Request for Incidental Harassment Authorization (NMFS)

Port of Nome Modification Project

Nome, Alaska

April 2023

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TABLE OF CONTENTS

List of Tables

List of Figures

Appendices

ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
ASAMM	Aerial Surveys of Arctic Marine Mammals
CAA	Conflict Avoidance Agreement
cm	centimeter(s)
CY	cubic yards
dB	decibel(s)
DPS	Distinct Population Segment
ESA	Endangered Species Act
ESW	effective strip half-width
ft	foot / feet
GPS	Global Positioning System
Hz	hertz
IHA	Incidental Harassment Authorization
in^3	cubic inches
kHz	kilohertz
km	kilometer(s)
km^2	square kilometers
km/hr	kilometers per hour
kt	knots
m	meter(s)
mi	mile(s)
mi^2	square miles
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
nmi	nautical miles
OCSP™	OPEN CELL SHEET PILE™
POC	Plan of Cooperation
PSO	Protected Species Observer
PTS	Permanent Threshold Shift
re 1 μPa	Relative to 1 micropascal
rms	root mean square
sec	seconds
SEL_{cum}	Cumulative Sound Exposure Levels
SPL_{rms}	Root Mean Square Sound Pressure Levels

TTS	temporary threshold shift
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
WETA	Water Emergency Transportation Authority
WSF	Washington State Ferry

1. DESCRIPTION OF SPECIFIC ACTIVITY

1.1. Introduction

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 (mi) northwest of Anchorage and is not connected to Alaska's road system or Alaska Marine Highway. Previous studies going back to at least 1997 by the U.S. Army Corps of Engineers (USACE) and others identify Nome as a major regional center of waterborne transportation and recommend improvements to the marine navigation system.

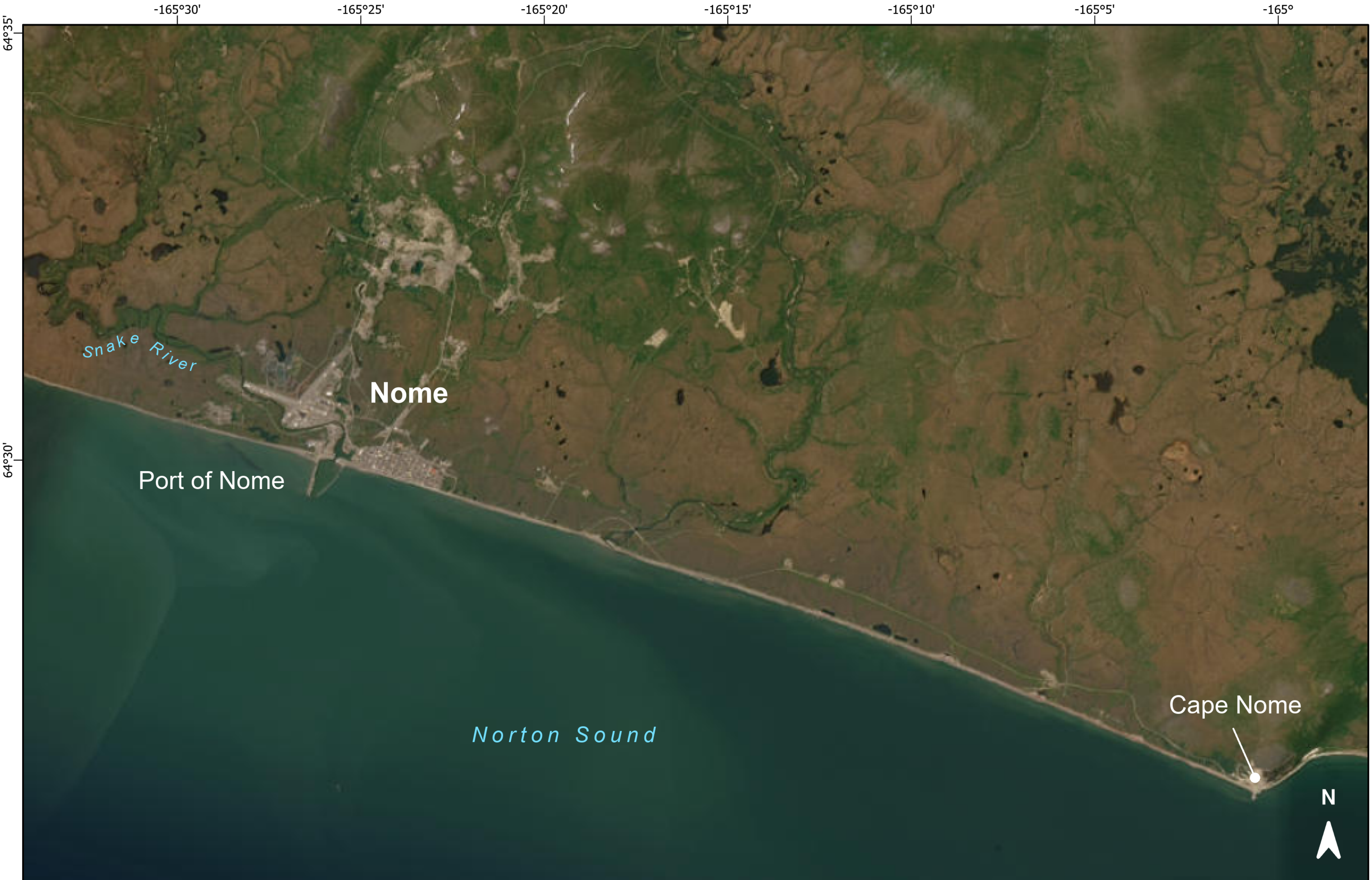
In 2020, the USACE completed a feasibility study (USACE 2020) for the Port of Nome modification project (Project) and is now re-engaging with agencies to move forward with Phase 1 of the Project. The proposed Project will occur in marine waters that support several marine mammal species. Proposed construction activities include pile driving. The noises generated by this activity have a possibility of acoustically harassing marine mammals, a form of "take" as defined under the Marine Mammal Protection Act of 1972 (MMPA), and thus are subject to governance under MMPA [1]. Incidental and unintentional harassment takes are authorized with the issuance of an Incidental Harassment Authorization (IHA) from the National Marine Fisheries Service (NMFS). MMPA identifies 14 specific items that must be addressed when applying for an IHA, which allow NMFS to fully evaluate whether the proposed actions remain incidental and unintentional. The 14 items are addressed below relative to the USACE Port of Nome Modification Project for Year 1 of Phase 1 proposed to begin in 2024.

In addition to this IHA request, 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.

1.2. Project Purpose and Need

The Project is needed to alleviate existing vessel restrictions imposed by insufficient harbor area. Increased vessel traffic in the Arctic, coupled with limited marine infrastructure in Nome and the region, results in operational inefficiencies, vessel damage, and decreased safety at the port. Increased costs and delays of goods and services threatens the long-term viability of surrounding communities. A safe, reliable, and efficient transportation hub at Nome is foundational to the long-term viability of communities in the region.

[1] Owl Ridge Natural Resource Consultants, Inc. has been subcontracted to PND Engineers, Inc. (contracted to the City of Nome) and designated as a technical representative by USACE to oversee the MMPA authorization process on the USACE's behalf.



NAD83 Alaska State Plane Zone 8

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PROJECT LOCATION AND VICINITY

Port of Nome Modifications Project
Request for Incidental Harassment Authorization

SCALE: 0 2 4 Mi / 0 3 6 Km

FIGURE: **1-1**

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1.3. Project Description

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 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 Project in three phases spanning an estimated 7 years. Each phase is described briefly below. As noted above, this IHA is for Year 1 of Phase 1.

- **Phase 1**. Construct a 3,500-ft 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 feet long would be constructed along the basin side of the causeway extension. Phase 1 would require four construction seasons to complete, starting in 2024.
- **Phase 2.** Dredge the new basin to a design depth of 40 ft below MLLW to create a Deep-Water Basin and dredge existing portions of the Outer Harbor to a new design depth of 28 ft below MLLW. Phase 2 would require three construction seasons to complete, starting in 2025.
- **Phase 3.** Construct a new 2,330-ft causeway with two additional docks, mooring dolphins, and beach bridge; construct a 1,570-ft breakwater offset to the east; remove the existing east breakwater; and dredge the remaining portions of the enlarged Outer Harbor. Phase 3 would require four construction seasons to complete, starting in 2027.

1.3.1. Planned Phase 1-Year 1 Activities

Completion of all Phase 1 activities is anticipated to take four open-water (e.g., May through October) construction seasons to complete. Phase 1 activities include mobilization, removal of the existing spur at the end of the existing west causeway breakwater, dredging of the west causeway extension footprint, construction of the OCSP dock (including pile driving), and associated vessel transit activities. The proposed construction sequence for Phase 1 is provided in Table 1-1.

The USACE estimates that specific Year 1 activities will include mobilization, removal of the breakwater spur, development of the quarry for rock and gravel (i.e., fill), dredging of the causeway footprint to accommodate for amor stone installation, pile driving of temporary template piles, and an estimated 35 percent installation of the sheet piles (Table 1-1) 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.

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EXISTING LAYOUT - PORT OF NOME

Port of Nome Modifications Project
Request for Incidental Harassment Authorization

SCALE:	FIGURE:
NA	1-2

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Table 1-1. Phase 1 construction activities and anticipated completion during Year 1.

Phase 1 Construction Activities	Year 1 Anticipated Completion (%) [1,2]	Notes	Section
Mobilization	100	Includes vessel transit to/from Anchorage or other staging location; removal of the existing west causeway spur breakwater	1.3.2 Mobilization and Site Preparation
Dredging of the west causeway footprint to accommodate armor stone installation	100	Dredged materials will be transported for placement at a predesignated site (likely along the east seawall)	1.3.3 Dredging
Installation of temporary template piles for template structures and barge support	35		1.3.4.1 Temporary Template Piles
Installation of the OCSP dock	35	Includes driving sheet and anchor piles, placing fill within the cell to grade, and compaction of fill	1.3.4 Sheet Pile Dock 1.3.4.7 Gravel Fill Production and Transport
Removal of temporary template piles	35[3]		1.3.4.1 Temporary Template Piles
Installation of fender and bollard piles	0		1.3.4.4 Fender piles 1.3.4.5 Bollard piles
Installation of dock appurtenances and utilities	0		1.3.4.6 Dock Appurtenances and Utilities

[1] Subject to adjustment by the construction contractor's means and methods.
[2] USACE conservatively uses 35 percent for the Year 1 pile driving estimation of completion, however, expects that the actual completed total will be lower based on adjustment by the construction contractor's means and methods.
[3] All installed temporary template piles will be removed prior to the end of the construction season.

1.3.2. Mobilization and Site Preparation

Project materials will be transported to Nome via barge. The origination location of the vessels will depend on the selected construction contractor's means and methods but would likely be Anchorage (Figure 1-3). Project vessels that transit between Anchorage and Nome will follow the most traveled direct route through Cook Inlet and Unimak Pass. It is anticipated that approximately 20 round trip vessel trips (i.e., barge, support tugs, fuel, etc.) will occur between Nome and Anchorage during Year 1. Project vessels will comply with all pertinent regulations, including protocols for marine mammal impact avoidance (Section 1.4 and Appendix A).

The spur at the end of the existing west causeway will be removed to prepare the site for extension of the stone causeway.

Vessel Transit Route

NAD 83 Alaska Albers

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PROPOSED VESSEL TRANSIT ROUTE BETWEEN ANCHORAGE AND NOME

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SCALE: 0 25 50 100 Mi; 0 30 60 120 Km

FIGURE: 1-3

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1.3.3. Dredging

Most dredging would occur during Phase 2; however, some sediment will be removed from the west causeway extension footprint during Phase 1 to accommodate armor stone installation. Dredging to 5 ft below the existing grade will be required in the non-harbor side armor stone toe footprint.

Total project (all three phases) construction dredging quantities will be approximately 2,015,800 cubic yards (CY) from the Outer Harbor and 517,600 CY from the Deep-Water Basin. Total Phase 1 construction dredging quantities are expected to be approximately 85,000 CY over three years. Depending upon final chemical and physical characterization of the dredging prism, dredged materials would be loaded to either a scow or truck for delivery to any of several predesignated and approved sites (i.e., upland location, current beach nourishment site, nearshore placement area, or offshore disposal location).

1.3.4. Sheet Pile Dock

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 (Appendix B). 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.

Piles are expected to be driven using vibratory pile driving methods. It is anticipated that the largest size vibratory hammer used for the Project will be an APE 200-6 (eccentric moment of 6,600 inch-pounds) or comparable vibratory hammer from another manufacturer such as ICE or HPSI (Figure 1-4). An impact hammer may be used only if hard driving conditions are encountered where the vibratory hammer is unsuccessful. Approximate quantities for total sheet, anchor, and fender piles and driving durations provided in Table 1-2 are for vibratory driving only, as it is the primary method of driving piles. Table 1-3 provides pile totals and potential drive durations for impact driving; however, these are to be considered secondary and are not cumulative with the vibratory driving totals.

1.3.4.1. Temporary Template Piles

Prior to construction of the OCSP dock, a temporary template will be constructed to aid in sheet pile cell installation. During Phase 1, Year 1, up to 35 percent (228) temporary template piles (steel pipe piles [24-inch or smaller] or H-piles [14-inch]) will be installed over an estimated 12 days of effort (up to 20 temporary piles per 24-hour workday; Table 1-2). Temporary template piles will be driven using vibratory pile driving equipment and will be removed following completion of each cell. Means and methods for extraction will be like temporary pile installation, using vibratory extraction methods. Quantities for temporary template piles noted in Table 1-2 are for either pipe piles or H-piles, not both. All temporary template piles will be removed prior to the end of the construction season.

1.3.4.2. Anchor Piles

A total of 77 14-inch H-pile anchor piles with welded connectors will be installed at the end of each sheet pile tailwall. During Phase 1, Year 1, approximately 35 percent (27 total) of the anchor piles are anticipated to be completed over an estimated 1–2 days of effort (up to 20 anchor piles per 24-hour workday; Table 1-2, Table 1-3).

Figure 1-4. Installing sheet piles with a vibratory hammer.

1.3.4.3. Sheet Piles

A total of 4,570 sheet piles (PS31 or similar) will be driven during the dock construction. Sheet piles are comprised of interlocking sheets (welded and slid together). Sheets will be driven in pairs, as one pile, to the required embedment until each cell is complete. During Phase 1, Year 1, approximately 35 percent (1,600 total) of the sheet piles may be driven over approximately 57 days of effort (up to 28 sheet piles [14 pairs] per 24-hour workday; Table 1-2, Table 1-3).

1.3.4.4. Fender Piles

A total of 61 fender piles (36-inch diameter) will be installed along the dock face to protect the dock from moored vessels. During Phase 1, Year 1, approximately 35 percent (21 total) of the fender piles are anticipated to be completed over an estimated 2 days of effort (up to 10–12 piles per 24-hour workday; Table 1-2, Table 1-3).

1.3.4.5. Bollard Piles

Two bollard piles (30-inch diameter pipe piles) will be installed on the dock to support mooring bollards. Bollard piles will be driven into completed, compacted cells using a vibratory hammer on land, and so are not included in calculations of potential take (Table 1-2).

Table 1-2. Materials and impacts summary – vibratory driving (primary method).

Pile Type	Construction Method	Hours Per Day[2]	Piles Per Day[3]	Phase 1		Year 1[1]	
				Number of Piles	Days Effort	Number of Piles	Days Effort
In Water							
Temporary template piles (Pipe piles ≤ 24")[4]	Installation	4	20	650	33	228	12
	Removal	4	20	650	33	228	12
(Alternate) Temporary template piles (H-piles 14")[5]	*Installation*	*(4)*	*(20)*	*(650)*	*(33)*	*(228)*	*(12)*
	Removal	*(4)*	*(20)*	*(650)*	*(33)*	*(228)*	*(12)*
Anchor piles[6] (14" HP14x89 or similar)	Installation	4	20	77	4	27	1–2
Sheet piles (20" PS31 or similar)	Installation	4	28 (14 pairs)	4,570	163	1,600	57
Fender piles (Pipe piles 36")	Installation	4	10–12	61	6	21	2
Upland							
Bollard piles[7] (Pipe piles 30")	Installation	4	10–12	2	1	NA[1]	NA[1]
High mast light piles[7] (Pipe piles 26")	Installation	4	10–12	12	1–2	NA[1]	NA[1]

[1] USACE conservatively uses 35 percent for the Year 1 pile driving estimation of completion for temporary, anchor, sheet, and fender piles, however, expects that the actual completed total will be lower based on adjustment by the construction contractor's means and methods.
[2] Hours per day are based on 24-hour workday periods and in-water sound production.
[3] Piles per day are based on 24-hour workday periods.
[4] All temporary template piles will be removed prior to the end of the construction season.
[5] H-pile may be used for template construction instead of pipe piles, but these would be in replacement of and not in addition to the pipe option quantity.
[6] One anchor pile is driven for each completed cell (66), the total number (77) accounts for any additional anchor piles that might need to be driven to accommodate temporary closures at the end of each construction season.
[7] Installation of bollard piles and high mast light piles will occur at the end of dock construction (i.e., likely during Years 3 or 4 of Phase 1) and will be driven into completed, compacted cells on land using a vibratory hammer (proofing for high mast light piles will also use impact driving), and so are not included in calculations of potential take.

Table 1-3. Materials and impacts summary – impact driving (secondary method).

Pile Type	Construction Method	Strikes Per Day[2]	Phase 1		Year 1[1]	
			Number of Piles	Days Effort	Number of Piles	Days Effort
In Water						
Temporary template piles (Pipe piles ≤ 24”)	Installation	400	650	33	228	12
(Alternate) Temporary template piles (H-piles 14”) (Installation)	*Installation*	*(400)*	*(650)*	*(33)*	*(228)*	*(12)*
Anchor piles[3] (14” HP14x89 or similar)	Installation	400	77	4	27	1–2
Sheet piles (20” PS31 or similar)	Installation	280	4,570	163	1,600	57
Fender piles (Pipe piles 36”)	Installation	140	61	6	21	2
Upland						
High mast light piles[4] (Pipe piles 26”)	Installation	NA	12	1–2	NA	NA

[1] USACE conservatively uses 35 percent for the Year 1 pile driving estimation of completion for temporary, anchor, sheet, and fender piles, however, expects that the actual completed total will be lower based on adjustment by the construction contractor’s means and methods.
[2] Assumes 0.05 seconds for pulse duration of impact driving and based on 24-hour workday periods.
[3] One anchor pile is driven for each completed cell (66), the total number (77) accounts for any additional anchor piles that might need to be driven to accommodate temporary closures at the end of each construction season.
[4] Installation of high mast light piles will occur at the end of dock construction (i.e., likely during Years 3 or 4 of Phase 1) and will be driven into completed, compacted cells on land using a vibratory hammer and impact driving for proofing, and so are not included in calculations of potential take.

1.3.4.6. Dock Appurtenances and Utilities

In addition to the main structural components and fill, the extended dock facility will include necessary appurtenances to meet the current and future needs of the Port of Nome. A steel face beam, bullrails, and heavy-duty bollards are planned along the entire face of the new structure. Twelve high-mast lights with buried electrical lines, utilities (fuel and water service lines), and dock anodes will also be installed into completed, compacted cells using a vibratory hammer and impact proofing on land, and so are not included in calculations of potential take (Table 1-2). Utilities will be provided along the new dock structure, including water and sewer lines, fuel delivery systems, and electrical power.

1.3.4.7. Gravel Fill Production and Transport

Following completion of each cell, fill materials will be placed behind the sheet pile with traditional earth-moving equipment (loaders, dump trucks, bulldozers, etc.). Fill will be placed in lifts with dump trucks and bulldozers and compacted with vibratory roller compactors. Fill will only be compacted above elevation +3 ft MLLW.

Gravel production is likely to occur at the Cape Nome quarry. Transport of fill materials between Cape Nome and the Project would occur overland and by barge. The quarry location and transport are subject to adjustment by the construction contractor's means and methods.

1.4. Sources of Anthropogenic Sound

In the Technical Guidance (NMFS 2018), sound sources are divided as the following:

- Non-impulsive: produce sounds that can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent, and typically do not have a high peak sound pressure with rapid rise/decay time that impulsive sounds do.
- Impulsive: produce sounds that are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay.

1.4.1. Underwater Sources

1.4.1.1. Vibratory Pile Driving and Gravel Fill

Table 1-4 summarizes the non-impulsive/continuous sources and details are provided in the following subsections.

Table 1-4. Parameters for underwater noise calculations for vibratory (non-impulsive, continuous) sources (primary method).

Source	Predicted Source Level (SPL_{RMS})[1]	Sound Exposure Level (SEL)[2]	Peak Source Level[3]	WFA[4] (kHz)	Estimated Duration		
					Piles per Day[5]	Minutes per Pile	Days of Effort
Temporary template piles (Pipe piles < 24") (Installation)	154.0	152.0	194.0	2.5	20	10	12

Source	Predicted Source Level (SPL_{RMS})[1]	Sound Exposure Level (SEL)[2]	Peak Source Level[3]	WFA[4] (kHz)	Estimated Duration		
					Piles per Day[5]	Minutes per Pile	Days of Effort
Temporary template piles (Pipe piles < 24") (Removal)	154.0	152.0	194.0	2.5	20	10	12
(Alternate) Temporary template piles (H-piles 14") (Installation)[6]	*(150.0)*	*(147.0)*	*(165.0)*	*(2.5)*	*(20)*	*(10)*	*(12)*
(Alternate) Temporary template piles (H-piles 14") (Removal)[6]	*(150.0)*	*(147.0)*	*(165.0)*	*(2.5)*	*(20)*	*(10)*	*(12)*
Anchor piles (H-piles 14")	150.0	147.0	165.0	2.5	20	10	1–2
Sheet piles (20" PS31 or similar)	160.7	161.1	171.5	2.5	28 (14 pairs)	10 (20 per pair)	57
Fender piles (Pipe piles 36")	170.0	170.0	180.0	2.5	12	10	2
Gravel fill	132.8	Not Available	Not Available	2.5	11 (hours per day)		30

[1] Average underwater sound pressure levels (SPL_{RMS}) are reported in dB re: 1 µPa @ 10 meters
[2] Sound exposure levels (SEL) are reported in dB re: 1 µPa^2-sec @ 10 m. SELs are averaged over one sec. unless otherwise noted
[3] Average underwater peak sound pressure levels are reported in dB re: 1 µPa @ 10 meters
[4] A Weighting Factor Adjustment of 2.5 was used for all Level A isopleth calculations for vibratory sources
[5] Hours are based on 24-hour workday periods and in-water sound production
[6] Durations for temporary template piles are for either pipe piles or H-piles (alternate method), not both.

1.4.1.1.1. Temporary template piles (Pipe piles < 24")

Vibratory pile driving of 24-inch steel pipe piles was monitored at Kodiak during the Alaska Marine Highway System ferry terminal modernization project. In this study the sound source levels were measured at an average SPL_{RMS} of 155.5 dB re: 1 µPa @ 10 m (Denes et al. 2016). More recently (2018), vibratory pile driving of 24-inch steel pipe piles was monitored during construction of a floating dock for the United States Coast Guard (USCG) at the Port of Los Angeles, as reported in Caltrans (2020). In this study, sound source levels during 24-inch pile driving were measured at a median SPL_{RMS} of 154 dB re: 1 µPa @ 10 m, median SELs at 152 dB re: 1 µPa @ 10 m, and maximum peak of 194 dB re: 1 µPa @ 10 m. Also reported in Caltrans (2020) were results from the Naval Base Kitsap Explosive Handling Wharf Project in which 165 dB was reported for 24-inch steel pipe piles.

NMFS conducted internal analyses in which all data for a given pile size presented in Caltrans (2015 and 2020) were averaged (unpublished data). Per NMFS guidance, the source level that best matched the average for vibratory pile driving of 24-inch steel pipe piles was 154 dB re: 1 µPa @ 10 m from the USCG Port of Los Angeles Floating Dock Project (NMFS personal communications, January 27, 2023).

Further, NMFS considered recommending 165 dB rms from the Naval Base Kitsap Explosive Handling Wharf Project as reported in CalTrans (2020); however, during analyses NMFS concluded the value may be an outlier and overly conservative. In summary, NMFS recommended using 154 dB re: 1 µPa @ 10 m from the USCG Port of Los Angeles Floating Dock Project (Caltrans 2020).

Vibratory removal is assumed to create lower noise levels than installation, so this value was also used for pile removal.

1.4.1.1.2. Anchor piles (H-piles 14")

Vibratory pile driving of 14-inch steel H-Piles was monitored during the Chevron Long Warf Project in Richmond, CA (Caltrans 2020). In this study, sound source levels during 14-inch H-pile driving were measured at an average SPL_{RMS} of 150 dB re: 1 µPa @ 10 m, SELs at 147 dB re: 1 µPa @ 10 m, and an average peak of 165 dB re: 1 µPa @ 10 m.

Vibratory removal is assumed to create lower noise levels than installation, so this value was also used for pile removal.

1.4.1.1.3. Sheet piles (20" PS31 or similar)

For 20-inch sheet pile driving, source levels measured during the UniSea G1 Dock Replacement project and reported in the Unalaska Marine Center (UMC) Dock Replacement Project IHA Application (PND 2016) were used. In this study, sound source levels during sheet pile driving were measured at an average SPL_{RMS} of 160.7 dB re: 1 µPa @ 10 m and an average peak of 171.5 dB re: 1 µPa @ 10 m. The sheet pile SELs were reported as 2-second average, so impact period was divided by half to predict cumulative effects resulting in 161.1 dB re: 1 µPa @ 10 m (PND 2016, 2020)

1.4.1.1.4. Fender piles (Pipe piles 36")

Vibratory pile driving of 36-inch steel shell piles was monitored during the Water Emergency Transportation Authority (WETA) Downtown San Francisco Ferry Terminal Expansion Project (Caltrans 2020). In this study, sound source levels during pile driving were measured at an average SPLRMS of 159 dB re: 1 µPa @ 10 m, SELs 159 dB re: 1 µPa @ 10 m, and an average peak of 191 dB re: 1 µPa @ 10 m. Caltrans (2015) reported a summary of near-source (10 m) unattenuated SPLs for in-water installation using vibratory methods (see Caltrans 2015 Table I.2-2) and values of an average SPLRMS of 170 dB re: 1 µPa @ 10 m, SELs 170 dB re: 1 µPa @ 10 m, and an average peak of 180 dB re: 1 µPa @ 10 m were provided. NMFS conducted internal analyses in which all data for a given pile size presented in Caltrans (2015 and 2020) were averaged (unpublished data). Per NMFS guidance, the source level that best matched the average for vibratory pile driving of 36-inch steel pipe piles was the generic example reported in Caltrans (2015) of SPLRMS of 170 dB re: 1 µPa @ 10 m and is considered more appropriate than the smaller value reported in the WETA Downtown Ferry Project (NMFS personal communications, January 27, 2023).

1.4.1.1.5. Gravel fill

For fill placement and compaction within the sheet pile cells, no direct measurements were available. Instead, as a proxy, measurements from a Cook Inlet bucket dredging project were used (Dickerson et al. 2001). The bucket dredging project measured sound levels during barge loading, bottom contact, bucket closing, bucket digging, and winch in operations, which have multiple similarities to the sound-producing activities during fill placement. The measured source levels from Dickerson et al. (2001) were averaged, producing an SPL_{RMS} of 132.8 dB re: 1 µPa @10 m (Dickerson et al. 2001, PND 2020).

1.4.1.1.6. Bollard and high mast light piles

Vibratory pile driving of bollard piles and high mast light piles will be in-filled, compacted cells; therefore, no in-water noise is anticipated. Only airborne noise is anticipated as a result of this activity.

1.4.1.2. Impact Pile Driving

Table 1-5 summarizes the impulsive/intermittent sources and details are provided in the following subsections.

Table 1-5. Parameters for underwater noise calculations for impact (impulsive, intermittent) sources (secondary method).

Source	Predicted Source Level (SPL_{RMS})[1]	Sound Exposure Level (SEL)[2]	Peak Source Level[3]	WFA[4] (kHz)	Estimated Duration		
					Piles per Day	Strikes per Pile	Days of Effort
Temporary template piles (Pipe piles ≤ 24”) (Installation)	189.0	178.0	203.0	2	20	20	12
(Alternate) Temporary template piles (H-piles 14”) (Installation)[5]	*(178.0)*	*(166.0)*	*(200.0)*	*(2)*	*(20)*	*(20)*	*(12)*
Anchor piles (H-piles 14”)	178.0	166.0	200.0	2	20	20	1–2
Sheet piles (20” PS31 or similar)[6]	189.0	179.0	205.0	2	28 (14 pairs)	10	57
Fender piles (Pipe piles 36”)	193.0	183.0	210.0	2	12	20	2

[1] Average underwater sound pressure levels (SPL_{RMS}) are reported in dB re: 1 µPa @ 10 meters
[2] Sound exposure levels (SEL) are reported in dB re: 1 μPa^2-sec @ 10 m. SELs are averaged over one sec. unless otherwise noted
[3] Average underwater peak sound pressure levels are reported in dB re: 1 µPa @ 10 meters
[4] A Weighting Factor Adjustment of 2 was used for all Level A isopleth calculations for impact sources
[5] Durations for temporary template piles are for either pipe piles or H-piles (alternate method), not both
[6] Data not available; used 24” AZ steel sheet piles (Caltrans 2020) as proxy

1.4.1.2.1. Temporary template piles (Pipe piles < 24”)

Impact pile driving of 24-inch steel pipe piles was monitored the during Rodeo dock repair in San Francisco Bay (Caltrans 2015). In this study, sound source levels during impact pile driving were measured at an average SPL_{RMS} of 189 dB re: 1 µPa @ 10 m, SELs at 178 dB re: 1 µPa @ 10 m), and an average peak of 203 dB re: 1 µPa @ 10 m.

1.4.1.2.2. Anchor piles (H-piles 14”)

Sound source levels for impact pile driving of 14-inch steel H-piles 12-inch steel H-piles were reported for the Parson Slough Sill Project in Monterey County, California (Caltrans 2020) The sound source levels reported included an average SPL_{RMS} at 178 dB re: 1 µPa @ 10 m, SELs at 166 dB re: 1 µPa @ 10 m, and average peak of 200 dB re: 1 µPa @ 10 m.

1.4.1.2.3. Sheet piles (20” PS31 or similar)

No impact pile driving of 20-inch sheet pipe piles was available however 24-inch AZ steel sheet pile driving during the Port of Oakland (Berth 23) project was monitored (Caltrans 2015). In this study, sound source levels were measured at an average SPL_{RMS} of 189 dB re: 1 µPa @ 10 m, SELs at 179 dB re: 1 µPa @ 10 m and an average peak of 205 dB re: 1 µPa @ 10 m.

1.4.1.2.4. Fender piles (Pipe piles 36”)

Impact pile driving of 36-inch steel pipe piles was monitored the during the Humboldt Bay Bridges (Caltrans 2015). In this study, sound source levels during pile driving were measured at an average SPL_{RMS} of 193 dB re: 1 µPa @ 10 m, SELs 183 dB re: 1 µPa @ 10 m, and an average peak of 210 dB re: 1 µPa @ 10 m.

1.4.2. Airborne Sources

Table 6-1 summarizes the airborne sources and details are provided in the following subsections.

Table 1-6. Airborne noise sources.

Source	Vibratory Source Level[1]	Impact Source Level[2]
In-Water		
Temporary template pile (Pipe piles < 24”) (Installation/Removal)	92.1	n/a
(Alternate) Temporary template pile (H-piles 14”) (Installation/Removal)	*(87.5)*	*n/a*
Anchor piles (H-piles 14”)	87.5	n/a
Sheet piles (20” PS31 or similar)[2]	96.4	n/a
Fender piles (Pipe piles 36”)	94.7[3]	n/a
Upland/Land-based		
Bollard piles (Pipe piles 30”)	96.5	110.0
High mast light piles (Pipe piles 26”)[4]	96.5	110.0

[1] Vibratory source levels for airborne noises are reported in dB_{L5EQ} re: 20 µPa @ 15 meters
[2] Impact source levels for airborne noises are reported in dB_{RMS} (unweighted) @ 15 meters; Impact source levels not provided for in-water pile driving as it is the secondary driving method and not anticipated to be used
[3] Data not available for pipe piles, round steel pipe interlocking abutment piles used as proxy and reported in dB_{L5EQ} re: 20 µPa @ 17 meters
[4] Data not available, 30" pipe piles (Laughlin 2010) used as proxy

1.4.2.1. Temporary template piles (Pipe piles < 24”)

Airborne noise levels for vibratory driving of 24-inch pipe piles were measured during the Bangor Test Pile Program at 92.1 dB_{L5EQ} re: 20 µPa at 15 meters (NAVFAC 2015).

1.4.2.2. Anchor piles (H-piles 14”)

Data for airborne noise levels from 14-inch anchor pile driving were not available, so source levels for vibratory installation of 18-inch piles from Laughlin (2010) were used as a proxy. Vibratory driving of 18-inch piles was measured at 87.5 dB_{L5EQ} re: 20 µPa at 15 meters. In this case, dB_{L5EQ} (or the 5-minute average continuous sound level) was considered equivalent to dB_{RMS} values, which would be calculated in a similar fashion. Vibratory removal is assumed to create lower noise levels than installation, so this value was also used for pile removal.

1.4.2.3. Sheet piles (20” PS31 or similar)

Data for airborne noise levels from 20-inch sheet were not available, so source levels for vibratory installation of 30-inch piles from Laughlin (2010) was used as a proxy, measured at 96.5 dB_{L5EQ} re: 20 µPa at 15 meters.

1.4.2.4. Fender piles (Pipe piles 36”)

Data for airborne noise levels of vibratory driving of 36-inch round steel pipe interlocking abutment piles from the Naval Base Point Loma Fuel Pier replacement project was measured at 94.7 dB_{L5EQ} re: 20 µPa at 17 meters (NAVFAC SW 2020).

1.4.2.5. Bollard piles (30”)

Data for airborne noise levels of vibratory installation of 30-inch pipe piles from Laughlin (2010) was used as a proxy, measured at 96.4 dB_{L5EQ} re: 20 µPa at 15 meters.

Based on in-air measurements at the Washington State Ferry (WSF) Port Townsend Ferry Terminal, impact pile driving of a 24-inch steel pile generated 110 dB dB_{RMS} (unweighted) at 15 meters, is assumed that in-air noise generated during impact driving of 30-inch diameter steel piles will generate the same source level (110 dB_{RMS}) and was used as a proxy (WSDOT 2017).

1.4.2.6. High-mast light piles (26”)

Data for airborne noise levels from high mast light piles were not available, so source levels for vibratory installation of 30-inch piles from Laughlin (2010) was used as a proxy, measured at 96.4 dB_{L5EQ} re: 20 µPa at 15 meters.

In-air measurements at the WSF Port Townsend Ferry Terminal, impact pile driving of a 24-inch steel pile generated 110 dB dB_{RMS} (unweighted) at 15 meters, is assumed that in-air noise generated during impact driving of 30-inch diameter steel piles will generate the same source level (110 dB_{RMS}) and is used as a proxy for 26-inch piles (WSDOT 2017).

Anticipated source levels for airborne noises are not anticipated to exceed disturbance thresholds for non-harbor seal pinnipeds beyond the 10-meter safety shut-down radius, so no additional impact isopleths were included for airborne noises.

2. DATES, DURATION, AND SPECIFIC GEOGRAPHICAL REGION

2.1. Dates

The presence of sea ice in Norton Sound limits the in-water construction season at Nome to roughly May through October. Severe autumn storms can further shorten the construction season. Construction of the entire proposed Project is expected to span seven years, even with some phases being constructed concurrently, Phase 1 – 2024 through 2027 (4 construction seasons), Phase 2 – 2025 through 2027 (3 construction seasons), and Phase 3 – 2027 through 2030 (4 construction seasons). Phase 1, Year 1, the first year of construction, covered by this application, is expected to occur during the open-water season between May and October 2024.

2.2. Duration

Construction activities (i.e., pile driving and dredging) will only occur during daylight hours, and typically for a 12-hour workday. When needed and due to the long summer day length at Nome's latitude 24-hour, multi-shift operations may occur during the in-water construction season. Workday duration may be limited by other considerations, such as worker availability and regulatory stipulations. For calculations used throughout this IHA application, a 24-hour workday was used to be conservative.

It is assumed that in-water sound associated with the pile driving and removal activities will comprise less than 20 percent of the total estimated project duration of 180 days (up to 720 hours based on 4 hours of pile-driving-related noise in a 24-hour workday). Activities such as moving equipment and moving and placing fill, which occur during the remaining 80 percent of the project duration will provide distinct periods where there is no pile driving noise. During this time, a much smaller area will be monitored to ensure that animals are not injured by equipment or materials.

2.3. Region of Activity

The Project site is within Norton Sound, just offshore of Nome. All construction activities would occur within approximately 3,600 ft of the shoreline. The seabed in this area is flat and featureless, with bottom sediments consisting of sand and silt, with scattered cobbles and boulders. The nearshore waters are shallow and deepen very gradually, reaching a depth of 60 ft at roughly 2 nautical miles (nmi) offshore.

Norton Sound is an extension of the northern Bering Sea but is hydrologically distinct from much of that region. The northern Bering Sea features strong oceanic currents flowing north into the Bering Strait, driving an oceanic ecosystem fed by the upwelling of nutrient-rich deep water to the ocean surface. The shallow, partially confined Norton Sound, on the other hand, is characterized by an inshore ecosystem that receives most of its nutrients from the Yukon and other inflowing rivers; winds and tides drive most of the mixing of water layers. During ice-free months, frequent storms can cause substantial redistribution of bottom sediments and disruption of benthic habitat at water depths of 60 ft or greater. In the Nome area, sea ice formation typically occurs in early November each year with spring break-up usually occurring in late May.

Nome has a population of less than 4,000 people, but serves as a primary transportation, administrative, and social services hub for much of Northwest Alaska. Nome is geographically quite isolated, with the nearest coastal communities being Golovin, about 70 air-miles to the east, and Teller, roughly 60 air-miles to the northwest. The coastline between these communities is almost entirely undeveloped and uninhabited, except for a handful of seasonal fishing camps.

3. SPECIES AND NUMBERS OF MARINE MAMMALS

Known ranges of several marine mammal species, subspecies, or distinct population segments (DPSs) encompass the portion of Norton Sound and vessel transit routes in which the proposed Project will occur. Table 3-1 lists these species along with their stock or population, MMPA and Endangered Species Act (ESA) status, occurrence in the project area (at the Port of Nome and along the vessel transit route to/from Anchorage), seasonality, and estimated abundance. These species were identified during consultation with the NMFS office in Alaska during the USACE project feasibility study in 2019–2020 and after re-engagement in 2022 in preparation for this IHA application.

For this IHA application the project area is divided into two separate regions: 1) Port of Nome project site and 2) proposed vessel transit route to and from Anchorage. Most of these species listed in Table 3-1 are unlikely to be observed near the Port of Nome project site due to the high volume of vessel traffic in and around the port or along the vessel transit route to and from Anchorage due to their small populations and very large ranges. Marine mammal species that can be reliably observed during the spring through fall seasons (May through November) near the project site at the Port of Nome are limited primarily to the bearded seal, ringed seal, ribbon seal, spotted seal, Steller sea lion, beluga whale, harbor porpoise, and killer whale. Additional marine mammal species that can be observed during transit to and from Anchorage are limited to primarily the harbor seal, Steller sea lion, harbor porpoise, and beluga whale (Cook Inlet DPS), killer whale, gray whale, fin whale, humpback whale, and minke whale. Descriptions of the aforementioned species are provided in Section 4. Other marine mammals not likely to be observed in the project area are presented in Table 3-1, however species descriptions are not included in this IHA application.

Table 3-1. MMPA-protected and ESA-listed species that may be present in the project area and along the vessel transit route to/from Anchorage and Nome.

Species	Population / Stock	Occurrence		Seasonality	Abundance	Status	
		Port of Nome	Vessel Transit Route			MMPA	ESA
Pinnipeds							
Bearded seal (*Erignathus barbatus*)	Beringia DPS	Common	Rare	Spring, Summer, Fall	273,676 (minimum)[1]	Depleted	Threatened
Harbor seal (*Phoca vitulina)*	Bristol Bay Stock	Rare	Common	Year-round	38,254 (minimum)[1]	Protected	NA
	Cook Inlet/Shelikof Strait	Rare	Common	Year-Round	26,907 (minimum)[1]	Protected	NA
Ringed seal (*Pusa hisipida hisipida)*	Arctic subspecies	Common	Uncommon	Year-round	158,507 (minimum)[1]	Depleted	Threatened
Ribbon seal* (*Histriophoca fasciata*)	Alaska Stock	Uncommon	Uncommon	Spring, Fall	163,086 (minimum)[1]	Protected	NA
Spotted seal (*Phoca larga)*	Alaska Stock	Common	Uncommon	Year-round	423,237 (minimum)[1]	Protected	NA
Steller sea lion (*Eumetopias jubatus)*	Western DPS	Common	Common	Year-round	52,932 (minimum)[1]	Depleted	Endangered
Northern fur seal* *(Callorhinus ursinus*)	E. Pacific Stock	Rare	Rare	Year-round	514,738 (minimum)[1]	Depleted	Endangered
Cetaceans - Odontocetes							
Beluga whale (*Delphinapterus leucas)*	E. Bering Sea Stock	Common	Rare	Spring, Summer, Fall	5,173 (minimum)[1]	Protected	NA
	E. Chukchi Sea Stock	Rare	Rare	Spring, Fall, Winter	8,875 (minimum)[1]	Protected	NA
	Beaufort Sea Stock	Rare	Rare	Spring, Fall, Winter	32,453 (minimum)[1]	Protected	NA
	Cook Inlet DPS	NA	Common	Year-round	267 (minimum)[1]	Depleted	Endangered

Species	Population / Stock	Occurrence		Seasonality	Abundance	Status	
		Port of Nome	Vessel Transit Route			MMPA	ESA
			(Cook Inlet only)				
Cuvier's beaked whale* (*Ziphius cavirostris*)	Alaska Stock	Very Rare	Rare	Year-round	Not Available	Protected	NA
Dall's porpoise* (*Phocoenoides dalli*)	Alaska Stock	Very Rare	Rare	Year-round	Not Available	Protected	NA
Harbor porpoise (*Phocoena phocoena*)	Bering Sea Stock	Common	Common	Spring, Summer, Fall	4,130 (minimum)[1]	Protected	NA
	Gulf of Alaska Stock	NA	Common	Spring, Summer, Fall	26,064 (minimum)[1]	Protected	NA
Killer whale (*Orca orca*)	E. North Pacific Alaska Resident Stock	Common	Common	Year-round	2,084 (identified)[1]	Protected	NA
	Gulf of Alaska, Aleutian Islands, and Bering Sea Transient Stock	Uncommon	Uncommon	Year-round	587 (identified)[1]	Protected	NA
Pacific white-sided dolphin* (*Lagenorhynchus obliquidens*)	North Pacific Stock	Very Rare	Rare	Year-round	26,880 (minimum)[1]	Protected	NA
Sperm whale* (*Physeter macrocephalus*)	North Pacific Stock	Very Rare	Rare	Summer	244 (minimum)[1]	Depleted	Endangered
Stejneger's beaked whale* (*Mesoplodon stejnegeri*)	All	Very Rare	Very Rare	Year-round	Not Available	Protected	NA

Species	Population / Stock	Occurrence		Seasonality	Abundance	Status	
		Port of Nome	Vessel Transit Route			MMPA	ESA
Cetaceans - Mysticetes							
Blue whale* (*Balaenoptera musculus)*	E. North Pacific Stock	Very Rare	Very Rare	Summer	1,767 (minimum)[2]	Depleted	Endangered
Bowhead whale* (*Balaena mysticetus*)	W. Arctic Stock	Rare	Rare	Winter, Spring	16,100 (minimum)[1]	Depleted	Endangered
Fin whale (*Balaenoptera physalus)*	Northeast Pacific Stock	Common	Common	Spring, Summer, Fall	2,554 (minimum)[1]	Depleted	Endangered
Gray whale (*Eschrichtius robustus*)	W. North Pacific DPS	Rare	Rare	Unknown	271 (minimum)[2]	Depleted	Endangered
	E. North Pacific DPS	Rare	Common	Spring, Summer, Fall	25,849 (minimum)[2]	Protected	NA
Humpback whale (*Megaptera novaeangliae)*	W. North Pacific Stock (Includes Western North Pacific DPS)	Unknown	Unknown	Unknown	865 (minimum)[1]	Depleted	Endangered (Western North Pacific DPS)
	Central North Pacific Stock (Includes Central North Pacific DPS and Hawaii DPS)	Uncommon	Common	Summer, Fall	7,891 (minimum)[1]	Depleted	Threatened (Central North Pacific DPS) Not Listed (Hawaii DPS)
Minke whale (*Balaenoptera acutorostrata*)	Alaska Stock	Common	Common	Year-round	Not Available	Protected	NA
N. Pacific right whale* (*Eubalaena japonica*)	Eastern North Pacific Stock	Very Rare	Very Rare	Spring, Summer	26 (minimum)[1]	Depleted	Endangered
Sei whale* (*Balaenoptera borealis)*	All	Very Rare	Very Rare	Unknown	Unknown	Depleted	Endangered

*Species are considered unlikely to be found in the project area and are not included in this IHA application
Sources: [1] Muto et al. 2022, [2] Carretta et al 2022,

4. STATUS AND DISTRIBUTION OF THE AFFECTED SPECIES

This section presents species anticipated to be present in the project areas (Port of Nome and Anchorage/Nome vessel transit route) in order of the following groups: pinnipeds, odontocetes, and mysticetes. Within each group, species accounts are presented in alphabetical order and include the following:

1. Species status (i.e., MMPA, ESA, and current minimum population estimate)
2. General distribution including critical habitat (if applicable)
3. Distribution near the proposed project area, including previous survey or traditional ecological knowledge (TEK) observations

Hearing ability information is provided for those species anticipated to be observed near the project site at the Port of Nome and for which take will be requested (bearded seal, ringed seal, ribbon seal, spotted seal, Steller sea lion, beluga whale, harbor porpoise, killer whale, gray whale, and minke whale).

4.1. Pinnipeds

4.1.1. Bearded Seal

4.1.1.1. Status

There are two recognized subspecies of the bearded seal: *Erignathus barbatus barbatus* and *E. b. nauticus*. The *E. b. nauticus* subspecies occurs in or near the project area and consists of two DPSs: Beringia and Okhotsk. The Alaska stock of bearded seals is defined as the portion of the Beringia DPS found in U.S. Waters (Muto et al. 2022). The Beringia DPS was listed as endangered under the ESA in 2012 (77 FR 76740) and is considered depleted under the MMPA. Critical habitat was designated in April 2022 for this species and comprises an area of marine habitat in the Bering, Chukchi, and Beaufort seas (87 FR 19180). The Alaska Marine Mammal Stock Assessment estimated a minimum number of 273,676 bearded seals within the U.S. Bering Sea (Muto et al. 2022).

4.1.1.2. General Distribution

Bearded seals have a circumpolar distribution, and their normal range extends from the Arctic Ocean to Sakhalin Island, or from 80° N to 45° N. In U.S. waters, bearded seals can be found across the continental shelf throughout the Bering, Chukchi, and Beaufort seas (Muto et al. 2022). Bearded seals prefer moving ice and open water over relatively shallow seafloors. They are closely associated with ice, preferring to winter in the Bering Sea and summer along the pack ice edge in the Chukchi Sea, although many summer in nearshore waters of the Beaufort Sea (NMFS 2022a). Pupping occurs on ice floes primarily in May in the Bering and Chukchi seas. Bearded seals feed primarily at or near the seabed, on benthic invertebrates, and demersal fish.

Spring surveys conducted in 1999 and 2000 along the Alaska coast indicate that bearded seals are typically more abundant 20–100 nmi from shore, except for high nearshore concentrations to the south of

Kivalina (Bengtson et al. 2000 and 2005, Simpkins et al. 2003). Many seals that winter in the Bering Sea move north through the Bering Strait from late April through June and spend the summer in the Chukchi Sea (Burns 1967, 1981).

4.1.1.2.1. Critical Habitat

Critical habitat for the bearded seal was designated in May 2022 and include marine waters within one specific area in the Bering, Chukchi, and Beaufort seas including waters off the coast of Nome (87 FR 19180).

Essential features established by NMFS for conservation of the bearded Beringia DPS are:

1. Sea ice habitat suitable for whelping and nursing, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 25 percent concentration and providing bearded seals access to those waters from the ice.
2. Sea ice habitat suitable as a platform for molting, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 15 percent concentration and providing bearded seals access to those waters from the ice.
3. Primary prey resources to support bearded seals: Waters 200 m or less in depth containing benthic organisms, including epifaunal and infaunal invertebrates, and demersal fishes.

4.1.1.3. Distribution near the Project Area

Bearded seals congregate at the open water found near Cape Nome and Sledge Island in winter and spring (Oceana and Kawerak 2014). Juvenile bearded seals may remain in open water during the summer, feeding in lagoons and rivers, but older individuals migrate north with the retreating pack ice. Juvenile bearded seals have been observed hauled out on land along lagoons and rivers in some areas of Alaska, including in the Bering Strait region in summer to early fall (Gadamus et al. 2015, Huntington et al. 2015). In addition, satellite tracking data obtained from juvenile bearded seals tagged in Alaska during 2014 to 2018 indicate that during the open-water period (July to October), about half of the seals that hauled out used terrestrial sites located south of the ice edge in Kotzebue Sound and Norton Sound whereas other seals remained near the ice edge and hauled out on ice (Olnes et al. 2020). During the USACE 2019 and 2021 marine mammal survey a single bearded seal was observed in September 2019. Bearded seals are a particularly important subsistence species (Oceana and Kawerak 2014).

Bearded seals are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.1.1.4. Hearing Ability

Bearded seals are part of the Phocidae family and are included in the phocid pinniped hearing group (NMFS 2016, 2018). Studies on young captive bearded seals (Sills et al. 2020) indicated underwater hearing with peak sensitivity near 50 dB re 1 µPa and a broad frequency range of best hearing extending from approximately 0.3 to 45 kilohertz (kHz).

4.1.2. Harbor Seal

4.1.2.1. Status

In 2010, NMFS and their co-management partners, the Alaska Native Harbor Seal Commission, identified 12 separate stocks of harbor seals based on genetic structure; prior to 2010 only three harbor seal stocks (Bering Sea, Gulf of Alaska, Southeast Alaska) were recognized. The current statewide abundance estimate for Alaska harbor seals is 243,938 (Boveng et al. 2019), based on aerial survey data collected from 1996 to 2018 (Boveng et al. 2019). The harbor seal stocks that overlap with the project area vessel transit route include the 1) Bristol Bay stock – ranging from Nunivak Island south to the west coast of Unimak Island and extending inland to Kvichak Bay and Lake Iliamna and 2) the Cook Inlet/Shelikof Strait stock – ranging from the southwest tip of Unimak Island east along the southern coast of the Alaska Peninsula to Elizabeth Island off the southwest tip of the Kenai Peninsula, including Cook Inlet, Knik Arm, and Turnagain Arm. The estimated minimum number for the Bristol Bay stock is 38,254 and for the Cook Inlet/Shelikof Strait stock is 26,907 (Muto et al. 2022).

4.1.2.2. General Distribution

Harbor seals inhabit coastal and estuarine waters throughout the Gulf of Alaska, Cook Inlet, the Aleutian Islands, and in the Bering Sea. They haul out on rocks, reefs, beaches, and drifting glacial ice and feed in marine, estuarine, and occasionally fresh waters. Harbor seals generally are non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Muto et al. 2022).

4.1.2.3. Distribution near the Project Area

Harbor seals are not expected to be observed near the project site at the Port of Nome, however they are being considered in this IHA as they could be observed from vessels that may transit from Anchorage to Nome (i.e., in Cook Inlet and the Gulf of Alaska).

4.1.3. Ribbon Seal

4.1.3.1. Status

The Alaska Marine Mammal Stock Assessment estimated a minimum number of 163,086 ribbon seals within the U.S. Bering Sea in the spring (Muto et al. 2022). Ribbon seals are listed as a species of concern. The main concern about the conservation status of the ribbon seal is associated with the loss of sea ice habitat associated with a warming climate. On July 10, 2013, NMFS determined that the listing of ribbon seals as threatened or endangered under the ESA was not warranted (78 FR 41371).

4.1.3.2. General Distribution

Ribbon seals range from the North Pacific Ocean and Bering Sea into the Chukchi and western Beaufort seas in Alaska. From late March to early May, ribbon seals inhabit the Bering Sea ice front (Burns 1970, Burns 1981, Braham et al. 1984). From May to mid-July the ice recedes, and ribbon seals move further north into the Bering Strait and the southern part of the Chukchi Sea (Muto et al. 2022). An estimated 6,000–25,000 ribbon seals from the eastern Bering Sea use the Chukchi Sea during the spring open-water period (Boveng et al. 2017).

4.1.3.3. Distribution near the Project Area

Ribbon seals are not commonly seen by hunters in most Bering Strait region communities, likely due to their more offshore concentration and that they are not as abundant as other seals. Concentrated groups of ribbon seals are seen occasionally and have been observed off of Cape Nome in late spring and late fall (Oceana and Kawerak 2014). These seals are expected to be occasionally encountered during construction activities at the Port of Nome and along the northern end (i.e., Norton Sound and the Bering Sea) of the vessel transit route.

Ribbon seals are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.1.3.4. Hearing Ability

Ribbon seals are part of the Phocidae family and are included in the phocid pinniped hearing group

4.1.4. Ringed Seal

4.1.4.1. Status

Ringed seals are the smallest and most common Arctic seal and are found in all seasonally ice-covered seas of the Northern Hemisphere. There are five recognized subspecies of ringed seals but only one, *Pusa hispida hispida,* occurs in Alaska (Muto et al. 2022). The ringed seal is protected under the MMPA and is listed as depleted. It was listed as threatened in 2012 due to the anticipated long-term alteration of its sea ice habitat. In March 2017, the District Court of Alaska vacated this listing; the NMFS appealed that ruling, and the species ESA status was eventually restored. Critical habitat was designated in April 2022 for this species and comprises an area of marine habitat in the Bering, Chukchi, and Beaufort seas (87 FR 19232). The Alaska Marine Mammal Stock Assessment estimated a minimum number of 158,507 ringed seals within the U.S. Bering Sea (Muto et al. 2022).

4.1.4.2. General Distribution

Ringed seals are distributed throughout Arctic waters in all seasonally ice-covered seas. In winter and early spring when sea ice is at its maximum coverage, they can be found in the northern Bering Sea (including Norton Sound), and throughout the Chukchi and Beaufort seas. They occur as far south as Bristol Bay in years of extensive ice coverage (Muto et al. 2022) but generally are not abundant south of Norton Sound except in nearshore areas (Frost 1985, 1988). Ringed seals are rarely seen hauled out on land.

4.1.4.2.1. Critical Habitat

Critical habitat for the ringed seal was designated in May 2022 and include marine waters within one specific area in the Bering, Chukchi, and Beaufort seas including waters off the coast of Nome (87 FR 19232).

Essential features established by NMFS for conservation of the ringed seal are:

1. Snow-covered sea ice habitat suitable for the formation and maintenance of subnivean birth lairs used for sheltering pups during whelping and nursing, which is defined as waters 3 m or more in depth (relative to MLLW) containing areas of seasonal landfast (shorefast) ice or dense, stable pack ice,

which have undergone deformation and contain snowdrifts of sufficient depth to form and maintain birth lairs (typically at least 54 centimeters [cm] deep).

2. Sea ice habitat suitable as a platform for basking and molting, which is defined as areas containing sea ice of 15 percent or more concentration in waters 3 m or more in depth (relative to MLLW).
3. Primary prey resources to support Arctic ringed seals, which are defined to be small, often schooling, fishes, in particular, Arctic cod (*Boreogadus saida*), saffron cod (*Eleginus gracilis*), and rainbow smelt (*Osmerus dentex*), and small crustaceans, in particular, shrimps and amphipods.

4.1.4.3. Distribution near the Project Area

Near Nome, ringed seals are often found in the open water offshore from Cape Nome and Safety Sound (Oceana and Kawerak 2014). Surveys conducted in the Bering Sea in the spring of 2012 and 2013 documented numerous ringed seals in both nearshore and offshore habitat extending south of Norton Sound (79 FR 73010, 9 December 2014, Muto et al 2022). During the Quintillion subsea fiber optic cable project two ringed seals were recorded within 60 kilometers (km) of Nome during July 2016 (Blees et al. 2017).

Ringed seals are considered in this IHA as they may occasionally be encountered during construction activities at the Port of Nome and along the northern end (i.e., Norton Sound and the Bering Sea) of the vessel transit route.

4.1.4.4. Hearing Ability

Ringed seals are part of the Phocidae family and are included in the phocid pinniped hearing group (NMFS 2016, 2018).

4.1.5. Spotted Seal

4.1.5.1. Status

The Alaska Marine Mammal Stock Assessment estimated a minimum number of 423,237 spotted seals within the U.S. Bering Sea (Muto et al. 2022). A status review of the species was completed in 2009 after the spotted seal was petitioned for listing under ESA relative to climate change and its effects on sea ice, however, the review found the listing as not warranted (Boveng et al. 2009). Spotted seals prefer the outmost margins of winter sea ice, so their winter range is typically south of Norton Sound. They are generally widespread through the Bering Sea and Norton Sound in summer and early fall and may haul out onto beaches in large groups. Spotted seal haul-out areas within Norton Sound include Stuart Island, Besboro Island, Cape Denbigh, Cape Darby, Rocky Point, Safety Sound, and Cape Wooley (Jewett 1997).

4.1.5.2. General Distribution

Spotted seals are widely distributed on the continental shelf of the Beaufort, Chukchi, southeastern East Siberian, Bering, and Okhotsk seas; south through the Sea of Japan; and into the northern Yellow Sea. From late fall through spring, spotted seal habitat use is primarily associated with seasonal sea ice. Most spotted seals spend the rest of the year making periodic foraging trips from haul-out sites onshore or on sea ice (NMFS 2022b).

4.1.5.3. Distribution near the Project Area

Most summer and fall concentrations of Norton Sound spotted seals are in the eastern portion of the Sound, where herring and small cod are more abundant. Spotted seals are reportedly more sensitive to human disturbances than other seals and have been displaced from some haulout and feeding areas due to such disturbance. However, spotted seals are regularly seen at the Port of Nome and within the harbor area, especially before or after the busy summer season, sometimes hauled out on the beach or breakwater (USACE personal communication with Charlie Lean, 2019). The existing Outer Basin at the Port of Nome, since the construction of the new entrance channel and east breakwater in 2006, has become the new river mouth and a sort of artificial lagoon of the Snake River. Seals and other marine mammals tend to congregate there, especially in the autumn (Oceana and Kawerak 2014). Spotted seals are an important subsistence species for Alaska Native hunters. During the Quintillion subsea fiber optic cable project, a total of 10 spotted seals were recorded within 60 km of Nome during July and August 2016 (Blees et al. 2017). During the USACE 2019 and 2021 marine mammal survey spotted seals were the second most frequently recorded marine mammal with 23 individuals observed (n = 16 during September 2019, n = 1 during August 2021, n = 2 during September 2021, and n = 4 during October 2021).

Spotted seals are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.1.5.4. Hearing Ability

Studies on young captive spotted seals showed amphibious hearing capabilities in air and under water more similar to the closely related harbor seal than to other ice seals (Sills et al. 2014). Sills et al. (2014) found a best range of sensitivity in air from 0.6 to 11 kHz, and underwater between 0.3 and 56 kHz. Other measurements indicated that spotted seals are efficient at extracting auditory signals from background noise.

4.1.6. Steller Sea Lion

4.1.6.1. Status

The Steller sea lion was listed as a threatened species under the ESA in November 1990 (55 FR 49204). In 1997, NMFS reclassified Steller sea lions into two DPSs based on genetic studies and other information (62 FR 24345). At that time, the Eastern DPS was listed as threatened, and the western DPS was listed as endangered (NMFS 2008). The Eastern DPS includes animals east of Cape Suckling, Alaska (144°W) and the western DPS includes animals at and west of Cape Suckling, which overlaps with the project area. Critical habitat was designated in 1993 (50 FR 226.202) for Steller sea lion and described as in waters Alaska west of 144°W longitude consisting of:

a. Aquatic zones that extend 20 nautical miles (nm), or 37 kilometers (km), seaward of each major haul out, and major rookery

b. Terrestrial zones that extend 3,000 ft (0.9 km) landward from each major haulout and major rookery.

c. Air zones that extend 3,000 ft (0.9 km) above the terrestrial zone of each major haul out and major rookery in Alaska.

d. Three aquatic foraging areas: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

The western DPS of Steller sea lions decreased from between 220,000 to 265,000 animals in the late 1970s to less than 50,000 in 2000 (Loughlin et al. 1984, Burkanov and Loughlin 2005). Since 2003, the abundance of the western DPS has increased, but there has been considerable regional variation in trends (Sease and Gudmundson 2002, Burkanov and Loughlin 2005, Fritz et al. 2013, 2015). Factors contributing to the decline of the stock include incidental take in fisheries, illegal and legal hunting, predation, disease, climate change, and contaminants. Counts of non-pup Steller sea lions at trend sites for the Western U.S. DPS increased 5.5 percent from 2000 to 2002, and at a similar rate between 2002 and 2004. These were the first region-wide increases for the western stock since standardized surveys began in the 1970s (see review in Holmes et al. 2007).

The most recent comprehensive aerial photographic and land-based surveys of western DPS sea lions in Alaska were conducted during the 2018 (Aleutian Islands west of Shumagin Islands) and 2019 (Southeast Alaska and Gulf of Alaska east of Shumagin Islands) breeding seasons (Sweeney et al. 2018, 2019). The western DPS Steller sea lion pup and non-pup model-predicted counts were 12,581 and 40,351, respectively for a total 52,932 sea lions (Muto et al. 2022). This is a decrease from the previous estimate of 53,624, however this does not represent a total population abundance estimate because the count was not corrected for animals at sea during the surveys or for pups that are born before or die after the surveys.

4.1.6.2. General Distribution

The centers of abundance and distribution for the western DPS are located in the Gulf of Alaska and Aleutian Islands. Members of this species are not known to migrate, but individuals disperse widely outside of the breeding season (late May to early July). At sea, Steller sea lions commonly occur near the 656-foot (200-meter) depth contour but have been found from nearshore to well beyond the continental shelf (Kajimura and Loughlin 1988). Sea lions move offshore to pelagic waters for feeding excursions. They are also capable of traveling long distances in a season. Sea lions may make semi-permanent or permanent one-way movements from one site to another (Chumbley et al. 1997, Burkanov and Loughlin 2005). Round trip transit of greater than 4,040 mi (6,500 km) by individual Steller sea lions has been documented (Jemison et al. 2013).

Land sites used by Steller sea lions are referred to as rookeries and haulouts. Rookeries are used by adult sea lions for pupping, nursing, and mating during the reproductive season (generally from late May to early July). Haulouts are used by all age classes of both genders but are generally not where sea lions reproduce. At sea, they are seen alone or in small groups, but may gather in large rafts at the surface near rookeries and haulouts or foraging sites. Steller sea lions prefer the colder temperate to subarctic waters of the North Pacific Ocean. Haulouts and rookeries usually consist of beaches (gravel, rocky or sand), ledges, and rocky reefs. In the Bering Sea and Okhotsk Sea, Steller sea lions may also haul out on sea ice, but this is considered atypical behavior.

4.1.6.3. Distribution near the Project Area

The nearest Steller sea lion critical habitat to the Port of Nome is on the east shore of St. Lawrence Island, about 140 mi to the southwest. However, Steller sea lions, especially juveniles and non-breeding males, can range through waters far beyond their primary use areas. Observations suggest that Steller sea lions are becoming common in the northern Bering Sea, including Norton Sound. Sea lions have been spotted hauling out in small numbers at Sledge Island, about 22 mi west of Nome. Their change in range is perhaps attributed to climate-change-driven, northward movement of pelagic fish prey species, such as Pacific cod (USACE personal communication with Gay Sheffield, 2018). During the Quintillion subsea fiber optic cable project, a Steller sea lion was recorded within 60 km of Nome during August 2016 (Blees et al. 2017).

Steller sea lions are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.1.6.4. Hearing Ability

The Steller sea lion hearing ability is similar to two other otariids, the California sea lion and northern fur seal. Data on the hearing ability of otariids is limited due to studies only being conducted on small sample sizes of captive individuals; however, the generalized hearing range for otariid pinnipeds underwater is 0.06–39 kHz (NMFS 2018). One study conducted on an individual Stellar sea lion identified an aerial hearing range of approximately 0.25 to 30 kHz with a range of best hearing sensitivity from 5 to 14.1 kHz when defined as the range of frequencies audible at 60 decibel (dB) sound pressure level (SPL) (Mulsow and Reichmuth 2010). Another study looked at the underwater sensitivities of one male and one female Steller sea lion. The male showed an underwater best hearing range from 1 to 16 kHz while the female showed a maximum hearing sensitivity from 16 to 25 kHz. The results could have been due to sexual dimorphism or individual differences (Kastelein et al. 2005).

4.2. Odontocetes

4.2.1. Beluga Whale

4.2.1.1. Status

NMFS has identified five stocks of beluga whales in U.S. waters, all of which are found in Alaskan waters. These are the Beaufort Sea, Bristol Bay, Eastern Bering Sea, Eastern Chukchi Sea and Cook Inlet DPS stocks. Four of these five stocks could be encountered near the project area; beluga whales in Norton Sound likely belong to the E. Bering Sea stock, with an estimated minimum population of 5,173 (Motu et al. 2022). It is also possible that beluga whales from the E. Chukchi Sea and Beaufort Sea stocks could be observed in Norton Sound during the winter, spring, and fall, as both stocks migrate between the Bering and Beaufort seas (Citta et al. 2017). During transit to and from Anchorage the Cook Inlet DPS could be encountered within Cook Inlet. The Cook Inlet DPS is the only beluga stock currently listed under the ESA. The Cook Inlet beluga population declined by nearly 75 percent since 1979 from about 1,300 whales to an estimated 276 in 2018.

4.2.1.2. General Distribution

Beluga whale global distribution ranges throughout the Arctic and sub-Arctic waters. They are found along coastal bays and inlets and can move between saltwater and freshwater. The E. Bering Sea stock remains in the Bering Sea but migrates south near Bristol Bay in winter and returns north to Norton Sound and the mouth of the Yukon River in summer (Suydam 2009, Hauser et al. 2014, Citta et al. 2017, Lowry et al. 2019). The Beaufort Sea stock depart the Bering Sea in early spring, migrate through the Chukchi Sea and into the Canadian waters of the Beaufort Sea where they remain in the summer and fall, and return to the Bering Sea in late fall (NMFS 2022c). The E. Chukchi Sea stock depart the Bering Sea in late spring and early summer, migrate through the Chukchi Sea and into the western Beaufort Sea where they remain in the summer, and return to the Bering Sea in the fall (NMFS 2022c). The Cook Inlet DPS are encountered year-round in Cook Inlet, although they tend to concentrate at the northern end of Cook Inlet during summer months, then disperse more widely through the inlet during fall, winter, and spring (NMFS 2022c).

4.2.1.3. Distribution near the Project Area

Beluga whales use Norton Sound during the entire open-water season, generally moving to southern Bering Sea waters during winter due to high ice concentrations in Norton Sound. During the spring and summer, beluga whales tend to concentrate in the eastern half of the Sound (Oceana and Kawerak 2014), but the whales may be seen migrating in large numbers close to the shoreline near Nome in late autumn (ADFG 2012). Jewett (1997) stated beluga whales "appear nearshore with the onset of herring spawning in early summer and feed on these as well as a wide variety of other fish congregating or migrating nearshore." They are often seen passing very close to the end of the Nome causeway during the fall migration and have been occasionally spotted within the Nome Outer Basin (USACE personal communication with Charlie Lean, 2019). Large groups of beluga have been observed in fall in front of Cape Nome and near Topkok (Oceana and Kawerak 2014). In 2012 two beluga whales from the E. Bering Sea stock were tagged near Nome. Prior to being tagged both were known to range throughout Norton Sound. The first of the two tagged belugas left Norton Sound in early November and the second departed in mid-November (Citta et al. 2017). Tagging data from the same study found that belugas from the E. Chukchi Sea and Beaufort Sea stocks also moved into the central and southern Bering Sea during winter months and did not move into Norton Sound (Citta et al. 2017). No beluga whales were seen during monitoring efforts at Nome during the 2016 Quintillion subsea fiber optic cable project (Blees et al. 2017). During the USACE 2019 and 2021 (Section 4.5) marine mammal survey the most frequently recorded marine mammal was the beluga whale with 129 individuals observed (n = 75 during September 2019, n = 45 during September 2021, and n = 12 during October 2021). E. Bering Sea belugas are an important nutritional and cultural resource to Alaska Natives and are harvested by more than 20 communities in Norton Sound and the Yukon (Ferguson et al. 2018b). Nome hunters harvest beluga on the west side of Cape Nome, all the way from Cape Nome to Nome, and from Nome west to Sledge Island (Oceana and Kawerak 2014).

Beluga whales from the E. Bering Sea stock are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome. Beluga whales from the E. Chukchi Sea and Beaufort Sea stocks are being considered in this IHA as they could be observed during transit from Anchorage to Nome (i.e., in the Bering Sea during the fall, winter and spring months). Beluga whales from the Cook Inlet DPS are being considered as they could be observed during transit from Anchorage to Nome within the waters of Cook Inlet all year.

4.2.1.4. Hearing Ability

Beluga whales produce a wide variety of sounds including whistles, squeals, moos, chirps, and clicks – earning them the nicknamed "canaries of the sea." Beluga whales rely on their hearing for echolocation, navigation, and hunting (NMFS 2022c). Beluga whales are toothed whales and are in the mid-frequency cetacean hearing group.

4.2.2. Harbor Porpoise

Harbor porpoise are small cetaceans widely distributed in shallow coastal waters less than 300 ft deep with temperatures below 60°F. They tend to be seen alone or in small groups of less than 10 individuals, are shy and wary of vessels, and typically surface to breathe in a slow, low-profile roll. These characteristics make the species difficult to count and study (NMFS 2022d). A 2008 ship survey estimated 5,713 individuals in the Bering Sea Stock, but this number is considered an underestimate, as the survey did not include the stock's entire range (Motu et al. 2022). During the Quintillion subsea fiber optic cable project four sightings of 8 total harbor porpoise were recorded within 60 km of Nome, four each during July and August 2016 (Blees et al. 2017). During the USACE 2019 and 2021 (Section 4.5) marine mammal survey a single harbor porpoise was observed east of the Nome Harbor breakwater in August 2021.

Harbor porpoise are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.2.2.1. Hearing Ability

Based on their hearing capacity, Harbor porpoise are considered to be in the high frequency functional hearing group, with assumed sensitivity matching sound they generate (NMFS 2016). Harbor porpoise' best estimated hearing ranges from 16 to 140 kHz with maximum sensitivity occurring between 100 and 140 kHz (Kastelein et al. 2005). The peak frequency produced by harbor porpoises for echolocation is 120 to 130 kHz, which corresponds with the maximum sensitivity range.

4.2.3. Killer Whale

4.2.3.1. Status

Scientific studies have revealed many different populations with several distinct ecotypes (or forms) of killer whales worldwide, some of which may be different species or subspecies (NMFS 2022e). Five stocks of the killer whale are found in Alaskan waters: 1) the Eastern North Pacific (ENP) Alaska Resident Stock; 2) the ENP Northern Resident Stock; 3) the ENP Gulf of Alaska, Aleutian Islands, and Bering Sea Transient Stock; 4) the AT1 Transient Stock; and 5) the West Coast Transient Stock (Muto et al. 2022). The ENP Alaska Resident Stock and the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient Stock are the only stocks with a known range into the Bering Sea and into Norton Sound. Neither stock is listed as depleted under the MMPA, nor are they listed as threatened or endangered under the ESA (Muto et al. 2022). The minimum population estimate of the ENP Alaska Resident stock is 2,084 animals and the minimum population estimate of the Gulf of Alaska, Aleutian Islands, and Bering Sea

Transient Stock is 587 animals (Motu et al. 2022). Systematic population assessment studies have not been conducted in the Bering, Chukchi, or Beaufort seas, and thus substantial numbers of killer whales, of each of the two ecotypes, may remain to be identified and counted (ADFG 2022a).

4.2.3.2. General Distribution

Killer whales are found in every ocean in the world and are the most widely distributed of all cetaceans. Killer whales are found throughout the North Pacific. Along the west coast of North America, killer whales occur along the entire Alaska coast (Braham and Dahlheim 1982).

4.2.3.3. Distribution near the Project Area

Killer whales entering Norton Sound are probably following seasonal movements of whales and pinnipeds. During the Quintillion subsea fiber optic cable project, a single killer whale was recorded within 60 km of Nome during July 2016 (Blees et al. 2017).

Killer whales are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.2.3.4. Hearing Ability

Killer whales rely on underwater sound for a variety of reasons including navigation, feeding, and communication. Killer whales use echolocation to assist with food gathering—transient killer whales use it rarely and most likely for hunting, while resident whales use it to locate salmon (Au et al. 2004). Killer whale social signals resemble the sound of mid-range tactical sonar (Southall et al. 2007), with signals commonly occurring as pulsed calls, whistles, and clicks (Szymanski et al. 1999). Increases in noise levels near killer whale habitat, like that associated with increasing vessel traffic, have been found to result in an increase in the duration of killer whale calls (Foote et al. 2004 as cited in Southall et al. 2007). Killer whales are part of the mid-frequency cetacean functional hearing group, with their estimated auditory bandwidth between 150 hertz (Hz) and 160 kHz (Southall et al. 2007).

4.3. Mysticetes

4.3.1. Fin Whale

4.3.1.1. Status

Fin whales in the U.S. are divided into four stocks: 1) California/Oregon/Washington; 2) Hawaii; 3) Alaska (Northeast Pacific); and 4) Western North Atlantic. Fin whales are listed as endangered, and the Northeast Pacific (Alaska) stock is classified as a strategic stock. The minimum population estimate for the Northeast Pacific (Alaska) stock is 2,554 individuals (Muto et al. 2022).

4.3.1.2. General Distribution

Fin whales are found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes. They occur year-round in a wide range of locations, but the density of individuals in any one area changes seasonally. Most migrate from the Arctic and Antarctic feeding areas in the summer to tropical breeding and calving areas in the winter. The location of winter breeding grounds is not known. Fin whales travel in the open seas, away from the coast, and are therefore difficult to track.

4.3.1.3. Distribution near the Project Area

Fin whales are not expected to be observed near the Port of Nome due to their general deep-water and offshore range. However, since fin whales are found in all oceans, it is possible they could be encountered during transit to and from Anchorage, in the Bering Sea, the Gulf of Alaska, and Lower Cook Inlet.

Fin whales are being considered in this IHA as they could be observed from vessels that may transit from Anchorage to Nome.

4.3.2. Gray Whale

4.3.2.1. Status

There are currently two populations of gray whales in the North Pacific Ocean; the eastern North Pacific stock (ENP) and the western North Pacific stock (WNP). The WNP was listed as endangered under the ESA in 1970 (35 FR 18319) and currently is estimated to contain only 271 individuals (Carretta et al. 2022). The ENP gray whale was listed as endangered under the ESA in 1970 (35 FR 18319); however, it was delisted in 1994 due to a successful recovery (59 FR 31094). The ENP gray whale is protected under the MMPA but is not listed as a strategic or depleted species (NMFS 2022f). The minimum population estimate for this stock is 25,849, an increase of 21 percent since 1988 (Carretta et al. 2022, NPFMC 2009b). Of the gray whales that may be protected, most are likely to be the non-ESA listed whales, however, whales from the listed WNP DPS are not distinguishable from the majority of gray whales that are only protected under the MMPA.

4.3.2.2. General Distribution

Gray whales are distributed throughout the North Pacific Ocean and are found primarily in shallow coastal waters (NMFS 2022f, Carretta et al. 2022). The WNP gray whale's migratory route is unknown but presumed to be between the Sea of Okhotsk and South Korea. Only the ENP gray whale's range extends into the project and vessel transit areas. Most whales in the ENP stock spend the summer and fall months feeding in the Chukchi, Beaufort, and northwestern Bering seas and migrate to the southern Gulf of California and Baja. A few individuals remain year-round off the coast of California or in the Straits of Juan De Fuca between the state of Washington and Vancouver Island (Carretta et al. 2022). On their northern migration, ENP gray whales enter the Bering Sea, primarily through Unimak Pass, mostly in April and May, and continue moving along the coast of Bristol Bay. After passing Nunivak Island, they head toward St. Lawrence Island, arriving in May and June. The whales disperse to spend the summer feeding in shallow waters (usually less than 200 ft (60 m) deep) of the northern and western Bering Sea and the Chukchi Sea. Gray whales begin their southward migration in mid-October, passing through Unimak Pass between late October and early January, arriving in Baja California, Mexico in December and January. Recent studies have found that the Chukchi Sea has replaced the northern Bering Sea as the preferred area for foraging gray whales owing to a decrease in amphipod biomass in the Bering Sea (Bluhm et al. 2007, Coyle et al. 2007).

4.3.2.3. Distribution near the Project Area

Ljungblad et al. (1982) and Ljungblad and Moore (1983) summarized aerial surveys conducted in the Bering Sea including the waters of Norton Sound in the early 1980s. Both reported gray whales feeding in large numbers in Norton Sound and waters near St. Lawrence Island. During the Chukchi Sea Environmental Studies Program (CSESP) a large number of gray whales (*n* = 55, including 2 calves) were observed feeding in late July approximately 130 km from the Port of Nome (Lomac-MacNair et al. 2022). During the Quintillion subsea fiber optic cable project three sightings of 8 total gray whales were seen within 60 km of Nome, four during July and four during November 2016 (Blees et al. 2017).

Gray whales are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.3.2.4. Hearing Ability

Gray whales are mysticetes and fall under the low-frequency cetacean hearing group (NMFS 2022f).

4.3.3. Humpback Whale

4.3.3.1. Status

There are three stocks of humpback whales in the North Pacific: 1) the California/Oregon/Washington and Mexico stock, consisting of winter/spring populations in coastal Central America and coastal Mexico which migrate to the coast of California and as far north as southern British Columbia in summer/fall (Calambokidis et al. 1989, 1993; Steiger et al. 1991); 2) the Central North Pacific stock, consisting of winter/spring populations of the Hawaiian Islands which migrate primarily to northern British Columbia/Southeast Alaska, the Gulf of Alaska, and the Bering Sea/Aleutian Islands (Baker et al. 1990, Perry et al. 1990, Calambokidis et al. 1997); and 3) the Western North Pacific stock, consisting of winter/spring populations off Asia which migrate primarily to Russia and the Bering Sea/Aleutian Islands.

There are 14 humpback whale DPS globally. NMFS is currently in the process of reviewing humpback whale stock structure under the MMPA considering the 14 DPS established under the ESA (81 FR 62259, 8 September 2016). Three of the 14 DPS occur in Alaskan waters: 1) the Western North Pacific DPS, 2) the Mexico DPS, and 3) the Hawaii DPS. The Western North Pacific DPS was listed as endangered under the ESA and currently is estimated to contain only 865 individuals (Carretta et al. 2022). The WNP breeds in the areas of Okinawa, Japan, and the Philippines and migrates to summer feeding grounds in the Feeds in the northern Pacific, primarily in the West Bering Sea and off the coast of Russia and the Aleutian Islands. The Mexico DPS, listed as threatened under the ESA, breeds along the Pacific coast of Mexico and the Revillagigedo Islands and transits the Baja California Peninsula to feed across a broad range from California to the Aleutian Islands, Alaska. The Hawaii DPS, not listed under ESA, breeds in the main Hawaiian Islands and migrates to feeding grounds in the North Pacific, including the Aleutian Islands/Bering Sea, Gulf of Alaska, Southeast Alaska, and northern British Columbia.

4.3.3.2. General Distribution

The humpback whale is distributed worldwide in all ocean basins. The humpback whale is seasonally migratory, mating and calving in tropical and subtropical waters in winter and spending summers feeding in temperate and subpolar seas. In Alaskan waters, humpbacks concentrate in Southeast Alaska, Prince William Sound, lower Cook Inlet, and along the Aleutian Islands in summer. Some humpback whales summer in the Bering Sea, and as far north as the Chukchi Sea (Brower et al. 2018, Lomac-MacNair et al.

2022). In 2007, humpbacks were spotted in the Beaufort Sea east of Utqiaġvik, suggesting a northward expansion of their summer feeding range (Zimmerman and Karpovich 2008). Humpback whales are regularly present and feeding in Cook Inlet in the summer.

4.3.3.3. Distribution in the Project Area

Humpback whales are most likely to be in the Bering Sea during the summer and fall and along the vessel transit route through the Gulf of Alaska and Lower Cook Inlet. It is not expected that humpback whales will be encountered near the project site at the Port of Nome.

Humpback whales are being considered in this IHA as they could be observed from vessels that may transit from Anchorage to Nome.

4.3.4. Minke Whale

4.3.4.1. Status

The Alaska stock of minke whales are migratory and are common in the waters of the Bering Sea, Gulf of Alaska, and Southeast Alaska in the spring and summer (NMFS 2022g). Little is known about the population structure or trends in the North Pacific, and no reliable population estimate exists for the Bering Sea region.

4.3.4.2. General Distribution

Minke whales occur in polar, temperate, and tropical waters worldwide in a range extending from the ice edge in the Arctic during the summer to near the equator during winter. Minke whales in Alaska are considered migratory and are typically found in the Arctic during summer months and near the equator during winter months (NMFS 2022g).

4.3.4.3. Distribution near the Project Area

During CSESP surveys (2008–2014) minke whales were observed near the Port of Nome (Lomac-MacNair et al. 2022). No minke whales were seen during monitoring efforts at Nome during the 2016 Quintillion subsea fiber optic cable project (Blees et al. 2017).

Minke whales are being considered in this IHA as they could be observed near the project site at the Port of Nome as well as from vessels that may transit from Anchorage to Nome.

4.3.4.4. Hearing Ability

Minke whales have a generalized hearing range of 7 Hz to 35 kHz and fall under the low-frequency cetacean hearing group (NMFS 2022g).

4.4. Port of Nome Marine Mammal Survey Results (2019-2021)

The USACE initiated baseline marine mammal surveys for the Port of Nome in September 2019. Surveys were conducted with one or two observers staged at either the base or end of the causeway or near the mouth of the Snake River. Due to COVID-19 pandemic and travel restrictions surveys were not conducted from October 2019 through June 2021. Surveys resumed in July 2021 and continued through October 2021. Species observed during USACE surveys included the spotted seal, bearded seal, beluga whale, and harbor porpoise (Table 4-1). The most frequently sighted species was the beluga whale (n = 129 individuals), observed during the month of September (2019 and 2021) and October 2021, followed by the spotted seal (n = 23 individuals), observed during all months surveyed except October. A single bearded seal was observed during July 2021 and a single harbor porpoise was observed during September 2019.

Table 4-1. Sightings and number (individuals) observed during the Port of Nome marine mammal surveys 2019-2021.

Species	Sep 2019	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Total
Spotted Seal	16	1	2	4	0	23
Bearded Seal	1	0	0	0	0	1
Beluga Whale	75	0	0	42	12	129
Harbor Porpoise	0	0	1	0	0	1
Total	93	1	2	46	12	154

5. TYPE OF INCIDENTIAL TAKING AUTHORIZATION REQUESTED

Under Section 101(a)(5)(D) of the MMPA, USACE requests an IHA for takes by Level B harassment (i.e., behavioral disturbance or temporary [hearing] threshold shift) (NMFS 2018) during certain operations associated with the construction of the proposed Project. USACE requests an IHA for one year with an effective date of May 1, 2024.

Take is requested for the installation of piles, as described in Section 1. The noise levels and potential impact isopleths that are expected to result from the construction of this Project are described in detail in the sections below. Mitigation measures (including operational shutdown and harassment zones) will be incorporated into the Project to minimize the potential for unauthorized injury or harassment. Protocols for observations and mitigation methods are discussed in detail in the Marine Mammal Monitoring and Mitigation Plan (4MP) (Appendix A). Takes of non-authorized species will be prevented by the mitigation measures described in Section 6.

5.1. Method of Incidental Taking

The Project includes vibratory pile installation and removal as a primary method and impact pile installation as a secondary method within the requested species' habitat range. Planned construction methods will temporarily increase the underwater and airborne noise within the project area. This increase in noise has the potential to result in behavioral disturbance and temporary threshold shifts (TTS).

5.2. Regulatory Thresholds and Modeling for the Effects of Anthropogenic Sound

Unless otherwise noted, the following notations will be used to express thresholds:

- Peak Sound Pressure Level (SPL_{PK}): The maximum absolute value of the instantaneous sound pressure that occurs during a specified time interval, measured in dB re: 1 µPa (e.g., 198 dB_{PEAK}) (Caltrans 2015, 2020)
- Average Root Mean Square Sound Pressure Level (SPL_{RMS}): A decibel measure of the square root of mean square pressure. For pulses, the average of the squared pressures over the time that comprises that portion of the wave form containing 90 percent of the sound energy of the impulse in dB re: 1 µPa (for underwater) and dB re: 20 µPa is used (for in air) (e.g., 185 dB_{RMS}) (Caltrans 2015, 2020)
- Sound Exposure Level (SEL): The integral over time of the squared pressure of a transient waveform, in dB re: 1 μPa_2–sec. (e.g., 173 dB_{SEL}). This approximates sound energy in the pulse (Caltrans 2015, 2020)
- Cumulative Sound Exposure Level (SEL_{CUM}): Cumulative exposure over the duration of the activity within a 24-hour period (NMFS 2018)

5.2.1. Updated Cumulative Sound Threshold Guidance, PTS

Determination of the cumulative underwater sound exposure levels (SEL_{CUM}) required to cause permanent threshold shift (PTS) in marine mammals within the project area was based on the technical guidelines published by NMFS in August 2016 and revised in April 2018 (NMFS 2016, 2018). This guidance considers the duration of the activity, the sound exposure level produced by the source during one working day (i.e., 24-hour workday), and the effective hearing range of the receiving species. Regulatory thresholds for potentially affected species, measured in one-day SEL_{CUM}, are summarized in Table 5-1.

Table 5-1. Underwater SEL_{CUM} PTS onset thresholds (NMFS 2018).

UNDERWATER - (dB re: 1 µPa)					
Source	**Low Frequency Cetaceans (LF)**	**Mid-Frequency Cetaceans (MF)**	**High Frequency Cetaceans (HF)**	**Phocid Pinnipeds (PW)**	**Otariid Pinnipeds (OW)**
Non-impulsive Noise	199	198	173	201	219
Impulsive Noise	183	185	155	185	203

Calculation of PTS impact isopleths under the new guidance utilized the methods presented in the *2018 Revision to Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* and the most recent version of the associated User Spreadsheet Tool (NMFS 2018). The spreadsheet accounts for effective hearing ranges using Weighting Factor Adjustments (WFAs), and this application uses the recommended values therein. Activity durations were estimated based on similar project experience (e.g., PND 2016, 2020).

5.2.2. Updated Peak Sound Threshold Guidance, TTS and PTS

In addition to thresholds for cumulative noise exposure, onset thresholds for peak sound pressures must be considered for impulsive sources (impact pile driving). Peak sound pressure level (SPL_{PK}) is defined as "the greatest absolute instantaneous sound pressure within a specified time interval and frequency band" (NMFS 2018) (Table 5-2).

Table 5-2. Underwater SPL_{PK} thresholds for impulsive noise (NMFS 2018).

UNDERWATER - (dB re: 1 µPa)					
Source	**Low Frequency Cetaceans (LF)**	**Mid-Frequency Cetaceans (MF)**	**High Frequency Cetaceans (HF)**	**Phocid Pinnipeds (PW)**	**Otariid Pinnipeds (OW)**
TTS Onset	213	224	196	212	226
PTS Onset	219	230	202	218	232

5.2.3. Interim Sound Threshold Guidance, Behavioral Disturbance

The updated guidance described above does not address behavioral disturbance from underwater or airborne noise. The interim sound threshold guidance previously published by NMFS and summarized in Table 5-3 will be used for estimating exposure behavioral disturbance isopleths (NMFS 2015).

Airborne noise thresholds have not been established for cetaceans (NMFS 2015), and no adverse impacts are anticipated from airborne noise to cetaceans in the project area.

Table 5-3. Behavioral disturbance thresholds (NMFS 2015).

<table>
<tr><th colspan="3">UNDERWATER - (dB re: 1 µPa)</th></tr>
<tr><th>Source</th><th colspan="2">Cetaceans & Pinnipeds</th></tr>
<tr><td>Non-impulsive Noise</td><td colspan="2">120</td></tr>
<tr><td>Impulsive Noise</td><td colspan="2">160</td></tr>
<tr><th colspan="3">AIRBORNE - (dB re: 20 µPa)</th></tr>
<tr><th>Source</th><th>Harbor Seals</th><th>Other Pinnipeds</th></tr>
<tr><td>All Source Types</td><td>90</td><td>100</td></tr>
</table>

Per the NMFS (2015) interim guidance, the practical spreading loss model was used to determine the zones in which pinnipeds and cetaceans have the potential to face behavioral disturbance from underwater noise. The formula for calculating practical spreading loss in *underwater noise* is:

$$TL = GL \times \log \frac{R_2}{R_1}$$

where:

TL = transmission loss (dB),

GL = geometric loss coefficient (15 is the only value allowed without real-time sound source verification)

R_2 is the range to the target sound pressure level (m)

R_1 is the distance from the source of the initial measurement (m)

Per the NMFS (2015) interim guidance, the spherical spreading loss model was used to determine the zones in which pinnipeds and cetaceans have the potential to face behavioral disturbance from airborne noise. The formula for calculating spherical spreading loss in *airborne noise* is:

$$TL = GL \times \log \frac{R_2}{R_1}$$

where:

TL = transmission loss (dB),

GL = geometric loss coefficient (20 is the standard value)

R_2 is the range to the target sound pressure level (m)

R_1 is the distance from the source of the initial measurement (m)

6. HARASSEMENT ESTIMATES FOR MARINE MAMMALS

6.1. Calculated Isopleths

Table 6-1 and Table 6-2 summarize the PTS onset and behavioral disturbance isopleths for underwater vibratory and impact sources, respectively. NMFS acoustic calculator reports are provided in Appendix C for both vibratory and impact sources.

Table 6-1. Calculated isopleths from underwater vibratory sources (primary method).

	PTS Onset Isopleth (m)					Behavioral Disturbance Isopleth (m)
Source	Low Frequency Cetaceans (LF)	Mid-Frequency Cetaceans (MF)	High Frequency Cetaceans (HF)	Phocid Pinnipeds (PW)	Otariid Pinnipeds (OW)	Cetaceans & Pinnipeds
Temporary template piles (Pipe piles ≤ 24”) (Installation)	5.2	0.5	7.7	3.2	0.2	1,847.8
Temporary template piles (Pipe piles ≤ 24”) (Removal)	5.2	0.5	7.7	3.2	0.2	1,847.8
(Alternate) template piles (H-piles 14”) (Installation)	2.8	0.2	4.2	1.7	0.1	1,000.0
(Alternate) template piles (H-piles 14”) (Removal)	2.8	0.2	4.2	1.7	0.1	1,000.0
Anchor piles (H-piles 14”)	2.8	0.2	4.2	1.7	0.1	1,000.0
Sheet piles ”20" PS31 or similar)	18.2	1.6	26.9	11.1	0.8	5,168.1
Fender piles (pipe piles”36")	43.2	3.8	63.8	26.2	1.8	21,544.3
Gravel fill	0.4	0.0	0.7	0.3	0.0	71.3

Table 6-2. Calculated isopleths from underwater impact sources (secondary method).

	PTS Onset Isopleth (m)					Behavioral Disturbance Isopleth (m)
Source	Low Frequency Cetaceans (LF)	Mid-Frequency Cetaceans (MF)	High Frequency Cetaceans (HF)	Phocid Pinnipeds (PW)	Otariid Pinnipeds (OW)	Cetaceans & Pinnipeds
Temporary template piles (Pipe piles ≤ 24”) (Installation)	251.6	8.9	299.7	134.7	9.8	857.7

Source	PTS Onset Isopleth (m)					Behavioral Disturbance Isopleth (m)
	Low Frequency Cetaceans (LF)	Mid-Frequency Cetaceans (MF)	High Frequency Cetaceans (HF)	Phocid Pinnipeds (PW)	Otariid Pinnipeds (OW)	Cetaceans & Pinnipeds
(Alternate) template piles (H-piles 14") (Installation)	39.9	1.4	47.5	21.3	1.6	158.5
Anchor piles (H-piles 14")	39.9	1.4	47.5	21.3	1.6	158.5
Sheet piles "20" PS31 or similar)	231.3	8.2	275.5	123.8	9.0	857.7
Fender piles (pipe piles"36")	385.7	13.7	459.4	206.4	15.0	1,584.9

6.2. Marine Mammal Densities

The number of marine mammals that may be exposed to noise is calculated by estimating the likelihood of a marine mammal being present within calculated impact isopleths during the associated activities. Expected marine mammal presence is determined by density estimates from previous survey efforts in regions closest to the proposed project area during construction (Table 6-3). When density estimates for the northern Bering Sea or Norton Sound were not available, density estimates from regions such as the Chukchi Sea and Aleutian Islands were used as a proxy.

Table 6-3. Marine mammal density estimates from previous survey efforts by location, year, and source.

Species	Density Estimate			
	Estimate (animals/km^2)	Location	Date	Source
Bearded seal	0.78	Bering Sea	1976	Braham et al. 1984
	0.07-0.14	Alaskan Chukchi Sea	199-200	Bengtson et al. 2005
	0.003-0.055	Northeastern Chukchi Sea (CSESP)	2008-2011	Aerts et al. 2013
	0.22	Bering Sea	2006	Ver Hoef et al. 2013
	0.39	Bering Sea	2012-2013	Conn et al. 2014
Ringed seal	0.1 – 2.0	Sea of Okhotsk	1964	Canada, GofCNRC 1965
	0.005-0.017	Bering Sea	1976	Braham et al. 1984
	0.81- 1.17	Alaskan Beaufort Sea	1996-1999	Frost et al. 2004
	1.62 – 1.91	Alaskan Chukchi Sea	1999-2000	Bengtson et al. 2005
	0.011-0.091	Northeastern Chukchi Sea (CSESP)	2008-2011	Aerts et al. 2013
Spotted seal	1.5	Bering Sea	1976	Braham et al. 1984
	0.011-0.091	Northeastern Chukchi Sea (CSESP)	2008-2011	Aerts et al. 2013
	0.60	Bering Sea	2012-2013	Conn et al. 2014

Species	Density Estimate			
	Estimate (animals/km^2)	Location	Date	Source
	0.84	Bering Sea	2006	Ver Hoef et al. 2013
Ribbon seal	0.002	Bering Sea	1976	Braham et al. 1984
Steller sea lion	52,932*	Aleutian Islands west of Shumagin Islands Southeast Alaska and Gulf of Alaska east of Shumagin Islands	2018-2019	Sweeny et al. 2018, 2019
Beluga whale	0.121	Norton Sound/Yukon Delta	2000	Lowry et al. 2017
Harbor porpoise	0.012	SEBS	2000	Moore et al. 2002
	0.0035	CEBS	1999	Moore et al. 2002
Killer whale	0.0025	SEBS	2000	Waite et al. 2002
	0.0056	Gulf of Alaska, Aleutian Islands	2001-2003	Zerbini et al. 2007
Gray whale	0.004	Western Beaufort Sea	2015	Ferguson et al. 2018a
	0.002	Northeastern Chukchi	2015	Ferguson et al. 2018a
	0.0013-0.0037	Beaufort Sea (ASAMM)	2011-2014	Owl Ridge 2016 (modified from Clarke et al. 2012, 2013, 2014, 2015).
	0.0016-0.0048	Chukchi Sea (ASAMM)	2011-2014	Owl Ridge 2016 (modified from Clarke et al. 2012, 2013, 2014, 2015).
Minke whale	0.0063	CEBS	1999	Moore et al. 2002
	0.0041	SEBS	2000	Moore et al. 2002

* Steller sea lion numbers are based on estimated number of seals per day (2/day) over the 130 days of construction

Notes: CEBS = central–eastern Bering Sea, SEBS = southeastern Bering Sea, ASAMM = Aerial survey for Arctic Marine Mammals, CSESP = Chukchi Sea Environmental Studies Program

6.2.1. Bearded Seal

In 1976 aerial surveys of bearded seals in the Bering Sea, densities ranged between 0.006 and 0.782 seals/km^2. Bearded seals were typically spotted in groups of one to two individuals with occasional larger groupings in denser areas (Braham et al. 1984). Bengtson et al. (2005) conducted aerial surveys in the Alaskan Chukchi Sea during May and June 1999 and 2000 that ranged from 0.07 to 0.14 seals/km^2 with the highest densities of ringed seals found in coastal waters south of Kivalina and near Kotzebue Sound. In the spring of 2012 and 2013, U.S. and Russian researchers conducted aerial abundance and distribution surveys over the entire ice-covered portions of the Bering Sea (Moreland et al. 2013). Conn et al. (2014), using a sub-sample of the data collected from the U.S. portion of the Bering Sea in 2012, calculated a posterior mean density estimate using an effective study area of 767,114 km^2 of 0.39 bearded seals/km^2 (95% CI 0.32–0.47). Results from 2006 helicopter transect surveys over a 279,880 km^2 subset of the study area calculated density estimates of 0.22 bearded seals/km^2 (95% CI 0.12–0.61; Ver Hoef et al.

2013). Density estimates for bearded seals were calculated during the CSESP from vessel data collected on visual line-transect marine mammal surveys during the open-water season within and near three offshore oil and gas prospects in the northeastern Chukchi Sea during July through October 2008-2010. Density estimates for bearded seals ranged from 0.003 to 0.055 seals/km^2.

A maximum anticipated density of 0.78 seals/km^2 was used in estimated take calculations for bearded seals.

6.2.2. Ribbon Seal

Ribbon seals range from the North Pacific Ocean and Bering Sea into the Chukchi and western Beaufort seas in Alaska. The Bering Sea ice is occupied by ribbon seals from late March to early May. From May to mid-July the ice recedes, and ribbon seals move further north into the Bering Strait and the southern part of the Chukchi Sea (Muto et al. 2022) An estimated 6,000–25,000 ribbon seals from the eastern Bering Sea use the Chukchi Sea during the spring open-water period (Boveng et al. 2017). In 1976 aerial surveys of ribbon seals in the Bering Sea, maximum reported densities were 0.002 seals/km^2 (Braham et al. 1984).

A maximum anticipated density of 0.002 seals/km^2 was used in estimated take calculations.

6.2.3. Ringed Seal

Frost et al. (2004) conducted surveys within 40 km of shore in the Alaskan Beaufort Sea during May-June 1996-1999 and observed ringed seal densities ranging from 0.81 seals/km^2 in 1996 to 1.17 seals/km^2 in 1999. Bengtson et al. (2005) conducted aerial surveys in the Alaskan Chukchi Sea during May-June 1999 and 2000 that ranged from 1.62 to 1.91 seals/km^2 with the highest densities of ringed seals found in coastal waters south of Kivalina and near Kotzebue Sound. In 1976 aerial surveys of ringed seals in the Bering Sea, densities ranged between 0.005 and 0.017 seals per seals/km^2 (Braham et al. 1984). Surveys conducted in 1964 of seals in their breeding grounds in the Sea of Okhotsk found a density of 0.1 to 2 seals/km^2 (Canada, GofCNRC 1965). Density estimates for ringed/spotted seals were calculated during the CSESP from vessel data collected on visual line-transect marine mammal surveys during the open-water season within and near three offshore oil and gas prospects in the northeastern Chukchi Sea during July through October 2008-2010. Ringed and spotted seals were often difficult to differentiate, therefore the category "ringed/spotted seal" was introduced to record seal sightings that could not be identified as either. Density estimates for ringed/spotted seals ranged from 0.011 to 0.091 seals/km^2.

A maximum anticipated density of 0.02 seals/km^2 was used in estimated take calculations.

6.2.4. Spotted Seal

The distribution of spotted seals is seasonally related to the life periods when they haul out on land and when they haul out on sea ice for whelping, nursing, breeding, and molting. From the late-fall through spring spotted seals are distributed where sea ice is available for them to haul out. From summer through fall the seasonal sea ice has melted and spotted seals use land for hauling out (Muto et al. 2022). An estimated 69,000 – 101,000 spotted seals from the eastern Bering Sea use the Chukchi Sea during the spring open-water period (Boveng et al. 2017). The most precise estimates to date are by Braham et al.

(1984), indicating the abundance of seals hauled out in the spring in the eastern Bering Sea ranges between 10,000 and 13,000.

In 1976 aerial surveys of spotted seals in the Bering Sea, densities ranged between 0.013 and 1.834 seals per seals/km^2 (Braham et al. 1984). In the spring of 2012 and 2013, U.S. and Russian researchers conducted aerial abundance and distribution surveys over the entire ice-covered portions of the Bering Sea (Moreland et al. 2013). Conn et al. (2014), using a sub-sample of the data collected from the U.S. portion of the Bering Sea in 2012, calculated a posterior mean density estimate using an effective study area of 767,114 km^2, were 0.60 spotted seals per seals/km^2 (95% CI 0.51–0.73). Results from 2006 helicopter transect surveys over a 279,880-km^2 subset of the study area where calculated density estimates of 0.84 spotted seals per seals/km^2 (95% CI 0.49–2.83; Ver Hoef et al. 2013).

Density estimates for ringed/spotted seals were calculated during the CSESP from vessel data collected on visual line-transect marine mammal surveys during the open-water season within and near three offshore oil and gas prospects in the northeastern Chukchi Sea during July through October 2008-2010. Ringed and spotted seals were often difficult to differentiate, therefore the category “ringed/spotted seal” was introduced to record seal sightings that could not be identified as either. Density estimates for ringed/spotted seals ranged from 0.011 to 0.091 seals per km^2.

A maximum anticipated density of 1.5 seals/km^2 was used in estimated take calculations.

6.2.5. Steller Sea Lion

Steller sea lions found in the Bering Sea are considered part of the Eastern Aleutian region. The most recent comprehensive aerial photographic and land-based surveys of western DPS Steller sea lions in Alaska were conducted during the 2018 (Aleutian Islands west of Shumagin Islands) and 2019 (Southeast Alaska and Gulf of Alaska east of Shumagin Islands) breeding seasons (Sweeney et al. 2018, 2019). The western DPS Steller sea lion pup and non-pup model-predicted counts in Alaska in 2019 were 12,581 (95% credible interval of 11,308-14,051) and 40,351 (35,886-44,884), respectively. The eastern Aleutian Islands region pups and non-pups have showed signs of recovery and have been increasing since the early 2000s.

The nearest Steller sea lion critical habitat to the Port of Nome is on the east shore of St. Lawrence Island, about 140 mi to the southwest. However, Steller sea lions, especially juveniles and non-breeding males, can range through waters far beyond their primary use areas. The NOAA Alaska Fisheries Science Center National Marine Mammal Laboratory (NMML) Alaska Ecosystem Program (AEP) maintains a list of known (*n* = 472) Steller sea lion terrestrial sites (haulouts and rookeries) in the U.S. portion of the sea lion range. The closest known haul-out sites to the project area are located at St. Lawrence Island (150 – 200 mi southwest of Nome) and all known rookeries are > 500 mi southwest of Nome, in the southern Bering Sea and Aleutian Islands. However, sea lions have been spotted hauling out in small numbers at Sledge Island, about 22 mi west of Nome and observations suggest that Steller sea lions are becoming common in the northern Bering Sea, including Norton Sound (Oceana and Kawerak 2014). During the Quintillion subsea fiber optic cable project, a Steller sea lion was recorded within 60 km of Nome during August 2016 (Blees et al. 2017).

In the 2016 UMC IHA application, the City of Unalaska requested authorization for Level B harassment of 923 Steller sea lions (1.9% of the minimum population estimate of the western DPS Steller sea lion). In this IHA application the project area occurred within critical habitat for three major haul-outs and one rookery; NMFS defines Steller sea lion critical habitat by a 20-nm radius (straight-line distance) encircling a major haul-out or rookery.

In the 2018 White Pass and Yukon Route (WP&YR) Railroad Dock Dolphin Installation IHA application in Skagway, WP&YR requested authorization for Level B harassment of 480 Steller sea lions, based on an estimate of 16 animals per day over 30 days of vibratory pile driving (< 1% of the minimum population estimate of the western DPS Steller sea lion). Although there is no critical habitat designated for Steller sea lions within the project area, the nearest critical habitat, the Gran Point haulout, is located approximately 22.5 mi south of the project area.

As there are no available density estimates for Steller sea lions in the northern Bering Sea or Norton Sound region, a maximum Level B harassment of 260 Steller sea lions was estimated, based on an estimate of two animals per day over 130 days of vibratory pile driving (< 0.05% of the population estimate [52,932 sea lions] of the western DPS Steller sea lion).

6.2.6. Beluga Whale

Beluga whales found in Norton Sound during the summer likely belong to the E. Bering Sea stock known to remain in the Bering Sea, migrating south near Bristol Bay in winter and returning north to Norton Sound and the mouth of the Yukon River in summer (Suydam 2009, Hauser et al. 2014, Citta et al. 2017, Lowry et al. 2019). Although it is possible that beluga whales from the E. Chukchi Sea and Beaufort Sea stocks could be observed in Norton Sound, likely it would be during the fall, winter, and spring as both stocks migrate between the Bering and Beaufort seas. The Beaufort Sea stock departs the Bering Sea in early spring, migrate through the Chukchi Sea and into the Canadian waters of the Beaufort Sea where they remain in the summer and fall, returning to the Bering Sea in late fall. The E. Chukchi Sea stock departs the Bering Sea in late spring and early summer, migrate through the Chukchi Sea and into the western Beaufort Sea where they remain in the summer, returning to the Bering Sea in the fall.

Dedicated aerial surveys for beluga whales in the Norton Sound/Yukon Delta region of Alaska were conducted during May, June, and September 1992, June 1993–95, June 1999–2000, and June 2017 (Lowry et al. 2017, Ferguson et al. 2018b). In all years except 1999 when there was extensive sea ice in the area, belugas were common off the Yukon Delta and in southern Norton Sound. In most years they were also seen in central Norton Sound. Density and abundance were estimated from the 2000 survey as it represented the most recent data and had the most complete and systematic coverage of the area, resulted in a density of 0.121 belugas/km^2 and corrected abundance of 6,994 beluga whales. The 2017 survey results corrected abundance estimate was 9,242 belugas (Ferguson et al. 2018b).

A maximum anticipated density of 0.121 belugas/km^2 was used in estimated take calculations.

6.2.7. Harbor Porpoise

Density estimates for harbor porpoise were derived from vessel survey data collected on visual line-transect surveys for cetaceans in the central–eastern Bering Sea (CEBS) in July and August 1999, and in the southeastern Bering Sea (SEBS) in June and July 2000 (Moore et al. 2002). Harbor porpoise were seen throughout the coastal (shore to 50 m) and middle shelf (50-100 m) zones in the SEBS with sighting in the coastal zone over four times that of the middle shelf zone. There were relatively few harbor porpoise in the CEBS. Density for harbor porpoise in the CEBS was 0.0035 porpoise/km^2 and in the SEBS was 0.012 animals/km^2. A maximum anticipated density of 0.012 porpoise/km^2 was used in estimated take calculations.

6.2.8. Killer Whale

Line transect ship surveys were conducted in July and August of 2001-2003 in coastal waters of the western Gulf of Alaska and the Aleutian Islands (Zerbini et al. 2007) and presented overall (resident and transient) killer whale density among the highest in the world at 5.6 whales/1000 km^2. Although density estimates are from waters south of the project area, Waite et al. (2002) estimated 391 (95% CI = 171-894) killer whales of all types in the southeastern Bering Sea using line-transect methods and indicates that density of killer whales is also high in this area (2.5 whales/1000 km^2).

A maximum anticipated density of 0.0056 whales/km^2 was used in estimated take calculations.

6.2.9. Gray Whale

Limited density numbers are available for gray whale densities in the Bering Sea and near Norton Sound. Gray whale density estimates are available from visual observations made on an unmanned aircraft system (UAS) in August and September 2015 in the northeastern Chukchi and western Beaufort Seas (Ferguson et al. 2018a). Density estimates for gray whales were 0.002 whales/km^2 in the west area (northeastern Chukchi Sea) and 0.004 whales/km^2 in the east area (western Beaufort Sea). Gray whale uncorrected densities were calculated in the Quintillion IHA application based on gray whale sighting data from the Arctic Survey for Marine Mammals (ASAMM) and the application of an effective strip half-width (ESW) of 1.15 (Ferguson and Clarke 2013). Calculated whale densities per km^2 varied between 0.0013 whales/km^2 (Beaufort summer), 0.0037 whales/km^2 (Beaufort fall), 0.0048 whales/km^2 (Chukchi summer), and 0.0016 whales/km^2 (Chukchi fall) (Owl Ridge 2016).

A maximum anticipated density of 0.005 whales/km^2 was used in take calculations.

6.2.10. Minke Whale

Density estimates for minke whales were derived from vessel survey data collected on visual line-transect surveys for cetaceans in the central–eastern Bering Sea (CEBS) in July and August 1999, and in the southeastern Bering Sea (SEBS) in June and July 2000 (Moore et al. 2002). Density for minke whales in the CEBS was 0.0041 whales/km^2 and in the SEBS was 0.0063 whales/km^2.

A maximum anticipated density of 0.0063 whales/km^2 was used in estimated take calculations.

6.3. Calculation of Estimated Takes by Activity

The acoustical footprint (i.e., the total ensonified area) were mapped based on the calculated impact isopleths in Table 6-1 and accounting for shoreline areas and existing infrastructure. Rates of take for each species were estimated as follows:

- For species with an available estimated abundance based on sightings per area (i.e., density estimates from previous survey effort; animals per km2), this number was multiplied by the acoustical footprint for each activity for vibratory methods (Table 6-4) and impact methods (Table 6-5).

- For Steller sea lions since no density estimates were available, numbers were based estimated number of seals per day (2 per day) over the 130 days of construction for vibratory (Table 6-4) and 83 days of construction for impact methods (Table 6-5).
- The number of days for each activity was increased by a contingency of 10% to account for the possibility of construction overages.
- Vibratory pile driving is the primary method to be used during this Project. The total requested Level B takes (presented in Table 6-6) are based on vibratory methods only. All Level B acoustical footprints for vibratory methods were larger than and encompassed the acoustical footprints associated with impact driving. Therefore, take numbers from vibratory methods were chosen to ensure conservative estimation.

Table 6-4. Estimated days of construction, ensonification zone and number of takes by species and activity for vibratory pile driving (primary method).

		Temporary Template Piles (24" Installation)	Temporary Template Piles (24" Removal)	Anchor piles (H-piles 14")	Sheet piles (20" PS31 or similar)	Fender piles (pipe piles 36")	Gravel Fill	*Total Days of Construction*
	Days of Construction[1]	14	14	3	63	3	33	*130*
	Ensonification Zone (km^2)	8.41	8.41	2.96	50.46	751.9	0.01	
Species	**Density (# / km^2)**	**Number of Estimated Takes per Activity**						**Total Takes**
Pinnipeds								
Bearded seal	0.78	91.8	91.8	6.9	2,479.7	1,759.5	0.4	4,430.2
Ribbon seal	0.002	0.2	0.2	0.0	6.4	4.5	0.0	11.4
Ringed seal	0.02	2.4	2.4	0.2	63.6	45.1	0.0	113.6
Spotted seal	1.5	176.6	176.6	13.3	4,768.6	3,383.7	0.7	8,519.5
Steller sea lion[2]	2/day	28.0	28.0	6.0	126.0	6.0	66.0	260.0
Odontocetes								
Beluga whale	0.121	14.2	14.2	1.1	384.7	273.0	0.1	687.2
Harbor porpoise	0.012	1.4	1.4	0.1	38.1	27.1	0.0	68.2
Killer whale	0.0056	0.7	0.7	0.0	17.8	12.6	0.0	31.8
Mysticetes								
Gray whale	0.005	0.6	0.6	0.0	15.9	11.3	0.0	28.4
Minke whale	0.0063	0.7	0.7	0.1	20.0	14.2	0.0	35.8

[1] Number of days for each activity was increased by a contingency of 10 percent to account for the possibility of construction overages
[2] Steller sea lion numbers are based estimated number of seals per day (2/day) over the 130 days of construction

Table 6-5. Estimated days of construction, ensonification zone and number of takes by species and activity for impact pile driving (secondary method).

		Temporary Template Piles (24" Installation)	Anchor piles (H-piles 14")	Sheet piles (20" PS31 or similar)	Fender piles (pipe piles 36")	*Total Days of Construction*
	Days of Construction[1]	14	3	63	3	*83*
	Ensonification Zone (km^2)	2.22	0.08	2.22	6.53	
Species	**Density (# / km^2)**	**Number of Estimated Takes per Activity**				**Total Takes**
Pinnipeds						
Bearded seal	0.78	24.3	0.2	109.2	15.3	148.9
Ribbon seal	0.002	0.1	0.0	0.3	0.0	0.4
Ringed seal	0.02	0.6	0.0	2.8	0.4	3.8
Spotted seal	1.5	46.7	0.4	210.0	29.4	286.4
Steller sea lion[2]	2/day	43.9	9.4	197.3	9.4	260.0
Odontocetes						
Beluga whale	0.121	3.8	0.0	16.9	2.4	23.1
Harbor porpoise	0.012	0.4	0.0	1.7	0.2	2.3
Killer whale	0.0056	0.2	0.0	0.8	0.1	1.1
Mysticetes						
Gray whale	0.005	0.2	0.0	0.7	0.1	1.0
Minke whale	0.0063	0.2	0.0	0.9	0.1	1.2

[1] Number of days for each activity was increased by a contingency of 10 percent to account for the possibility of construction overages.
[2] Steller sea lion numbers are based estimated number of seals per day (2/day) over the 130 days of construction

The estimated take as a percentage of the marine mammal stock is 2 percent or less in all cases except beluga whales (Table 6-6). The highest percent of population estimated to be taken is for the beluga whales when calculated based on abundance estimates for the E. Bering Sea stock only. This unrealistically assumes that all takes would occur only from this stock of the three stocks potentially present. Assuming mixing of the three stocks during spring and fall migrations of the E. Chukchi Sea Stock and Beaufort Sea Stock, if all three stocks abundance estimates were used (i.e., 8,357 for E. Bering Sea stock + 8,875 for E. Chukchi Sea Stock + 32,453 for Beaufort Sea stock) the percent of the population would be less than 2 percent (Table 6-6).

Table 6-6. Level B take request and percentage of stock.

Species	Total Requested Level B Takes[1]	Abundance (minimum)	Percent Population
Pinnipeds			
Bearded seal	4,431	273,676	1.6%
Ribbon seal	12	163,086	0.007%
Ringed seal	114	158,507	0.07%
Spotted seal	8,520	423,237	2%
Steller sea lion	260	52,932	0.5%
Odontocetes			
Beluga whale (E. Bering Sea stock)	688	5,173[2]	13.3%
Beluga whale (All 3 Stocks)		*46,5015[3]*	*1.5%*
Harbor porpoise	69	4,130	1.7%
Killer whale	32	2,084	1.5%
Mysticetes			
Gray whale (E. North Pacific and W. North Pacific stocks)	29	26,120[4]	0.11%
Minke whale	36	NA	NA

[1] Total takes rounded up from total presented in Table 6-4
[2] Beluga whale abundance estimate is for Eastern Bering Sea stock only
[3] Beluga whale abundance estimate is for all three stocks (5,173 for E. Bering Sea stock + 8,875 for E. Chukchi Sea Stock + 32,453 for Beaufort Sea stock
[4] Gray whale abundance estimate is for Eastern North Pacific (25,849) and Western North Pacific (271) stocks combined

7. ANTICIPATED IMPACT OF THE ACTIVITY ON THE SPECIES OR STOCK

7.1. Introduction

The proposed Project has the potential to impact marine mammals by increasing noise levels. Likely effects may include temporary behavioral responses to non-injurious noise from in-water construction activities and minor alteration in foraging or resting areas. Underwater sounds will likely minimally displace schools of forage fish in the action area. ESA-listed species may experience some energetic cost from short term dispersal of prey, resulting in short term expenditure of energy seeking other sources or waiting for prey to re-aggregate following noise effects.

7.2. Noise

Pinnipeds and cetaceans are sensitive to underwater and airborne noise. Recent studies have shown that even moderate levels of underwater noise can cause a temporary loss in hearing sensitivity in some marine mammals (Kastak et al. 2005). Increases in noise levels from in-water activities can reduce a marine mammal's capability to hear other noises, like background noise and noise created by their prey and predators, otherwise known as auditory masking (Southall et al. 2007). This results in difficulties with communication, predator avoidance, and prey capture, among others. Anthropogenic sounds can also result in behavioral modification, including changes in foraging and habitat use or separation of mother and infant pairs (MMC 2007).

Marine mammals can also experience changes in sensitivity to sounds after exposure to intense sounds for long periods. These changes, called threshold shifts, can occur on a temporary or permanent level, depending on the intensity of the sound and length of time to which the animal is exposed to the sound. Typically, TTS includes impacts to middle-ear muscular activity, increased blood flow, and general auditory fatigue (Southall et al. 2007). At the TTS level, the animals do not experience a permanent change in hearing sensitivity and exhibit no signs of physical injury. PTS would occur if the animal subjected to the increased sound level did not return to pre-exposure conditions within an order of weeks or if the animal exhibited physical injuries (Southall et al. 2007).

The proposed Project will have the possibility of resulting in Level B harassment of pinnipeds and cetaceans. Level B harassment is temporary in nature, and the impacts associated with the potential harassment resulting from this Project will be temporary. Mitigation measures discussed in Section 11 are expected to minimize the risk for potential PTS or Level A harassment.

8. ANTICIPATED IMPACTS ON SUBSISTENCE USES

8.1. Potential Impact on Subsistence Hunting

A Plan of Cooperation (POC) will be distributed to potentially affected communities and subsistence organizations. The plan will be revised and adapted using community input, and communication will remain ongoing throughout the Project. The POC is attached as Appendix D of this application and summarizes known concerns such as: 1) potential impacts from underwater noise caused by project activities, 2) potential access limitations to subsistence areas caused by the construction of the new dock, and 3) potential impacts to subsistence vessel and marine mammal movements due to increases in vessel activity once the port modifications are completed. As part of the POC, USACE will continue to engage with potentially affected communities and subsistence organizations to minimize and mitigate any negative impacts from the project activities.

8.2. Marine Mammal Species used for Subsistence

Marine mammal species under NMFS jurisdiction that may occur in the project area which are known to be harvested for subsistence during open-water months (May through October) include beluga whale, four species collectively known as ice seals (ringed seal, bearded seal, ribbon seal, and spotted seal), and Steller sea lion.

8.2.1. Beluga Whale

The Eastern Bering Sea stock of beluga whales are harvested by nine Norton Sound communities (Elim, Golovin, Koyuk, Nome/Council, Saint Michael, Shaktoolik, Stebbins, Unalakleet, and White Mountain) (NSB 2022). Of the nine communities, Frost and Suydam (2010) reported the highest annual harvest at Koyuk (n=55) and an annual average of 0.6 belugas harvested by Nome. Hunters have reported to harvest beluga on the west side of Cape Nome, all the way from Cape Nome to Nome, and from Nome west to Sledge Island (Oceana and Kawerak 2014). Beluga subsistence areas between spring and fall are documented between Cape Nome to Cape Darby and around the east coastline of Norton Sound to Stewart Island (Oceana and Kawerak 2014).

8.2.2. Ice Seals

Ice seals are hunted within Norton Sound region. Georgette et al. (1998) summarizes a subsistence survey of six Norton Sound-Bering Strait communities (Mainland coastal: Brevig Mission, Golovin, Shaktoolik, and Stebbins; Offshore: Savoonga and Gambell) between 1996 and 1997 and reports seals taken for subsistence in all months, with seasonal peaks in spring (May-June) and fall (September-October).

Bearded seals, preferred for their large size and quality of meat, were harvested by all communities, but Gambell had the highest harvest rate of any community. Bearded seals are typically harvested in early summer as they migrate northward.

Spotted seals, valued for their skins, are reported in large numbers during ice-free months (Georgette et al. 1998). Spotted seals occur closer to shore, allowing for easier harvesting than bearded seals or walrus, which occur further from shore and for a shorter window as they migrate north more quickly (Oceana and

Kawerak 2014). Ringed seals, the most abundant and accessible, were harvested in all months and taken in higher numbers than other species from the mainland coastal communities.

Ribbon seals were reported to be present in Norton Sound "only occasionally" and are more common in the open areas near Brevig Mission, Gambell, and Savoonga (Georgette et al. 1998). Ribbon seals are harvested less than other seals because their distribution does not overlap with most hunting areas and their taste is not preferred (Oceana and Kawerak 2014).

8.2.3. Steller Sea Lion

During the 1996-1997 survey, no Steller sea lions were reported as hunted, however, hunters in Gambell, Savoonga, and Brevig Mission reported they do hunt for them occasionally (Georgette et al. 1998). Additionally, only 20 Steller sea lions were reported taken between 1992 and 1998 (NMFS 2008, Wolf and Mishler 1999, Wolf and Hutchinson-Scarbrough 1999). Steller sea lions occasionally haul out on Sledge Island (Oceana and Kawerak 2014).

8.2.4. Potential Impacts to Subsistence Species

Beluga whales have been traditionally hunted in Norton Sound; however, project impacts are not expected to reach traditional harvest areas. USACE will coordinate with local subsistence groups to avoid or mitigate impacts to beluga whale harvests.

Project activities avoid traditional ice seal harvest windows, so are not expected to negatively impact hunting of ice seals. USACE will coordinate with local subsistence groups to avoid or mitigate impacts to ice seal harvests.

Steller sea lions are not frequently harvested in Norton Sound, but USACE will coordinate with local subsistence groups to avoid or mitigate potential impacts to Steller sea lion harvests.

9. ANTICIPATED IMPACTS ON HABITAT

9.1. Critical Habitat

Critical habitat is defined as "specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations for protection" and "specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation." Critical habitat typically supports unique foraging, refugia, or reproductive habitat features.

Critical habitat addressed in the sections below include the species—bearded seal and ringed seal—for which Level B take is being requested and have critical habitat overlapping with the Port of Nome project area. Critical habitat overlapping with the vessel transit route is addressed in Section 4.8 of the 4MP (Appendix A).

9.1.1. Bearded Seal and Ringed Seal Critical Habitat

Critical habitat for the bearded seal and ringed seal was designated in May 2022 and include marine waters within one specific area in the Bering, Chukchi, and Beaufort seas including waters off the coast of Nome (Figure 9-1, Figure 9-2).

Essential features established by NMFS for conservation of the bearded seal DPS are:

1. Sea ice habitat suitable for whelping and nursing, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 25 percent concentration and providing bearded seals access to those waters from the ice.
2. Sea ice habitat suitable as a platform for molting, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 15 percent concentration and providing bearded seals access to those waters from the ice.
3. Primary prey resources to support bearded seals: Waters 200 m or less in depth containing benthic organisms, including epifaunal and infaunal invertebrates, and demersal fishes.

Essential features established by NMFS for conservation of the ringed seal are:

1. Snow-covered sea ice habitat suitable for the formation and maintenance of subnivean birth lairs used for sheltering pups during whelping and nursing, which is defined as waters 3 m or more in depth (relative to MLLW) containing areas of seasonal landfast (shorefast) ice or dense, stable pack ice, which have undergone deformation and contain snowdrifts of sufficient depth to form and maintain birth lairs (typically at least 54 cm deep).
2. Sea ice habitat suitable as a platform for basking and molting, which is defined as areas containing sea ice of 15 percent or more concentration in waters 3 m or more in depth (relative to MLLW).

3. Primary prey resources to support Arctic ringed seals, which are defined to be small, often schooling, fishes, in particular, Arctic cod (*Boreogadus saida*), saffron cod (*Eleginus gracilis*), and rainbow smelt (*Osmerus dentex*), and small crustaceans, in particular, shrimps and amphipods.

Further assessment of potential impacts of the project to bearded seal and ringed seal critical habitat is outlined below using essential features established by NMFS.

9.1.2. Sea Ice Habitat

For bearded seals sea ice is an essential feature for whelping, nursing, and molting. For ringed seals sea ice habitat is an essential feature for basking and molting and snow-covered sea ice habitat is essential for the formation and maintenance of subnivean birth lairs for whelping and nursing. The Project is scheduled to occur during the summer and open-water season; therefore, no sea ice is expected to be present and no impacts on sea ice habitat are expected to occur.

9.1.3. Prey Resources

Dredging of the nearshore environment for the construction of the OCSP dock would result in increased suspended sediment load in the water column, but any such effects would be minor and likely restricted to the area within approximately 200 ft (60 m) of the dredging activity. Dredging would result in the destruction and burial of benthic invertebrates in the rubblemound causeway footprint; however, any effects would be minor given the amount of available habitat of this type within Norton Sound, and the Bering, Chukchi and Beaufort seas. Therefore, construction of the dock, dredging of the rubblemound causeway footprint, and construction vessel traffic would not be expected to have an effect on the bearded seal prey species (benthic organisms including epifaunal and infaunal invertebrates, and demersal fishes) and ringed seal prey species (Arctic cod, saffron cod, rainbow smelt, and small crustaceans, [shrimps and amphipods]). Sound generated by construction activities (including pile driving, gravel fill, and vessels) and physical disturbance of the fish habitat would be negligible, if they were to occur.

9.1.4. Area of Potential Impact

The bearded seal and ringed seal critical habitat areas do not include permanent manmade structures such as boat ramps, docks, and pilings that were in existence within the legal boundaries as of May 2, 2022. Therefore, the current dock and causeway footprints are not included, however the area of potential impact outside of the existing dock and causeway as well as the anticipated ensonification area are within the seals' critical habitat. The proposed area of impact (i.e., largest potential ensonification area during in-water noise activities[2]) including the dredging footprint and construction is 751.9 km^2, 0.11 percent of the approximate 667,000 km^2 of critical habitat for the bearded seal (Figure 9-1) and 0.12 percent of the approximate 603,500 km^2 of critical habitat for the ringed seal (Figure 9-2). Based on this small percentage of impact area overlapping with the bearded seal and ringed seal critical habitat, impacts are expected to be negligible, if they were to occur.

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[2] Derived from behavioral disturbance isopleth for vibratory sheet pile driving area (see Table 6-1)

Bearded Seal Critical Habitat

Area of Potential Impact

NAD 83 Alaska Albers

US Army Corps of Engineers®

PND ENGINEERS, INC.

BEARDED SEAL CRITICAL HABITAT AREA

Port of Nome Modifications Project
Request for Incidental Harassment Authorization

SCALE: 0 50 100 200 Mi; 0 50 100 200 Km

FIGURE: 9-1

PND_016.aprx, 1/19/2023 12:01 PM R02

Ringed Seal Critical Habitat

Area of Potential Impact

NAD 83 Alaska Albers

US Army Corps of Engineers®

PND ENGINEERS, INC.

RINGED SEAL CRITICAL HABITAT AREA

Port of Nome Modifications Project
Request for Incidental Harassment Authorization

SCALE: 0 50 100 200 Mi; 0 50 100 200 Km

FIGURE: 9-2

PND_017.aprx, 1/30/2023 4:43 PM, R02

9.2. Direct Impacts

The primary reason that animals might leave habitats in the project area would be due to elevated noise levels. Construction activities will likely have temporary impacts on listed species foraging or resting habitat through increases in underwater and airborne sound from project activities. Project-related disturbances might be detectable at beaches nearby the City of Nome, however no heavily used haulouts are known nearby. Effects will be short-term and are not anticipated to extend beyond the construction phase of the Project. Best management practices and mitigation used to minimize potential environmental effects from project activities are described in Section 11 and the 4MP.

While it is possible that pinnipeds and cetaceans may avoid the project area during construction, they are not likely to abandon the site altogether.

9.3. Indirect Impacts

Indirect effects to marine mammals, such as noise-induced dispersal or disaggregation of prey, would be insignificant and discountable due to the temporary nature of the activity. After activities cease each day, it is expected that forage fish will re-aggregate and become more available.

9.4. Cumulative Impacts

The sum of these effects is not expected to adversely modify habitat or jeopardize the local populations of marine mammals. Current and habitual use of the dock is expected to continue at existing levels. As this project proposes no significant long-term effects to protected species or their habitat, it is not expected to contribute significantly to cumulative impacts with other potential projects.

10. ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

The construction of the dock and causeway, and potential increase in the presence of vessels, will result in both an extremely minor loss of benthic habitat and a very small increase in features for fish. However, this loss would be insignificant and discountable regarding a permanent loss or modification of habitat. Therefore, the proposed project is not likely to result in the permanent loss or modification of any marine mammal habitat.

11. MITIGATION MEASURES

The following mitigation measures will be implemented during in-water construction activities to ensure the least practicable adverse impact, to minimize the effects of authorized impacts, and to record unavoidable, observable effects.

The proposed project avoids impacts as much as practicable, but impacts cannot be avoided entirely as this project is dependent on maritime access by nature. The following measures and BMPs will be incorporated by the applicant to minimize potential impacts:

11.1. Noise Mitigation

Noise levels will be minimized during construction by the use of 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.

11.2. In-Water or Over Water Construction Activities

During all in-water or over-water construction activities that have the potential to affect marine mammals, a shutdown zone of 10 m will be monitored to ensure that marine mammals are not endangered by physical interaction with construction equipment.

11.3. Dredging Activities

During all 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.

11.4. Monitoring and Shutdown Procedures

Qualified observers with stop-work authority will be on site before and during any in-water or over-water construction. Observers will conduct monitoring activities in accordance with protocols reviewed and approved by NMFS. At least the minimum number of observers necessary to view the entire monitoring area will be onsite, depending on construction activities, environmental conditions, and harbor activities. A detailed 4MP is found in Appendix A.

All marine mammal species authorized under the IHA issued for in-water construction activities associated with the Port of Nome Modification Project entering the harassment zones will be recorded. NMFS will be notified and consulted if a non-authorized species or species for which an authorized take has been met is observed in a harassment zone. If any marine mammal is observed approaching a shutdown zone, in-water activities will cease.

11.5. Vessel Interactions

To avoid harassment-take to marine mammals, USACE is proposing to implement the following mitigation measures during vessel transit:

- USACE will conduct a vessel captain briefing prior to operations to ensure they understand their obligations in meeting the objectives and requirements the 4MP (Appendix A).
- PSOs or trained project crew will be stationed aboard the vessels during transit to/from Anchorage.

Crews aboard project vessels will follow NMFS's marine mammal viewing guidelines and regulations as practicable. (https://alaskafisheries.noaa.gov/protectedresources/mmv/guide.htm).

Species-specific mitigation measures will be implemented in addition to the NMFS marine mammal guidelines and regulations and are detailed in the 4MP (Appendix A).

12. PLAN OF COOPERATION

A Plan of Cooperation (POC) was prepared for this project and is included as Appendix D. The focus of the POC is to minimize potential adverse impacts to local subsistence harvest of marine mammals. USACE will coordinate with potentially affected community and subsistence groups, as described in the POC, to mitigate any other identified negative impacts to subsistence activities.

13. MONITORING AND REPORTING

Monitoring and reporting potential acoustical impacts to local marine mammals are fully addressed in the 4MP attached as Appendix A.

14. SUGGESTED MEANS OF COORDINATION

All data recorded during marine mammal monitoring of the proposed project will be provided to NMFS in the 90-day monitoring report. This report will provide details on marine mammal presence and usage in the project area. The monitoring data will inform NMFS and future applicants requesting authorization under the MMPA about the behavior and adaptability of pinnipeds and cetaceans for future projects of a similar nature.

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APPENDICES

Appendix A. Marine Mammal Monitoring and Mitigation Plan

Marine Mammal Monitoring and Mitigation Plan
Port of Nome Modification Project
Nome, Alaska

April 2023

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TABLE OF CONTENTS

List of Tables

List of Figures

Appendices

ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
BA	Biological Assessment
ESA	Endangered Species Act
IHA	Incidental Harassment Authorization
km	kilometer
LOC	Letter of Concurrence
m	meter
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
OCSP	OPEN CELL SHEET PILE™ system
POC	Plan of Cooperation
PTS	Permanent Threshold Shift
PSO	Protected Species Observer
SDEZ	Susitna Delta Exclusion Zone
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1. INTRODUCTION

1.1. Project Description

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) is being 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.

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 Port of Nome Modification project (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 in an L-shape as well as provide approximately 2,030 feet 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 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.

US Army Corps of Engineers®

PND ENGINEERS, INC.

PROJECT LOCATION AND VICINITY

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

SCALE: 0 2 4 Mi / 0 3 6 Km

FIGURE: 1-1

US Army Corps of Engineers

PND Engineers, Inc.

EXISTING LAYOUT - PORT OF NOME

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

SCALE:	FIGURE:
NA	1-2

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

2. IHA AUTHORIZATION

This 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, minke whales, gray whales, killer whales, harbor porpoises, and beluga whales.

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).

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.[1]

[1] 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[1]	Shutdown Zone[2] (m)			Harassment Zone[3]	Minimum Recommended Number of PSOs[4]
		Unauthorized Species	Authorized Cetaceans[5]	Authorized Pinnipeds[6]	Authorized Cetaceans[5] & Pinnipeds[6]	
Temporary template piles (24" pipe)	Vibratory Installation/Removal	Visible range[7]	10	10	2,000	1
	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[7]	30	20	5,200	3
	Impact Installation	1,000	300	150	1,000	1
Fender piles (Pipe piles 36")	Vibratory Installation	Visible range[7]	70	30	21,600	3
	Impact Installation	1,600	500	210	1,600	1
Gravel fill[8]	Conventional Machinery	100	10	10	100	1
Dredging	Conventional Machinery	300	300	300	300	1

[1]The project includes vibratory pile installation and removal as a primary method and impact pile installation as a secondary method
[2]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
[3]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
[4]See section 4.1 for descriptions of PSO monitoring locations
[5]Authorized cetacean species include beluga whale, minke whale, gray whale, harbor porpoise, and killer whale
[6]Authorized pinniped species include bearded seal, ringed seal, spotted seal, ribbon seal, and Steller sea lion
[7]Anticipated visible range from the monitoring locations is estimated to be 2,000 m in fair weather
[8]The 10-m shutdown zone applies during all in-water and over-water construction activities not otherwise listed in this table

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.

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-inch sheet piles and 36-inch 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 will be calculated for the two pile types that have harassment zones that exceed the observable area (2,000 m): the 20-inch sheet and the 36-inch fender pile. Assumed take will be calculated using the harassment zones, observable area, unobservable area, and sighting rate during ensonification 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), and the unobservable area is the area within the harassment zone that PSOs cannot effectively monitor (e.g., greater than 2,000 m; Appendix A; Figure A-2, Figure A-4, Figure A-5). The sighting rate will be calculated based on the total number of sightings within the observable area during the total hours of observation effort during ensonification for the specific pile type. The assumed take will be calculated by multiplying sighting rate by the unobservable area. Assumed take will be added to the real-time take numbers for total take estimation.

3. PROTECTED SPECIES OBSERVERS

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, the Biological Opinion (BiOp), 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, the BiOp, 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.

4. MITIGATION MEASURES

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 and final BiOp.

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 three) 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-inch) and fender piles (36-inch). However, PSO 1 will be able to closely monitor the applicable shutdown zones at or near the pile driving activities and PSOs 2 and 3 will monitor from the shoreline approximately 3.5 km to the east and west 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. 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-inch), Anchor H-piles (14-inch), 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 observe for no more than 12-hours per day and rotate in shifts, 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. Pre-Activity Monitoring

The following monitoring methodology will be implemented 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 (30 minutes for ESA-listed species).
- 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 (30 minutes for ESA-listed species), at which point the activity may begin.

4.4. 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.

4.5. 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 re-commence.

4.6. 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.

4.7. 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 following cessation of impact pile driving for a period of 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.

4.8. 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.

4.9. 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, BiOp, 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.

4.9.1. Steller Sea Lion

- Vessels will not approach within 3 nm of Steller sea lion rookery sites (50 CFR 224.103), 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.

4.9.2. 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).

4.9.3. 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 Zone2 (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.
    - All vessels should maintain a speed below 4 knots. 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

[2] 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 low-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.

(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 project crew must observe from a position that affords a view of all waters within a 100-meter radius of all vessels under power (in gear).

4.9.4. North Pacific Right Whale

- Vessels will avoid the North Pacific right whale critical habitat (73 FR 19000), when possible, maintaining a ship log for when vessels enter/exit the North pacific right whale critical habitat.
- Vessels will travel at speeds of 10 knots per hour or less within the boundaries of the North Pacific right whale critical habitat.
- 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).

4.9.5. 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.

5. MEASURES TO REDUCE IMPACTS TO SUBSISTENCE USERS

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.
- 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).

6. REPORTING

6.1. Notification of ESA-listed Species

Observations of ESA-listed species will be reported as required by the BiOp. 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 BiOp.

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, itp.davis@noaa.gov, and 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

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), NMFS Alaska Region (akr.section7@noaa.gov), and to the Alaska regional stranding network (T: 877.925.7773) as soon as feasible. 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.

7. REFERENCES

64 FR 14066. 1999. Part 224 – Endangered Marine and Anadromous Species. Volume 64, No. 55. NMFS, NOAA, U.S. Dept. of Commerce. March 23, 1999. Accessed via https://www.govinfo.gov/content/pkg/FR-1999-03-23/pdf/99-6626.pdf

73 FR 19000. 2008. Endangered and Threatened Species Designation of Critical Habitat for North Pacific Right Whale. Volume 73, No. 68. NMFS, NOAA, U.S. Dept. of Commerce. April 8, 2008. Accessed via https:// https://www.govinfo.gov/content/pkg/FR-2008-04-08/pdf/E8-7233.pdf

National Marine Fisheries Service (NMFS). 2016. Recovery Plan for the Cook Inlet Beluga Whale (*Delphinapterus leucas*). December 2016.

National Marine Fisheries Service (NMFS). 2018. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p.

APPENDICES

Appendix A. Mitigation Zones

Observer Location

Observable Area

US Army Corps of Engineers®

PND ENGINEERS, INC.

OBSERVER LOCATIONS AND OBSERVABLE AREA

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

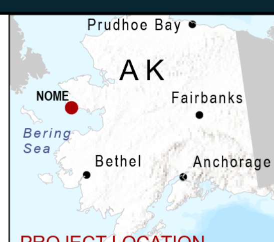
SCALE: 0 0.75 1.5 3 Mi

0 0.75 1.5 3 Km

FIGURE: A-1

PND_010.aprx, 1/26/2023 9:43 AM, R01

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



US Army Corps of Engineers®

PND ENGINEERS, INC.

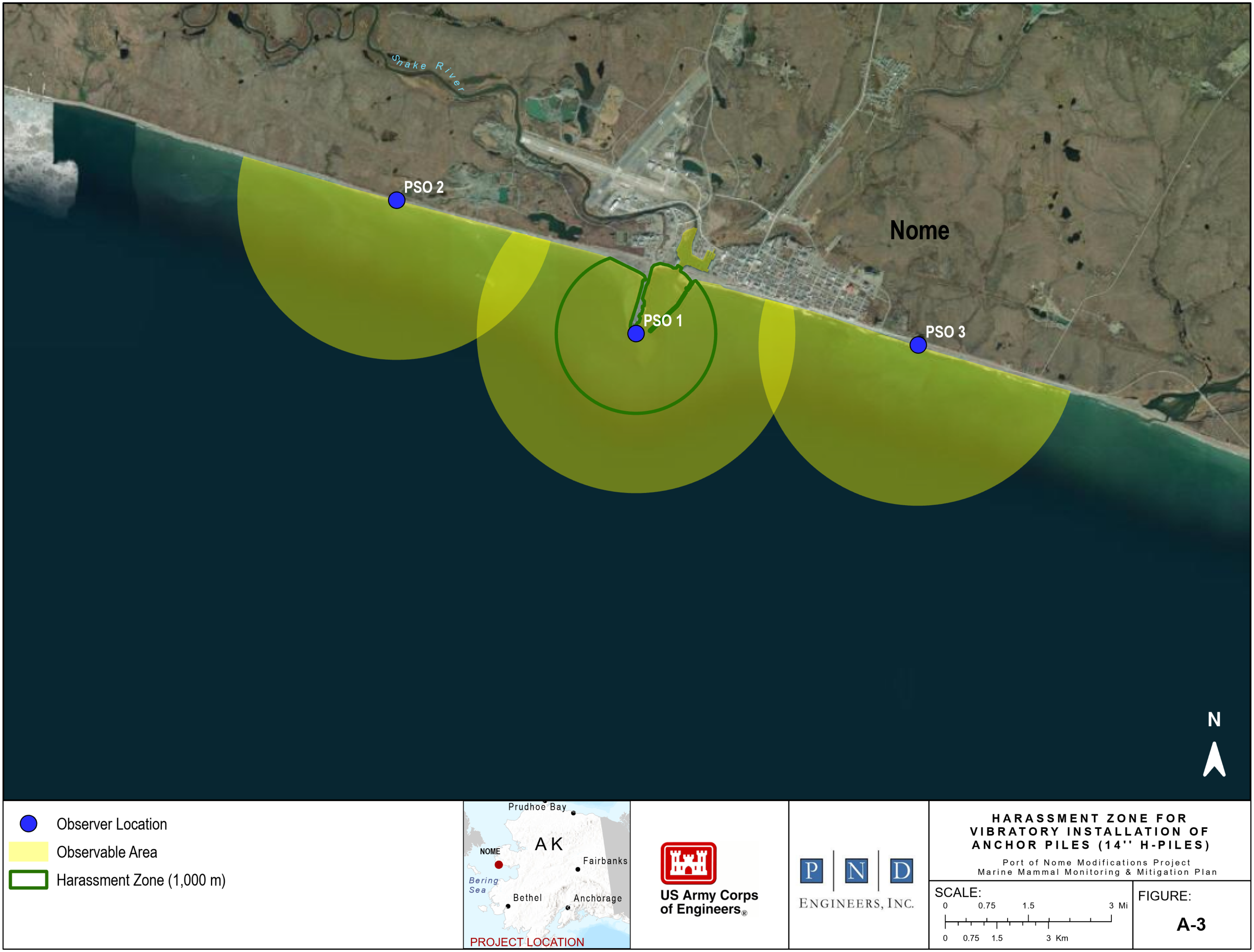
HARASSMENT ZONE FOR VIBRATORY INSTALLATION/REMOVAL OF TEMPORARY TEMPLATE PILES (24'')

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

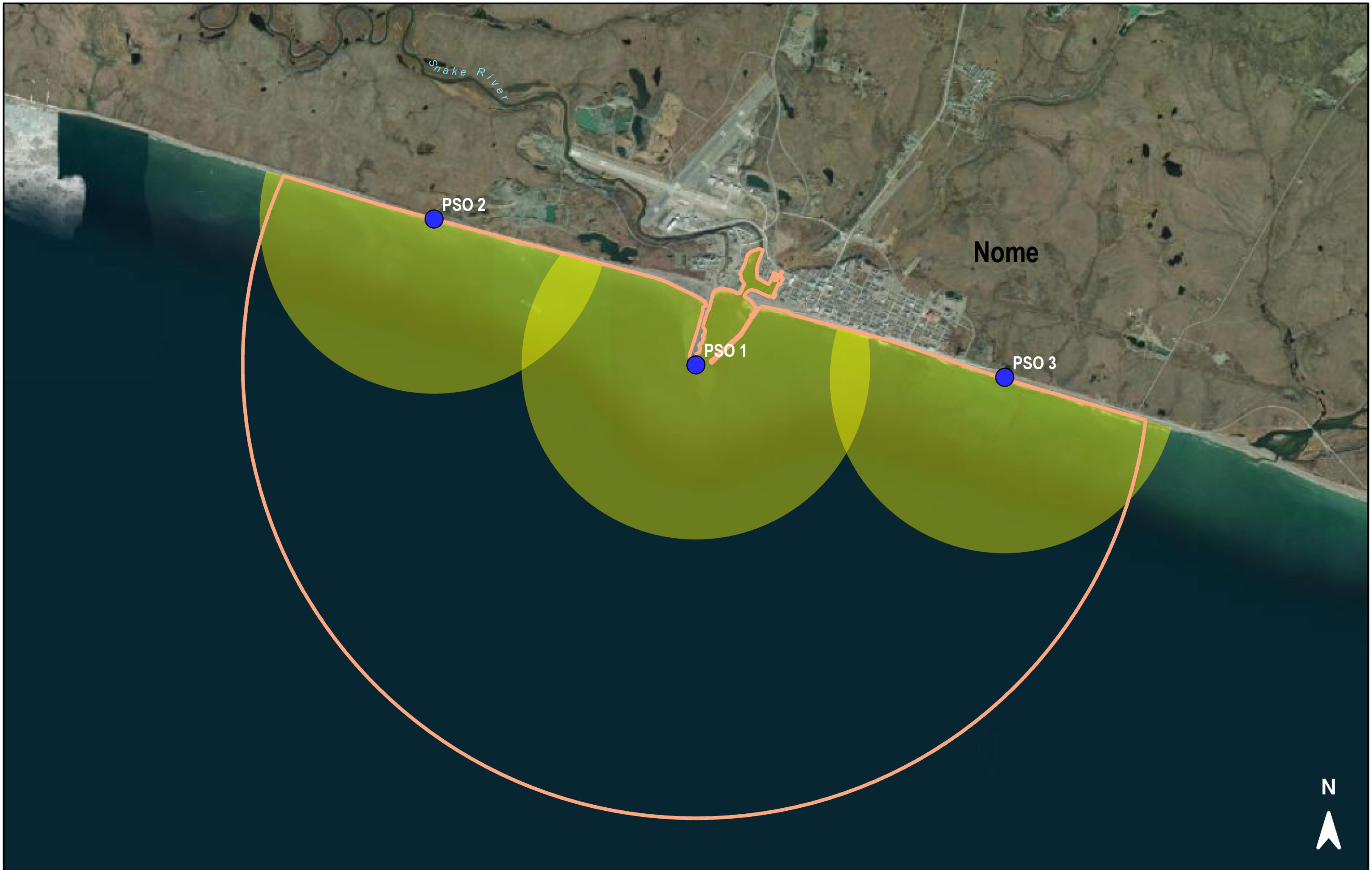
SCALE: 0 0.75 1.5 3 Mi; 0 0.75 1.5 3 Km

FIGURE: **A-2**

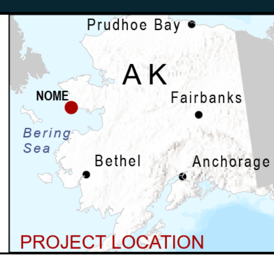
PND_011.aprx, 1/27/2023 1:46 PM, R01



PND_012.aprx, 10/11/2022 5:44 PM, R01



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



US Army Corps of Engineers®

P N D ENGINEERS, INC.

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

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-4

PND_013.aprx, 1/27/2023 2:00 PM, R01

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

US Army Corps of Engineers®

PND ENGINEERS, INC.

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

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

SCALE:
0 2.25 4.5 9 Mi
0 2.5 5 10 Km

FIGURE:
A-5

PND_014.aprx, 1/30/2023 4:17 PM, R01

Observer Location
Observable Area
Monitoring Zone (100 m)

US Army Corps of Engineers®

PND ENGINEERS, INC.

HARASSMENT ZONE FOR GRAVEL FILL

Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

SCALE: 0 0.38 0.75 1.5 Mi; 0 0.4 0.8 1.6 Km

FIGURE: **A-6**

PND_015.aprx, 1/30/2023 5:27 PM, R01

Observer Location

Observable Area

Harassment Zone (300 m)

US Army Corps of Engineers®

PND ENGINEERS, INC.

HARASSMENT ZONE FOR DREDGING

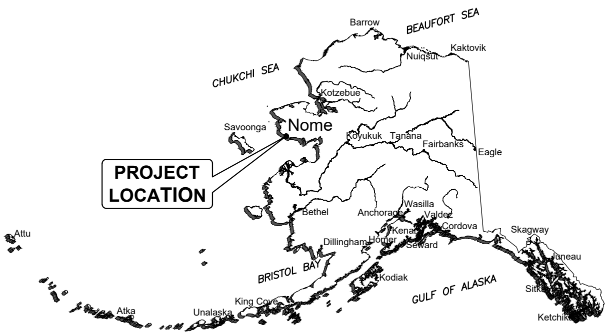
Port of Nome Modifications Project
Marine Mammal Monitoring & Mitigation Plan

SCALE:
0 0.38 0.75 1.5 Mi
0 0.4 0.8 1.6 Km

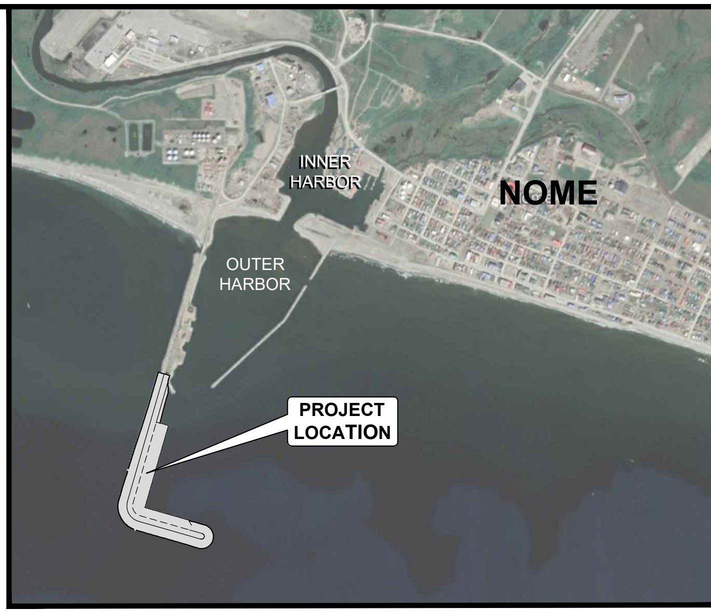
FIGURE:
A-7

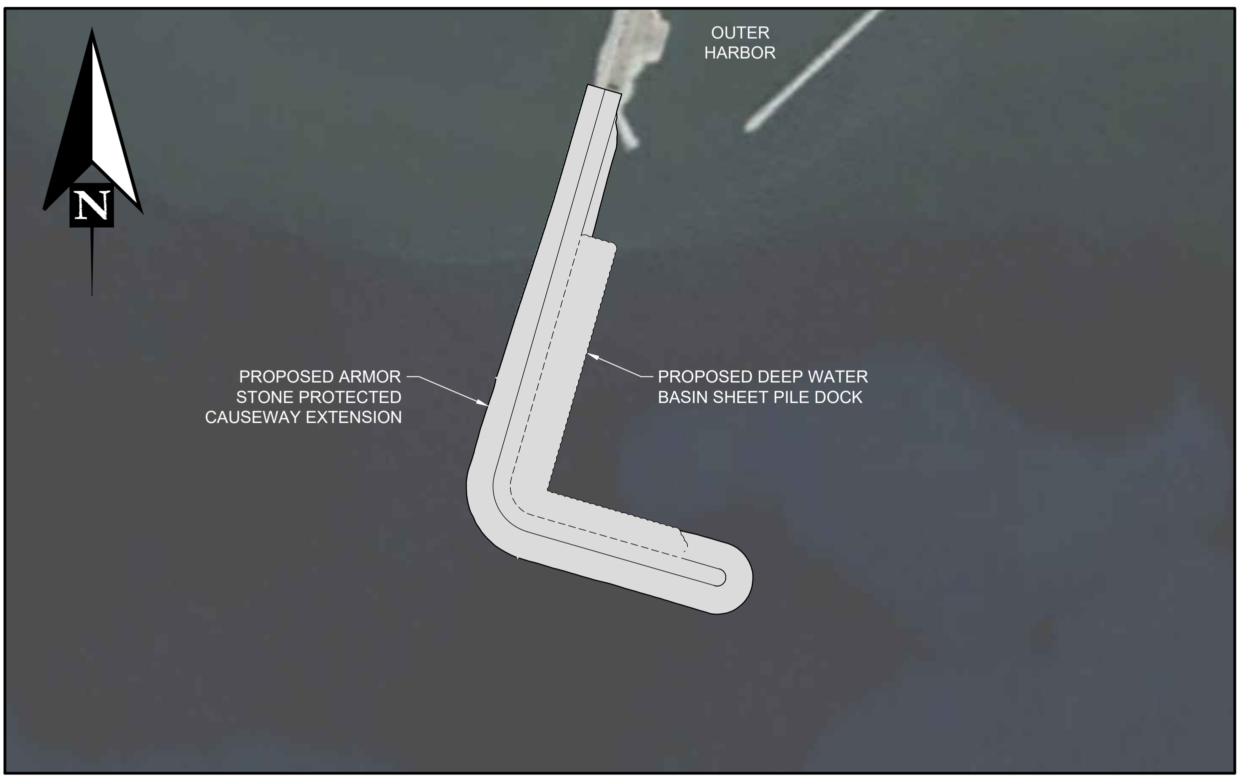
PND_020.aprx, 10/21/2022 7:36 AM, R01

Appendix B. Engineering Design Drawings



STATE OF ALASKA





PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

VICINITY

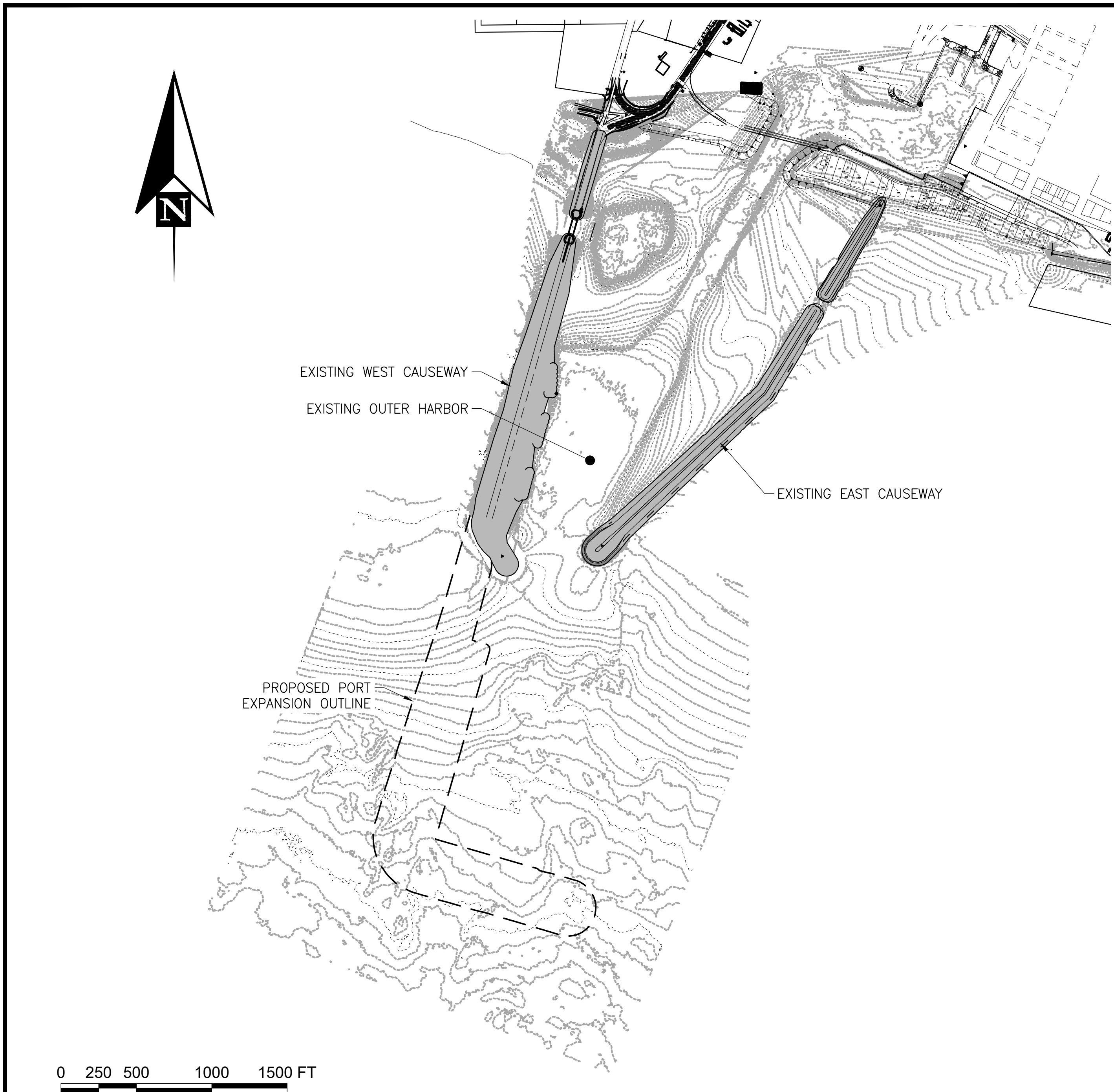
PORT OF NOME
307 BELMONT ST.

NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022 SHEET 1 of 7

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\01 Vicinity.dwg, Sep 9 2022, REV0



PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

EXISTING SITE PLAN

PORT OF NOME
307 BELMONT ST.

PORT of NOME
ALASKA

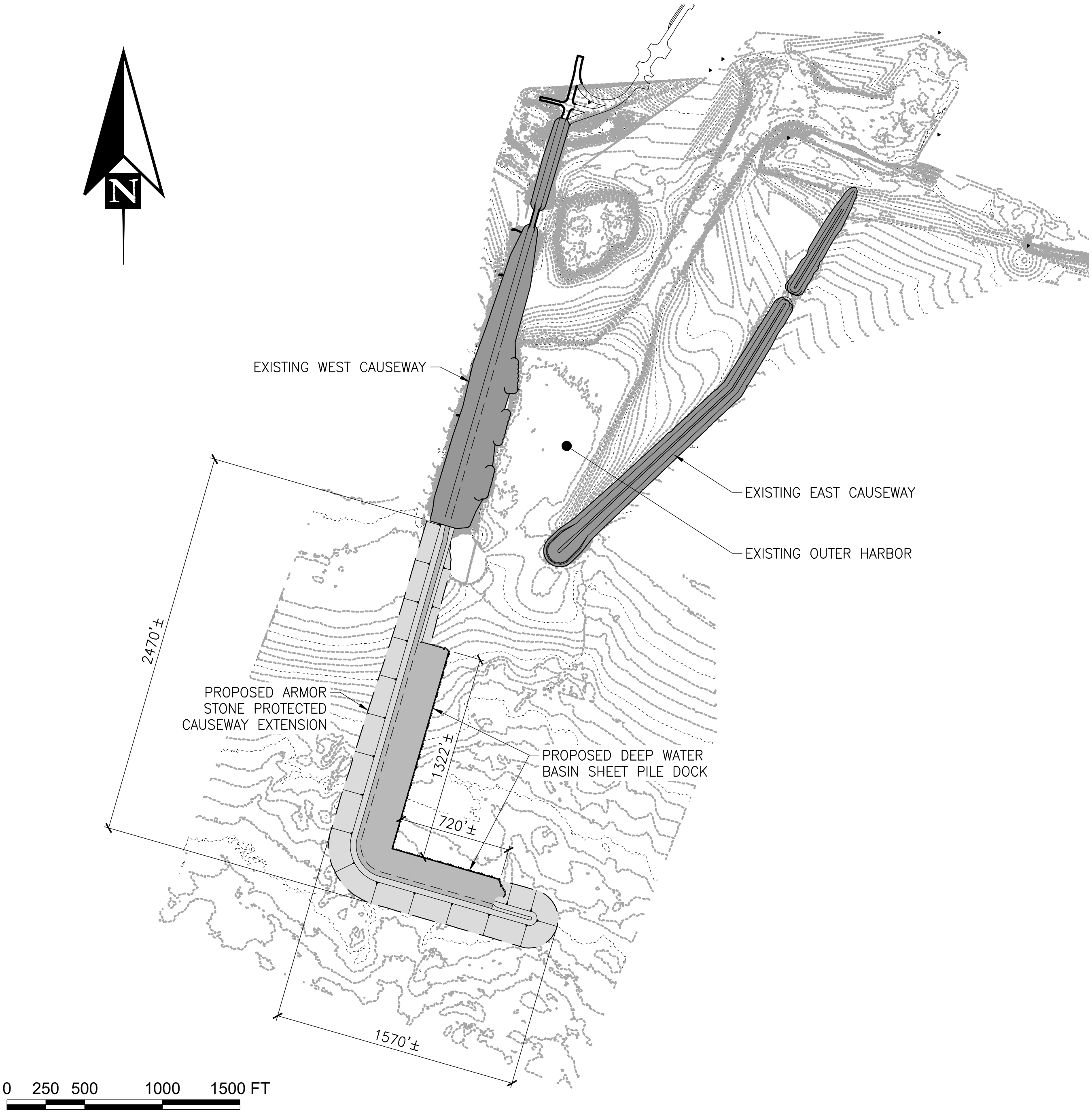
NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022

SHEET **2** of **7**

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\02 Existing Site Plan.dwg, Sep 9 2022, REV0



PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

PROPOSED SITE PLAN

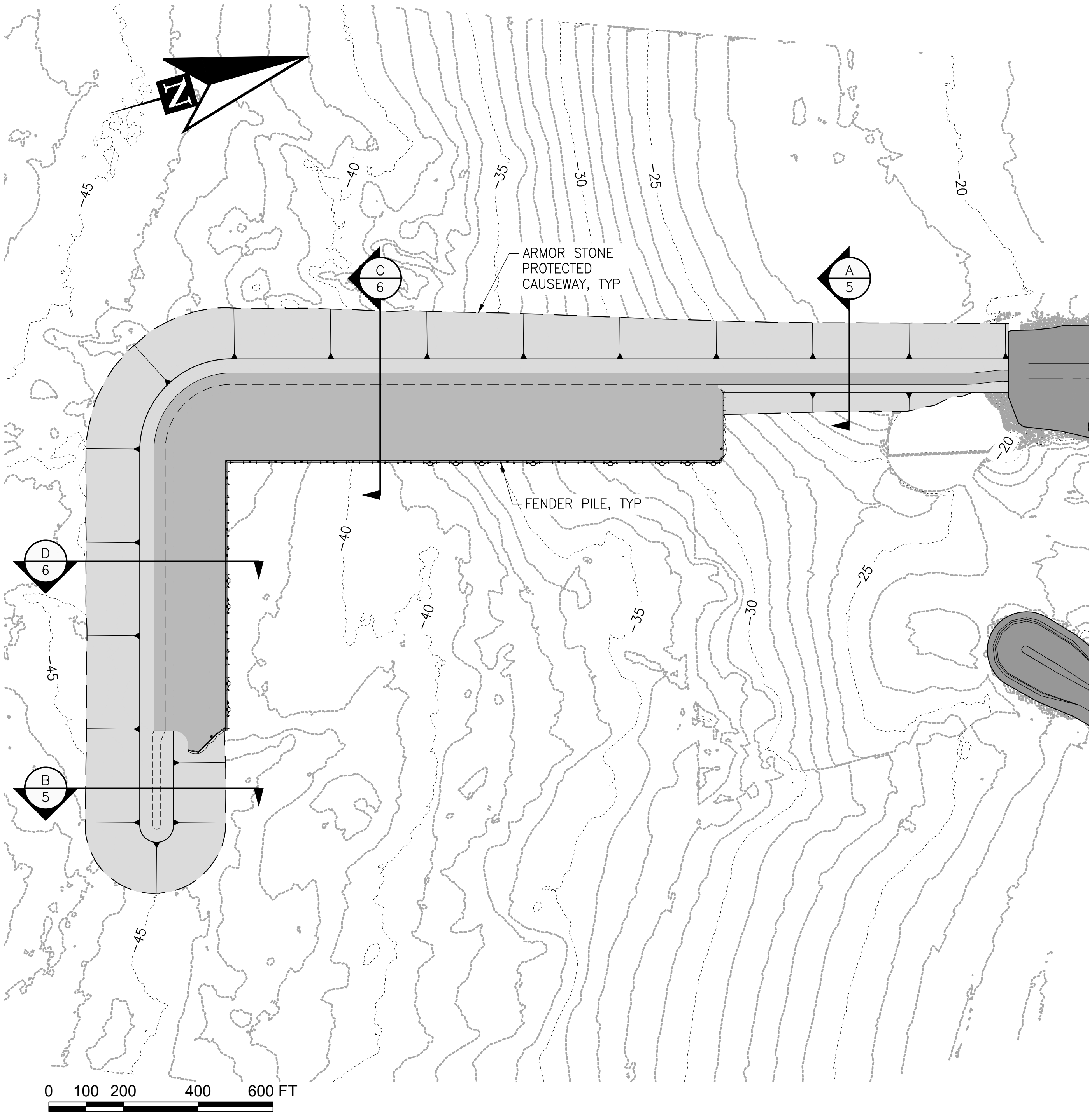
PORT OF NOME
307 BELMONT ST.

NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022 SHEET **3** of **7**

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\03 Proposed Site Plan.dwg, Sep 9 2022, REV0



PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

ENLARGED SITE PLAN

PORT OF NOME
307 BELMONT ST.

PORT of NOME
ALASKA

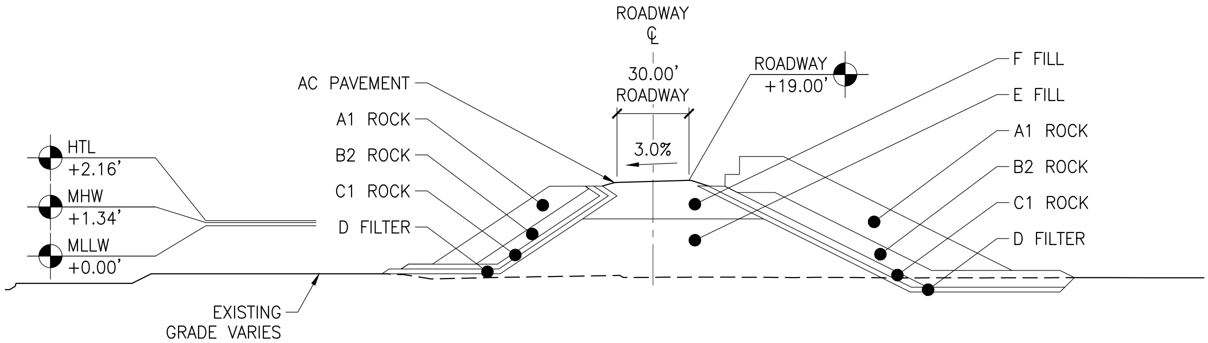
NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022

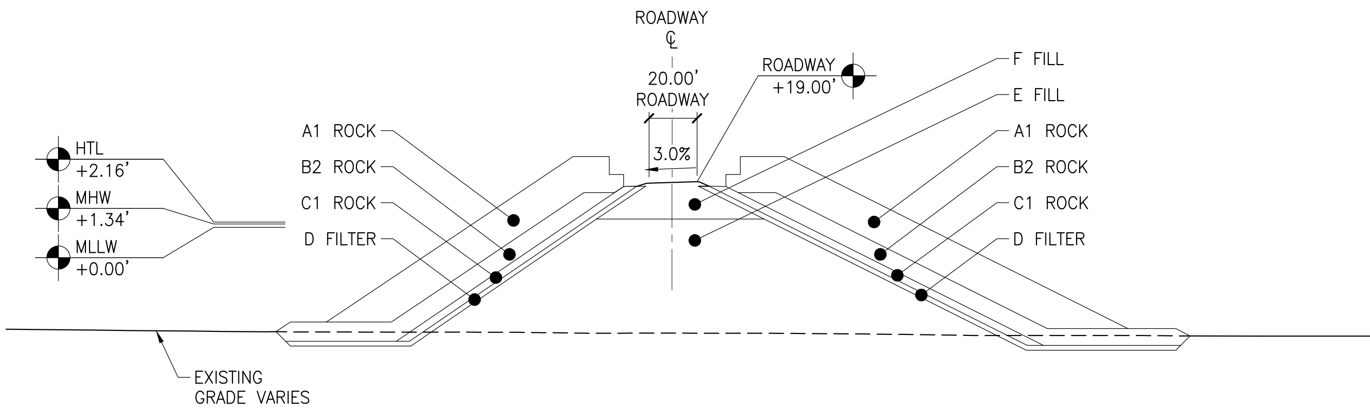
SHEET **4** of **7**

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\04 Enlarged Site Plan.dwg, Sep 9 2022, REV0



A/4 **CAUSEWAY TYPICAL SECTION**

NTS



B/4 **CAUSEWAY TYPICAL SECTION**

NTS

PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

CAUSEWAY TYPICAL SECTIONS

PORT OF NOME
307 BELMONT ST.

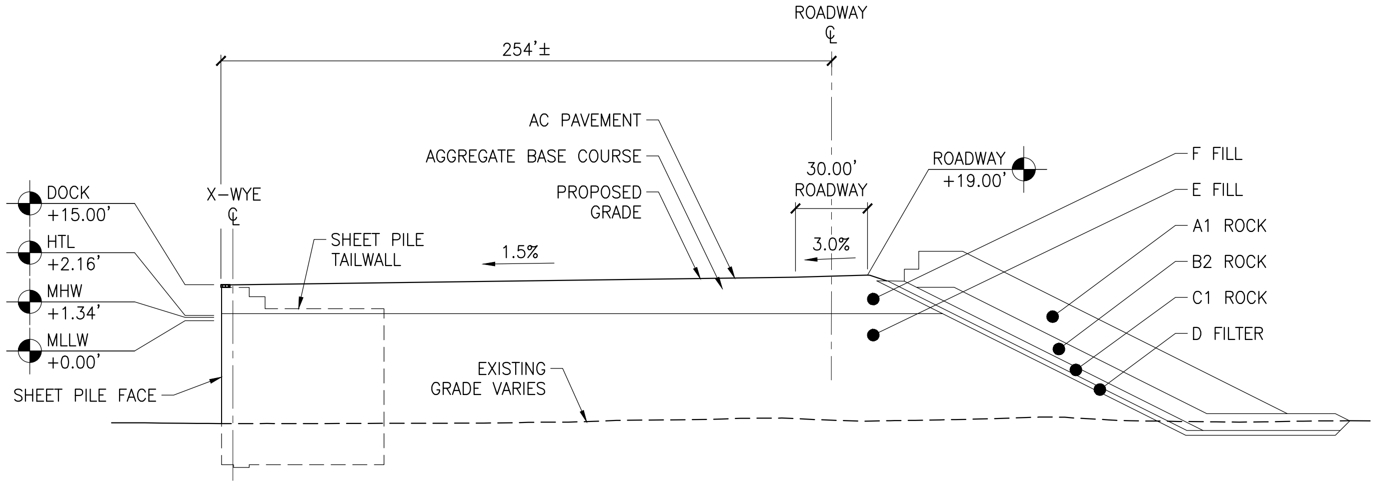
PORT of NOME ALASKA

NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

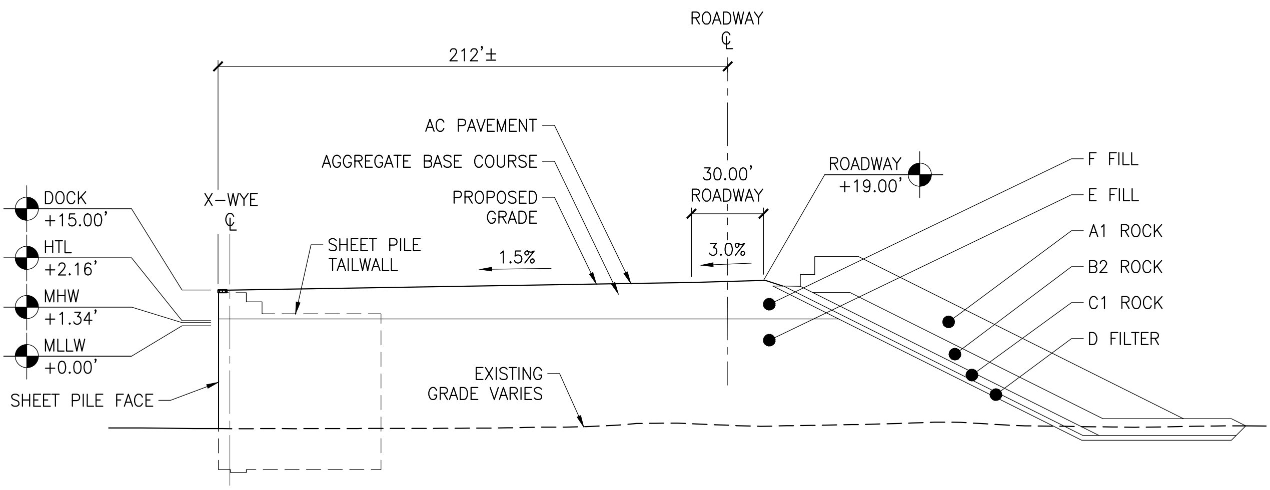
9/09/2022 SHEET **5** of **7**

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\05_06 Typical Sections.dwg, Sep 9 2022, REV0



C / 4 DOCK TYPICAL SECTION

NTS



D / 4 DOCK TYPICAL SECTION

NTS

PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

DOCK TYPICAL SECTIONS

PORT OF NOME
307 BELMONT ST.

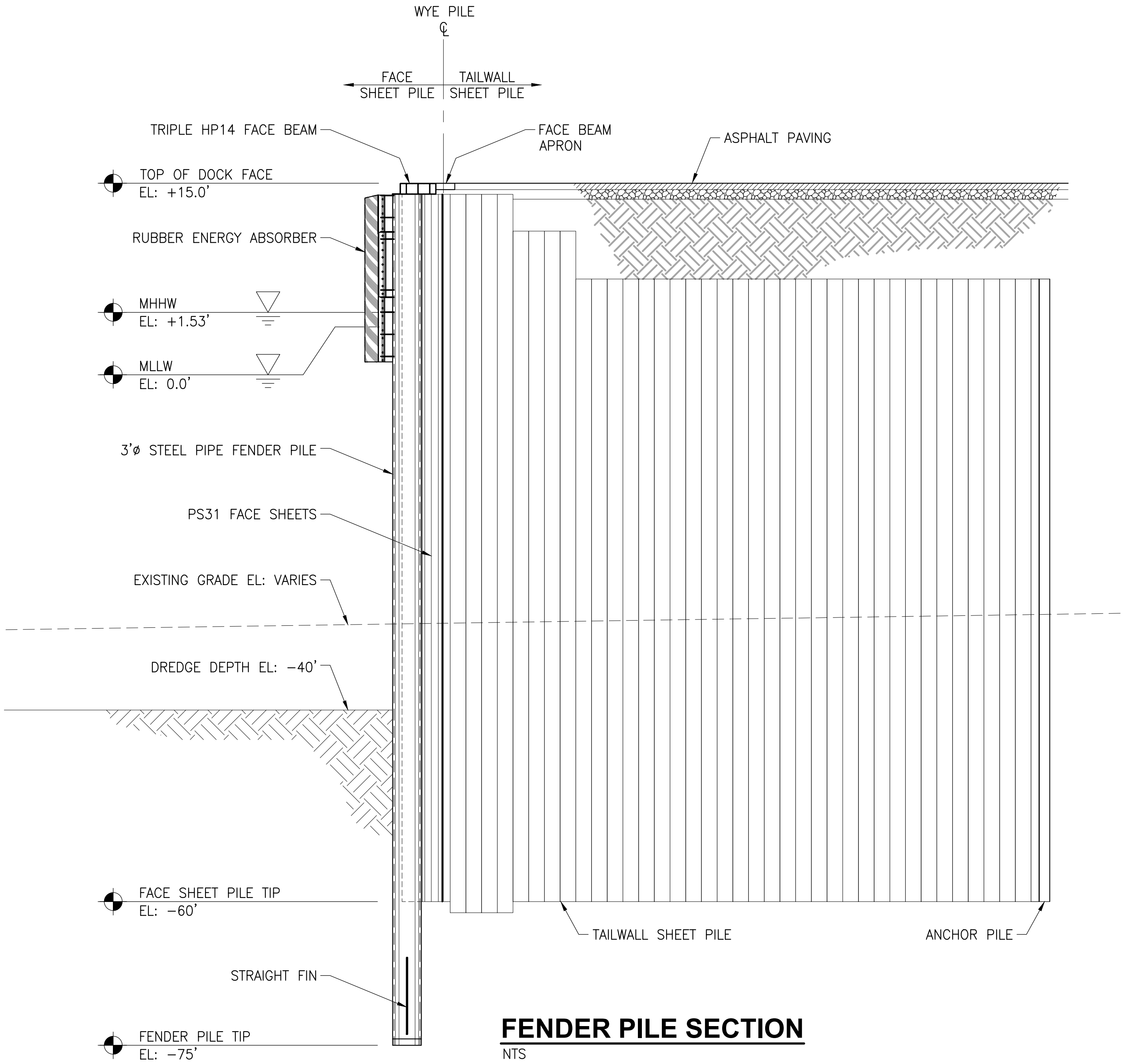
NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022

SHEET **6** of **7**

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\05_06 Typical Sections.dwg, Sep 9 2022, REV0



FENDER PILE SECTION

NTS

PURPOSE:
PROVIDE EXPANSION OF THE PORT FOR SAFE, RELIABLE, AND EFFICIENT NAVIGATION FOR VESSELS OPERATING IN THE HUB PORT OF NOME

FENDER PILE SECTION

PORT OF NOME
307 BELMONT ST.

NOME ARCTIC PORT EXPANSION

AT: BEARING SEA
NOME, AK

9/09/2022

PND CAD File: J:\2021\211102 Nome Arctic Port Expansion Project\Drawings\Permit Drawings\07 Fender Pile Section.dwg, Sep 9 2022, REV0

Appendix C. NMFS Acoustic Calculator Reports

Derived from the Multi-Species Pile Driving Calculator accessed 10/14/2022.

Filename: BLANK Multi-Species (August 2022b) PUBLIC_508_ORPR1.xlsx

https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance#other-nmfs-acoustic-thresholds-and-tools

Vibratory Pile Driving Reports

VIBRATORY PILE DRIVING REPORT

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

VERSION 1.2-Multi-Species: 2022

Example title

PROJECT INFORMATION	RMS
Sound pressure level (dB)	150
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	20
Duration to drive pile (minutes)	10
Duration of sound production in day	12000
Cumulative SEL at measured distance	191

OTHER INFO Anchor Piles (H-Piles 14")

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

NO FISHES

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	10.0
ISOPLETHS (feet)	32.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.1	0.2
ISOPLETHS (feet)	0.4	0.7

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	2.8	0.2	4.2	1.7	0.1
PTS ONSET (SELcum isopleth, feet)	9.2	0.8	13.7	5.6	0.4
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	1,000.0	LF Cet. present			
Behavior (RMS isopleth, feet)	3,280.8				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

Example title

PROJECT INFORMATION	RMS
Sound pressure level (dB)	160.7
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	28
Duration to drive pile (minutes)	10
Duration of sound production in day	16800
Cumulative SEL at measured distance	203

OTHER INFO	Sheet Piles (20")
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

NO FISHES

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	51.7
ISOPLETHS (feet)	169.6

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.7	1.1
ISOPLETHS (feet)	2.4	3.7

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	18.2	1.6	26.9	11.1	0.8
PTS ONSET (SELcum isopleth, feet)	59.8	5.3	88.4	36.3	2.5
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	5,168.1	LF Cet. present			
Behavior (RMS isopleth, feet)	16,955.8				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

Port of Nome Modification Projet | Owl Ridge Natural Resource Consultants

PROJECT INFORMATION	RMS
Sound pressure level (dB)	154
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	20
Duration to drive pile (minutes)	10
Duration of sound production in day	12000
Cumulative SEL at measured distance	195

OTHER INFO Temporary Template Piles (24")

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

NO FISHES

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	18.5
ISOPLETHS (feet)	60.6

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.2	0.4
ISOPLETHS (feet)	0.7	1.3

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	5.2	0.5	7.7	3.2	0.2
PTS ONSET (SELcum isopleth, feet)	17.1	1.5	25.2	10.4	0.7
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	1,847.8	LF Cet. present			
Behavior (RMS isopleth, feet)	6,062.5				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

Port of Nome Modification Projet | Owl Ridge Natural Resource Consultants

PROJECT INFORMATION	RMS
Sound pressure level (dB)	170
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	12
Duration to drive pile (minutes)	10
Duration of sound production in day	7200
Cumulative SEL at measured distance	209

OTHER INFO Fender Piles (36")

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

NO FISHES

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	215.4
ISOPLETHS (feet)	706.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	1.7	4.6
ISOPLETHS (feet)	5.7	15.2

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	43.2	3.8	63.8	26.2	1.8
PTS ONSET (SELcum isopleth, feet)	141.6	12.6	209.4	86.1	6.0
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	21,544.3	LF Cet. present			
Behavior (RMS isopleth, feet)	70,683.6				

VIBRATORY PILE DRIVING REPORT

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

VERSION 1.2-Multi-Species: 2022

Example title

PROJECT INFORMATION	RMS
Sound pressure level (dB)	132.8
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	1
Duration to drive pile (minutes)	660
Duration of sound production in day	39600
Cumulative SEL at measured distance	179

OTHER INFO	Gravil fill
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

NO FISHES

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	0.7
ISOPLETHS (feet)	2.3

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.0	0.0
ISOPLETHS (feet)	0.1	0.1

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	0.4	0.0	0.7	0.3	0.0
PTS ONSET (SELcum isopleth, feet)	1.5	0.1	2.2	0.9	0.1
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	71.3	LF Cet. present			
Behavior (RMS isopleth, feet)	234.1				

Impact Pile Driving Reports

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

Example title

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	200	166	178
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	20		
Number of strikes per pile	20		
Number of strikes per day	400		
Cumulative SEL at measured distance	192		

OTHER INFO	Anchor Piles (14")
NOTES	0
Attenuation	0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	4.0	21.6	39.9	735.6	NO FISHES
Isopleth (feet)	13.1	70.9	131.0	2,413.5	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	1.6	15.8	NO SEA TURTLES
Isopleth (feet)	0.2	5.2	52.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	7.4	0.6	0.1
PTS ONSET (Peak isopleth, feet)	1.8	0.3	24.1	2.1	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	39.9	1.4	47.5	21.3	1.6
PTS ONSET (SEL_{cum} isopleth, feet)	130.8	4.7	155.9	70.0	5.1
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	158.5	LF Cet. present			
Behavior (RMS isopleth, feet)	520.0				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

Example title

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	200	179	189
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	28		
Number of strikes per pile	10		
Number of strikes per day	280		
Cumulative SEL at measured distance	203		

OTHER INFO	Sheet piles (20")
NOTES	0
Attenuation	0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY: Peak Isopleth	ONSET OF PHYSICAL INJURY: SEL_{cum} Isopleth, Fish ≥ 2 g	ONSET OF PHYSICAL INJURY: SEL_{cum} Isopleth, Fish < 2 g	BEHAVIOR: RMS Isopleth	
ISOPLETHS (meters)	8.6	125.3	231.6	3,981.1	NO FISHES
Isopleth (feet)	28.1	411.2	759.9	13,061.3	

SEA TURTLES

	PTS ONSET: Peak Isopleth	PTS ONSET: SEL_{cum} Isopleth	BEHAVIOR: RMS Isopleth	
ISOPLETHS (meters)	0.2	9.2	85.8	NO SEA TURTLES
Isopleth (feet)	0.5	30.3	281.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.2	15.8	1.4	0.2
PTS ONSET (Peak isopleth, feet)	3.8	0.7	52.0	4.5	0.5
PTS ONSET (SEL_{cum} isopleth, meters)	231.3	8.2	275.5	123.8	9.0
PTS ONSET (SEL_{cum} isopleth, feet)	758.9	27.0	903.9	406.1	29.6
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	857.7	LF Cet. present			
Behavior (RMS isopleth, feet)	2,814.0				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

Example title

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	203	178	189
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	20		
Number of strikes per pile	20		
Number of strikes per day	400		
Cumulative SEL at measured distance	204		

OTHER INFO Temporary Template Piles (24")

NOTES 0

Attenuation 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	6.3	136.4	252.0	3,981.1	NO FISHES
Isopleth (feet)	20.7	447.4	826.7	13,061.3	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	10.0	85.8	NO SEA TURTLES
Isopleth (feet)	0.4	32.9	281.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.9	0.2	11.7	1.0	0.1
PTS ONSET (Peak isopleth, feet)	2.8	0.5	38.3	3.3	0.4
PTS ONSET (SEL_{cum} isopleth, meters)	251.6	8.9	299.7	134.7	9.8
PTS ONSET (SEL_{cum} isopleth, feet)	825.6	29.4	983.4	441.8	32.2
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	857.7	LF Cet. present			
Behavior (RMS isopleth, feet)	2,814.0				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

Example title

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	200	183	193
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	12		
Number of strikes per pile	20		
Number of strikes per day	240		
Cumulative SEL at measured distance	207		

OTHER INFO Fender Piles (36")

NOTES 0

Attenuation 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	18.5	209.0	386.2	7,356.4	NO FISHES
Isopleth (feet)	60.6	685.7	1,267.0	24,135.2	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.3	15.4	158.5	NO SEA TURTLES
Isopleth (feet)	1.1	50.5	520.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	385.7	13.7	459.4	206.4	15.0
PTS ONSET (SEL_{cum} isopleth, feet)	1,265.3	45.0	1,507.2	677.1	49.3
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	1,584.9	LF Cet. present			
Behavior (RMS isopleth, feet)	5,199.8				

Appendix D. Plan of Cooperation

Plan of Cooperation

Port of Nome Modification Project

Version 1

April 2023

Prepared for:

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Anchorage, AK 99503

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Document Number: PND003-22-007F2

TABLE OF CONTENTS

List of Tables

List of Figures

Appendices

ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
BA	Biological Assessment
CAP	Continuing Authorities Program
ESA	Endangered Species Act
IFREA	Integrated Feasibility Report and Environmental Assessment
IHA	Incidental Harassment Authorization
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NSB	North Slope Borough
OCSP™	OPEN CELL SHEET PILE™
POC	Plan of Cooperation
USACE	U.S. Army Corps of Engineers

1. INTRODUCTION

1.1. Project Description

This Plan of Cooperation (POC) 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) is being prepared in accordance with Section 7(c) of the Endangered Species Act (ESA) regarding the potential effects on federally listed species and marine mammals and their habitats. Additional details of the proposed project, environmental baseline, and potential impacts are described in the project's IHA Application linked below:

- Incidental Harassment Authorization Application: <*link to be inserted when published to agency website*>

1.1.1. Project Location

The Port of Nome, located in Sitŋasuaq (Nome) 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 Port of Nome Modification project (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 in an L-shape as well as provide approximately 2,030 feet 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 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. This POC covers just Year 1 of Phase 1 but may be revised as the project continues in subsequent years.

US Army Corps of Engineers

P N D ENGINEERS, INC.

PROJECT LOCATION AND VICINITY

Port of Nome Modifications Project
Plan of Cooperation

SCALE: 0 25 50 100 Mi / 0 25 50 100 Km

FIGURE: 1-1

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US Army Corps of Engineers®

P N D ENGINEERS, INC.

EXISTING LAYOUT - PORT OF NOME

Port of Nome Modifications Project
Plan of Cooperation

SCALE:	FIGURE:
NA	1-2

PND_018.aprx, 10/11/2022 2:25 PM

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 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 feet 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 (i.e., 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 for amor stone installation, pile driving of temporary template piles, and an estimated 35 percent installation of the sheet piles (Table 1-1) 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.

1.1.3. Affected Species

Marine mammal species that may occur in the project area which are known to be harvested for subsistence during open-water months (May through October) include ringed seal, bearded seal, ribbon seal, and spotted seal (these four species are collectively known as ice seals), Steller sea lion, Pacific walrus, and beluga whale. This POC will be provided to both National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) as a requirement of the IHA because they have joint jurisdiction over marine mammals, thus Pacific walrus are included in the affected species.

1.1.3.1. Beluga Whale

The Eastern Bering Sea stock of beluga whales are harvested by nine Norton Sound communities (Elim, Golovin, Koyuk, Nome/Council, Saint Michael, Shaktoolik, Stebbins, Unalakleet, and White Mountain) (NSB 2022). Of the nine communities, Frost and Suydam (2010) reported the highest annual harvest at Koyuk (n=55) and an annual average of 0.6 belugas harvested by Nome. Hunters have reported to harvest beluga on the west side of Cape Nome, all the way from Cape Nome to Nome, and from Nome west to Sledge Island (Oceana and Kawerak 2014). Beluga subsistence areas between spring and fall are documented between Cape Nome to Cape Darby and around the east coastline of Norton Sound to Stewart Island (Oceana and Kawerak 2014).

1.1.3.2. Ice Seals

Ice seals, including bearded, ringed, spotted, and ribbon seals, are hunted within the Bering Strait region. Georgette et al. (1998) summarizes a subsistence survey of six Norton Sound-Bering Strait communities (Mainland coastal: Brevig Mission, Golovin, Shaktoolik, and Stebbins; Offshore: Savoonga and Gambell) between 1996 and 1997 and reports seals taken for subsistence in all months, with seasonal peaks in spring (May-June) and fall (September-October).

Bearded seals, preferred for their large size and quality of meat, were harvested by all communities, but Gambell had the highest harvest rate of any community. Bearded seals are typically harvested in early summer as they migrate northward.

Spotted seals, valued for their skins, are reported in large numbers during ice-free months (Georgette et al. 1998). Spotted seals occur closer to shore, allowing for easier harvesting than bearded seals or walrus, which occur further from shore and for a shorter window as they migrate north more quickly (Oceana and Kawerak 2014). Ringed seals, the most abundant and accessible, were harvested in all months and taken in higher numbers than other species from the mainland coastal communities.

Ribbon seals were reported to be present in Norton Sound "only occasionally" and are more common in the open areas near Brevig Mission, Gambell, and Savoonga. Ribbon seals are harvested less than other seals because their distribution does not overlap with most hunting areas and their taste is not preferred (Oceana and Kawerak 2014).

1.1.3.3. Steller Sea Lion

During the 1996-1997 survey, no Steller sea lions were reported as hunted, however, hunters in Gambell, Savoonga, and Brevig Mission reported they do hunt for them occasionally (Georgette et al. 1998). Additionally, only 20 Steller sea lions were reported taken between 1992 and 1998 (NMFS 2008, Wolf and Mishler 1998, Wolf and Hutchinson-Scarbrough 1999). Steller sea lions occasionally haul out on Sledge Island (Oceana and Kawerak 2014).

1.1.3.4. Pacific Walrus

Pacific walruses are harvested generally in the spring to early summer during migration north (occasionally fall and winter) by communities of the Bering Strait region with 84 percent of the harvest occurring in Little Diomede, Gambell, Savoonga, Shishmaref, and Wales (Snyder 2005). Communities of Norton Sound including Nome, Unalakleet, Stebbins, as well as King Island, report they hunt walrus (EWC 2022). Snyder (2005) reported seven walruses harvested from King Island and 17 walruses from the Nome Eskimo Community during 2004. Local knowledge indicates that the spring hunting is occurring earlier and for a shorter period then in the past (Oceana and Kawerak 2014). Walruses no longer come close to shore near Nome during migration and hunters have reported traveling 10 to 50 miles offshore to find them (Oceana and Kawerak 2014). Hunters have reported traveling to King Island where walruses are known to haul out (Oceana and Kawerak 2014).

1.2. Potentially Affected Subsistence Users

The Port of Nome is located in Sitŋasuaq[1] (Nome) on the Seward Peninsula, Alaska, on the Norton Sound coast of the Bering Sea (Figure 1-1). Norton Sound communities, including Nasirvik (White Mountain), Cingik or Siŋik (Golovin), Neviarcaurluq (Elim), Kuuyuk (Koyuk), Saktuliq (Shaktoolik), Uŋalaqłiit (Unalakleet), Taciq (St. Michael), and Tapraq (Stebbins). Other communities to the north include Port

[1] Alaska Native place names as listed in the University of Alaska Fairbanks Alaska Native Language Archive (https://www.uaf.edu/anla/collections/map/names/).

Clarence, Tala (Teller), Sitaisaq (Brevig Mission), Ugiuvak (King Island), and Iŋaliq (Little Diomede). Sivunga (Savoonga) and Sivuqaq (Gambell) of St. Lawrence Island may also subsistence hunt in and near Norton Sound.

1.3. Potential Impacts to Subsistence Users

Primary effects of the action are anticipated to be increased underwater noise levels during construction, which may affect marine species within range of the project. No negative impacts to water quality are anticipated, and the project is not expected to significantly increase vessel traffic in the area. The project's IHA provides additional detail of all anticipated effects and species-by-species analysis of the impacts.

1.3.1. Underwater Noise

Sources of underwater noise for this project include pile driving/removal and fill placement. Anticipated sound source levels and their associated ensonification isopleths are summarized in Section 6 of the IHA Application. Details of source level and regulatory protocols are described in the project's IHA.

1.3.2. Access to Subsistence Hunting Areas

Increasing the length and infrastructure of the port could impact hunters' ability to access subsistence areas by increasing the time and fuel needed to exit the harbor. USACE will coordinate with local subsistence groups to avoid or mitigate potential limitations to accessing subsistence hunting areas.

1.3.3. Increased Vessel Activity

Increased vessel traffic at the port following construction may introduce larger obstacles for subsistence vessels to maneuver and may affect marine mammals and their movements. USACE will coordinate with local subsistence groups to avoid or mitigate potential limitations caused by increases in vessel activity.

1.3.4. Potential Impacts to Subsistence Species

Beluga whales have been traditionally hunted in Norton Sound; however, project impacts are not expected to reach traditional harvest areas. USACE will coordinate with local subsistence groups to avoid or mitigate impacts to beluga whale harvests.

Project activities avoid traditional ice seal harvest windows, so are not expected to negatively impact hunting of bearded seals or ringed seals. Although Pacific walruses have been harvested into June during spring harvests, most project activities will occur outside of traditional harvest windows. USACE will coordinate with local subsistence groups to avoid or mitigate impacts to ice seal and walrus harvests.

Steller sea lions are not frequently harvested in Norton Sound, but USACE will coordinate with local subsistence groups to avoid or mitigate potential impacts to Steller sea lion harvests.

2. SUBSISTENCE COMMUNITY ENGAGEMENT

2.1. Coordination/Engagement to Date

The USACE has been coordinating with potentially affected communities and subsistence groups (Table A-1, Appendix A) about this project since April 2018, as documented in the Integrated Feasibility Report and Environmental Assessment (IFREA) (USACE 2020) and summarized in Table 2-1. The coordination to date has been conducted prior to development of this POC, thus some details of the meetings were not available for incorporation into the document. Details pertaining to subsistence concerns are identified in Table 2-1 and proposed resolutions to the primary concerns are in Table 2-2. Following distribution of the POC, details of each meeting will be retained and provided as appendices to this POC and the distribution list in Table 2-3 will be updated.

The USACE is continuing with active coordination as this project moves towards construction in May 2024 and will formally notify the groups of this POC upon completion and distribution.

Table 2-1. Communication with subsistence communities, including a brief summary of issues raised by the communities.

Date	Communication Method	Associated Documents	Meeting Attendees (applicant and subsistence groups)	Topics/Content	Summary of MMPA Subsistence-Related Concerns Raised
April 24-25, 2018	Meeting: Planning Charette	USACE 2020[1]	• USACE (Alaska District, Pacific Ocean Division, Headquarters, and Deep Draft Navigation Planning Center of Expertise) • City of Nome (non-Federal sponsor) • Native Village of White Mountain • Bering Strait Native Corporation • Sitnasuak Native Corporation • Nome Eskimo Community • Kawerak, Inc. • Crowley • Howlett Engineering • PND Engineering, Inc. • Alaska Marine Pilot's Association • University of Alaska Sea Grant • U.S. Coast Guard (USCG) • U.S. Fish and Wildlife Service (USFWS) • National Marine Fisheries Service (NMFS)	Project scoping/planning	Details not available in USACE (2020)

Date	Communication Method	Associated Documents	Meeting Attendees (applicant and subsistence groups)	Topics/Content	Summary of MMPA Subsistence-Related Concerns Raised
October 3, 2018	Meeting: Government to Government	USACE 2020	• USACE • Nome Eskimo Community • Kawerak, Inc.	Cultural, social, and economic impacts	• Local access to the Snake River and Nome shoreline must be maintained as they are residents' only direct access to subsistence resources • Large vessels anticipated at the finished dock could make it difficult to maneuver small subsistence vessels in and out of the port • The cost of the port modifications could induce the City of Nome to start requiring that small subsistence vessels pay for annual permits • Increased ship traffic and larger vessels using the port may affect marine mammals and their migration movements
November 15, 2018	Meeting: City of Nome Planning Commission monthly meeting	USACE 2020	• USACE (Alaska District) • Public attendees of Nome	Community outreach	Details not available in USACE (2020)
March 27, 2019	Meeting: Government to Government	USACE 2020	• USACE • Nome Eskimo Community • Kawerak, Inc.	Cultural, social, and economic impacts	• Local access to the Snake River and Nome shoreline must be maintained as they are residents' only direct access to subsistence resources • Large vessels anticipated at the finished dock could make it difficult to maneuver small subsistence vessels in and out of the port. • The cost of the port modifications could induce the City of Nome to

Date	Communication Method	Associated Documents	Meeting Attendees (applicant and subsistence groups)	Topics/Content	Summary of MMPA Subsistence-Related Concerns Raised
					start requiring that small subsistence vessels pay for annual permits • Increased ship traffic and larger vessels using the port may affect marine mammals and their migration movements
May 8 to June 7, 2019	Public Comment Period of the draft IFREA document	USACE 2020	Public	Public comments	• Impacts to Native culture and subsistence resources • Increased fuel/time needed to get out of the harbor and reach subsistence use areas
June 18, 2019	Meeting: Community outreach and public scoping meeting; Public comments on the draft IFREA document (public comment period closed June 7, 2019)	USACE 2020	• USACE (Alaska District) • Public attendees of Nome	Public scoping	• Access concerns; request a subsistence boat launching area at the western side of the design • Safety Sound to the east of Nome is critically important to seals (especially pups and sub-adults)
July 19, 2019	Meeting: Port Commissioners Meeting's public workshop	USACE 2020	• USACE (Alaska District) • Public attendees of Nome	Project updates	Details not available in USACE (2020)
August 10, 2019	Meeting: Port Commissioners Meeting's public workshop	USACE 2020	• USACE (Alaska District) • Public attendees of Nome	Project updates	Details not available in USACE (2020)
December 31, 2019 to January 30, 2020	Public Comment Period of the Second Draft IFR/Supplemental EA	USACE 2020	Public	Public comments	• Impacts to subsistence are not adequately analyzed • Public outreach and notification were not sufficient • The project must support subsistence vessels

Date	Communication Method	Associated Documents	Meeting Attendees (applicant and subsistence groups)	Topics/Content	Summary of MMPA Subsistence-Related Concerns Raised
February 28, 2020	Meeting: Government to Government	USACE 2020	• USACE • Nome Eskimo Community	Consultation	Details not available in USACE (2020)
July 8, 2020	Meeting (virtual): Continuing Authorities Program (CAP) Charette	N/A	Not available	Not available	Not available
November 12, 2021	Meeting (virtual): CAP National Historic Preservation Act (NHPA) Programmatic Agreement (PA)	N/A	• USACE • City of Nome • SHPO • Sitnasuak Native Corporation • Kawerak, Inc.	Not available	Not available
December 9, 2021	Meeting (virtual): CAP NHPA PA	N/A	• USACE • City of Nome • SHPO • Sitnasuak Native Corporation • Kawerak, Inc. • King Island Native Community • Nome Eskimo Community • Solomon Traditional Council • Nome Port Commission	Not available	Not available
February 9, 2022	Meeting (virtual): Public meeting	N/A	• USACE • Public	Project updates	Not available
July 11, 2022	Meeting	N/A	• USACE • Nome Eskimo Community	Not available	Not available

[1] USACE. 2020. Integrated Feasibility Report and Environmental Assessment

Table 2-2. Detailed explanation and resolution of MMPA subsistence-related concerns.

Detailed MMPA Subsistence-Related Concern Raised	Resolution of MMPA Subsistence-Related Concern (or explanation of why concern was not resolved)
Concern over access to subsistence areas including increased time and fuel needed to exit the harbor. Large vessels anticipated at the finished dock could make it difficult to maneuver small subsistence vessels in and out of the port. Suggested including a subsistence boat launching area to allow for westward access.	Resolution currently pending
Impacts to subsistence have not been adequately analyzed	Through this POC process, USACE will continue to coordinate with local subsistence groups. The project's Incidental Harassment Authorization will also address impacts to subsistence through the MMPA process with NMFS.
Increased ship traffic and larger vessels using the port may affect marine mammals and their migration movements	Resolution currently pending

Table 2-3. Record of distribution of POC.

Date of Distribution	Version
October 2022	Version 1 (*insert date once distributed*)

2.2. Plans for Future Coordination/Engagement

USACE will continue to schedule meetings with the potentially affected communities and subsistence groups to discuss the project, its potential effects on subsistence, and proposed mitigation measures. Currently planned meetings are outlined in Table 2-4, which will be updated as more meetings are scheduled. This POC will be updated to provide community feedback and responses. Community-requested mitigation will be incorporated into the project to the extent feasible.

As the project start date approaches, USACE will provide regular updates to the potentially affected communities and subsistence groups and will consult during the POC process to identify the preferred communications for project updates (e.g., public radio announcements, newsletters).

Table 2-4. Upcoming meetings for future engagement.

Date	Communication Method	Meeting Attendees (applicant and subsistence groups)	Topics/Content
December 12–15, 2022	Meeting: Alaska Eskimo Whaling Commission (AEWC) Commissioners Meeting	• USACE • AEWC Commissioners • Industry • Public	• Conflict Avoidance Agreement (CAA)
TBD – Postponed following October 2022 storm damage in Nome	Meeting	• USACE • Nome Eskimo Community	• Discuss access and other subsistence concerns

3. MITIGATION FOR SUBSISTENCE USES OF MARINE MAMMALS

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

- USACE will continue to coordinate with local subsistence groups throughout the duration of project activities.
- USACE will station observers as described in the Marine Mammal Monitoring and Mitigation Plan (4MP) accompanying the IHA Application. In-water work will stop if a protected species enters a shutdown zone, as described in the 4MP.
- 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 agency-provided marine mammal viewing guidelines and regulations as practicable (e.g., https://alaskafisheries.noaa.gov/protectedresources/mmv/guide.htm).

4. REFERENCES

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Wolfe, R. J., and L. B. Hutchinson-Scarbrough. 1999. The subsistence harvest of harbor seal and sea lion by Alaska Natives in 1998. Alaska Dep. of Fish and Game, Juneau, AK, Subsistence Div. Tech. Paper No. 250. 72 pp.

APPENDICES

APPENDIX A. POC DISTRIBUTION LIST

The distribution list below includes community organizations near Nome and Norton Sound as well as several entities or groups NMFS recommended be consulted for *all* projects in the Arctic, including some located outside of the project area region (indicated by blue font). These groups will be provided with a copy of the POC when initially distributed and USACE will modify the distribution list if any groups request to be removed considering their proximity to and interest in this project. Specific contacts for several groups have not been confirmed at this time but this table will be updated as contacts are established.

Table A-1. POC Distribution List.

Agency/ Affiliation	POC	Physical Address	Phone	Email
Cities, Villages, Native Corporations, and IRA Councils				
City of Utqiagvik (Barrow)	Fannie Mitiktaun Suvlu, City of Utqiagvik Mayor	2022 Ahkovak St, Barrow, Alaska	(907) 852-5211	City of Utqiagvik (Barrow)
Native Village of Barrow	Mary Jane Lang, Executive Director	6090 Boxer St, Utqiagvik, AK 99723	(907) 852-4411	Native Village of Barrow
City of Point Hope			(907) 368-2537	akphogov@hotmail.com
Native Village of Point Hope	Alzred Oomittuk, Executive Director	916 Ippiq Street, Pt. Hope, AK, 99766	(907) 368-2330	executive.director@tikigaq.org
Native Village of Point Lay/ Point Lay IRA		217 Qigalik Avenue Point Lay, AK 99759	(907) 833-5052	nvpl.ira@gmail.com; ptlay.ira@gmail.com
City of Nome	Joy Baker	102 Division St., Nome, AK 99762	(907) 443-6663	jbaker@nomealaska.org
Kawerak, Inc		500 Seppala Dr. Nome, AK 99762	(907) 443-5231	contact@kawerak.org
King Island Native Community		Mailing: P.O. Box 682, Nome, Ak 99762	(907) 443-2209	Tc.ki@kawerak.org
Nome Eskimo Community		Mailing: P.O. Box 1090, Nome, AK 99762; Physical: 200 W. 5th Ave, Nome, AK 99762	(907) 443-2246	
Sitnasuak Native Corporation		Mailing: P.O. Box 905, Nome, AK 99762; Physical: 214 Front St. 2nd Floor, Nome, AK 99762	(907) 387-1200; 1-877-443-2632	

Agency/ Affiliation	POC	Physical Address	Phone	Email
Unalakleet Native Corporation		Mailing: P.O. Box 100, Unalakleet, AK 99772	(907) 624-3833	uncadmin@ak.net
Bering Straits Native Corporation		Mailing: P.O. Box 1008, Nome, AK 99762; Physical: 110 Front St. Suite 300, Nome, AK 99762	(907) 443-5252; 800-478-5079	info@beringstraits.com
St. Mary's Native Corporation		Mailing: P.O. Box 149 Saint Mary's, AK 99658; Physical: 100 Yupik Rd, Saint Mary's, AK 99658	(907-438-2315	
Subsistence-related Organizations				
Alaska Eskimo Whaling Commission (AEWC)	Lesley Hopson		(907) 442-3491	LHopson@aewc-alaska.com
Ice Seal Committee	John Goodwin; NSB-DWM: Billy Adams, Andy Von Duyke; Executive Manager: Carla Kayotuk	Alaska Ice Seal Committee, P.O. Box 413, Kotzebue, AK 99752	(907) 852-2611; (907) 852-0350	jgoodwin@otz.net
Eskimo Walrus Commission	Sierra Smith, Natural Resources Specialist; Vera Metcalf, EWC Director	P.O. Box 948, Nome, AK 99762	(907) 443-4378; (907) 443-4380	ssmith@kawerak.org
Alaska Beluga Whale Committee (ABWC)	Willie Goodwin; Kathy Frost; Secretary, Exec. Committee	Alaska Beluga Whale Committee, P.O. Box 334, Kotzebue, AK 99752		argagiaq@gmail.com; kjfrost@hawaii.rr.com
Alaska Nannut Co-Management Council	Katya Gray, Executive Director	Mailing P.O. Box 2027, Nome, AK 99762; Physical: 400 Bering St., Suite 205, Nome, AK 99762	(907) 443-6890; (907) 304-2274	info@nannut.org
Barrow Whaling Captains Association				
Kaktovik Whaling Captains Association				

Agency/ Affiliation	POC	Physical Address	Phone	Email
Other Community Entities				
Northwest Arctic Borough (NAB)	Siikauraq Martha Whiting, Planning Director	163 Lagoon Street, Kotzebue, AK 99752	(907) 442-8209	mwhiting@nwabor.org
Indigenous People's Council for Marine Mammals (IPCoMM)	Carol Torsen, IPCoMM, Executive Director	800 E Dimond Blvd, Suite 3-615, Anchorage, AK 99515	(907) 349-8066	ctorsenipcomm@alaska.net
Arctic Safety Waterways Committee		P.O. Box 92326, Anchorage, AK 99509	(907) 727-2585	
The NSB Department of Wildlife Management	Todd Sformo, John Citta	Mailing: P.O. Box 69, Utqiagvik, AK 99723; Physical: 1274 Agvik Street	(907) 852-0350	Todd.Sformo@north-slope.org; john.citta@north-slope.org
The NSB Planning Department	Gordon Brower, Director; Lilly Kilapsuk, Acting Land Management Regulations Manager		(907) 852-0320	
Voice of the Arctic Inupiat		Mailing: P.O. Box 240241, Anchorage, AK 99503; Physical: 914 Ippiq Street, Point Hope, AK 99766	(907) 334-0605	info@inupiatvoice.org
Arctic Slope Native Association		7000 Uula St. Utqiagvik, AK 99723	(907) 852-2762	