammal observations; and

• Other human activity in the area.

Reporting

A draft report will be submitted within 90 calendar days of the completion of the activity, or within 45 calendar days prior to the effective date of a subsequent IHA (if applicable). The report will include information on marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of any mitigation shutdowns and results of those actions, as well as an estimate of total take based on the number of marine mammals observed during the course of construction. A final report must be submitted within 30 days following resolution of comments from NMFS on the draft report.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner not authorized by the IHA (if issued), such as a Level A harassment, or a take of a marine mammal species other than those proposed for authorization, UniSea would immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources. The report would include the following information:

• Time, date, and location (latitude/longitude) of the incident;

• Description of the incident;

• Status of all sound source use in the 24 hours preceding the incident;

• Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);

• Description of all marine mammal observations in the 24 hours preceding the incident;

• Species identification or description of the animal(s) involved;

• Fate of the animal(s); and

• Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with UniSea to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. UniSea would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that UniSea discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition), UniSea would immediately report the incident tomailto: the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Stranding Coordinator.

The report would include the same information identified in the paragraph above. Construction related activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with UniSea to determine whether modifications in the activities are appropriate.

In the event that UniSea discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), UniSea would report the incident to Jolie Harrison (*Jolie.Harrison@noaa.gov*), Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and Aleria Jensen (*Aleria.Jensen@noaa.gov*), Alaska Stranding Coordinator, within 24 hours of the discovery. UniSea would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: ''. . . any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].''

All anticipated takes would be by Level B harassment, resulting from vibratory and impact pile driving and involving temporary changes in behavior. Based on the best available information, the proposed activities—vibratory and impact pile driving—would not result in serious injuries or mortalities to marine mammals even in the absence of the planned mitigation and monitoring measures. However, the proposed mitigation and monitoring measures are expected to minimize the potential for injury, such that take by Level A harassment is considered discountable.

If a marine mammal responds to a stimulus by changing its behavior (*e.g.,* through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007). Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound.

This practice potentially overestimates the numbers of marine mammals taken, as it is often difficult to distinguish between the individual animals harassed and incidences of harassment. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (*e.g.,* because of foraging opportunities) is stronger than the deterrence presented by the harassing activity. The Steller sea lions and harbor seals expected to occur in the project area are not branded, thus we expect that the identification of individual animals, even by experienced MMOs, would be extremely difficult. This would further increase the likelihood that repeated exposures of an individual, even within the same day, could be recorded as multiple takes.

UniSea has requested authorization for the incidental taking of small numbers of Steller sea lions and harbor seals that may result from pile driving activities associated with the dock construction project described previously in this document. In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then incorporate information about marine mammal density or abundance in the project area. We first provide information on applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidences of take.

Sound Thresholds

We use generic sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a ''take'' by harassment might occur. To date, no studies have been conducted that explicitly examine impacts to marine mammals from pile driving sounds or from which empirical sound thresholds have been established. These thresholds should be considered guidelines for estimating when harassment may occur (*i.e.,* when an animal is exposed to levels equal to or exceeding the relevant criterion) in specific contexts; however, useful contextual information that may inform our assessment of effects is typically lacking and we consider these thresholds as step functions. NMFS is currently revising these acoustic guidelines; for more information on that process, please see: *www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

TABLE 4—CURRENT NMFS ACOUSTIC EXPOSURE CRITERIA

Criterion	Definition	Threshold
Level A harassment (underwater)	Injury (PTS—any level above that which is known to cause TTS).	180 dB (cetaceans)/190 dB (pinnipeds) (rms).
Level B harassment (underwater)	Behavioral disruption	160 dB (impulsive source*)/120 dB (continuous source*) (rms).
Level B harassment (airborne)**	Behavioral disruption	90 dB (harbor seals)/100 dB (other pinnipeds) (unweighted).

* Impact pile driving produces impulsive noise; vibratory pile driving produces non-pulsed (continuous) noise.

** NMFS has not established any formal criteria for harassment resulting from exposure to airborne sound. However, these thresholds represent the best available information regarding the effects of pinniped exposure to such sound and NMFS' practice is to associate exposure at these levels with Level B harassment.

Distance to Sound Thresholds

Underwater Sound Propagation Formula—Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * \log_{10}(R_1/R_2)$, where

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log[range]). A practical spreading value of fifteen is often used under conditions, such as Iliuliuk Harbor, where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) is assumed here.

Underwater Sound—The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity occurs. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at the UniSea dock, studies with similar properties to the specified activity were evaluated. See Section 5 of UniSea's application for a detailed description of the information considered in determining reasonable proxy source level values. UniSea used representative source levels of 165 dB rms for installation of steel sheet piles using a vibratory hammer (CALTRANS 2012), 163 dB rms for vibratory removal and installation of a 24-inch steel pile (Rodkin 2013), 184 dB rms for impact pile driving of a 24-inch steel pile (Rodkin 2013), and 165 dB (re: 1 μPa at 1m) at 200 Hz for down-the-hole drilling (URS 2011).

TABLE 5—MODELED DISTANCES FROM G1 DOCK TO NMFS LEVEL A AND LEVEL B HARASSMENT THRESHOLDS (ISOPLETHS) DURING PILE INSTALLATION AND REMOVAL

Threshold	Distance (meters)*
Impact driving, pinniped injury (190 dB).	4.64**
Impact driving, pinniped disturbance (160 dB).	500
Vibratory driving, pinniped injury (190 dB).	< 1 m**
Vibratory driving or down-the-hole drilling, pinniped disturbance (120 dB).	10,000
Vibratory removal, pinniped injury (160 dB).	< 1 m**
Vibratory removal, pinniped disturbance (120 dB).	7,400

* Distances shown are modeled maximum distances and do not account for landmasses which are expected to reduce the actual distances to sound thresholds.

** These are modeled distances to the Level A harassment threshold, however the exclusion zone will conservatively extend to 10 m, thus any marine mammal within a 10 m radius of activity would trigger a shutdown.

Iliuliuk Harbor does not represent open water, or free field, conditions. Therefore, sounds would attenuate as they encounter land masses. As a result, and as described above, pile driving noise in the project area is not expected to propagate to the calculated distances for the 160 dB or 120 dB thresholds as shown in Table 5. See Appendix B of UniSea's IHA application for figures depicting the actual extents of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving, taking into account the attenuation provided by landmasses.

Airborne Sound—Pile driving can generate airborne sound that could potentially result in disturbance to pinnipeds that are hauled out or at the water's surface. As a result, UniSea analyzed the potential for pinnipeds hauled out or swimming at the surface near the G1 dock to be exposed to airborne SPLs that could result in Level B behavioral harassment. A spherical spreading loss model (*i.e.,* 6 dB reduction in sound level for each doubling of distance from the source), in which there is a perfectly unobstructed (free-field) environment not limited by depth or water surface, is appropriate for use with airborne sound and was used to estimate the distance to the airborne thresholds.

As discussed above regarding underwater sound from pile driving, the intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity occurs. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at Iliuliuk Harbor, studies with similar properties to the proposed action, as described previously, were evaluated. UniSea used representative source levels of 100 dB Leq/rms at 22 m for vibratory removal and installation of a 24-inch steel pile and 100 dB Leq/rms at 26 m for impact driven 24-inch steel piles. Please see Section 5 of UniSea's application for details of the information considered. These values result in a disturbance zone (radial distance) of 3.16 m for harbor seals and 1.0 m for Steller sea lions. No data was found for the airborne sound levels expected from the installation of steel sheet piles or 18-inch steel piles, but sound levels from the installation of steel sheet piles and 18-inch steel piles are likely to be within a similar range as sound levels mentioned above.

Despite the modeled distances described above, no incidents of incidental take resulting solely from airborne sound are likely, as distances to the harassment thresholds would not reach areas where pinnipeds are known to haul out in the area of the project. Harbor seal haulout locations may change slightly depending on weather patterns, human disturbance, or prey availability, but the closest known harbor seal haulout to the project location is on the north side of Hog island, located west of Amaknak Island in Unalaska Bay, approximately 3 km from the G1 dock (pers. comm., L. Fritz, NMML, to J. Carduner, NMFS, Oct 30, 2015). Steller sea lions have greater site fidelity than harbor seals; the closest known Steller sea lion haulout is at Priest Rock, a point that juts into the Bering Sea on the northeastern corner of Unalaska Bay, approximately 20 km from the project site (pers. comm., L. Fritz, NMML, to J. Carduner, NMFS, Oct 30, 2015).

We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when their heads are above the water's surface. However, these animals would previously have been ''taken'' as a result of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Multiple incidents of exposure to sound above NMFS' thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Marine Mammal Occurrence

The most appropriate information available was used to estimate the number of potential incidences of take. Density estimates for Steller sea lions and harbor seals in Iliuliuk Harbor, and more broadly in the waters surrounding Unalaska Island, are not readily available. Likewise, we were not able to find any published literature or reports describing densities or estimating abundance of either species in the project area. As such, data collected from marine mammal surveys represent the best available information on the occurrence of both species in the project area.

Beginning in April 2015, UniSea personnel began conducting marine mammal surveys of Iliuliuk Harbor under the direction of an ecological consultant. Observers recorded data on all marine mammals that were observed, including Steller sea lions, whales, and harbor seals. Both stationary and roving observations occurred within a 1,000 m radius of the project site (see Figure 9 in the IHA application for a depiction of survey points and marine mammal observations). A combination of two of the stationary observation points were surveyed each day, for a total of 15 minutes at each point, and the roving route was checked once per day over a time span of 15 minutes, covering areas between the docks that were too difficult to see from the stationary points. The survey recorded the number of animals observed, the species, their primary activity, and any additional notes. From January through October 2015, a total of 323 Steller sea lions and 33 harbor seals were observed during 1,432 separate observations over the course of 358 hours of surveys. These surveys represent the most recent data on marine mammal occurrence in the harbor, and represent the only targeted marine mammal surveys of the project area that we are aware of.

Data from bird surveys of Iliuliuk Harbor conducted by the U.S. Army Corps of Engineers (USACE) from 2001–2007, which included observations of marine mammals in the harbor, were also available; however, we determined that these data were unreliable as a basis for prediction of marine mammal abundance in the project location as the goal of the USACE surveys was to develop a snapshot of waterfowl and seabird location and abundance in the harbor, thus the surveys would have been designed and carried out differently if the goal had been to document marine mammal use of the harbor (pers. comm., C. Hoffman, USACE, to J. Carduner, NMFS, October 26, 2015). Additionally, USACE surveys occurred only in winter; as Steller sea lion abundance is expected to vary significantly between the breeding and the non-breeding season in the project location, data that were collected only during the non-breeding season have limited utility in predicting year-round abundance. As such, we determined that the data from the surveys commissioned by UniSea in 2015 represents the best available information on marine mammals in the project location.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in the project location. Density data for marine mammal species in the project location is not available. Therefore the data collected from marine mammal surveys of Iliuliuk Harbor in 2015 represent the best available information on marine mammal populations in the project location, and this data was used to estimate take. As such, the zones that have been calculated to contain the areas ensonified to the Level A and Level B thresholds for pinnipeds have been calculated for mitigation and monitoring purposes and were not used in the calculation of take. See Table 6 for total estimated incidents of take. Estimates were based on the following assumptions:

- All marine mammals estimated to be in areas ensonified by noise exceeding the Level B harassment threshold for impact and vibratory driving (as shown in Appendix B of the IHA application) are assumed to be in the water 100% of the time. This assumption is based on the fact that there are no haulouts or rookeries within the area predicted to be ensonified to the Level B harassment threshold based on modeling.
- Predicted exposures were based on total estimated total duration of pile driving/removal hours, which are estimated at 1,080 hours over the entire project. This estimate is based on a 180 day project time frame, an average work day of 12 hours (work days may be longer than 12 hours in summer and shorter than 12 hours in winter), and an estimate that approximately 50% of time during those work days will include pile driving and removal activities (with the other 50% of work days spent on non-pile driving activities which will not result in marine mammal take, such as installing templating and bracing, moving equipment, etc.).
- Vibratory or impact driving could occur at any time during the ''duration'' and our approach to take calculation assumes a rate of occurrence that is the same for any of the calculated zones.
- The hourly marine mammal observation rate recorded during marine mammal surveys of Iliuliuk Harbor in 2015 is reflective of the hourly rate that will be observed during the construction project.
- Takes were calculated based on estimated rates of occurrence for each species in the project area and this rate was assumed to be the same regardless of the size of the zone (for impact or vibratory driving/removal).
- Activities that may be accomplished by either impact driving or down-the-hole drilling (*i.e.* fender support/pin piles, miscellaneous support piles, and temporary support piles) were assumed to be accomplished via impact driving. If any of these activities are ultimately accomplished via down-the-hole drilling instead of impact driving, this would not result in a change in the amount of overall effort (as they will be accomplished via down-the-hole drilling instead of, and not in addition to, impact driving). As take estimates are calculated based on effort and not marine mammal densities, this would not change the take estimate.

Take estimates for Steller sea lions and harbor seals were calculated using the following series of steps:

1. The average hourly rate of animals observed during 2015 marine mammal surveys of Iliuliuk Harbor was calculated separately for both species (''Observation Rate''). Thus ''Observation Rate'' (OR) = No. of individuals observed/hours of observation;

2. The 95% confidence interval was calculated for the data set, and the upper bound of the 95% confidence interval was added to the Observation Rate to account for variability of the

small data set (''Exposure Rate''). Thus ''Exposure Rate'' (XR) = μ_{OR} + CI_{95} (where μ_{OR} = average of monthly observation rates and CI_{95} = 95% confidence interval (normal distribution);

3. The total estimated hours of pile driving work over the entire project was calculated, as described above (''Duration''); Thus ''Duration'' = total number of work days (180) * average work hours per day (12) * percentage of pile driving time during work days (0.5) = total work hours for the project (1,080); and

4. The estimated number of exposures was calculated by multiplying the ''Duration'' by the estimated ''Exposure Rate'' for each species. Thus, estimated takes = Duration * XR.

Please refer to Appendix G of the IHA application for a more thorough description of the statistical analysis of the observation data from marine mammal surveys.

Steller Sea Lion—Steller sea lion density data for the project area is not available. Steller sea lions occur year-round in the Aleutian Islands and within Unalaska Bay and Iliuliuk Harbor. As described above, local abundance in the non-breeding season (winter months) is generally lower overall; data from surveys conducted by UniSea in 2015 revealed Steller sea lions were present in Iliuliuk Harbor in all months that surveys occurred. We assume, based on marine mammal surveys of Iliuliuk Harbor, and based on the best available information on seasonal abundance patterns of the species including over 20 years of NMML survey data collected in Unalaska, that Steller sea lions will be regularly observed in the project area during all months of construction. As described above, all Steller sea lions in the project area at a given time are assumed to be in the water, thus any sea lion within the modeled area of ensonification exceeding the Level B harassment threshold would be recorded as taken by Level B harassment.

Estimated take of Steller sea lions was calculated using the equations described above, as follows:

μ_{OR} = 1.219 individuals/hr
CI_{95} = 0.798
XR = 2.016
Estimated exposures (Level B harassment) = 2.016 * 1,080 = 2,177

Thus we estimate that a total of 2,177 Steller sea lion takes will occur as a result of the proposed UniSea G1 dock construction project.

Harbor Seal—Harbor seal density data for the project location is not available. We assume, based on the best on the best available information, that harbor seals will be encountered in low numbers throughout the duration of the project. We relied on the best available information to estimate take of harbor seals, which in this case was survey data collected from the 2015 marine mammal surveys of Iliuliuk Harbor as described above. That survey data showed harbor seals are present in the harbor only occasionally, with only 33 seals observed over the entire survey. NMML surveys have not been performed in Iliuliuk Harbor, but the most recent NMML surveys of Unalaska Bay confirm that harbor seals are present in the area in relatively small numbers, with the most recent haulout counts in Unalaska Bay (2008–11) recording no more than 19 individuals at the three known haulouts there. NMML surveys have been limited to the months of July and August, so it is not known whether harbor seal abundance in the project area varies seasonally. The 2015 marine mammal surveys of Iliuliuk Harbor showed numbers of harbor seals in the harbor increasing from July through October, but the sample size for those months was extremely small (n=30). As described above, all harbor seals in the project area at a given time are assumed to be in the water, thus any harbor seals within the modeled area of ensonification exceeding the Level B harassment threshold would be recorded as taken by Level B harassment.

Estimated take of harbor seals was calculated using the equations described above, as follows:

μ_{OR} = 0.171 individuals/hr
CI_{95} = 0.185
XR = 0.356
Estimated exposures (Level B harassment) = 0.356 * 1,080 hours = 385

Thus we estimate that a total of 385 harbor seal takes will occur as a result of the proposed UniSea G1 dock construction project (Table 6).

We therefore propose to authorize the take, by Level B harassment only, of a total of 2,177 Steller sea lions (western DPS) and 385 harbor seals (Aleutian Islands stock) as a result of the proposed construction project. These take estimates are considered reasonable estimates of the number of marine mammal exposures to sound above the Level B harassment threshold that are likely to occur over the course of the project, and not the number of individual animals exposed. For instance, for pinnipeds that associate fishing boats in Iliuliuk Harbor with reliable sources of food, there will almost certainly be some overlap in individuals present day-to-day depending on the number of vessels entering the harbor, however each instance of exposure for these individuals will be recorded as a separate, additional take. Moreover, because we anticipate that marine mammal observers will typically be unable to determine from field observations whether the same or different individuals are being exposed over the course of a workday, each observation of a marine mammal will be recorded as a new take, although an individual theoretically would only be considered as taken once in a given day.

TABLE 6—NUMBER OF POTENTIAL INCIDENTAL TAKES OF MARINE MAMMALS, AND PERCENTAGE OF STOCK ABUNDANCE, AS A RESULT OF THE PROPOSED PROJECT

Species	Underwater [1]		Percentage of stock abundance
	Level A	Level B (120 dB)	
Steller sea lion	0	2,177	4
Harbor seal	0	385	11

[1] We assume, for reasons described earlier, that no takes would occur as a result of airborne noise.

Analyses and Preliminary Determinations

Negligible Impact Analysis

NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''. . .an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.'' A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of Level B harassment takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through behavioral harassment, we consider other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

Pile driving activities associated with the proposed dock construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Potential takes could occur if marine mammals are present in the ZOI when pile driving is happening, which is likely to occur because: (1) Steller sea lions have established haulouts near Iliuliuk Harbor and are frequently observed in Iliuliuk Harbor, in varying numbers depending on season and prey availability, and probably associate fishing boats entering the harbor with reliable food sources; and (2) harbor seals are observed in Iliuliuk Harbor occasionally and are known to haulout at sites outside the harbor, including one site approximately 3 km from the project location.

No serious injury or mortality of marine mammals would be anticipated as a result of vibratory and impact pile driving, regardless of mitigation and monitoring measures. Vibratory hammers do not have significant potential to cause injury to marine mammals due to the relatively low source levels produced (less than 180 dB rms) and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels than vibratory driving and much sharper rise time to reach those peaks. The potential for injury that may otherwise result from exposure to noise associated with impact pile driving will effectively be minimized through the implementation of the planned mitigation measures. These measures include: the implementation of a exclusion zone, which is expected to eliminate the likelihood of marine mammal exposure to noise at received levels that could result in injury; the use of ''soft start'' before pile driving, which is expected to provide marine mammals near or within the zone of potential injury with sufficient time to vacate the area; and the use of a sound attenuation system which is expected to dampen the sharp, potentially injurious peaks associated with impact driving and to reduce the overall source level to some extent (it is difficult to predict the extent of attenuation provided as underwater recordings have not been performed for the type of bubble curtain proposed for use). We believe the required mitigation measures, which have been successfully implemented in similar pile driving projects, will minimize the possibility of injury that may otherwise exist as a result of impact pile driving.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from similar pile driving projects that have received incidental take authorizations from NMFS, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging. Most likely, individuals will simply move away from the sound source and be temporarily displaced from the area of pile driving (though even this reaction has been observed primarily in association with impact pile driving). In response to vibratory driving, harbor seals have been observed to orient towards and sometimes move towards the sound. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

No pinniped rookeries or haul-outs are present within the project area, and the project area is not known to provide foraging habitat of any special importance to either Steller sea lions or harbor seals (other than is afforded by the migration of salmonids to and from Iliuliuk Stream and the occasional availability of discarded fish from commercial fishing boats and fish processing facilities in the project area). No cetaceans are expected within the project area. While we are not aware of comparable construction projects in the project location, the pile driving activities analyzed here are similar to other in-water construction activities that have received incidental harassment authorizations previously, including projects at Naval Base Kitsap Bangor in Hood Canal, Washington, and at the Port of Friday Harbor in the San Juan Islands, which have occurred with no reported injuries or mortalities to marine mammals, and no known long-term adverse consequences to marine mammals from behavioral harassment.

In summary, this negligible impact analysis is founded on the following factors: (1) The possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidences of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any major rookeries and only a few isolated haulout areas near the project site; (4) the absence of any other known areas or features of special significance for foraging or reproduction within the project area; and (5) the presumed efficacy of planned mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individual animals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, we preliminarily find that the total marine mammal take from UniSea's dock construction activities in Iliuliuk Harbor will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

The numbers of animals authorized to be taken would be considered small relative to the relevant stocks or populations (4 percent and 11 percent for Steller sea lions and harbor seals, respectively) even if each estimated taking occurred to a new individual. However, the likelihood that each take would occur to a new individual is extremely low. As described above, for those sea lions that associate fishing boats with reliable sources of food, there will almost certainly be some overlap in individuals present day-to-day depending on the number of vessels entering the harbor. It is expected that operations at a separate, nearby UniSea dock and the associated UniSea processing facilities, as well as at seafood processing facilities owned by other companies based in Iliuliuk Harbor, will continue as usual during construction on the G1 dock, so it is likely that sea lions accustomed to seeking food at these facilities will continue to be attracted to the area during portions of the construction activities.

Further, these takes are likely to occur only within some small portion of the overall regional stock. For example, of the estimated 55,422 western DPS Steller sea lions throughout Alaska, there are probably no more than 300 individuals with site fidelity to the three haulouts located nearest to the project location, based on over twenty years of NMML survey data (see ''Description of Marine Mammals in the Area of the Specified Activity'' above). For harbor seals, NMML survey data suggest there are likely no more than 60 individuals that use the three haulouts nearest to the project location (the only haulouts in Unalaska Bay). Thus the estimate of take is an estimate of the number of anticipated exposures, rather than an estimate of the number of individuals that will be taken, as we expect the majority of exposures would be repeat exposures that would accrue to the same individuals. As such, the authorized takes would represent a much smaller number of individuals of both Steller sea lions and harbor seals, in relation to total stock sizes.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, we preliminarily find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

Subsistence hunting and fishing is an important part of the history and culture of Unalaska Island. However, the number of Steller sea lions and harbor seals harvested in Unalaska decreased from 1994 through 2008; in 2008, the last year for which data is available, there were no Steller sea lions or harbor seals reported as harvested for subsistence use. Data on pinnipeds hunted for subsistence use in Unalaska has not been collected since 2008. For a summary of data on pinniped harvests in Unalaska from 1994–2008, see Section 8 of the IHA application.

Aside from the apparently decreasing rate of subsistence hunting in Unalaska, Iliuliuk Harbor is not likely to be used for subsistence hunting or fishing due to its industrial nature, with several fish processing facilities located along the shoreline of the harbor. In addition, the proposed construction project is likely to result only in short-term, temporary impacts to pinnipeds in the form of possible behavior changes, and is not expected to result in the injury or death of any marine mammal. As such, the proposed project is not likely to adversely impact the availability of any marine mammal species or stocks that may otherwise be used for subsistence purposes.

Endangered Species Act (ESA)

There is one marine mammal species (western DPS Steller sea lion) with confirmed occurrence in the project area that is listed as endangered under the ESA. The NMFS Permits and Conservation Division has initiated consultation with the NMFS Alaska Regional Office Protected Resources Division under section 7 of the ESA on the issuance of an IHA to UniSea under section 101(a)(5)(D) of the MMPA for this activity. Consultation will be concluded prior to a determination on the issuance of an IHA.

Proposed Authorization

As a result of these preliminary determinations, we propose to issue an IHA to UniSea, Inc., to conduct the described dock construction activities in Iliuliuk Harbor, from March 1, 2016 through February 28, 2017, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed IHA language is provided next.

This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

1. This Incidental Harassment Authorization (IHA) is valid from March 1, 2016 through February 28, 2017.

2. This IHA is valid only for pile driving and removal activities associated with construction of the UniSea G1 dock in Iliuliuk Harbor, Unalaska, AK.

3. General Conditions

(a) A copy of this IHA must be in the possession of UniSea, its designees, and work crew personnel operating under the authority of this IHA.

(b) The species authorized for taking are the harbor seal (*Phoca vitulina*) and Steller sea lion (*Eumetopias jubatus*).

(c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 6 in the proposed IHA authorization for numbers of take authorized.

(d) The taking by injury (Level A harassment), serious injury, or death of any of the species listed in condition 3(b) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.

(e) UniSea shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, and UniSea staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures:

(a) During impact and vibratory pile driving and removal, and down-the-hole drilling, UniSea shall implement a minimum shutdown zone of 10 m radius around the pile being driven or removed, to be effective for marine mammals. If a marine mammal comes within the relevant zone, such operations shall cease.

(b) UniSea shall establish monitoring locations as described in the Marine Mammal Monitoring Plan (Monitoring Plan; attached). For all pile driving and removal activities, a minimum of two observers shall be on duty, in addition to a monitoring coordinator. The primary responsibility of one of these observers shall be to monitor the shutdown zone, while the additional observer shall be positioned for optimal monitoring of the surrounding waters within Iliuliuk Harbor. These observers shall record all observations of marine mammals, regardless of distance from the pile being driven, as well as behavior and potential behavioral reactions of the animals.

(c) Monitoring shall take place from fifteen minutes prior to initiation of pile driving activity or down-the-hole drilling activity through thirty minutes post-completion of such activity. Pre-activity monitoring shall be conducted for fifteen minutes to ensure that the exclusion zone is clear of marine mammals, and pile driving or down-the-hole drilling may commence when observers have declared the exclusion zone clear of marine mammals. In the event of a delay or shutdown of activity resulting from marine mammals in the exclusion zone, animals shall be allowed to remain in the exclusion zone (*i.e.,* must leave of their own volition) and their behavior shall be monitored and documented. Monitoring shall occur throughout the time required to drive a pile. The exclusion zone must be determined to be clear during periods of good visibility (*i.e.,* the entire exclusion zone and surrounding waters must be visible to the naked eye).

(d) If a marine mammal approaches or enters the exclusion zone, all pile driving or down-the-hole drilling activities shall be halted. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the exclusion zone, or fifteen minutes have passed without re-detection of the animal.

(e) Monitoring shall be conducted by qualified observers, as described in the Monitoring Plan. Trained observers shall be placed from the best vantage point(s) practicable (*i.e.,* provides the most unobstructed view of the monitoring zones and are at the highest elevation possible) to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator.

(f) UniSea shall use sound attenuation devices during impact pile driving operations.

(g) UniSea shall use soft start techniques recommended by NMFS for vibratory and impact pile driving. Soft start for vibratory drivers requires contractors to initiate sound for fifteen seconds at reduced energy followed by a thirty-second waiting period. This procedure is repeated two additional times. Soft start for impact drivers requires contractors to provide an initial set of strikes at reduced energy, followed by a one minute waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's pile driving and at any time following cessation of pile driving for a period of thirty minutes or longer. UniSea may discontinue use of vibratory soft starts if unsafe working conditions believed to result from implementation of the measure are reported by the contractor, verified by an independent safety inspection, and reported to NMFS.

(h) 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 the zone improves to acceptable levels.

5. Monitoring

The holder of this Authorization is required to conduct marine mammal monitoring during pile driving activity. Marine mammal monitoring and reporting shall be conducted in accordance with the Monitoring Plan.

(a) UniSea shall collect sighting data and behavioral responses to pile driving/removal for marine mammal species observed in the region of activity during the period of activity. All observers shall be trained in marine mammal identification and behaviors, and shall have no other construction related tasks while conducting monitoring.

(b) For all marine mammal monitoring, the information shall be recorded as described in the Monitoring Plan.

6. Reporting

The holder of this Authorization is required to:

(a) Submit a draft report on all marine mammal monitoring conducted under the IHA within 90 calendar days of the end of the in-water work period, or within 45 calendar days of the renewal of the IHA (if applicable). A final report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Monitoring Plan, at minimum (see attached).

(b) Reporting injured or dead marine mammals:

i. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA (as determined by the lead observer), such as an injury (Level A harassment), serious injury, or mortality, UniSea shall immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator, NMFS. The report must include the following information:

A. Time and date of the incident;

B. Description of the incident;

C. Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);

D. Description of all marine mammal observations in the 24 hours preceding the incident;

E. Species identification or description of the animal(s) involved;

F. Fate of the animal(s); and

G. Photographs or video footage of the animal(s).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with UniSea to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. UniSea may not resume their activities until notified by NMFS.

i. In the event that UniSea discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.,* in less than a moderate state of decomposition), UniSea shall immediately report the incident to the Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator, NMFS.

The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident and makes a final determination on the cause of the reported injury or death. NMFS will work with UniSea to determine whether additional mitigation measures or modifications to the activities are appropriate.

ii. In the event that UniSea discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), UniSea shall report the incident to the Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator, NMFS, within 24 hours of the discovery. UniSea shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS. The cause of injury or death may be subject to review and a final determination by NMFS.

7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines that the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

Request for Public Comments

We request comment on our analysis, the draft authorization, and any other aspect of this Notice of Proposed IHA for UniSea's dock construction activities. Please include with your comments any supporting data or literature citations to help inform our final decision on UniSea's request for an MMPA authorization.

Dated: December 17, 2015.

Perry F. Gayaldo,

Deputy Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE343

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the U.S. Air Force Conducting Maritime Weapon Systems Evaluation Program Operational Testing Within the Eglin Gulf Test and Training Range

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS (hereinafter, ''we'' or ''our'') received an application from the U.S. Department of the Air Force, Headquarters 96th Air Base Wing (Air Force), Eglin Air Force Base (Eglin AFB), requesting an Incidental Harassment Authorization (Authorization) to take marine mammals, by harassment, incidental to a Maritime Weapon Systems Evaluation Program (Maritime WSEP) within a section of the Eglin Gulf Test and Training Range in the northern Gulf of Mexico.

Eglin AFB's activities are military readiness activities per the Marine Mammal Protection Act (MMPA), as amended by the National Defense Authorization Act (NDAA) for Fiscal Year 2004. Per the MMPA, NMFS requests comments on its proposal to issue an Authorization to Eglin AFB to incidentally take, by Level B and Level A harassment, two species of marine mammals, the Atlantic bottlenose dolphin (*Tursiops truncatus*) and Atlantic spotted dolphin (*Stenella frontalis*), during the specified activity.

DATES: NMFS must receive comments and information no later than January 22, 2016.

ADDRESSES: Address comments on the application to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. The mailbox address for providing email comments is *ITP.Cody@noaa.gov.* Please include 0648–XE343 in the subject line. Comments sent via email to *ITP.Cody@noaa.gov,* including all attachments, must not exceed a 25-megabyte file size. NMFS is not responsible for email comments sent to addresses other than the one provided in this notice.

Instructions: All submitted comments are a part of the public record, and generally we will post them to *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm* without change. All Personal Identifying Information (for example, name, address, *etc.*) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

To obtain an electronic copy of the 2015 renewal request, the 2014 application, a list of the references used in this document, and Eglin AFB's Environmental Assessment (EA) titled, ''Maritime Weapons System Evaluation Program,'' write to the previously mentioned address, telephone the contact listed here (see **FOR FURTHER INFORMATION CONTACT**), or visit the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm.*

FOR FURTHER INFORMATION CONTACT: Jeannine Cody, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if, after NMFS provides a notice of a proposed authorization to the public for review and comment: (1) NMFS makes certain findings; and (2) the taking is limited to harassment.

An Authorization for incidental takings for marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such taking are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.''

The National Defense Authorization Act of 2004 (NDAA; Public Law 108–136) removed the ''small numbers'' and ''specified geographical region'' limitations indicated earlier and amended the definition of harassment as it applies to a ''military readiness activity'' to read as follows (Section 3(18)(B) of the MMPA): (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B Harassment].

Summary of Request

On February 5, 2015, we issued an Authorization to Eglin AFB to take marine mammals, by harassment, incidental to a Maritime Weapon Systems Evaluation Program (Maritime WSEP) within the Eglin Gulf Test and Training Range (EGTTR) in the Gulf of Mexico from February through April 2015 (see 80 FR 17394, April 1, 2015). Eglin AFB conducted the Maritime WSEP training activities between February 9–12, and March 16–19, 2015. However, due to unavailability of some of the live munitions, Eglin AFB released only 1.05 percent of the munitions proposed for the 2015 military readiness activities. On May 28, 2015, we received a renewal request for an Authorization from Eglin AFB to complete the missions authorized in 2015. Following the initial application submission, Eglin AFB submitted a revised version of the renewal request on December 3, 2015. We considered the revised renewal request as adequate and complete on December 10, 2015.

Eglin AFB proposes to conduct Maritime WESP missions within the EGTTR airspace over the Gulf of