Revised Marine Mammal Monitoring & Mitigation Plan

Eareckson Air Station Long-term Fuel Pier Repairs Project

Shemya Island, Alaska



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ACRONYMS AND ABBREVIATIONS

- 4MP Marine Mammal Monitoring and Mitigation Plan Decibel dB Down-the-Hole DTH EAS Eareckson Air Station
- GPS
- Global Positioning System Incidental Harassment Authorization IHA
- National Marine Fisheries Service NMFS
- NOAA National Oceanic Atmospheric Administration
- Pier Fuel Pier
- Personal Protective Equipment Sound Pressure Level PPE
- SPL
- United States Air Force USAF

1.0 Introduction

The purpose of this Marine Mammal Monitoring and Mitigation Plan (4MP) is to provide a protocol for monitoring of affected species during the proposed construction of the Eareckson Air Station Long-term Fuel Pier Repairs Project in Alcan Harbor, Shemya Island, Alaska (Figure 1-1). This plan was developed to support the Incidental Harassment Authorization (IHA) document for Marine Mammal Protection Act, Section 101(a)(5)(D) permitting. The IHA application provides a more in-depth discussion on the marine mammal monitoring and mitigation plan for the project.

A Marine Mammal Monitoring Program will be implemented at the start of construction and will follow the protocols outlined in this 4MP. The primary goals of the monitoring program are to:

- Monitor the proposed shutdown (i.e., Level A) and monitoring zones;
- Estimate the number of marine mammals exposed to noise at established thresholds;
- Document marine mammal responses;
- Minimize impacts to the marine mammal species present in the project area by implementing mitigation measures including monitoring, clearing the zones, soft start, and shutdown procedures; and,
- Collect data on the occurrence and behavior of marine mammal species in the project area and any potential impacts from the project.



Figure 1-1. Project Location

2.0 Project Description

This 4MP has been revised based on new NMFS guidance and an updated work plan. An updated work plan was required due to pile acquisition and manufacturing issue delays that offset the original proposed schedule.

The project will extend the Eareckson Air Station (EAS) fuel pier's (Pier's) life by 50 years by replacing and refurbishing the existing Pier and Pier facilities and armoring the adjacent western shoreline. The project will take approximately three to four construction seasons, ranging from April to October, to complete. While the entire project is described in this section, an IHA is sought only for the project's pile driving removal and installation actions. Pile driving did take place in 2024. However, pile fabrication issues preventing proper interlocking piles led to schedule delays. Pile driving operations are now anticipated to occur in 2025 and likely to extend into 2026. The other project activities are either not in-water activities or are in-water activities that can be easily mitigated to avoid the need for take. An IHA is being sought for pile driving operations, which, by virtue of the large underwater zones of ensonification, cannot be effectively mitigated with monitoring and shutdowns to avoid all potential takes.

Project activities include:

- Mobilization and project-dedicated vessel movement;
- Pile installation and removal (for pipe-pipe combination wall system);
- Screening and clearance activities;
- Remote equipment operations;
- · Removal of existing precast dolosse from western shoreline;
- Crushing/recycling concrete;
- Cyclopean concrete placement;
- Pier deck demolition;
- Pressure grouting existing Pier structure;
- Pier leveling course placement;
- Electrical system rough-in;
- Fuel line repair and backfill;
- Pour in place Pier concrete deck;
- Electrical system upgrades finish;
- Fuel line upgrades finish;
- Shoreline revetment installation; and,
- Demobilization.

Pile installation for the pipe-pipe combination wall system is the only activity in which take is being requested. The tentative start of pile driving activities in 2025 is June.

The project requires the installation of various types and sizes of piles using a vibratory hammer, an impact hammer, and down-the-hole (DTH) drilling and hammering methods. These activities are anticipated to result in Level B harassment (behavioral disruption) and possibly a small amount of Level A disturbance to some species. This 4MP will be implemented to reduce

the potential for exposure to Level A harassment and document instances of Level B harassment.

3.0 Methods

Experienced land-based marine mammal observers will be located on-site before, during, and after in-water construction activity at sites appropriate for monitoring marine mammals within and approaching the Level A and Level B harassment zones (Section 3.4). Names and resumes of observers will be submitted to the National Marine Fisheries Service (NMFS) for approval prior to the start of construction.

During observation periods, observers will continuously scan the area for marine mammals using binoculars and the naked eye. Observers will work shifts of up to four consecutive hours maximum followed by an observer rotation or a 1-hour break and will work no more than 12 hours in any 24-hour period. Observers will collect data including, but not limited to, environmental conditions (e.g., sea state, precipitation, glare, etc.), marine mammal sightings (e.g., species, numbers, location, behavior, responses to construction activity, etc.), construction activity at the time of sighting, and number of marine mammal exposures. Observers will conduct observations, meet training requirements, fill out data forms, and report findings in accordance with this 4MP.

Observers will implement mitigation measures including monitoring of the proposed shutdown and monitoring zones, clearing of the zones, and shutdown procedures. They will be in continuous contact with the construction personnel via two-way radio. Cellular phones do not work on Shemya Island, so back-up radios will be on hand.

An employee of the construction contractor will be identified as the main point of contact for observers at the start of each construction day. Observers will report directly to the monitoring coordinator when a shutdown is deemed necessary due to marine mammals approaching the relevant shutdown zones during a potentially hazardous construction activity.

3.1 Observer Qualifications

Monitoring will be conducted by qualified, trained marine mammal observers (hereafter, "observers"). For an individual to be considered qualified to serve as an observer, the following requirements must be met:

- 1. Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance;
- Physical capability of performing essential duties, including sitting or standing for periods of up to four hours, using binoculars or other field aids, and documenting observations;
- 3. Experience and ability to conduct field observations and collect data according to assigned protocols;
- 4. Experience or training in the field identification of marine mammals and marine mammal behavior, including the ability to accurately identify marine mammal species in Alaskan waters;
- 5. Sufficient training, orientation, or experience with the construction operation to provide for identification of concurrent activities and for personal safety during observations;
- 6. Writing skills sufficient to prepare reports of observations; and,

7. Ability to communicate orally, by radio and in person, with project personnel to provide real-time information on marine mammals observed in the area and the appropriate mitigation response for the circumstances.

3.2 Data Collection

Observers will use a NMFS-approved Observation Record (Appendix A) which will be completed by each observer for each survey day and location. Observation records will be used by observers to record the following:

- Date and time that permitted construction activity begins or ends;
- Weather parameters (e.g., percent cloud cover, percent glare, visibility) and sea state (The Beaufort Wind Force Scale [Appendix B] will be used to determine sea-state);
- Species, numbers, and, if possible, sex and age class of observed marine mammals;
- Construction activities occurring during each sighting;
- Marine mammal behavior patterns observed, including bearing and direction of travel;
- Specific focus should be paid to behavioral reactions just prior to, or during, soft-start and shutdown procedures;
- Location of marine mammal, distance from observer to the marine mammal, and distance from pile driving activities to marine mammals;
- Record of whether an observation required the implementation of mitigation measures, including shutdown procedures and the duration of each shutdown; and,
- Other human activity in the area. Record the hull numbers of fishing vessels if possible.

3.3 Equipment

The following equipment will be required to conduct observations for this project:

- Appropriate Personal Protective Equipment (PPE);
- Portable radios and headsets for the observers to communicate with the monitoring coordinator and other observers;
- Contact information for the other observers, monitoring coordinator, and NMFS point of contact;
- Daily tide tables for the project area;
- Watch or chronometer;
- Binoculars (7x50 or stronger) with built-in rangefinder (rangefinder may be provided separately);
- Spotting scope (20-50X) on a tripod or window mount. Only one is required to be on site and it should be placed at the best vantage point for a given day to monitor the far end of the Level A zones and other areas of interest as necessary;
- Hand-held Global Positioning System (GPS) unit, map and compass, or grid map to record locations of marine mammals;
- Copies of the 4MP, IHA, and/or other relevant permit requirement specifications in sealed clear plastic cover; and,

 Clipboard with pre-standardized monitoring Observation Record forms on waterproof paper.

3.4 Level A and Level B Harassment Zones

Zones have been established to delineate areas where marine mammals would experience Level A or Level B harassment due to exposure to underwater sound from construction activity. Shutdown of construction will occur where the underwater sound pressure levels (SPLs) are anticipated to equal or exceed the Level A harassment thresholds for permitted pinnipeds and cetaceans or where the Level B harassment threshold would be exceeded for a marine mammal not included in the IHA. Where underwater SPLs would exceed the Level B harassment thresholds for non-impulsive (120 dB isopleth) and impulsive (160 dB isopleth) sound sources, observers will monitor and record sightings and behavior of permitted species but will not shut down.

Species with permitted "take" (Level B harassment) under the IHA include the following species: Baird's beaked whale (*Berardius bairdii*), Dall's porpoise (*Phocoenoides dalli*), fin whale (*Balaenoptera physalus*), harbor porpoise (*Phocoena phocoena*), harbor seal (*Phoca vitulina richards*i), humpback whale (*Megaptera novaeangliae*), killer whale (*Orcinus orca*), minke whale (*Balaenoptera acutorostrata*), northern fur seal (*Callorhinus ursinus*), sperm whale (*Physeter macrocephalus*), Stejneger's beaked whale (*Mesoplodon densirostris*), and Steller sea lion (*Eumetopias jubatus*). Take of any other marine mammal by Level B harassment is not permitted under the IHA. Species with allowable Level A take under the IHA include Dall's porpoise, fin whale, harbor porpoise, harbor seal, humpback whale, northern fur seal, minke whale, and Steller sea lion. Shutdowns will be implemented to best of the observers' abilities to avoid any Level A take. Table provides the Level B and Level A harassment take numbers by species authorized under the issued NMFS IHA.

Common Name	Scientific Name	Stock	Level B Harassment Takes Authorized	Level A Harassment Takes Authorized
Fin whale	Balaenoptera physalus	Northeast Pacific	14	7
Humpback whale	Megaptera novaengliae	Western North Pacific	3	1
		Mexico – North Pacific	10	2
		Hawai'i	118	20
Minke whale	Balaenoptera acutorostrata	Alaska	5	3
Sperm whale	Physeter microcephalus	North Pacific	40	0
Baird's beaked whale	Berardius bairdii	Alaska	10	0
Stejneger's whale	Mesoplodon stejnegeri	Alaska	8	0
Killer whale	Orcinus orca	ENP Alaska Resident		
		ENP Gulf of Alaska, Aleutian Islands, and Bering Sea	176	0
Dall's porpoise	Phocoenoides dalli	Alaska	20	19
Harbor porpoise	Phocoena phocoena	Bering Sea	9	6
Northern fur seal	Callorhinus ursinus	Eastern Pacific	Ę	5
Steller sea lion	Eumetopias jubatus	Western U.S.	89	10
Harbor seal	Phoca vitulina	Aleutian Islands	319	176

Table 3-1. Level B and Level /	A Harassment A	uthorized Takes I	ov S	pecies
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Determination of harassment radii was discussed fully in Section 11 of the IHA application for 2024, which used the 2018 National Oceanic Atmospheric Administration (NOAA) Marine Mammal Acoustic Technical Memorandum by NMFS for the project's IHA application. During

the IHA application review process and development of the issued 2024 IHA, most distances were revised after lengthy reviews with NMFS staff. Due to the timing change of pile driving activities that required a new IHA application, the harassment radii were further revised in conjugation with NMFS for the 2025 IHA based on the updated NOAA Marine Mammal Acoustic Technical Guidance, NOAA Technical Memorandum NMFS-OPR-71, "2024 Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts."

The final radii are summarized in Table 3-2, Table 3-3, Figure 3-3, Figure 3-1, and Figure 3-2 below. Figure 3-1 shows the Level B harassment zones with the thick yellow line at approximately 40 kilometers with sideboards for propagation due to physical propagation boundaries. Figure 3 2 shows the Level A shutdown zones at 1, 1.2, and 1.4 kilometers as well as the thick yellow boundary for applying these zones. Figure 3-3 shows a close-up view of the Level A shutdown zones at 25, 30, 35, 50, 60, 120, 215, 260, 290, 350, 400, and 500 meters. While this shows the spatial relationship of these radii to the Pier for an example of a pile being driven on the northeast corner of the Pier, the only relevant radii would be those pertaining to the method of pile driving employed for a given pile. Thus, Figures 3-1 through 3-3 provide a means of visualizing the concept of the zones but the actual zones will be based on the specific location of each pile being driven. If additional acoustic data collection determines that different radii are appropriate, the table(s) will be updated accordingly.

Activity	Low Frequency Cetaceans	High Frequency Cetaceans	Very High Frequency Cetaceans	Phocids	Otariids	Isopleths (Meters)
Vibratory 42-inch	44.2	17.0	36.1	56.9	19.2	16,343
Vibratory 30-inch	19.9	7.6	16.2	25.6	8.6	11,656
DTH 42-inch	2,540.0	324.1	3,930.8	2,256.5	841.1	39,811
DTH 30-inch	2,246.4	287.0	3,480.9	1,998.3	744.9	39,811
Impact 42-inch 1800 Strike	2,007.8	256.2	3,102.7	1,783.6	664.9	1,359
Impact 30-inch 900 Strike	930.4	118.7	1,439.9	826.6	308.1	1,166

Table 3-2. Level A Shutdown and Level B Monitoring Zones for Pile Driving Operations

Table 3-3. Revised Shutdown Zone for Each Pile Driving Activity and Species Hearing Group

	Shutdown Zones (Meters)							
Activity	Low Frequency Cetaceans	High Frequency Cetaceans	Very High Frequency Cetaceans	Phocids	Otariids	Northern Sea Otters ¹		
Vibratory 42-inch		50		60	50	35		
Vibratory 30-inch	25			30	2	25		
DTH 42-inch		350				215		
DTH 30-inch	nch 1 000		500	400		1 250		
Impact 42-inch 1800 Strike	1,000	260	500	400		1,359		
Impact 30-inch 900 Strike		120				1,166		

¹ The United States Fish and Wildlife Service provided shutdown distances for northern sea otters (*Enhydra lutris*) in their Letter of Concurrence for the project.



Figure 3-1. Level B Harassment Monitoring Zones



Figure 3-2. Expanded View of Level A Harassment Shutdown Zones



Figure 3-3. Spatial Layout of Shutdown Zones between 25 and 500 Meters Based on the Example of a Pile Being Driven on the NE Corner of the Pier.

The 42-inch impact pile driving Level A zones exceed Level B zones for low and very high frequency cetaceans and phocids, and the 30-inch impact pile driving Level A zones exceed Level B zones for very high cetaceans.

The harassment zones will be monitored throughout the time required to drive or remove a pile. If a marine mammal enters the monitoring zone, an exposure will be recorded, and marine mammal behaviors documented. However, pile driving would continue without stopping, unless the marine mammal approaches or enters the shutdown zone. If a marine mammal approaches or enters the shutdown zone. If a marine mammal approaches or enters the shutdown zone, all pile driving/removal activities will be immediately halted. For northern sea otters (*Enhydra lutris*), all pile driving would cease before they enter the ensonified area since zero exposures are permitted (see Table 3-3).

During in-water or over-water construction activities having the potential to affect marine mammals, but not involving pile driving, a minimum shutdown zone of 10 meters will be monitored to ensure that marine mammals are not endangered by physical interaction with construction equipment. These activities could include, but are not limited to, the positioning of the pile on the substrate via a crane ("stabbing" the pile) or the removal of the pile from the water column/substrate via a crane ("deadpull"), or the slinging of construction materials via crane. Minimum shutdown zones for non-pile driving in-water and over-water activities are summarized in Table 3-4.

Table 3-4. Shutdown Zone for Non-Pile Driving In-Water and Over-Water Activities and Species Hearing Group

	Shutdown Zones (Meters)						
Activity	Low	High	Very High			Northern	
Activity	Frequency	Frequency	Frequency	Phocids	Otariids	Sea	
	Cetaceans	Cetaceans	Cetaceans			Otters	
In-Water and Over-Water							
Construction Activities with No			10				
Specified Minimum Shutdown Zone							
Dredging, Screening, and	300						
Underwater Excavating Activities	300						
Scour Protection Installation			10			50	

3.5 Observer Monitoring Locations

To monitor the Level A and Level B harassment zones effectively, observers will be positioned at the best practicable vantage points, taking into consideration safety, access, and space limitations. Observers will be stationed at locations that provide adequate visual coverage for the Level A and Level B harassment zones. Proposed observation locations are depicted in Figure 3-4.



Figure 3-4. Proposed Observer Monitoring Locations A-E

Three locations would be monitored at all times during construction due to the large size of the Level A zone for low frequency cetaceans. The observer locations will be decided by the observers based on the work scheduled, visibility, and sea state. Location "D" is ideal but is sometimes too high and shrouded in fog. Observers may select alternate locations that work better for the conditions at the time.

One observer will be placed at a suitable location on or near the Pier to observe the Level A harassment zones. This observer's monitoring will be primarily dedicated to observing Level A harassment zones; however, this observer will also record all marine mammal sightings beyond

the radius of the Level A harassment zone, provided it does not interfere with their effectiveness at carrying out the shutdown procedures.

Two additional observers will be situated to provide visibility of the Level A and Level B harassment zones. If visibility does not allow for full monitoring of the Level A and Level B harassment zones, additional stations or vantage point will be sought.

3.6 Monitoring Techniques

Observers will collect sighting data and behaviors of marine mammal species that are observed in the shutdown and monitoring zones during periods of construction. NMFS requires that the observers have no other construction-related tasks while conducting monitoring. Observation necessitates that daylight is sufficient for observers to visualize the entirety of the monitoring zones, so observations will commence and complete during daylight hours. Monitoring of shutdown and observation zones will take place from 30 minutes prior to initiation through 30 minutes post-completion of all pile driving and removal activities.

3.6.1 Pre-Activity Monitoring

The following survey methodology will be implemented prior to commencing permitted activities:

- Prior to the start of permitted activities, observers will monitor the shutdown and monitoring zones for 30 minutes. They will ensure that no marine mammals are present within shutdown zone before permitted activities begin.
- The shutdown zone will be cleared when marine mammals have not been observed within zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft start cannot proceed until the marine mammal has left the zone or has not been observed for 15 minutes (for pinnipeds and northern sea otters) and 30 minutes (for cetaceans).
- When all applicable zones have been cleared, the observers will radio the monitoring coordinator. Permitted activities will not commence until the monitoring coordinator receives verbal confirmation the zones are clear.
- If permitted species are present within the Level B monitoring zone, work will not be delayed, but observers will monitor and document the behavior of individuals that remain in the monitoring zone.
- In case of fog or reduced visibility, observers must be able to see the entirety of Level A shutdown zones for the type of activity being undertaken (i.e., vibratory or impact pile driving or DTH) before permitted activities can be initiated.

3.6.2 Soft Start Procedures

Soft start procedures will be used prior to periods of pile removal, pile installation, and in-water fill placement to allow marine mammals to leave the area prior to exposure to maximum noise levels. The following soft start procedures are as follows:

- For vibratory hammers, the soft start technique will initiate noise from the hammer for short periods at a reduced energy level, followed by a brief waiting period and repeating the procedure two additional times.
- For impact hammers, the soft start technique will initiate several strikes at a reduced energy level, followed by a brief waiting period. This procedure would also be repeated two additional times.

• If work ceases for more than 30 minutes, soft start procedures must recommence prior to performing additional work.

3.6.3 During-Activity Monitoring

The following survey methodology will be implemented during permitted activities:

- If permitted species are observed within the monitoring zone during permitted activities, an exposure would be recorded, and behaviors documented. Work will not stop unless a marine mammal enters or appears likely to enter the shutdown zone.
- If the Level B harassment zone has been observed for the pre-activity period and nonpermitted species are not present within the zone, soft start procedures can commence, and work can continue even if visibility becomes impaired within the Level B zone.
- If the Level A zone for the type of activity being undertaken (i.e., vibratory or impact pile driving or DTH) is not fully visible, work cannot continue.

3.6.4 Shutdown

If a marine mammal enters or appears likely to enter the shutdown zone:

- The observers shall immediately radio or call to alert the monitoring coordinator.
- All permitted activities will be immediately halted.
- In the event of a shutdown of pile installation or removal operations, permitted activities may resume only when:
 - The marine mammal(s) within or approaching the shutdown zone has been visually confirmed beyond the shutdown zone or has not been resighted in the size for 15 minutes (for pinnipeds and northern sea otters) or 30 minutes (for cetaceans); and,
 - Observers will then radio the monitoring coordinator that activities can recommence.

3.6.5 Breaks in Work

During an in-water construction delay, the shutdown and monitoring zones will continue to be monitored. No exposures will be recorded for permitted species in the monitoring zone if there are no concurrent permitted construction activities.

If permitted activities cease for more than 30 minutes and monitoring has not continued, preactivity monitoring and soft start procedures must recommence. This includes breaks due to scheduled or unforeseen construction practices or breaks due to permit-required shutdown. Following 30 minutes of monitoring, work can begin according to the pre-activity monitoring protocols. Work cannot begin if a marine mammal is within the shutdown zone or if visibility is not clear throughout the shutdown and monitoring zones.

3.6.6 Post-Activity Monitoring

Monitoring of the shutdown and monitoring zones will continue for 30 minutes following completion of piledriving and DTH activities. A post-monitoring period is not required for other in-water construction. These surveys will record observations and will focus on observing and reporting unusual or abnormal behavior of marine mammals. Observation Record forms will be used to document observed behavior.

4.0 Reporting

4.1 Modifications

The 4MP for the 2024 IHA was revised based on new NMFS guidance for the 2025 IHA. In the event that the United States Air Force (USAF) needs to modify terms of this revised 4MP, the NMFS representative will be promptly contacted for discussion of the requested modification.

4.2 Unauthorized Exposure without Injury

If an unauthorized exposure without injury (as described below) occurs, observers will initiate shutdown, observe the marine mammal leaving the shutdown zone, and resume work according to the directions in Section 3.6.4. If this occurs, report of the exposure will be made to NMFS Alaska Region within one business day.

4.3 Injured or Dead Marine Mammal

If observers or a contractor finds an injured, sick, or dead marine mammal, a USAF representative will notify NMFS and provide the species or description of the marine mammal(s), condition of the marine mammal or carcass, location, date, and time of first discovery, observed behaviors (if alive), and photo or video (if available). The USAF will undertake certain actions based on the specific circumstances that led to the injury or death of the marine mammal(s):

- If marine mammal's condition is a direct result of the project, notification will be made, and work will stop until NMFS is able to review the circumstances of the prohibited take.
- If the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded marine mammal, carcass with moderate to advanced decomposition, scavenger damage), USAF shall report the incident within 24 hours of the discovery. Construction activities may continue while NMFS reviews the circumstances of the incident and makes a final determination on the cause of the reported injury or death.
- If cause of death is unclear, USAF shall immediately report the incident. Construction
 activities may continue while NMFS reviews the circumstances of the incident and
 makes a final determination on the cause of the reported injury or death. NMFS will work
 with USAF to determine whether additional mitigation measures or modifications to the
 activities are appropriate.

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

Reports to NMFS will be made to the Office of Protected Resources and the Alaska Regional Stranding Coordinator.

4.4 NMFS Annual Report

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

comprehensive report will be prepared and submitted to NMFS within 30 calendar days following resolution of comments on the draft report from NMFS.

The reports shall include at a minimum:

- General data:
 - Date and time of activity.
 - Water conditions (e.g., sea-state).
 - Weather conditions (e.g., percent cover, percent glare, visibility).
- Specific pile driving data:
 - Description of the pile driving activity being conducted (pile locations, pile size and type), and times (onset and completion) when pile driving occurs.
 - The construction contractor and/or marine mammal monitoring staff will coordinate to ensure that pile driving times and strike counts are accurately recorded. The duration of soft start procedures should be noted as separate from the full power driving duration.
 - Description of in-water construction activity not involving pile driving (location, type of activity, onset and completion times).
- Pre-activity observational survey-specific data:
 - Date and time survey is initiated and terminated.
 - Description of any observable marine mammals and their behavior in the immediate area during monitoring.
 - Times when pile driving, or other in-water construction is delayed due to presence of marine mammals within shutdown zones.
- During-activity observational survey-specific data:
 - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding the monitoring zones, including the following:
 - Distance from marine mammal to pile driving sound source.
 - Reason why/why not shutdown implemented.
 - If a shutdown was implemented, behavioral reactions noted and if they occurred before or after implementation of the shutdown.
 - If a shutdown was implemented, the distance from marine mammal to sound source at the time of the shutdown.
 - Behavioral reactions noted during soft starts and if they occurred before or after implementation of the soft start.
 - Distance to the marine mammal from the sound source during soft start.
- Post-activity observational survey-specific data (30-minute period after daily work ceases):
 - Results, which include the detections and behavioral reactions of marine mammals, the species and numbers observed, sighting rates and distances; and,

 Refined exposure estimate based on the number of marine mammals observed. This may be reported as a rate of take (number of marine mammals per hour or per day) or using some other appropriate metric.

4.5 United States Fish and Wildlife Service Reporting

The only marine mammal under United States Fish and Wildlife jurisdiction with potential to occur within the Level A and Level B harassment zones of the project is the northern sea otter. No take is being requested for this species due to its rare occurrence within waters near Shemya Island. The USAF will submit reports and contact the USFWS as described in Section 4.1 through Section 4.4 with the United States Fish and Wildlife Service if a northern sea otter is observed and a shutdown is required during project construction .

Appendix A.

Marine Mammal Observation Record

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OBSERVATION RECORD Project Name: Eareckson Air Station Long-term Pier Repair Monitoring Location: Date: Time Effort Initiated: Time Effort Completed Page of

Time	Visibility	Glare	Weather Condition	Wave Height	BSS	Wind Dir.	Swel	ē	
	B-P-M-G-E	%	S - PC - L - R - F - OC - SN - HR	Lt / Mod / Hvy		NSEW	N S	м 2	>
	B-P-M-G-E	%	S-PC-L-R-F-OC-SN-HR	Lt / Mod / Hvy		NSEW	N S	л Ш	>
	B-P-M-G-E	%	S - PC - L - R - F - OC - SN - HR	Lt / Mod / Hvy		NSEW	N S	2	>
	B-P-M-G-E	%	S-PC-L-R-F-OC-SN-HR	Lt / Mod / Hvy		NSEW	N N	м Ш	>
	B-P-M-G-E	%	S - PC - L - R - F - OC - SN - HR	Lt / Mod / Hvy		NSEW	N S	л Ш	>
	B-P-M-G-E	%	S-PC-L-R-F-OC-SN-HR	Lt / Mod / Hvy		NSEW	N S	~ Ш	>
	B-P-M-G-E	%	S-PC-L-R-F-OC-SN-HR	Lt / Mod / Hwy		NSEW	N N		>

Behavior Changel Response to Activity/ Comments/ Human Activity/ Vessel Hull # or Name/ Visibility Notice									
Exposure?	N/A								
Mitigation Type	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE	SS - BC - DE - SD - NONE
Construction Type	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE	SSV - SSI - V - DR - I - DP - ST - OWC - NOWC - NONE
Behavior Code(s)									
Group Size	MIN: MAX: BEST:								
Species									
Sighting Cue	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER	BL - BO - BR - DF - SA - OTHER
Obs.									
Zonc/ Radius/ Impact Pile #?									
WP/ Grid #/ Dir. of Travel	GRID N or S W or E								
Time/Dur. (Start/End time if cont.)									
Sight # (1 or 1.1 if resight)									
Event Code	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF	E ON - PRE - POST - CON - S - M - OR - E OFF

BEHAVIOR CODES

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

VISIBILITY

CODE	DISTANCE VISIBLE		
В	Bad (<0.5km)		
Р	Poor (0.5-0.9km)		
М	Moderate (0.9-3km)		
G	Good (3-10km)		
E	Excellent (>10km)		

WEATHER CONDITIONS

CODE	WEATHER CONDITION			
S	Sunny			
PC	Partly Cloudy			
L	Light Rain			
R	Steady Rain			
F	Fog			
OC	Overcast			
SN	Snow			
HR	Heavy Rain			

WAVE HEIGHT

CODE	WAVE HEIGHT				
Lt	Light (0-3ft)				
Mod	Moderate (4-6ft)				
Hvy	Heavy (>6ft)				

GLARE

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

BEAUFORT SEA SCALE (BSS)

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

WIND DIRECTION

Wind direction should also be where the wind is coming from.

SWELL DIRECTION

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

SPECIES

CODE	MARINE MAMMAL SPECIES
BBW	Baird's Beaked Whale
BW	Blue Whale
DP	Dall's Porpoise
FW	Fin Whale
GW	Gray Whale
HP	Harbor Porpoise
HS	Harbor Seal
HW	Humpback Whale
KW	Killer Whale
MW	Minke Whale
NFS	Northern Fur Seal
NPRW	North Pacific Right Whale
PWSD	Pacific White-Sided Dolphin
RS	Ribbon Seal
SW	Sperm Whale
SBW	Stejneger's Beaked Whale
SSL	Steller Sea Lion
NSO	Northern Sea Otter
UW	Unknown Whale
UP	Unknown Pinniped
UNK	Unknown

SIGHTING CUES

CODE	ACTIVITY TYPE				
BL	Blow				
BO	Body				
BR	Breach				
DF	Dorsal Fin				
SA	Surface Activity				
OTR	Other				

EVENT CODES

CODE	ACTIVITY TYPE			
E ON	Effort On			
E OFF	Effort Off			
PRE	Pre-Construction Watch			
POST	Post-Construction Watch			
CON	Construction (see types)			
S	Sighting			
М	Migration (see types)			
OR	Observer Rotation			

CONSTRUCTION TYPE

CODE	ACTIVITY TYPE			
V	Vibratory Pile Driving			
1	Impact Pile Driving			
DP	Dead pull			
ST	Stabbing			
DR	Drilling			
OWC	Over-Water Constrcution			
NOWC	No Over-Water Construction			
NONE	No Construction			

MITIGATION TYPE

CODE	ACTIVITY TYPE
SS	Soft Start
BC	Bubble Curatin
DE	Delay onset of in-water work
SD	Shut down in-water water

Appendix B. Beaufort Sea Scale

Beaufort Number (Wind Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions	Heights of Waves (Feet)	Photographic Example
0	<1	Calm	Sea surface smooth and mirror-like	0	
1	1-3	Light Air	Scaly ripples, no foam crests	0-1	
2	4-6	Light Breeze	Small wavelets, crest glassy, no breaking	1-2	
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	2-3.5	

4	11-16	Moderate Breeze	Small waves, becoming longer, numerous whitecaps	1-4	
5	17-21	Fresh Breeze	Moderate waves, taking longer form, many whitecaps, some spray	4-8	
6	22-27	Strong Breeze	Larger waves, whitecaps common, more spray	8-13	
7	28-33	Near Gale	Sea heaps up, white foam streaks off breakers	13-19	
8	34-40	Gale	Moderately high, waves of greater length, edges of crests begin to break into spindrift, foam blown into streaks	18-25	

9	41-47	Strong Gale	High waves, sea begins to roll, dense streaks of foam, spray may reduce visibility	23-32	
10	48-55	Storm	Very high waves, with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	29-41	
11	56-63	Violent Storm	Exceptionall y high waves, foam patches cover sea, visibility more reduced	37-52	
12	64+	Hurricane	Air filled with foam, sea completely white with driving spray, visibility greatly reduced	45+	

Images obtained from an online webpage titled, "The Seas of the Beaufort Scale," at http://www.meiotic.co.uk/my/research/beaufort-seas/.