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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648- XR045

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Whittier Ferry Terminal Alaska Class Ferry Modification Project

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

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from Alaska Department of Transportation and Public Facilities (ADOT&PF) for authorization to take marine mammals incidental to the Whittier Ferry Terminal Alaska Class Ferry Modification Project in Whittier, Alaska. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

ADDRESSES: Comments 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.Davis@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. 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 online at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Leah Davis, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On June 6, 2019, NMFS received a request from ADOT&PF for an IHA to take marine mammals incidental to the relocation of one dolphin at the Whittier Ferry Terminal in Whittier, Alaska. The application was deemed adequate and complete on September 27, 2019. ADOT&PF's request is for take of a small number of five species of marine mammals by Level B harassment. Neither ADOT&PF nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

ADOT&PF is seeking an IHA for ferry terminal modifications at the Whittier Ferry terminal in Whittier, AK. Whitter is located at the head of Passage Canal, a deep-water fjord within Prince William Sound. The project includes relocation of one dolphin to accommodate a new, Alaska Class Ferry, the M/V Hubbard, as it is wider than the ferries currently operating in Prince William Sound. The dolphin will be removed using a vibratory hammer, and reinstalled using both vibratory and impact hammers. Additionally, construction will include modifying the existing catwalk and landing and modifying the bridge girder connection. Pile removal and installation associated with the project are expected to result in Level B harassment of humpback whale, killer whale, Dall's porpoise, Steller sea lion, and harbor seal. The ensonified area is expected to reach 12.0 km beyond the project site in Passage Canal. In-water construction is expected to occur over six work days during February and March 2020.

Dates and Duration

The IHA will be effective from February 2020 to January 2021. The project, including mobilization and demobilization, is expected to occur during February and March 2020. In-water work will occur over six days with pile extraction and pile reinstallation each expected to occur over three days. Pile driving activity is expected to range from 30 minutes to 150 minutes each day.

Specific Geographic Region

The dolphin proposed to be moved is located on state submerged land (ADL 23147) at 60.777°N, 148.683°W at the Whittier Ferry Terminal in Whitter, AK. Whittier is located at the head of Passage Canal, a deep-water fjord within Prince William Sound. Passage Canal itself is a deep (to nearly 244 m [800 ft]) fjord approximately 9.7

kilometers (km) (6 miles [mi]) long and 2.4 km (1.5 mi) wide. Several streams feed into the waterway including meltwater streams emanating from Learnard, Shakespeare, and Whittier glaciers. Tidal energy limits the production of nearshore kelps (*e.g., Fuscus*) and eelgrass (*Zostera marina*), and most marine invertebrates present are hard-bottom habitat species such as mussels, barnacles, limpets, chitons, and snails (U.S. Army Corps of Engineers (USACE) 2015). Pacific herring (*Clupea pallasii*) is seasonally present at the head of the Passage Canal and appears to be the dominate fish found in the project area (USACE 2015), although major herring spawning areas within Prince William Sound are well outside Passage Canal (Alaska Department of Environmental Conservation [ADEC] 2005). Returning hatchery king salmon (*Oncorhynchus tshawytscha*) are also found in Passage Canal mid-May to mid-June, while native silver salmon (*O. kisutch*) runs are found mid-July through late August. Passage Canal supports the largest colony of black-legged kittiwakes in Prince William Sound (located 2.4 km [1.5 mi] north of the terminal).

Because Whittier is connected to the Alaska Highway System via the Portage Glacier Highway and Anton Anderson Memorial Tunnel, it is a port of call for cruise ships and a popular destination for sport fisherman, tourists, and outdoor enthusiasts. It is also the marine hub of the only road system connecting Anchorage with Prince William Sound.

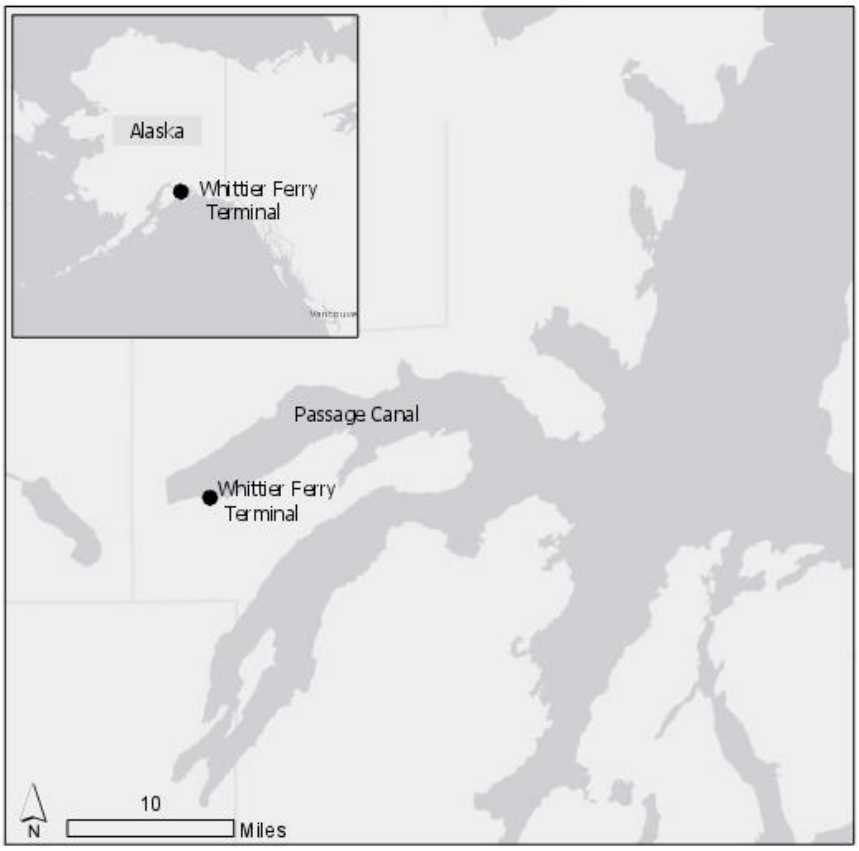

Figure 1: Project location in southern Alaska.

Detailed Description of Specific Activity

The proposed project would use a vibratory hammer to extract four 30-inch (0.76m) piles, each 39.6 m (130 ft) in length, comprising dolphin S3 at the Whittier Ferry Terminal, and then reinstall them at a new location approximately 1.2 m (4 ft) southeast of the existing location using the same vibratory hammer. Each pile will then be proofed with an impact hammer to achieve a final depth of approximately 19.8 m (65 ft) into the seafloor. ADOT&PF estimates that an average of 1.5 piles will be removed or installed per day.

Additional construction components include modifying the existing catwalk and landing and modifying the bridge girder connection. These ancillary actions occur above water, and are only expected to impact pinnipeds that are hauled out in the area where

sound levels exceed in-air harassment thresholds. There are no pinniped haul-out sites near the construction site, and no harassment from airborne sound is expected to result from project activities. Therefore, above-water construction activities will not be considered further in this document.

Table 1: Pile extraction and reinstallation activity.

Pile Type/Activity	No. of Piles	Vibratory Duration	Impact Duration	Strike Duration	Total Hours	Average Piles per Day	Days of Removal or Reinstallation
30-in Steel Extraction	4	30 min	N/A	N/A	2	1.5	3
30-in Steel Reinstallation	4	45 min	30 min (400 strikes)	0.1 sec	5	1.5	3
Total	8	300 min	120 min (1600 strikes)	N/A	7	N/A	6

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see *Proposed Mitigation* and *Proposed Monitoring and Reporting*).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species with expected potential for occurrence in Passage Canal and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is 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 (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprise that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Alaska and U.S. Pacific SARs (*e.g.*, Muto *et al.*, 2019). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2018 SARs (Muto *et al.*, 2019 and Carretta *et al.*, 2019).

Table 2: Marine mammals that could occur in the project area.

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundan	PBR	Annual M/SI[3]

				ce survey)[2]		
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	139
Family Balaenopteridae (rorquals)						
Fin whale	*Balaenoptera physalus*	Northeast Pacific	E, D, Y	see SAR (see SAR, see SAR, 2013)	5.1	0.6
Humpback whale	*Megaptera novaeangilae*	Central North Pacific	-, -, Y	10,103 (0.300, 7,891, 2006)	83	26
		California/ Oregon/ Washington	-, -, Y	2,900 (0.05, 2,784, 2014)	16.7	≥40.2
		Western North Pacific	E, D, Y	1,107 (0.300, 865, 2006)	3	3.0
Minke whale	*Balaenoptera acutorostra*	Alaska	-, -, N	N/A (see SAR, N/A, see SAR)	Undetermined	0
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	Eastern North Pacific, Alaska Resident	-, -, N	2,347c (N/A, 2,347, 2012)	24	1
		Gulf, Aleutian, Bering Transient	-, -, N	587c (N/A, 587, 2012)	5.87	1
		AT1 Transient	-, D, Y	7c (N/A, 7, 2017)	0.01	0

Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	North Pacific	-, -, N	26,880 (Unknown, Unknown, 1990)	Undetermined	0
Family Phocoenidae (porpoises)						
Dall's porpoise	*Phocoenoides dalli*	Alaska	-, -, N	83,400 (0.097, N/A, 1991)	Undetermined	38
Harbor porpoise	*Phocoena*	Gulf of Alaska	-, -, Y	31,046 (0.214, N/A, 1998)	Undetermined	72
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*	U.S.	-, -, N	257,606 (N.A, 233,515, 2014)	14,011	≥321
Steller sea lion	*Eumetopias jubatus*	Western U.S.	E, D, Y	54,267a (Unknown, 54,267, 2017)	326	247
Family Phocidae (earless seals)						
Pacific harbor seal	*Phoca vitulina*	Prince William Sound	-, -, N	29,889 (see SAR, 27,936, 2011)	838	279

1 - Endangered Species Act (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 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- NMFS marine mammal stock assessment reports online at: *www.nmfs.noaa.gov/pr/sars/*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. 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 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
Note: Italicized species are not expected to be taken or proposed for authorization.

All species that could potentially occur in the proposed survey areas are included in Table 2. However, the temporal and/or spatial occurrence of gray whale, fin whale, minke whale, Pacific white-sided dolphin, harbor porpoise, and California sea lion are such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Gray whales do not regularly enter Prince William Sound, and charter operators have only observed gray whales in Passage Canal twice in the past 20 years (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers. comm.). Fin whales typically arrive to the Gulf of Alaska in May, well after the February and March work window, and there is only one record of a fin whale occurring within Passage Canal in the past 20 years (M. Kopec, Whittier Marine Charters, pers. comm.). Minke whales are not expected to occur in the ensonified area, as in the past 20 years, marine mammal charter operators have seen fewer than five minke whales within Passage Canal, and they are typically found farther south during winter months (NMFS 2018b). Extensive marine mammal surveys conducted within Prince William Sound by Hall (1979) and Waite (2003) yielded no sightings of Pacific white-sided dolphins. Based on habitat preferences and past survey results, this dolphin is unlikely to occur in the Action Area, especially given the early spring work-window. Over the last 20 years, none have been observed in the inlet by charter operators (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers.

comm.). Harbor porpoise have not been observed in Passage Canal during over two decades of whale watching by one charter operator (M. Bender, Lazy Otter Charters, pers. comm.), and are considered extremely rare in Passage Canal by another (M. Kopec, Whittier Marine Charters, pers. comm.). California sea lions are rarely sighted in southern Alaska. NMFS' anecdotal sighting database includes four sightings in Seward and Kachemak Bay, and they were also documented during the Apache 2012 seismic survey in Cook Inlet. However, California sea lions have not been observed in Passage Canal.

In addition, the northern sea otter may be found in Whittier, AK. However, northern sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

Humpback Whale

The humpback whale (*Megaptera novaeangilae*) is distributed worldwide in all ocean basins. Relatively high densities of humpback whales are found in feeding grounds in southeast Alaska and northern British Columbia, particularly during summer months. Humpbacks migrate to Alaska to feed after months of fasting in low latitude breeding grounds. The timing of migration varies among individuals: most humpbacks begin returning to Alaska in spring and most depart Alaska for southern breeding grounds in fall or winter. Peak numbers of humpbacks in southeast Alaska occur during late summer to early fall, but because there is significant overlap between departing and returning whales, humpbacks can be found in Alaska feeding grounds in every month of the year (Baker *et al.* 1985, Straley 1990, Witteveen and Wynne 2017). There is also an apparent

increase in the number of humpbacks overwintering in feeding grounds in Alaska (Straley *et al.* 2018).

Based on over two decades of whale watching activity in Passage Canal, humpback whales have been observed in Passage Canal on only very rare occasions and remained for very short periods (M. Bender, Lazy Otter Charters, pers. comm.). Reported occurrence is approximately once per year (M. Kopec, Whittier Marine Charters, pers. comm.). However, there is a chance that a humpback may occur in Passage Canal if herring are present.

Based on extensive photo identification data, NMFS has determined that individual humpback whales encountered in the Gulf of Alaska have an 89 percent probability of being from the recovered (delisted) Hawaii Distinct Population Segment (DPS) (Wade *et al.* 2016). Therefore, there is an 89 percent probability that a humpback occurring in Passage Canal is from the Hawaii DPS and Central North Pacific stock. Given the low overall likelihood of encountering any humpbacks, other DPSs of humpback whale will not be considered further in this document and any humpback whales seen will belong to the Central North Pacific stock.

Killer Whale

Killer whales (*Orcinus orca)* are found in every ocean of the world (NMFS 2018c) and are the most widely distributed marine mammal (Leatherwood and Dahlheim 1978). NMFS considers three stocks of killer whales to seasonally inhabit Prince William Sound: Eastern North Pacific Alaska Resident stock (2,347 individuals); Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock (587 individuals); and the small AT1 Transient stock (7 individuals) (Muto *et al.* 2019).

On rare occasions killer whales have been reported to occur in Passage Canal, but they do not occur there on a regular basis (M. Bender, Lazy Otter Charters, pers. comm.). They are seen in the inlet approximately once each year (M. Kopec, Whittier Marine Charters, pers. comm.). Killer whales that may occur in Passage Canal during the project are expected to be either from the Eastern North Pacific Alaska Resident stock, or the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock. Based on the AT1 Transient killer whale small stock size (seven individuals), and the small stock size in comparison with all killer whales potentially present in Prince William Sound (2,941 individuals), we do not expect any AT1 Transients to enter Passage Canal during the project. AT1 Transient killer whales will not be considered further in this document.

Dall's Porpoise

Dall's porpoises (*Phocoenoides dalli)* are widely distributed in the North Pacific Ocean, usually in deep oceanic waters (183 m (>600 ft)), over the continental shelf or along slopes (NMFS 2018d, Hall 1979, Muto *et al.* 2019). They occur along the west coast of the United States ranging from California to the Bering Sea in Alaska (NMFS 2018d). Dall's porpoises occur in Alaskan waters year-round (Muto *et al.* 2019) and typically give birth between June and September to single calves (NMFS 2018d). They have occasionally been observed near the entrance of Passage Canal, but within the inlet they are considered exceedingly rare (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers. comm.).

Steller Sea Lion

The Steller sea lion (*Eumetopias jubatus)* was listed as a threatened species under the ESA in 1990 following declines of 63 percent on certain rookeries since 1985 and

declines of 82 percent since 1960 (55 FR 12645, April 5, 1990). In 1997, two DPSs of Steller sea lion were identified based on differences in genetics, distribution, phenotypic traits, and population trends (62 FR 24345, May 5, 1997; Fritz *et al.* 2013): the Eastern DPS found east of Cape Suckling (144°W) and the Western DPS found west of Cape Suckling. At that time the Western DPS was up-listed to endangered due to continuing declines. However, the Eastern DPS population increased and was eventually removed from the ESA listing in 2013 (78 FR 66140, November 4, 2013).

Steller sea lions are often seen near Whittier during May to August salmon runs but are irregularly seen in the project area the rest of the year, although as many as ten sea lions haul out year-round on a channel buoy within Shotgun Cove approximately 6 km (3.7 mi) northeast of the project location (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers. comm.).

Steller sea lion critical habitat within Prince William Sound includes three major haulouts (The Needle, Perry Island, and Point Eleanor), and several more haulouts plus two rookeries (Seal Rocks and Fish Island). When including the designated 20-nautical-mile (nm) zone around each denoting critical habitat (foraging), most of Prince William Sound falls within Steller sea lion critical habitat. However, the nearest major haulout is >20 nm from the project location; thus, no sea lion critical habitat falls within the Level B harassment zone.

Harbor Seal

Harbor seals (*Phoca vitulina)* range from Baja California north along the west coasts of California, Oregon, Washington, 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. Harbor seals are irregularly present in the project area. Small numbers have been reported (K. Sinclair, Whittier Harbormaster, pers. comm.) in the Whittier boat harbor feeding on the mussels and barnacles growing on the harbor pilings but apparently remained only if this food source remained. They are occasionally seen mid-inlet throughout the year and four to ten individuals have recently been observed hauled out on a rock pinnacle at the mouth of Logging Camp Bay approximately 12.4 km (7.7 mi) northeast of the project area (M. Bender, Lazy Otter Charters, pers. comm.). Harbor seals are the species most likely to be present in the Level B harassment zone during the proposed pile driving.

Harbor seals forage on fish and invertebrates (Wynne 2012). They are opportunistic feeders that forage in marine, estuarine, and freshwater habitats, adjusting their foraging behavior to take advantage of prey that are seasonally and locally abundant (Payne and Selzer 1989). In Alaska, harbor seals typically give birth to single pups between May and mid-July. The birthing location of harbor seal pups occurs at many different haul-out sites and is not restricted to a few major rookeries (Kinkhart *et al.* 2008). Pupping and weaning coincide with the summer haulout. (Sease 1992).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, 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 directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018a) described generalized hearing ranges for these marine mammal hearing groups (NMFS 2018a). Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

Table 3: Marine Mammal Hearing Groups (NMFS, 2018a).

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

***** Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

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 and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018a) for a review of available information. Five marine mammal species (three cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed project activities. Please refer to Table 2. Of the cetacean species that may be present, one is classified as a low-frequency cetacean (humpback whale), one is classified as a mid-frequency cetacean (killer whale), and one is classified as a high-frequency cetacean (Dall's porpoise).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The *Estimated Take by Incidental Harassment* section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The *Negligible Impact Analysis and Determination* section considers the content of this section, the *Estimated Take by Incidental Harassment* section, and the *Proposed Mitigation* section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far. The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

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.

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving, and vibratory pile removal. The sounds produced by these activities fall into one of two general sound types: Impulsive and non-impulsive. Impulsive sounds (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) are

typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI 1986; NIOSH 1998; ANSI 2005; NMFS 2018a). Non-impulsive sounds (*e.g.* aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with raid rise/decay time that impulsive sounds do (ANSI 1995; NIOSH 1998; NMFS 2018a). 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).

Two types of pile hammers would be used on this project: Impact and vibratory. 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 sound pressure levels (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).

The likely or possible impacts of ADOT&PF's proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel;

however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and removal.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the primary means by which marine mammals may be harassed from ADOT&PF's specified activity. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.* 2007). In general, exposure to pile driving and removal noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving and removal noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.* 2004; Southall *et al.* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018a). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018a), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.*, impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (i.e., how an animal uses sound within the frequency band of the signal; *e.g.*, Kastelein *et al.* 2014), and the overlap between the animal and the source (*e.g.*, spatial, temporal, and spectral).

Permanent Threshold Shift (PTS)—NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018a). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.* 1958, 1959; Ward 1960; Kryter *et al.* 1966; Miller 1974; Ahroon *et al.* 1996; Henderson *et al.* 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.* 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons,

experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS 2018a).

Temporary Threshold Shift (TTS)—A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018a). Based on data from cetacean TTS measurements (see Southall *et al.* 2007), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.* 2000; Finneran *et al.* 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SELcum) in an accelerating fashion: At low exposures with lower SELcum, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SELcum, the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.*, recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been

observed in marine mammals, as well as humans and other taxa (Southall *et al.* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale *(Delphinapterus leucas*), harbor porpoise (*Phocoena phocoena*), and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and five species of pinnipeds exposed to a limited number of sound sources (*i.e.*, mostly tones and octave-band noise) in laboratory settings (Finneran 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), Finneran (2015), and Table 5 in NMFS (2018a). Installing piles requires a combination of impact pile driving and vibratory pile driving. For the project, these activities would not occur at the same time and there would likely be pauses in activities producing the sound during each day. Given these pauses and that many marine mammals are likely moving through the ensonified area and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment—Exposure to noise from pile driving and removal also has the potential to behaviorally disturb marine mammals. Available studies show wide

variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.*, Lusseau and Bejder 2007; Weilgart 2007; NRC 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, 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 (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.*, species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.*, Richardson *et al.* 1995; Wartzok *et al.* 2003; Southall *et al.* 2007; Weilgart 2007; Archer *et al.* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.* 2012), and can vary depending on characteristics associated with the sound source (*e.g.*, whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem

more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B-C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.*, bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.*, Croll *et al.* 2001; Nowacek *et al.* 2004; Madsen *et al.* 2006; Yazvenko *et al.* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

In 2016, ADOT&PF documented observations of marine mammals during construction activities (*i.e.*, pile driving and down-hole drilling) at the Kodiak Ferry Dock (see 80 FR 60636, October 7, 2015, for Final IHA Federal Register notice). In the marine mammal monitoring report for that project (ABR 2016), 1,281 Steller sea lions were observed within the behavioral disturbance zone during pile driving or drilling (*i.e.*, documented as Level B harassment take). Of these, 19 individuals demonstrated an alert behavior, 7 were fleeing, and 19 swam away from the project site. All other animals were engaged in activities such as milling, foraging, or fighting and did not change their

behavior. In addition, two sea lions approached within 20 meters of active vibratory pile driving activities. Harbor seals were observed within the disturbance zone during pile driving activities; none of them displayed disturbance behaviors. Killer whales were also observed within the Level B harassment zone during pile driving, and were travelling or milling. No signs of disturbance were noted for killer whales. Given the similarities in activities and habitat and the fact the same species are involved, we expect similar behavioral responses of marine mammals to the specified activity. That is, disturbance, if any, is likely to be temporary and localized (*e.g.*, small area movements). Monitoring reports from other recent pile driving projects have observed similar behaviors.

Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.*, snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.*, pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.*, signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.*, sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at

frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked.

Airborne Acoustic Effects—Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels exceeding the acoustic thresholds. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. 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 the area and move further from the source. However, these animals would previously have been `taken' because 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. 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 Habitat Effects

ADOT&PF's construction activities could have localized, temporary impacts on marine mammal habitat by increasing in-water sound pressure levels and slightly decreasing water quality. Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater sound. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During impact and vibratory pile driving, elevated levels of underwater noise would ensonify the canal where both fish and mammals may occur and could affect foraging success.

In-Water Construction Effects on Potential Foraging Habitat

ADOT&PF's project involves moving the four piles comprising dolphin S3 1.2 m (4 feet), thus all habitat modification would remain within the same footprint as the existing ferry terminal and facilities. The total seafloor area affected from extracting and relocating piles is about 15 m^2 (161 ft^2), a small area compared to the vast foraging area available to marine mammals in Prince William Sound. The pile driving process may result in removing barnacles and mussels (potential harbor seal prey) from the pilings, but once reseated, these pilings would again be available as substrate for these invertebrates.

Pile installation and removal may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. ADOT&PF must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile

(Everitt *et al.* 1980). Cetaceans are not expected to be close enough to the project pile driving areas to experience effects of turbidity, and any pinnipeds could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals. Furthermore, pile driving and removal at the project site would not obstruct movements or migration of marine mammals.

Avoidance by potential prey (*i.e.*, fish) of the immediate area due to the temporary loss of this foraging habitat is also 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 the nearby vicinity in Prince William Sound.

The duration of the construction activities is relatively short, with pile driving and removal activities expected to occur during just seven hours over six days. Impacts to habitat and prey are expected to be temporary and minimal based on the short duration of activities.

In-Water Construction Effects on Potential Prey (Fish)

Construction activities would produce continuous (*i.e.*, vibratory pile driving) and pulsed (*i.e.* impact driving) sounds. Fish react to sounds that 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). 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.

The most likely impact to fish from pile driving and drilling 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. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project. Additionally, fish species that are important marine mammal prey, such as Pacific herring and salmon, are unlikely to be present in appreciable numbers during the February-March work window (Bishop and Green 2009, NMFS 2019).

Construction activities, in the form of increased turbidity, have the potential to adversely affect fish in the project area. Increased turbidity is expected to occur in the immediate vicinity (on the order of 10 feet or less) of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle. Given the limited area affected, any effects on fish are expected to be minor or negligible. In addition, best management practices would be in effect, which would limit the extent of turbidity to the immediate project area.

In summary, given the short daily duration of sound associated with individual pile driving and drilling events and the relatively small areas being 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, we conclude that impacts

of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. 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).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to pile driving and removal activities. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.*, shutdown zones) discussed in detail below in Proposed Mitigation section, Level A harassment is neither anticipated nor proposed to be authorized.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic

threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) root mean square (rms) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources.

ADOT&PF's proposed activity includes the use of continuous (vibratory pile driving and removal) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (NMFS, 2018a) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). ADOT&PF's proposed activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving and removal) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 4: Thresholds identifying the onset of Permanent Threshold Shift (PTS).

	PTS Onset Acoustic Thresholds* **(Received Level)**

Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving and removal). The maximum (underwater) area ensonified above the thresholds for behavioral harassment referenced above is 20.5 km^2 (7.9 mi^2) and is governed by the inlet topography.

The project includes vibratory and impact pile installation of steel pipe piles and vibratory removal of steel pipe piles. Source levels of pile installation and removal activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each pile size and driving method are presented in Table 5. The vibratory and impact source levels for 30-inch (0.76m) pile installation is from pile driving activities at the Auke Bay Ferry Terminal in November 2015 (Denes *et al.*, 2016). Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

Table 5: Sound source levels for pile driving methods.

Pile Size and Method	Source Level (SPL at 10m)			Literature Source
	dB RMS	dB SEL[a]	dB peak	
30-inch Vibratory	168.0	N/A	N/A	Denes *et al.* 2016
30-inch Impact	191.3	N/A	206.0	Denes *et al.* 2016

[a] Sound exposure level (dB re 1 μPa^2-sec).

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

TL = transmission loss in dB

B = transmission loss coefficient

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

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Site-specific transmission loss data for Whittier are not available, therefore the default coefficient of 15 is used to determine the distances to the Level A and Level B harassment thresholds.

Table 6: Pile driving source levels and distances to Level B harassment thresholds.

Pile Size and Method	Source level at 10m (dB re 1 µPa rms)	Level B threshold (dB re 1 µPa rms)	Propagation (xLogR)	Distance to Level B threshold (km)	Level B harassment ensonified area (km^2)
30-inch Vibratory	168.0	120	15	15.8	20.5
30-inch Impact	191.3	160	15	1.2	1.24

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may

result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as pile driving, NMFS User Spreadsheet predicts the distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below.

Table 7: User spreadsheet input parameters used for calculating Level A harassment isopleths.

Pile Size and Installation Method	**30-inch Pile Vibratory Installation and Removal**	**30-inch Pile Impact Installation (SEL_{cum})**	**30-inch Pile Impact Installation (PK)**
Spreadsheet Tab Used	A.1)Vibratory pile driving	E.1) Impact pile driving	E.1) Impact pile driving
Weighting Factor Adjustment (kHz)	2.5	2	2
Source Level (SPL@ 10m)	168.0 dB rms	191.3 dB rms	206 dB peak
Number of piles within 24-h period	1.5	1.5	
Duration to drive a single pile (minutes)	45		
Strike Duration (seconds)		0.1	
Number of strikes per pile		400	
Activity Duration (seconds) within 24-h period	4050	60	
Propagation (xLogR)	15	15	
Distance from source level measurement	10	10	10

(meters)			

Table 8: Calculated distances to Level A harassment isopleths.

Activity	Level A harassment zone (m)				
	Low-Frequency Cetaceans	**Mid-Frequency Cetaceans**	**High-Frequency Cetaceans**	**Phocid Pinnipeds**	**Otariid Pinnipeds**
30-inch Pile Vibratory Installation and Removal	22	2	32	13	1
30-inch Pile Impact Installation (SEL_{cum})	547	20	652	293	21
30-inch Pile Impact Installation (PK)	1	NA	19	2	N/A

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. No systematic surveys for marine mammals have occurred in Passage Canal. Animal presence is based on the observations by whale watching charters based out of Whittier, which specifically search for marine mammals in Passage Canal and one of which operates during the February and March construction window.

Here we describe how the information provided above is brought together to produce a quantitative take estimate. Because reliable densities are not available and marine mammal presence in Passage Canal is minimal, take requests are species specific and a general take calculation formula does not apply.

Humpback Whale

Based on over two decades of whale watching activity in Passage Canal, humpback whales have been observed in Passage Canal on only very rare occasions and remained for very short periods (M. Bender, Lazy Otter Charters, pers. comm.). Reported occurrence is approximately once per year (M. Kopec, Whittier Marine Charters, pers. comm.).

ADOT&PF estimates that one humpback whale may enter Passage Canal and remain in the Canal for several days during the project if herring are present. Therefore, ADOT&PF has requested take of one whale for each of the six project days for a total of six humpback whale takes.

The largest Level A harassment zone for humpback whales extends 547m from the source during impact installation of 30-inch (0.76m) piles (Table 8). Given the irregular and small presence of humpback whales in Passage Canal, and the fact that PSOs are expected to detect humpback whales before they enter the Level A harassment zone and implement shutdowns to prevent take by Level A harassment, Level A harassment takes of humpback whales have not been requested and are not proposed to be authorized.

Killer Whale

On rare occasions killer whales have been reported to make brief sorties into Passage Canal, but they are not regular residents there (M. Bender, Lazy Otter Charters, pers. comm.). They are seen in the inlet approximately once each year (M. Kopec, Whittier Marine Charters, pers. comm.). ADOT&PF estimates that one pod may enter the Level B harassment zone during the project. Based on that estimate, ADOT&PF requests

20 killer whale takes, which equates to the largest, single pod (AB) entering the project area on one day of pile driving.

The largest Level A harassment zone for killer whales extends 20 m from the source during impact installation of 30-inch (0.76m) piles (Table 8). Given the irregular and small presence of killer whales in Passage Canal, and the fact that PSOs are expected to detect killer whales before they enter the Level A harassment zone and implement shutdown zones to prevent take by Level A harassment, Level A harassment takes of killer whales have not been requested and are not proposed to be authorized.

Dall's Porpoise

Dall's porpoises have occasionally been observed near the entrance of Passage Canal, but within the inlet they are considered exceedingly rare (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers. comm.). ADOT&PF has requested take of five Dall's porpoise, based on the springtime average group size (4.59 individuals) from Prince William Sound surveys conducted by Moran *et al.* (2018). The estimate assumes that one group enters the Level B harassment zone on one day of pile driving.

The largest SEL_{cum} Level A harassment zone for Dall's porpoise extends 652m from the source during impact installation of 30-inch (0.76m) piles (Table 8), while the Peak Level A harassment zone for the same activity is 19m (Table 8). As noted in Table 10, a 200-m shutdown zone will be implemented for Dall's porpoises. The SEL_{cum} Level A harassment zone includes a time component, however, we do not expect Dall's porpoises to remain in the area within 652m during impact pile driving for a long enough

period to experience Level A harassment. Therefore, takes of Dall's porpoises by Level A harassment have not been requested and are not proposed to be authorized.

Steller Sea Lion

Steller sea lions are often seen near Whittier during May to August salmon runs but are irregularly seen in the Action Area the rest of the year, although as many as ten sea lions haul out year-round on a channel buoy within Shotgun Cove approximately 6 km (3.7 mi) northeast of the Action Area (M. Bender, Lazy Otter Charters, pers. comm.; M. Kopec, Whittier Marine Charters, pers. comm.).

An average of five Steller sea lions haul out on the buoy in Shotgun Cove. ADOT&PF estimates that half of those animals (average of 2.5) may enter the Level B harassment zone on each of the six days of pile driving, and requests a total of 15 Level B harassment takes of Steller sea lions. Due to the limited prey availability in the project area in February and March (Bishop and Green 2009, NMFS 2019), NMFS acknowledges that the requested Level B harassment takes are unlikely to occur. However, the takes are being both proposed for authorization and analyzed at the request of the applicant to ensure MMPA coverage should they occur in the ensonified zone during the specified activities.

The largest Level A harassment zone for otariid pinnipeds extends 21m from the source during impact installation of 30-inch (0.76m) piles (Table 8). ADOT&PF is planning to implement a minimum 25-m shutdown zone during all pile installation and removal activities (see Proposed Mitigation section), which is expected to eliminate the potential for Level A harassment take of Steller sea lions. Therefore, takes of Steller sea

lions by Level A harassment have not been requested and are not proposed to be authorized.

Harbor Seal

Harbor seal use of the project area is occasional and sporadic. If food is available, small numbers of harbor seals may remain for extended periods in the Whittier boat harbors feeding on sessile invertebrates growing on harbor pilings. Otherwise, they are only occasionally seen in the mid-inlet, although sightings do occur year-round. Recently, four to ten seals (typically about five) have been observed hauling out on a rock pinnacle in Logging Camp Bay located 12.4 km (7.7 mi) east of the project area (M. Bender, Lazy Otter Charters, pers. comm.). ADOT&PF assumes that on any given day, half (2.5 average) of these seals might occur in the Level B harassment zone during each of the six days of pile driving, and therefore is requesting 15 Level B harassment takes of harbor seals.

The largest SEL_{cum} Level A harassment zone for phocid pinnipeds extends 293m from the source during impact installation of 30-inch (0.76m) piles (Table 8), while the Peak Level A harassment zone for the same activity is 1.6m (Table 8) . ADOT&PF is planning to implement a 50-m shutdown zone during vibratory pile installation and removal activities and a 100-m shutdown zone during impact pile installation for phocid pinnipeds (Table 10). The SEL_{cum} Level A harassment zone includes a time component, however, we do not expect harbor seals to remain in the area within 293m during impact pile driving for a long enough period to experience Level A harassment. Therefore, takes of harbor seals by Level A harassment have not been requested and are not proposed to be authorized.

Table 9: Estimated take by Level B harassment only, by species and stock.

Common name	Stock	Stock abundance[a]	Level B take	Proposed take as percentage of stock
Humpback whale	Central North Pacific	10,103	6[b]	0.06
Killer whale	Eastern North Pacific, Alaska Resident	2,347	20	0.85
	Gulf, Aleutian, Bering Transient	587	20	3.41
Dall's porpoise	Alaska	83,400	5	0.01
Steller sea lion	Western U.S.	54,267	15	0.03
Harbor seal	Prince William Sound	29,889	15	0.05

[a] Stock or DPS size is Nbest according to NMFS 2018 Stock Assessment Reports.
[b] For ESA section 7 consultation purposes, 89% of humpbacks in the project area are designated to the Hawaii DPS, therefore, this individual humpback whale is expected to be from the Hawaii DPS.

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 (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and

technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In addition to the measures described later in this section, ADOT&PF will employ the following standard mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;

- For in-water heavy machinery work other than pile driving (*e.g.*, standard barges, *etc.*), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) Movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- To minimize impacts from vessel interactions with marine mammals, the crew aboard project vessels (tugs, barges, and monitoring vessels) will follow NMFS's marine mammal viewing guidelines and regulations as practicable
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal will shut down immediately if such species are observed within or on a path towards the monitoring zone (*i.e.*, Level B harassment zone); and
- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following mitigation measures would apply to ADOT&PF's in-water construction activities:

Establishment of Shutdown Zone for Level A Harassment—For all pile driving/removal and drilling activities, ADOT&PF will establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of

activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the activity type and marine mammal hearing group (see Table 10). The largest shutdown zones are generally for low frequency and high frequency cetaceans as shown in Table 10. The placement of Protected Species Observers (PSOs) during all pile driving and pile removal activities (described in detail in the Proposed Monitoring and Reporting Section) will ensure that the entire shutdown zone is visible during pile installation.

Table 10: Shutdown zones during pile installation and removal.

Activity	Shutdown zone (m)				
	LF cetaceans	**MF cetaceans**	**HF cetaceans**	**Phocids**	**Otariids**
Vibratory pile installation and removal	50				
Impact pile installation	550	25	200	100	25

Establishment of Monitoring Zones for Level B Harassment—ADOT&PF would establish monitoring zones to correlate with Level B harassment zones or zones of influence which are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory driving and drilling. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. The proposed monitoring zones are described in Table 11. Placement

of PSOs on the shorelines around Passage Canal allow PSOs to observe marine mammals within Passage Canal. Should PSOs determine the monitoring zone cannot be effectively observed in its entirety, Level B harassment exposures will be recorded and extrapolated based upon the number of observed take and the percentage of the Level B harassment zone that was not visible.

Table 11: Marine mammal monitoring zones.

Activity	Monitoring zone (m)
Vibratory pile installation and removal	12,000
Impact pile installation	1,200

Soft Start—The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors would be required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure would be conducted a total of three times before impact pile driving begins. Soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer. Soft start is not required during vibratory pile driving and removal activities.

Pre-Activity Monitoring—Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal or drilling of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the

zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the Level B harassment zone has been observed for 30 minutes and no species for which take is not authorized are present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B harassment monitoring zone. When a marine mammal for which Level B harassment take is authorized is present in the Level B harassment zone, activities may begin and Level B harassment take will be recorded. As stated above, if the entire Level B harassment zone is not visible at the start of construction, piling or drilling activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B harassment and shutdown zones will commence.

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 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. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Visual Monitoring

Monitoring would be conducted 30 minutes before, during, and 30 minutes after pile driving/removal activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as

long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

There will be at least two PSOs employed during all pile driving/removal activities. PSO will not perform duties for more than 12 hours in a 24-hour period. For impact and vibratory pile driving and removal, one PSO would be positioned at the end of the terminal catwalk near the pile driving/removal activities at the best practical vantage point. A second PSO would be stationed approximately 2.5km down Shotgun Cove Road and Trail. For vibratory pile driving and removal, two additional PSOs will be stationed along Shotgun Cove Road and Trail, each approximately 2.5km down the trail from the previous PSO. Observed take will be extrapolated across unobserved portions of the Level B harassment zone.

If Station 2 is not accessible by way of Shotgun Cove Road and Trail, a vessel will be used as a monitoring station. If Stations 3 or 4 are not accessible by way of Shotgun Cove Road and Trail, take observed by PSOs at Stations 1 and 2 will be extrapolated across the unobserved portion of the project area.

As part of monitoring, PSOs would scan the waters using binoculars, and/or spotting scopes, and would use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs would be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, 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/delay procedures when applicable by

calling for the shutdown to the hammer operator. Qualified observers are trained and/or experienced professionals, 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; use of binoculars may be necessary to correctly identify the target;
- Independent observers (*i.e.,* not construction personnel);
- Observers must have their CVs/resumes submitted to and approved by NMFS;
- Advanced education in biological science or related field (*i.e.,* undergraduate degree or higher). Observers may substitute education or training for experience;
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- At least one observer must have prior experience working as an observer;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; 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.

Reporting

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving and removal activities. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- 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 the marine mammals to the observation point;
- Locations of all marine mammal observations;
- An estimate of total take based on proportion of the monitoring zone that was observed; and
- Other human activity in the area.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, ADOT&PF would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.*, Beaufort sea state, 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 ADOT&PF to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. ADOT&PF would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that ADOT&PF discovers an injured or dead marine mammal, and the lead PSO 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 as described in the next paragraph), ADOT&PF would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with ADOT&PF to determine whether modifications in the activities are appropriate.

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

Negligible Impact Analysis and Determination

NMFS has defined negligible impact 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 (50 CFR 216.103). 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 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 harassment, NMFS considers 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 effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving installation and removal activities associated with the 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, from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level B harassment identified above when these activities are underway.

The takes from Level B harassment would be due to potential behavioral disturbance. No Level A harassment is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for Level A harassment and the scale and intensity of Level B harassment are

minimized through the construction method and the implementation of the planned mitigation measures (see Proposed Mitigation section).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Most likely for pile driving, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving and drilling, although even this reaction has been observed primarily only in association with impact pile driving. Level B harassment will be reduced to the level of least practicable adverse 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 area while the activity is occurring. While vibratory driving associated with the proposed project may produce sound at distances of many kilometers from the project site, thus intruding on some habitat, the ensonified area is already less-preferred habitat when the project is not underway. Therefore, we expect that animals annoyed by project sound would simply avoid the area and use more-preferred habitats.

The project is also not expected to have significant adverse effects on affected marine mammals' habitats. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the

impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;
- No injury is anticipated or authorized;
- Any resulting Level B harassment is expected to be short-term and of relatively low impact;
- The activity area does not include any known biologically important areas. In fact, nearby habitat is considered non-optimal given the low likelihood of many known prey resources during the months of the activity;
- The area impacted by the specified activity is very small relative to the overall habitat ranges of all species;
- The project area does not include ESA-designated critical habitat and does not overlap with any Biologically Important Areas (BIAs);
- The project is only taking place over six total pile driving/removal days;
- The project has the potential to impact less than 3.5% of each impacted stock; and
- The proposed mitigation measures are expected to reduce the effects of the specified activity to the level of least practicable adverse impact.

In addition, although affected Steller sea lions are from a DPS that is listed under the ESA, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' ability to recover. 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 activities will have only minor, short-term effects on individuals. The specified activities are 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, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Table 9 demonstrates the number of animals that could be exposed to received noise levels that could cause Level B harassment for the proposed work in Whittier. Our

analysis shows that less than 1 percent of most affected stocks could be taken by Level B harassment, with the exception of the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock of killer whales, for which less than four percent of the stock could be taken. The numbers of animals proposed to be taken for these stocks would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual, which is an extremely unlikely scenario.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Hunters from two native villages – Chenega Bay and Tatitlek – and native hunters living in Cordova annually harvest marine mammals within Prince William Sound as part

of a subsistence lifestyle (Fall and Zimpelman 2016). Chenega Bay hunters annually harvest a few harbor seals and sea otters and have hunted Steller sea lions in the past (Wolfe et al. 2009). Most hunting occurs locally. Hunters from Tatitlek harvest harbor seals and sea lions over most of central Prince William Sound, although their hunting range does not extend to Passage Canal (Fall and Zimpelman 2016). Native hunters living in Cordova mostly harvest harbor seals but occasionally take sea otters and sea lions (Fall and Zimpelman 2016). All villages are greater than 100 km (62 mi) by boat travel from Passage Canal. The short-term, relatively low-impact, Level B harassment takes resulting from construction activities associated with the Whittier Ferry Terminal modifications project will have no impact on the ability of hunters from these villages to harvest marine mammals. Therefore, NMFS has preliminarily determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the Alaska Region, Protected Resource Division Office, whenever we propose to authorize take for endangered or threatened species.

NMFS is proposing to authorize take of western stock Steller sea lions under the MMPA. For purposes of the Endangered Species Act, the NMFS Permits and

Conservation Division has preliminarily determined that this action is not likely to adversely affect western DPS Steller sea lions because we do not expect Steller sea lions to use habitats near Whittier during the season when construction will occur. Effects on western DPS Steller sea lions are thus extremely unlikely to occur, and considered discountable under the ESA. The Permits and Conservation Division will request concurrence in this determination from the NMFS Alaska Region, per section 7 of the ESA.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to ADOT&PF for conducting pile installation and removal activities at the Whittier Ferry Terminal in Whittier, Alaska between February and March 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHA for the proposed pile driving project. We also request at this time comment on the potential renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent Renewal.

On a case-by-case basis, NMFS may issue a one-year IHA renewal with an additional 15 days for public comments when (1) another year of identical or nearly

identical activities as described in the Specified Activities section of this notice is planned or (2) the activities as described in the Specified Activities section of this notice would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the Dates and Duration section of this notice, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to expiration of the current IHA.
- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested Renewal are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take because only a subset of the initially analyzed activities remain to be completed under the Renewal).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

- Upon review of the request for Renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: October 16, 2019.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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