

# Marine Mammal Monitoring and Mitigation Plan

## Port of Nome Modification Project

### Nome, Alaska

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Prepared for:

PND Engineers, Inc.  
1506 W. 36<sup>th</sup> Avenue  
Anchorage, AK 99503



ENGINEERS, INC.

U.S. Army Corps of Engineers  
2204 3<sup>rd</sup> Steet  
Elmendorf AFB, AK 99506



Prepared by:

Owl Ridge Natural Resource Consultants, Inc.  
4060 B Street, Suite 200  
Anchorage, Alaska 99503  
T: 907.344.3448  
[www.owlridgenrc.com](http://www.owlridgenrc.com)



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Appendix A. Mitigation Zones

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## ACRONYMS AND ABBREVIATIONS

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4MP	Marine Mammal Monitoring and Mitigation Plan
BA	Biological Assessment
BiOp	Biological Opinion
CFR	Code of Federal Regulations
ESA	Endangered Species Act
ft	feet/foot
FR	Federal Regulation
IHA	Incidental Harassment Authorization
in	inch
km	kilometer
km/h	kilometers per hour
kn	knot
LOC	Letter of Concurrence
m	meter
MHHW	mean higher high water
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
OCSP	OPEN CELL SHEET PILE™ system
OPR	Office of Protected Resources
PAM	passive acoustic monitoring
POC	Plan of Cooperation
PRP	peer review panel
PTS	Permanent Threshold Shift
PSO	Protected Species Observer
SFV	sound field verification
SDEZ	Susitna Delta Exclusion Zone
UAV	unmanned aerial vehicle
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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## 1. INTRODUCTION

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This Marine Mammal Monitoring and Mitigation Plan (4MP) was developed in accordance with Marine Mammal Protection Act (MMPA) requirements for the issuance of an Incidental Harassment Authorization (IHA) for project activities (e.g., pile driving) during Year 1 of the U.S. Army Corps of Engineers (USACE) Port of Nome Modification project (Project). A Biological Assessment (BA) and resulting Biological Opinion (BiOp) were prepared in accordance with Section 7(c) of the Endangered Species Act (ESA) for the National Marine Fisheries Service (NMFS) regarding the potential effects on federally listed species and marine mammals and their habitats. Similarly, USACE underwent informal Section 7 consultation with U.S. Fish and Wildlife Service (USFWS) and received a letter of concurrence (LOC) stating the proposed action is not likely to adversely affect ESA-designated species or critical habitat. In addition, USACE consulted with USFWS regarding USFWS-managed MMPA species that may be present in the project areas (Pacific walrus; *Odobenus rosmarus divergens*). However, it was decided based on the low likelihood of Pacific walrus occurrence in the project area along with the implementation of adequate mitigation measures an IHA would not be necessary.

The monitoring contractor is responsible for adhering to requirements within the issued IHA (NMFS 2023b) and BiOp (NMFS 2023a) in conjunction with this 4MP.

The objectives of this monitoring plan are to increase knowledge of:

- Marine mammal species that occur in the project area
- Potential impacts to populations of marine mammals expected to occur in the project area
- Movement and activity of marine mammals

### 1.1. Project Description

#### 1.1.1. Project Location

The Port of Nome, located on the Seward Peninsula, Alaska, is a regional hub port situated on the Norton Sound coast of the Bering Sea (Figure 1-1). Nome is approximately 545 miles northwest of Anchorage and is not connected to Alaska's road system or Alaska Marine Highway.

In 2020, the USACE completed a feasibility study for the Project and is now re-engaging with agencies to move forward with Phase 1 of the Project. The City of Nome and USACE are proposing to expand the Port of Nome to provide much needed additional capacity to serve the Arctic as well as to alleviate congestion at the existing port facilities. The existing port facility consists of an outer harbor bounded by a stone causeway on the west, and a stone breakwater on the east, connected to a smaller inner harbor (Figure 1-2).

The proposed Project will extend the existing rubble mound causeway by approximately 3,500 feet (ft) in an L-shape as well as provide approximately 2,030 ft of additional sheet pile dock face and fendering for vessel traffic. The new dock will be constructed using an OPEN CELL SHEET PILE™ system (OCSP™) that consists of a bulkhead with flexible walls constructed of steel sheet pile with embedded tailwall diaphragms supported by the substrate, similar in design to the three sheet pile docks located in the

existing harbor. The new OCSP dock will consist of approximately 66 cells. Cells are constructed utilizing flat-web sheet piles, connector x-wyes (fabricated from three one-half-width sheet pile sections), and anchor piles. After all the piles for a cell have been installed, clean gravel fill will be placed within the cell. This process will continue sequentially until all the sheet pile cells are installed and backfilled. The cells are typically constructed one at a time. The contractor may use two sets of templates so they can “leapfrog” (complete the pile driving of one cell and start on the next while removing and reinstalling the template from the completed cell). However, only one hammer will be used at a time. The new rubble mound causeway will be constructed similarly to the existing causeway and east breakwaters consisting of large armor stone placed in layers to resist wave and ice loads. Armor stone on the exterior (non-harbor) side of the causeway will have some layers placed below the existing mudline, requiring dredging of the seafloor during construction.

The USACE proposes to implement the construction project in three phases spanning an estimated seven years. However, this 4MP is currently only for Year 1 of Phase 1 but could be revised as the project continues in subsequent years.

### ***1.1.2. Planned Phase 1, Year 1 Activities***

Phase 1 is described below. The subsequent Phases 2 and 3 are only conceptual at this time and briefly discussed in the BA and IHA application.

- **Phase 1.** Construct a 3,500-foot L-shaped extension of the existing west causeway, forming a new basin beyond the existing Outer Harbor. A continuous OCSP dock approximately 2,030 linear ft long would be constructed along the basin side of the causeway extension. Phase 1 would require four construction seasons to complete, starting in 2024.

The USACE estimates that Year 1 activities will occur during the open water season (e.g., May through October) and include mobilization (including construction-vessel transit from Anchorage to Nome), removal of the breakwater spur, development of the quarry for rock and gravel (i.e., fill), dredging of the causeway footprint to accommodate armor stone installation, pile driving of temporary template piles, and an estimated 35 percent installation of the total sheet piles required for the OCSP dock. The remainder of the sheet pile installation, installation of fender and bollard piles, dock appurtenances and utilities, and removal of temporary template piles will occur in subsequent years of Phase 1.

The following activities require monitoring and are described in detail in the IHA Application:

- Temporary template pile installation – up to 228 steel pipe piles (24-inch [in] or smaller) or H-piles (14-in or smaller)
- Temporary template pile removal – up to 228 steel pipe piles (24-in or smaller) or H-piles (14-in or smaller)
- Sheet piles – up to 1,600 20-in sheet piles, driven in pairs
- Anchor piles – up to 27 steel anchor piles (14-in H piles)
- Fender piles – up to 21 36-in pipe piles
- Fill placement – gravel fill placed and compacted using conventional construction equipment from land or barge





**PROJECT LOCATION AND VICINITY**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan

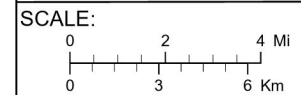


FIGURE:  
**1-1**





Inner Harbor

Outer Harbor

East Causeway

West Causeway

Breakwater Spur

	 <p><b>US Army Corps of Engineers®</b></p>	 <p><b>P   N   D</b> ENGINEERS, INC.</p>	<p><b>EXISTING LAYOUT - PORT OF NOME</b></p> <p>Port of Nome Modifications Project Marine Mammal Monitoring &amp; Mitigation Plan</p> <table border="1"> <tr> <td data-bbox="1551 1474 1871 1573"> <p>SCALE: <b>NA</b></p> </td> <td data-bbox="1871 1474 2053 1573"> <p>FIGURE: <b>1-2</b></p> </td> </tr> </table>		<p>SCALE: <b>NA</b></p>	<p>FIGURE: <b>1-2</b></p>
<p>SCALE: <b>NA</b></p>	<p>FIGURE: <b>1-2</b></p>					



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## 2. IHA AUTHORIZATION

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The project IHA specifically requests authorization for the take of certain marine mammals during in-water construction activities by non-injurious harassment. Situations and takes of species not covered under the IHA are not authorized.

### 2.1. Authorized Species

The NMFS IHA issued under the MMPA authorizes Level B take of a limited number of bearded seals, ringed seals, spotted seals, ribbon seals, Steller sea lions, bowhead whales, minke whales, gray whales, killer whales, harbor porpoises, and beluga whales. Although Level B take is authorized for bowhead whales, work will shut down if a bowhead whale is observed within or entering the harassment zone.

Level B takes may not exceed the number of authorized takes for this project. Level A harassment resulting from the Project is not authorized for any species. For authorized species, work will shut down if an individual enters an applicable shutdown zone (see Table 2-1) or if the number of authorized takes for that species has been exceeded.

Work will shut down if any unauthorized protected species enters any harassment zone. This may include, but is not limited to humpback whales and fin whales, each of which have (or had) ranges overlapping the project area but are not anticipated within the project area during the construction period and are not included within the IHA. Level B take of unauthorized species is prohibited.

### 2.2. Authorized Take Numbers

Total authorized take numbers are outlined in the IHA. Take numbers may not be exceeded under any circumstances. USACE shall coordinate with NMFS regularly to determine the assumed number of takes based on sightings.

Shutdown measures must be implemented if the number of any allotted marine mammal takes reaches the limit authorized under the IHA and if such marine mammals are sighted within the vicinity of the project area and are approaching their respective shutdown or harassment zones.

### 2.3. Mitigation Zones

Mitigation zones include shutdown, harassment, and assumed take zones and were established to delineate areas in which mitigation methods and real time takes will be implemented. Per the NMFS acoustic guidance (NMFS 2018), shutdown zones were derived based on the calculated Permanent Threshold Shift (PTS) onset isopleth for vibratory and impact pile driving methods (See Section 6.1 of IHA Application; Table 2-1). Harassment zones were derived based on the behavioral disturbance isopleth for vibratory and impact pile driving methods (Table 2-1, Section 2.3.2). Selection of the appropriate shutdown or harassment zone depends on the concurrent work activities such as pile type, installation or removal, and installation method (i.e., vibratory or impact hammer), however only one hammer will be used at a time.

To be conservative, mitigation zones were rounded up to the next increment reasonable for visual monitoring and take estimation. Real-time take estimation will occur daily to ensure that the number of

take for species for which incidental take has been authorized is not exceeded. Assumed take will occur after completion of the project.<sup>1</sup>

### **2.3.1. Shutdown Zones**

Work which could cause noise levels to rise above non-permitted thresholds will shut down if protected species are approaching shutdown zones (Table 2-1). For authorized species, work will shut down if individuals approach the applicable shutdown zone (Table 2-1). Following a shutdown, in-water construction activities must not resume except by the protocols described in Section 3.

If a species for which authorization has not been granted or a species for which authorization has been granted but the authorized take numbers are met is observed approaching or within the applicable harassment zone, in-water construction activities must shut down immediately using protocols described in Section 3.

During all in-water or over-water construction activities having the potential to affect marine mammals, a shutdown zone of 10 meters (m) will be enforced to ensure that animals are not endangered by physical interaction with construction equipment (Table 2-1). These activities could include, but are not limited to support-vessel activities, barge operations, the positioning of piles via a crane (“stabbing” the pile), the removal of piles via a crane (“deadpull”), placement of fill, or the over-water slinging of construction materials.

During dredging activities, a shutdown zone of 300 m or the distance to an acoustic barrier (e.g., breakwater) will be enforced to ensure that animals are not endangered by physical interaction with construction equipment (Table 2-1).

### **2.3.2. Harassment Zones**

Harassment zones (except for the assumed take zones described in Section 2.3.3) will be continuously observed to record permitted species occurrences and behavior as described in Section 3. Real-time Level B take of authorized species will be estimated daily for each individual observed within the applicable harassment zone during the associated construction activity (Table 2-1; Appendix A) to ensure authorized take numbers are not exceeded. Precise take estimation (and assumed take calculation) will occur following completion of the project using the harassment zones.

Harassment zones were derived from the Level B harassment isopleth distances (see Tables 6-1 and 6-2 in IHA Section 6.1) for vibratory and impact pile driving methods. Harassment zones were rounded up to the next increment reasonable for visual monitoring and take estimation. Harassment zones do not exist for species for which authorization has not been granted and in-water construction activities must cease if such species is observed entering or within the harassment zone.

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<sup>1</sup> Take estimation will be calculated following completion of the survey using the Level B harassment isopleth distances (see Table 6-1 and 6-2 in IHA Section 6.1).

**Table 2-1. Mitigation zones (shutdown and harassment) for authorized and unauthorized species.**

Pile Type	Construction Method <sup>1</sup>	Shutdown Zone <sup>2</sup> (m)			Harassment Zone <sup>3</sup>	Minimum Recommended Number of PSOs <sup>7</sup>
		Unauthorized Species and Bowhead Whales <sup>4</sup>	Authorized Cetaceans <sup>5</sup>	Authorized Pinnipeds <sup>6</sup>	Authorized Cetaceans <sup>5</sup> & Pinnipeds <sup>6</sup>	
Temporary template piles (24" pipe)	Vibratory Installation/Removal	Visible range <sup>8</sup>	10	10	2,000	2
	Impact Installation	1,000	300	150	1,000	1
Temporary template piles (14" H-Pile)	Vibratory Installation/Removal	1,000	10	10	1,000	1
	Impact Installation	200	300	150	200	1
Anchor piles (14" H-Pile)	Vibratory Installation	1,000	10	10	1,000	1
	Impact Installation	200	300	150	200	1
Sheet piles (20" PS31 or similar)	Vibratory Installation	Visible range <sup>8</sup>	30	20	5,200	2
	Impact Installation	1,000	300	150	1,000	1
Fender piles (Pipe piles 36")	Vibratory Installation	Visible range <sup>8</sup>	70	30	21,600	2
	Impact Installation	1,600	500	210	1,600	2
Gravel fill and in-water/over-water construction activities <sup>9</sup>	Conventional Machinery	100	10	10	100	1
Dredging	Conventional Machinery	300	300	300	300	1

<sup>1</sup>The project includes vibratory pile installation and removal as a primary method and impact pile installation as a secondary method

<sup>2</sup>Shutdown zones were derived from PTS onset isopleth distances (see Tables 6-1 and 6-2 in IHA Section 6.1) for vibratory and impact pile driving methods. Shutdown zones were rounded up to the next increment reasonable for visual monitoring and extend to the distance of the shutdown zone radii or to the distance of an acoustic barrier (e.g., breakwater)

<sup>3</sup>Harassment zones were derived from the Level B isopleth distances (see Tables 6-1 and 6-2 in IHA Section 6.1) for vibratory and impact pile driving methods. Harassment zones were rounded up to the next increment reasonable for visual monitoring and take estimation. Harassment zones extend to the harassment zone radii or to the distance of an acoustic barrier (e.g., breakwater)

<sup>4</sup>Although Level B take is authorized for bowhead whales, work will shut down if a bowhead whale is observed within or entering the harassment zone

See section 4.1 for descriptions of PSO monitoring locations

<sup>5</sup>Authorized cetacean species include beluga whale, minke whale, gray whale, harbor porpoise, and killer whale

<sup>6</sup>Authorized pinniped species include bearded seal, ringed seal, spotted seal, ribbon seal, and Steller sea lion

<sup>7</sup>During activities where the level B zones extend beyond 1,000 m, USACE agrees to have one Level B monitoring PSO at the monitoring location to the south of the construction zone, and a lead/shutdown PSO only in the middle zone at the construction site

<sup>8</sup>Anticipated visible range from the monitoring locations is estimated to be 2,000 m in fair weather

<sup>9</sup>The 10-m shutdown zone applies during all in-water and over-water construction activities (i.e., gravel fill, crane operations) not otherwise listed in this table (see Section 6.1.1.7 of the BiOp [NMFS 2023a])



Pile driving activities will be halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or within the applicable harassment zone.

Level A take is not authorized for any species for this project.

### **2.3.3. Assumed Take Zones**

Due to the lack of high ground or significantly tall infrastructure at the Port of Nome, it will not be possible for observers to perceive the entire harassment zone when equipment such as the 20-in sheet piles and 36-in fender piles are being installed/removed. Anticipated visible range (i.e., the observable area) from the monitoring locations is estimated to be 2,000 m in fair weather. Assumed take zones are sections of the harassment zone that are beyond the Protected Species Observers (PSOs) ability to directly monitor (i.e., unobservable area). The assumed take zones will be assumed to have authorized species present at an agreed rate of take during in-water construction activities. These zones need not be visible for work to begin.

Species that are not included within the IHA application are assumed to be so unlikely within the project area that they will not be present within the applicable harassment zone during construction and are not included in the assumed take calculations. In the unlikely event that an individual for which authorization has not been granted is sighted within the range of the applicable harassment zone, in-water construction activities will cease.

#### **2.3.3.1. Assumed Take Calculations**

Assumed take may be calculated for the two pile types that have harassment zones that exceed the observable area (2,000 m): the 20-in sheet and the 36-in fender pile (Figure A-4 and Figure A-5 [Appendix A]). Assumed take may be calculated using the harassment zones, observable area, unobservable area, sighting rate during ensonification, and available acoustic monitoring data for the specific pile type. The observable area is the area within the harassment zone that PSOs can effectively monitor (e.g., within 2,000 m; Figure A-1 [Appendix A]), and the unobservable area is the area within the harassment zone that PSOs cannot effectively monitor (e.g., greater than 2,000 m; Figure A-4, Figure A-5 [Appendix A]).

## **3. PROTECTED SPECIES OBSERVERS**

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Monitoring will be conducted by independent, qualified PSOs with no other assigned tasks. At least one lead PSO must have prior experience working as an observer during construction activities. Other PSOs may substitute education (a degree in biological science or related field), training, or equivalent Alaska Native traditional knowledge for experience. All PSOs must be NMFS-approved and resumes/qualifications provided to NMFS at least one-week prior to in-water work.

PSOs must possess:

- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations

- Ability to conduct field observations and collect data according to assigned protocols
- Visual acuity in both eyes (correction to 20-20 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
- Experience or training in the field identification of marine mammals, including the identification of behaviors
- Experience or training in ESA and MMPA regulations
- Experience or training in PSO roles and responsibilities
- The lead PSO will possess 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, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior
- 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
- The lead PSO will possess the ability to report observations in an electronic and usable format

PSOs will conduct observations, meet training requirements, fill out data forms, and report findings in accordance with the NMFS-issued IHA (NMFS 2023b), the BiOp (NMFS 2023a), and this 4MP. PSO qualifications will be submitted for approval by NMFS prior to the onset of pile driving.

### **3.1. PSO Roles and Responsibilities**

There are three major PSO responsibilities:

- Observe and record marine mammals
- Ensure mitigation procedures are followed accordingly
- Follow monitoring and data collection procedures

The main purpose of the PSO monitoring program is to ensure compliance with regulations set in place by NMFS to ensure disturbance of marine mammals is minimized, and potential effects on marine mammals are documented. The PSOs will implement the monitoring and mitigation measures specified in the NMFS-issued IHA (NMFS 2023b), the BiOp (NMFS 2023a), and in this 4MP. The primary roles of the PSO program are:

- **Monitoring:** Observe for marine mammals and determine numbers of marine mammals exposed to sound pulses and their reactions (where applicable) and document those as required.
- **Mitigation:** Implement zone-clearance; observe for and detect marine mammals within, or about to enter the applicable mitigation zone; implement necessary shut down procedures when applicable; advise construction crew of mitigation procedures.

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## 4. MONITORING AND MITIGATION MEASURES

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Implementation of mitigation measures will be conducted by qualified, trained PSOs or USACE (or its designee), depending on the requirement. It is the responsibility of USACE and their contractors to be familiar with the mitigation measures in the issued IHA (NMFS 2023b) and BiOp (NMFS 2023a).

### 4.1. General Mitigation Measures, Monitoring Locations, and Communication

PSOs will be located on-site before, during, and after in-water construction activities for monitoring protected species within (and approaching) mitigation zones. PSOs will be in continuous contact with the construction personnel to implement appropriate mitigation measures. The construction contractor will designate the monitoring coordinator (and alternate replacement) for PSOs at the start of each construction day. PSOs will report directly to the monitoring coordinator when a shutdown is deemed necessary.

USACE (or its designee) will conduct briefings for construction supervisors and crews and the monitoring team prior to the start of all pile driving activity and when new personnel join, to explain responsibilities, communication procedures, monitoring protocols, and operational procedures.

To monitor effectively, PSOs will be positioned at the best practicable vantage points, taking into consideration security, safety, access, and space limitations. Ideally, this vantage point is an elevated stable platform, such as the dock near pile-driving operations. Observer locations must be identified that:

1. Have an unobstructed view of the work being conducted
2. Have an unobstructed view of all the water within the shutdown and as much of the harassment zone as possible

Potential observation locations are provided in Figure A-1 (Appendix A) and precise locations will be confirmed prior to the start of the project. For all pile driving activities, a minimum of one (and up to two) PSOs will be on duty, depending on the applicable mitigation zone (Table 2-1). PSOs must be assigned to each active pile driving location to monitor the shutdown zones. Due to the geography of the area and size of the harassment zone, it is anticipated that PSOs will not be able to observe the entire harassment zone for the vibratory installation of sheet piles (20-in) and fender piles (36-in). However, PSO 1 will be able to closely monitor the applicable shutdown zones at or near the pile driving activities and PSO 2 will monitor from the shoreline approximately 3.5 km to the east of the Port of Nome, to maximize coverage of the harassment zones and observe for animals approaching the area. Maximum effective observation distance is estimated at up to 2,000 m. However, during activities where the Level B zones extend beyond 1,000 m, USACE agrees to have one Level B monitoring PSO at the monitoring location to the south of the construction zone, and a lead/shutdown PSO only in the middle zone at the construction site. PSOs will observe for and record all observations of marine mammals, regardless of distance from the pile being driven.

During vibratory driving of temporary template piles (24-in), Anchor H-piles (14-in), impact driving, fill placement, and in-water work, a minimum of one observer will be on duty at the dock at whatever vantage point gives an unobstructed view of the applicable harassment zone. If construction activities

impede visibility of the zone, a second observer will be stationed at another location. PSOs will be stationed on elevated platforms as feasible to maximize the observable area.

## **4.2. Monitoring Techniques**

During observation periods, PSOs will continuously and systematically scan the area for marine mammals using 7x50 (or similar) reticle binoculars and the naked eye. New or inexperienced PSOs will be paired with an experienced PSO or experienced field biologist as long as necessary to ensure the quality of marine mammal observations and data recording is kept consistent. PSOs will rotate every four hours and not work more than 12-hours per day, when possible, to maximize observations during daylight hours (e.g., between civil dawn and civil dusk). PSOs will collect data as listed below.

PSOs will use either laser range finders or a series of “landmarks” at varying distances from each observer for reference. Landmarks can be buildings, signs, or other stationary objects on land that are located at increasing distances from each observation platform. The distance to the landmarks should be measured prior to the start of construction and referenced throughout the season to record visibility. PSOs should record visibility according to the farthest landmark the laser range finder can detect or that the PSO can clearly see.

Additional PSO equipment may include tide-tables for the project area, a watch or chronometer, a global positioning system or method to obtain geographic coordinates, a camera, and data-forms or electronic data sheets.

Observation necessitates that daylight is sufficient for PSOs to visualize the entirety of the mitigation zones, so observations and in-water construction activities will commence and be completed during daylight hours.

## **4.3. Baseline Monitoring**

Weather and ice permitting, USACE intends to conduct monitoring for 1 week before and 1 week after pile driving. Monitoring will include stationing one PSO on site for approximately one week (e.g., total of eight hours per day) to monitor for marine mammals. The monitoring duration and locations will be determined based on timing of break-up relative to the start of construction and logistical support.

## **4.4. Daily Monitoring During Construction**

### **4.4.1. Pre-Activity Monitoring**

The following monitoring methodology will be implemented each day prior to commencing in-water construction activities:

- Observation of shutdown and Level B harassment zones will take place from 30 minutes prior to initiation through 30 minutes post-completion of all in-water construction activities.
- The shutdown zone will be cleared when marine mammals have not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, in-water construction activities cannot proceed until the animal has left the zone of its own volition or has not been observed for 15 minutes (pinnipeds) and 30 minutes (cetaceans).



- If authorized species are present within the harassment zone, work will not be delayed, but PSOs will monitor and document the behavior of individuals that remain in the harassment zone.
- When all applicable shutdown zones are clear of protected species, the PSOs will radio the monitoring coordinator. In-water construction activities will not commence until the monitoring coordinator receives verbal confirmation the zones are clear.
- In case of inclement weather (e.g., fog, heavy rain) or reduced visibility, PSOs must be able to see the entirety of shutdown and applicable harassment zones before in-water activities can be initiated. Assumed take zones do not need to be fully visible for work to start.
- In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone, their behavior must be monitored and documented until they leave of their own volition or the zone has been clear of marine mammals for 15 minutes (pinnipeds) and 30 minutes (cetaceans) at which point the activity may begin.

#### ***4.4.2. During-Activity Monitoring***

The following monitoring methodology will be implemented during in-water construction activities:

- If authorized species are observed within the harassment zone during in-water construction activities, an exposure will be recorded, and behaviors documented. Work will not stop unless an animal enters or appears likely to enter the shutdown zone.
- For assumed take zones, monitors will extrapolate a rate of take commensurate with observed exposure rates and appropriate to the area of the assumed take zone. Regular coordination with NMFS will occur to determine the assumed number of takes based on sightings.
- Total exposures will be reported based upon the combined recorded takes and extrapolated takes.

#### ***4.4.3. Post-Activity Monitoring***

Observation of the shutdown and harassment zones will continue for 30 minutes following completion of pile driving. A post-monitoring period is not required for other in-water construction. These surveys will record sightings, focusing on observing and reporting unusual or abnormal behavior of protected species.

### **4.5. Shutdown Procedure**

If a protected species enters or appears likely to enter a shutdown zone, the PSOs shall immediately radio to alert the monitoring coordinator and all in-water construction activities will be immediately halted. The PSOs will continue to monitor, and document protected species behaviors until the animal leaves the shutdown zone of its own volition. The PSO or monitoring coordinator will immediately report the occurrence to NMFS (see contact information provided in the IHA or BiOp for ESA-listed species).

In the event of a shutdown, in-water construction activities may resume only when the animal(s) within or approaching the shutdown zone has been visually confirmed beyond or headed away from the shutdown zone, or when 15 minutes (30-minutes for ESA-listed species) have passed without re-detection of the animal. Observers will then notify the monitoring coordinator that activities can recommence.

## 4.6. Soft Start Mitigation

Soft start mitigation techniques will be implemented when impact pile driving. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. A soft start must be implemented at the start of each day's impact pile driving and at any time there has been a pause in impact pile driving that exceeds 30 minutes or longer. Following a soft start, impact pile driving may commence and continue provided ESA-listed species remain absent from the applicable shutdown zone.

## 4.7. Data Collection

PSOs will collect environmental data, sightings, and behaviors of marine mammal species that are observed in the shutdown and harassment zones during in-water construction activities. The following information about operations and marine mammal sightings will be carefully and accurately recorded in data forms or into electronic data sheets:

- Dates and times (begin and end) of all marine mammal monitoring
- Construction activities occurring during each daily observation period, including:
  - The number and type of piles that were driven and the method (e.g., impact, vibratory, down-the-hole)
  - Total duration of driving time for each pile (vibratory driving) and number of strikes for each pile (impact driving)
- PSO names and locations during marine mammal monitoring
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance
- Upon observation of a marine mammal, the following information:
  - Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting
  - Time of sighting
  - Identification of the animal(s) (e.g., genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species
  - Distance and location of each observed marine mammal relative to the pile being driven for each sighting
  - Estimated number of animals (min/max/best estimate)
  - Estimated number of animals by cohort (adults, juveniles, neonates, group composition, etc.)
  - Animal's closest point of approach and estimated time spent within the harassment zone

- Description of any marine mammal behavioral observations (e.g., observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (e.g., no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching)
- Number of marine mammals detected within the harassment zones, by species
- Detailed information about implementation of any mitigation (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any

USACE recommends that the PSO contractor collect data using a reporting app. Regardless of whether a reporting app used, the USACE requires that the PSO contractor provide monitoring data in a digital format (e.g., Excel) and original data forms, if applicable. The USACE must submit this data to NMFS along with the draft report, as required by the IHA.

#### **4.8. Vessel Transit Route Monitoring and Mitigation**

To avoid harassment (i.e., take to marine mammals during vessel transit), USACE is proposing to implement the following mitigation measures:

- USACE (or designee) will conduct a vessel captains briefing prior to operations to ensure they understand their obligations in meeting the objectives and requirements of this 4MP
- PSOs or dedicated crew member(s) with no other duties will be stationed aboard the vessels during transit to/from Anchorage

Crews aboard project vessels will follow the most conservative mitigation measures as outlined in the project specific IHA (NMFS 2023b), BiOp (NMFS 2023a), or NMFS marine mammal viewing guidelines and regulations as practicable (<https://www.fisheries.noaa.gov/topic/marine-life-viewing-guidelines>).

The following species-specific mitigation measures will be implemented in addition to the NMFS marine mammal guidelines and regulations.

##### **4.8.1. *Steller Sea Lion***

- Vessels will not approach within 3 nm of Steller sea lion rookery sites (50 FR 226.202), the nearest known rookery to the project area is approximately 140 km away on St. Lawrence Island.
- Vessels will avoid approaching within 3,000 ft of any Steller sea lion haulout or rookery.

##### **4.8.2. *Northern Sea Otter***

- Vessels will remain 500 m from rafts of otters.
- Vessels will remain 200 m from all otters if possible, maintaining a 50 m minimum.
- Vessels will not separate grouped individuals.
- Vessels will travel at slow to no-wake speed while in vicinity of otters.
- Vessels will avoid directly heading towards otters (maneuver around).

### 4.8.3. *Cook Inlet Beluga Whale*

- Vessels will avoid the Cook Inlet beluga whale critical habitat (NMFS 2016), when possible, maintaining a ship log for when vessels enter/exit the critical habitat.
- Vessels will avoid transiting through the Susitna Delta Exclusion Zone<sup>2</sup> (SDEZ); however, if unavoidable, transiting vessels will exercise special caution in the SDEZ to minimize impacts within this seasonally vital Cook Inlet beluga whale habitat. For vessels operating in the SDEZ, the following should be implemented.
  - Project vessels operating in Cook Inlet must maintain a distance of at least 2.4 km (1.5 miles) south of the mean lower low water line between the Little Susitna River and Beluga River.
  - USACE must time Port of Alaska departures or recalls aligned with the tide periods to avoid navigating at through-water speeds exceeding 7.4 km/h (4 knots [kn]), as practicable and as safety allows.
  - All vessels should maintain a speed below 4 kn. Crews must note the numbers, date, time, coordinates, and proximity to vessels of any belugas observed during operations and report these observations to NMFS. Descriptions of any course or speed alterations must also be reported to NMFS.
  - PSOs or dedicated crew member(s) with no other duties must be in place to monitor for ESA-listed species prior to and during all vessel movements when vessels are under power (propellers spinning). PSOs are not required to be observing when vessels are not under power (not in gear).
  - PSOs or dedicated crew member(s) with no other duties must observe from a position that affords a view of all waters within a 100-meter radius of all vessels under power (in gear).

### 4.8.4. *North Pacific Right Whale*

- Vessels will avoid the North Pacific right whale critical habitat (73 FR 19000), when possible,
- If traveling through North Pacific right whale critical habitat cannot be avoided, vessels will:
  - i. Travel through North Pacific right whale critical habitat at 5 kn or less; or at 10 kn or less while PSOs or dedicated crew member will maintain a constant watch for marine mammals from the bridge; and
  - ii. Maintain a log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat.

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<sup>2</sup> The Susitna Delta Exclusion Zone, between April 15 and November 15, is defined as the union of the areas defined by (1) a 16-km (10-mi) buffer of the Beluga River thalweg seaward of the mean lower-low water (MLLW) line; (2) a 16-km (10-mi) buffer of the Little Susitna River thalweg seaward of the MLLW line; (3) a 16-km (10-mi) buffer of the MLLW line between the Beluga River and Little Susitna River; (4) the buffer extends landward along the thalweg to include the intertidal waters within rivers and streams up to their mean higher high water (MHHW) line. The southern boundary extends from Tyonek to Point Possession.



- Vessels will remain at least 460 m away from any observed North Pacific right whales (64 FR 14066).
- PSOs or dedicated crew member(s) with no other duties will implement course alterations or reductions in speed, as needed to avoid North Pacific right whale harassment.
- Alert other vessels in the vicinity of observed whale(s).

#### **4.8.5. *Other Large Whales (i.e., humpback and fin whales)***

- PSOs or dedicated crew member(s) with no other duties will implement course alterations or reductions in vessel speed, as needed to avoid potential interactions or disturbances of large whales.

### **4.9. Aerial Monitoring**

If, and when, USACE drives fender piles, it must conduct a minimum of one aerial overflight to assist in estimating species presence in the far field during fender pile installation. USACE will conduct two aerial overflights if it determines that it is practicable to do so. The overflight may be conducted with an unmanned aerial vehicle (UAV) capable of recording and/or transmitting video of sufficient quality to detect and identify marine mammals in the survey area. The NOAA does not have concrete standards for aerial monitoring (e.g., altitude, duration, area covered, etc.), but expects project- and equipment-specific criteria to be developed in an aerial monitoring plan in coordination with the NOAA (Davis 2024).

### **4.10. Acoustic Monitoring**

#### **4.10.1. *Passive Acoustic Monitoring***

USACE must deploy the passive acoustic monitoring (PAM) equipment one week before pile driving begins and collect the equipment one week after pile driving activities conclude, as feasible considering logistics and timing of ice break-up and freeze-up. USACE must use the data collected from the PAM to estimate marine mammal occurrence in the far-field and must compare the acoustic detections in the far-field to the visual detections in the near-field in its annual monitoring report. USACE must conduct the acoustic monitoring in accordance with a NMFS-approved acoustic monitoring plan which will outline the planned instrumentation. Given that the plan has not yet been developed, the exact locations of the PAM equipment have not yet been determined. However, USACE will consider the Peer Review Panel (PRP) recommended locations in development of its plan, and NMFS will consider the PRP's recommended locations in its review of the plan. For further details, see the Federal Register Notice of Issuance of IHA (88 FR 61806). Acoustic monitoring report requirements are listed in Section 6.6.

#### **4.10.2. *Sound Field Verification***

USACE must conduct sound field verification (SFV) measurements of sheet pile installation to determine project-specific propagation loss. USACE intends to conduct this SFV early in the sheet pile driving process, though sheet pile driving may not occur early in the construction season, depending on the contractor and construction progress. If USACE provides data early in the construction season, NMFS may adjust the shutdown zones and revise the Level A and Level B harassment zones, as appropriate, and pending review and approval of the results of SFV. USACE is required to submit an acoustic monitoring plan for NMFS approval prior to the start of acoustic monitoring. NOAA/NMFS recommends SFV of

10% of piles of a given type (i.e., sheet piles; Davis 2024). For further details, see the Federal Register Notice of Issuance of IHA (88 FR 61806). Acoustic monitoring report requirements are listed in Section 6.6.

## **5. MEASURES TO REDUCE IMPACTS TO SUBSISTENCE USERS**

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In addition to this 4MP, the proposed Project includes the following measures to mitigate potential impacts on subsistence use of marine mammals.

- USACE will coordinate with potentially affected community and subsistence groups, as described in the Plan of Cooperation (POC), to mitigate any other identified negative impacts to subsistence activities. Additionally, USACE will notify the communities of any changes in the operation and take action to avoid or mitigate impacts to subsistence harvest.
- Noise levels will be minimized during construction using appropriately sized piles. The use of vibratory pile driving methods will also reduce sound levels entering the water during construction and reduce the impacts to marine mammals, fish, and seabirds. Properly sized equipment will be used to drive piles.
- Impacts from vessel interactions with marine mammals will be minimized through appropriate crew training; crews aboard project vessels will follow NMFS marine mammal viewing guidelines and regulations as practicable. (<https://alaskafisheries.noaa.gov/protectedresources/mmv/guide.htm>).
- USACE will coordinate with Tribal Leadership to develop culturally appropriate information and educational materials for the Port of Nome construction workforce. These materials will include language that states that Alaska Natives have the right to customary and traditional harvest of marine mammals in marine waters, including in and around the Port area when subsistence opportunities present themselves.

## **6. REPORTING**

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### **6.1. Notification of ESA-listed Species**

Observations of ESA-listed species will be reported as required by the BiOp (NMFS 2023a). For example, NMFS requires all observations of North Pacific right whales be reported within 24 hours and other reporting by the end of the calendar year.

### **6.2. Monthly Reports**

Monitoring and mitigation reports will be submitted monthly as required in the IHA (NMFS 2023b) and BiOp (NMFS 2023a) by the 15<sup>th</sup> of the month following the reporting period. For example, the report for activities conducted in June will be submitted by July 15.

### 6.3. 90-Day Technical Report

A comprehensive monitoring report documenting marine mammal observations will be submitted to NMFS at the end of the in-water work season. The draft report will be submitted to the agencies within 90 calendar days of the completion of the monitoring program or 60 calendar days prior to the issuance of any subsequent IHA for construction activity at the same location, whichever comes first. A final report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report. If no comments are received from NMFS within 30 calendar days of receipt of the draft report, the report shall be considered final. All draft and final monitoring reports must be submitted to [PR.ITP.MonitoringReports@noaa.gov](mailto:PR.ITP.MonitoringReports@noaa.gov), [itp.davis@noaa.gov](mailto:itp.davis@noaa.gov), and [akr.section7@noaa.gov](mailto:akr.section7@noaa.gov).

The report will include marine mammal observations (pre-activity, during-activity, and post-activity) during in-water construction activities and the informational elements described in this 4MP. At a minimum, the report shall include:

- Dates and times (begin and end) of all marine mammal monitoring
- Construction activities occurring during each daily observation period, including
  - The number and type of piles that were driven and the method (e.g., impact, vibratory, down-the-hole)
  - Total duration of driving time for each pile (vibratory driving) and number of strikes for each pile (impact driving)
- PSO locations during marine mammal monitoring
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance
- Upon observation of a marine mammal, the following information:
  - Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting
  - Time of sighting
  - Identification of the animal(s) (e.g., genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species
  - Distance and location of each observed marine mammal relative to the pile being driven for each sighting
  - Estimated number of animals (min/max/best estimate)
  - Estimated number of animals by cohort (adults, juveniles, neonates, group composition, etc.)
  - Animal's closest point of approach and estimated time spent within the harassment zone
  - Description of any marine mammal behavioral observations (e.g., observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have

resulted from the activity (e.g., no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching)

- Number of marine mammals detected within the harassment zones, by species
- Detailed information about implementation of any mitigation (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any
- PSO datasheets and/or raw sighting data
- Statistical power analysis must be conducted to estimate the minimum number of sightings or sample size required for the pre- and post-monitoring periods to detect an effect in marine mammal presence due to the construction disturbance (i.e., whether the pre- and post-monitoring periods were of a sufficient length)
- Recommendations for improvements to monitoring activities in future years based on lessons learned during Year 1. Include the results of the statistical power analysis in the lessons learned.

#### **6.4. Notification of Injured or Dead Marine Mammals**

If personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder must report the incident to the Office of Protected Resources (OPR), NMFS (PR.ITP.MonitoringReports@noaa.gov and [itp.davis@noaa.gov](mailto:itp.davis@noaa.gov)), NMFS Alaska Region ([akr.section7@noaa.gov](mailto:akr.section7@noaa.gov)), and to the Alaska regional stranding network (877-925-7773) as soon as feasible. NMFS will coordinate with local stranding responders as necessary.

If the death or injury was clearly caused by the specified activity, the IHA-holder must immediately cease the activities until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable)
- Species identification (if known) or description of the animal(s) involved
- Condition of the animal(s) (including carcass condition if the animal is dead)
- Observed behaviors of the animal(s), if alive
- If available, photographs or video footage of the animal(s)
- General circumstances under which the animal was discovered

If directed by NMFS, to preserve biological materials in the best possible state for later analysis of cause of death, care should be taken in handling dead specimens. In preservation of biological materials from a dead animal, the finder (i.e., PSO) has the responsibility to ensure that evidence associated with the specimen is not needlessly disturbed.



## 6.5. Notification of Live Ice Seal Pups

If live seal pups are found hauled out on the beach or in the port within the construction area, do not approach or touch the animals and the IHA-holder must report the incident to the OPR, NMFS (PR.ITP.MonitoringReports@noaa.gov and [itp.davis@noaa.gov](mailto:itp.davis@noaa.gov)), NMFS Alaska Region ([akr.section7@noaa.gov](mailto:akr.section7@noaa.gov)), and to the Alaska regional stranding network (877-925-7773) as soon as feasible. NMFS will coordinate with local stranding responders as necessary.

## 6.6. Acoustic Monitoring Report

USACE must submit an acoustic monitoring report (PAM and SFV) within 90 calendar days of the completion of monitoring or 60 calendar days prior to the requested issuance of any subsequent IHA for construction activity at the same location, whichever comes first. The acoustic monitoring report must include the following, at a minimum:

- Hydrophone equipment and methods: recording devices, sampling rate, sensitivity of the PAM equipment, locations of the hydrophones, duty cycle, distance (m) from the pile where recordings were made, depth of recording devices, depth of water in area of recording devices;
- Type and size of pile being driven, substrate type, method of driving during recordings;
- Mean, median, and maximum received sound levels: root mean square sound pressure level (SPLrms) in 1-sec segments, peak sound pressure level (SPLpeak), cumulative sound exposure level (SELcum), duration to install each pile;
- Duration per pile measured, one-third octave band spectrum, power spectral density plot;
- Estimated source levels referenced to 10m, transmission loss coefficients, and estimated Level A and Level B harassment isopleths; and
- Number of acoustic detections, by species and operation mode (including no activity periods as the “undisturbed” condition).

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## 7. REFERENCES

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## **APPENDICES**

## **Appendix A. Mitigation Zones**



- Observer Location
- Observable Area



**OBSERVER LOCATIONS AND  
OBSERVABLE AREA**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan

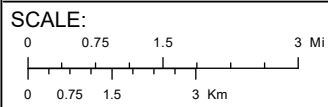


FIGURE:  
**A-1**



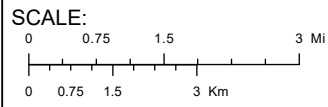


- Observer Location
- Observable Area
- Harassment Zone (2,000 m)



**HARASSMENT ZONE FOR  
VIBRATORY INSTALLATION/REMOVAL  
OF TEMPORARY TEMPLATE PILES (24'')**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan



**FIGURE:**  
**A-2**





- Observer Location
- Observable Area
- Harassment Zone (1,000 m)



**HARASSMENT ZONE FOR VIBRATORY INSTALLATION OF ANCHOR PILES (14" H-PILES)**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan

**SCALE:**

0 0.75 1.5 3 Mi

0 0.75 1.5 3 Km

**FIGURE:**  
**A-3**

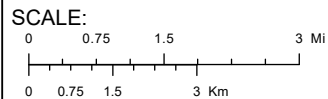


- Observer Location
- Observable Area
- Harassment Zone (5,200 m)



**HARASSMENT ZONE FOR  
VIBRATORY INSTALLATION OF  
SHEET PILES (20'' PS31 OR SIMILAR)**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan



**FIGURE:**  
**A-4**



- Observer Location
- Observable Area
- Harassment Zone (21,600 m)



**HARASSMENT ZONE FOR  
VIBRATORY INSTALLATION OF  
FENDER PILES (PIPE PILES 36'')**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan

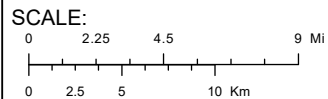


FIGURE:  
**A-5**





- Observer Location
- Observable Area
- Harassment Zone (100 m)



<b>HARASSMENT ZONE FOR GRAVEL FILL</b>	
Port of Nome Modifications Project Marine Mammal Monitoring & Mitigation Plan	
<b>SCALE:</b> 	<b>FIGURE:</b> <p style="text-align: center; font-size: large;"><b>A-6</b></p>

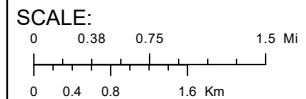


- Observer Location
- Observable Area
- Harassment Zone (300 m)



**HARASSMENT ZONE  
FOR DREDGING**

Port of Nome Modifications Project  
Marine Mammal Monitoring & Mitigation Plan



**FIGURE:  
A-7**