Request for an Incidental Harassment Authorization
Trident Seafoods Corporation
Bunkhouse Dock Replacement Project

Near Island Channel, Kodiak, Alaska

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Revised July 2023 and September 2023

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ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
ADF&G	Alaska Department of Fish and Game
ANSI	American National Standards Institute
AWC	Anadromous Waters Catalog
dB	decibel
DPS	distinct population segment
DTH	down-the-hole
EDPS	eastern distinct population segment
ENP	Eastern North Pacific
EFH	essential fish habitat
ESA	Endangered Species Act
ESCA	Endangered Species Conservation Act
ft	feet
HF	high-frequency
Hz	Hertz
IHA	Incidental Harassment Authorization
kHz	kilohertz
km	kilometers
LF	low-frequency
LOA	Letter of Authorization
MF	mid-frequency
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act of 1972
M/SI	mortality/serious injury
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PCFG	Pacific Coast Feeding Group
PBR	potential biological removal
PR1	Permits Division (NMFS)
PSO	protected species observer
PTS	permanent threshold shift
RMS	root mean square
SEL	sound exposure level
SolsticeAK	Solstice Alaska Consulting
SPL	sound pressure level
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SSL	sound source level
TLC	transmission loss coefficient
Trident	Trident Seafoods Corporation
UME	unusual mortality event

µPa	micropascal
U.S.	United States
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
WDPS	western distinct population segment
WFA	weighting factor adjustment
WNP	Western North Pacific

1 DESCRIPTION OF SPECIFIED ACTIVITY

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

1.1 OVERVIEW

Trident Seafoods Corporation (Trident) plans to remove and replace their Bunkhouse Dock on the western shore of Near Island Channel along the working waterfront in Kodiak, Alaska (Figure 1).

The dock replacement would require removal of existing piles and installation of new piles in marine waters that support several marine mammal species. Pile driving may result in auditory injury (Level A harassment) and behavioral harassment (Level B harassment) of select marine mammal species. Construction would begin in March 2024 and occur for 94 hours over 55, not necessarily consecutive, days.

The Marine Mammal Protection Act of 1972 (MMPA) prohibits the taking of marine mammals; to take is defined as to "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill", except under certain situations. Section 101 (a)(5)(D) of the MMPA allows for the issuance of an Incidental Harassment Authorization (IHA) provided an activity results in negligible impacts on marine mammals and would not adversely affect subsistence use of these animals.

Trident is requesting an IHA for Level B take of 6 marine mammal species and Level A take of 1 marine mammal species that may occur in the vicinity of the project area in Near Island Channel. The species for which Level B take is requested are: humpback whales, Dall's porpoise, harbor porpoise, killer whales, harbor seals, and Steller sea lions. Level A take is requested for Steller sea lions.

As set out by 50 CFR 216.104, Submission of Requests, the items required for this application are included in the following Sections 1 through 14.

1.2 DETAILED DESCRIPTION OF SPECIFIC ACTIVITIES

1.2.1 Location

The Trident Kodiak Bunkhouse Dock Replacement Project would be located in Kodiak, Alaska along the western shore of Near Island Channel within Township 27S, Range 19W, Section 32, Seward Meridian at Latitude 57.785854°, Longitude -152.406346° (United States Geological Survey Quadrangle Kodiak D2) (Figures 1 and 2; Appendix A: Sheet 1). Construction would occur within the footprint of the existing Trident-owned Bunkhouse Dock.

Figure 1. Trident Kodiak Bunkhouse Dock Replacement Project Location and Vicinity Map

Figure 2. Trident Kodiak Bunkhouse Dock Replacement Project Location

1.2.2 Purpose and Need

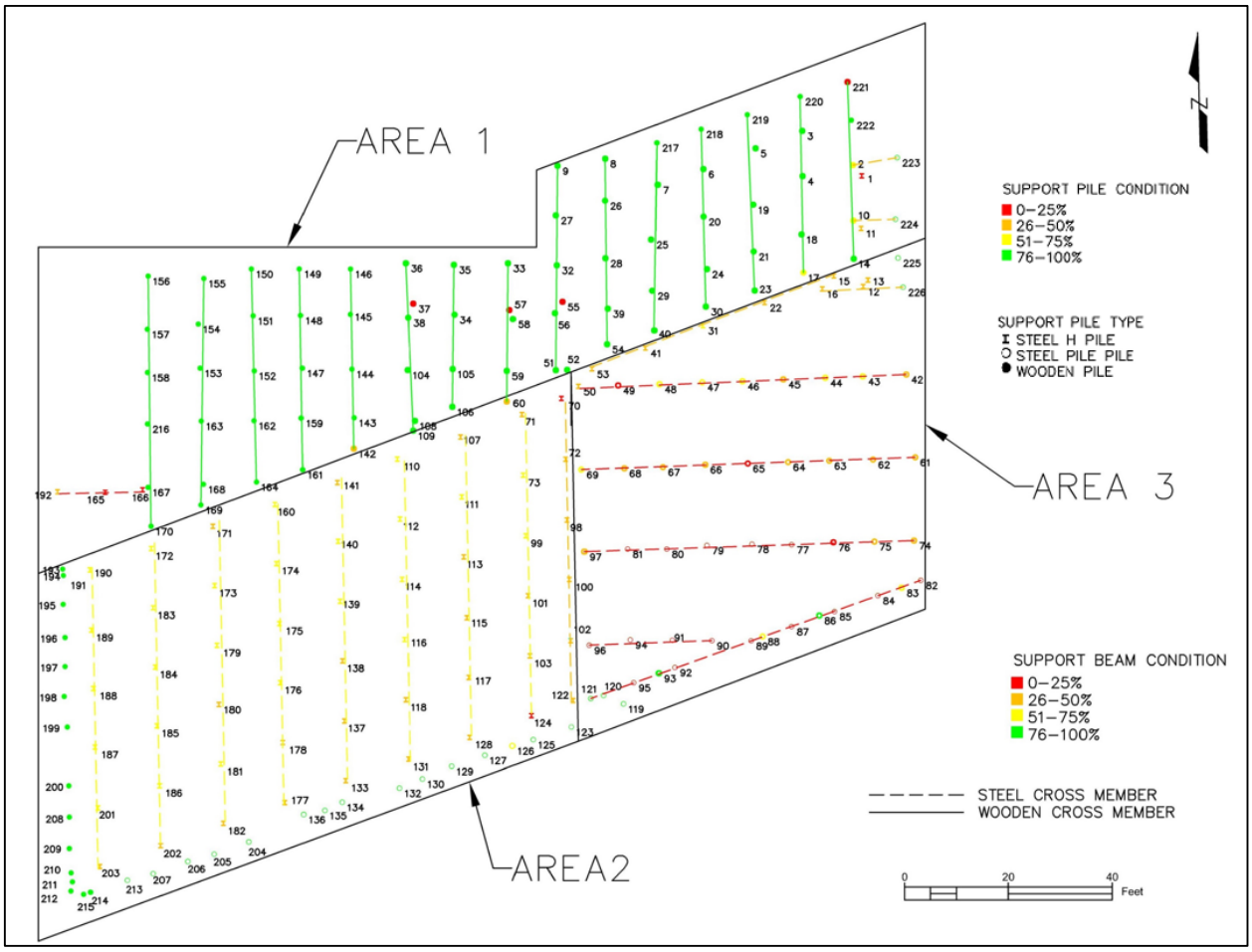
The purpose of the project is to replace Trident's degraded Bunkhouse Dock. The proposed dock replacement is needed to continue to provide safe housing and waterfront infrastructure to an integral part of the commercial fishing industry, seafood processing, and community of Kodiak.

Kodiak Island has strong historical and cultural ties to commercial fishing. Kodiak experienced exponential growth in the commercial fishing and processing sectors in the early 1960s. By 1968, in terms of dollar value, Kodiak was the most productive fishing port in the United States (U.S.). In 2020, Kodiak ranked third in the U.S. by volume (364 million pounds) and seventh in value ($88 million) (National Marine Fisheries Service [NMFS] 2022). On a local level, the commercial fishing industry (harvesting and processing) is the largest contributor to the local economy outside of the U.S. Coast Guard (USCG) Base. In 2019, commercial fisheries in Kodiak supported 1,681 resident fishermen ($117 million in gross earnings), 14 shore-based processing facilities, and 2,245 processing workers (55 percent resident and 45 percent non-resident) (Alaska Seafood Marketing Institute 2022). As a result, the City of Kodiak has prioritized supporting, maintaining, upgrading, and replacing publicly and privately owned commercial fishing infrastructure (City of Kodiak 2010).

Trident owns 3 of the 14 shore-based processing facilities in Kodiak. The Bunkhouse Dock is adjacent to Trident's Star of Kodiak Plant and serves as one of the primary housing facilities for up to 64 of Trident's 350 employees (Trident 2022). These employees would not be able to live and work in Kodiak without suitable housing, leaving positions required to keep up with the demands of the commercial fishing industry unfilled.

All of Trident's facilities are regularly maintained, and two of the three facilities have received major upgrades since their construction. The Bunkhouse Dock was constructed immediately following the 1964 earthquake and has been minimally upgraded since its construction, resulting in severe degradation of the structure. A portion of the structure has been condemned (Figure 3: Area 3). The main steel support piles in all three areas were rated at 50 percent or less following a November 2021 structural assessment. The support beam condition ratings ranged from 0 to 100 percent depending on the area of the dock (Figure 3) (Northern Geotechnical Engineering 2021).

Figure 3. Trident Kodiak Bunkhouse Dock Existing Structure Condition



1.2.3 Anticipated Changes in Vessel Traffic

The action area experiences high levels of marine vessel traffic year-round. Marine vessels that use the action area include cruise ships, passenger ferries, charter and commercial fishing vessels, barges, and freight vessels (U.S. Army Corps of Engineers [USACE] 2019; City of Kodiak 2022).

Kodiak has the largest fleet of fishing vessels on the west coast with two harbors that service 1,200 fishing and general-purpose recreational vessels annually (Kodiak Maritime Museum 2018; City of Kodiak 2022). As a result, it is one of the top fishing ports in the country in terms of landings and value (NMFS 2022). The Port of Kodiak also maintains three deep-water piers that support the state ferry, cargo vessels, and cruise ships (City of Kodiak 2022).

Once construction is completed, an increase in vessel traffic is not anticipated in Southwest Alaska waters or commercial vessels travelling to Kodiak, Alaska. The purpose of the project is to replace a degrading dock that is past its usable life to continue to service vessels that currently travel Alaska waters.

1.2.4 Proposed Action

The Trident Kodiak Bunkhouse Dock Replacement Project would involve removing components associated with the existing dock structure, and installing all components of the new pile supported fixed dock at the same location (Figure 4; Appendix A: Sheet 2).

Existing in-water components (to be removed):

- The existing concrete deck
- One hundred 14-inch diameter timber piles
- Seventy-five 14-inch steel H-piles
- Sixty 16-inch diameter steel piles

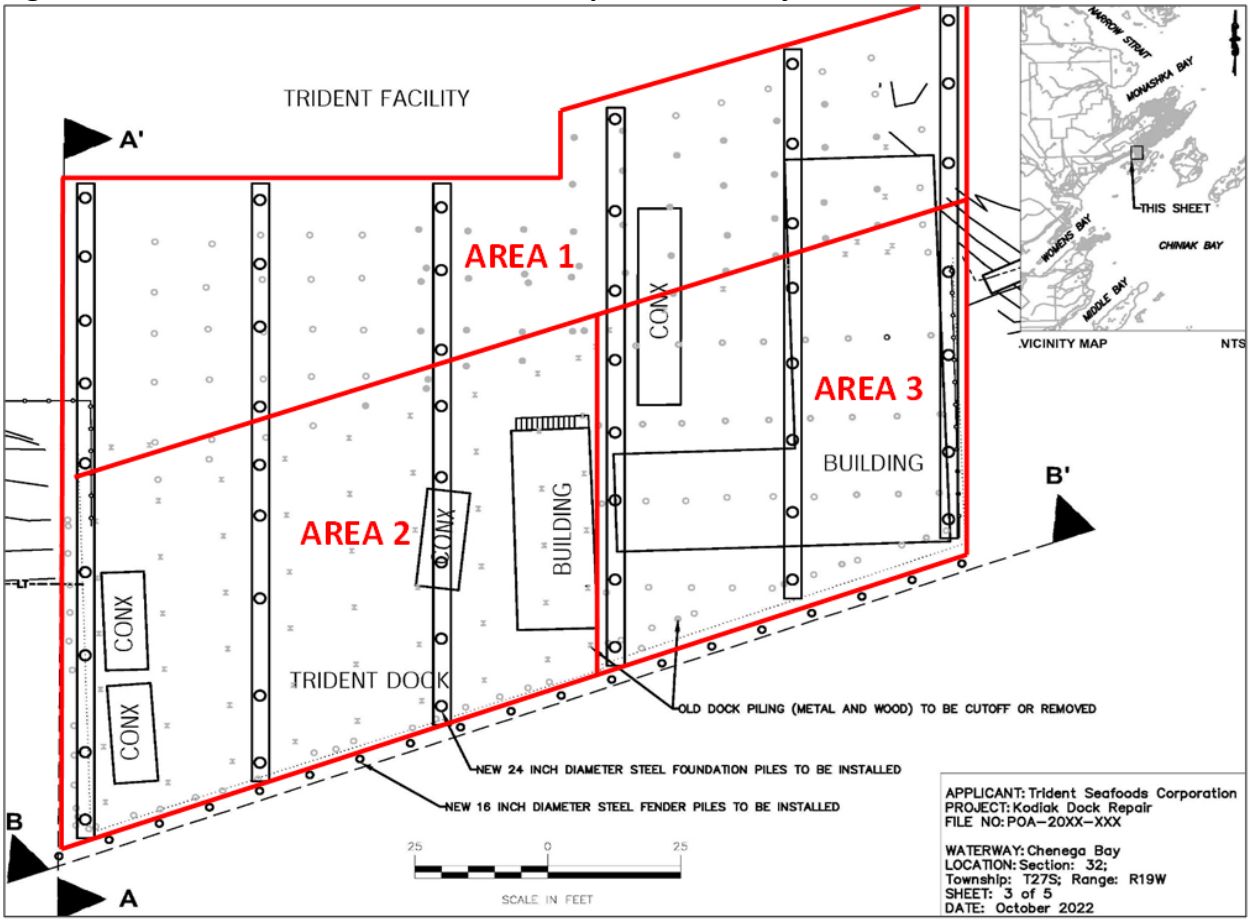
New in-water components (to be installed):

- Twenty 24-inch diameter temporary steel piles to guide the permanent piles into place
- Twenty-six 16-inch diameter permanent steel piles
- Fifty-two 24-inch diameter permanent steel piles

Additional project components include:

- Dock components such as bull rail, fenders, mooring cleat, cast-in-place concrete dock surface, and mast lights (note: these components would be installed out of water).

Figure 4. Trident Kodiak Bunkhouse Dock Replacement Project Site Plan



1.2.5 Construction Methods

1.2.5.1 Construction Vessels

The following vessels are expected to support construction and protected species monitoring:

- Two construction barges (*Stan Boice* [140 feet [ft] by 48 ft by 21 ft] and *Swinomish* [150 ft by 48 ft by 15.5 ft]) onsite to support construction.
- Two material barges (onsite one at a time) to deliver and stage materials.
- One 45-foot tug with a 1,046-horsepower motor for localized movements, transported to the site on one of the construction barges.
- Four 25-foot skiffs, two with 200-horsepower motors and two with 40-horsepower outboard motors, transported to the site on the construction barges.
- One 85-foot tug with a 3,800-horsepower engine to transport the construction and material barges.

1.2.5.2 Equipment

The following pile installation equipment is expected to be used (Table 1):

Table 1. Construction Equipment that will Produce Noise

Driving mechanism	Pile driver	Properties
Vibratory pile driving	ICE 28-B	271 tons driving force
Pinnacle Summit 180 DTH hammer	Holt 6,000 series top head	Torque 6,500 to 94,000 foot per pound

1.2.5.3 Transport of Materials and Equipment

The material barges would transport materials to the project site from Washington state over approximately 10 days. The construction barges would travel to the project site from Juneau, Alaska over approximately seven days. Each barge would be transported by an 85-foot-long tug travelling between 6 knots and 8 knots. These types of barges and tugs frequently travel the known vessel routes to, from, and within Alaska.

Each construction barge would be secured in place at the project site by four mooring anchors or two spuds. The anchors or spuds would be below the water surface and would not be a hazard to navigation. The material barge would be tied to one of the construction barges and materials would be moved onto the construction barge by crane. Local barge movements to the next pile installation area would occur in approximately 100-foot increments at a speed of less than 2 knots.

1.2.5.4 Transport of Workers to and from Work Platform

Workers would be transported from a local harbor to the barge via 25-foot skiffs. There may be multiple shore-to-barge trips per day; however, the area of travel would be limited and close to shore. Four skiffs would support construction and transport workers. These vessels would travel at approximately 3 knots on average and would only operate near the construction site.

Protected species observers (PSOs) may use a skiff to observe the action area. PSO protocols including potential skiff-based monitoring will be developed in consultation with NMFS and described in the Marine Mammal Monitoring and Mitigation Plan (4MP) that will be submitted with this assessment.

1.2.5.5 Other In-water Construction and Heavy Machinery Activities

The proposed action will involve in-water construction and heavy machinery activities in addition to the activities described above. These include using standard barges and tug boats and positioning piles on the substrate using a crane (i.e., “stabbing the pile”).

1.2.5.6 Construction Sequence

Construction would follow the following sequence:

1. Working offshore to onshore, remove the existing dock deck and piles. Place all removed material on a barge and send to Seattle for proper disposal.
2. Working onshore to offshore, vibrate and drill four temporary piles into place.

3. Weld a frame around the four temporary piles to guide the installation of permanent piles.
4. Vibrate and then DTH drill permanent piles into place within the template.
5. Remove the temporary piles within the template with the deadpull method and/or vibratory hammer.
6. Move to the next permanent pile installation location and repeat steps one through five until all permanent piles are in place.

The cast-in-place concrete deck, mechanical systems, and other above-water components listed above would be constructed and installed after all piles are installed.

Table 2 provides an estimate of time required for pile installation and removal. Section 2.1 below details estimated construction duration.

1.2.5.7 Installation/Removal Methods

Removal of Existing Dock Components

Sixty 16-inch steel piles, seventy-five 14-inch steel H-piles, and one-hundred 14-inch timber piles would be removed using the deadpull method. The vibratory hammer would be used to extract approximately 10 percent of the existing piles or the contractor may opt to cut them at mudline if the deadpull method is unsuccessful.

Installation and Removal of Temporary Piles

Twenty 24-inch steel temporary piles would be installed through overburden to refusal (approximately 5 ft into bedrock) using the vibratory hammer and DTH. Temporary piles would be removed using the deadpull method. The vibratory hammer would be used if the deadpull method is unsuccessful.

Installation of Permanent Piles

All permanent piles would be installed at least 10 ft into bedrock. The vibratory hammer would be used to install each pile to refusal. The down-the-hole (DTH) hammer would be used to socket the piles to their final embedment depth.

Please see Table 2 for a conservative estimate of the amount of time required for pile installation and removal.

Table 2. Trident Kodiak Bunkhouse Dock Replacement Project Pile Installation and Removal Summary

Description	Project Component						
	Existing Pile Removal[1]	Existing Pile Removal[1]	Existing Pile Removal[1]	Temp Pile Installation	Temp Pile Removal	Perm Pile Installation	Perm Pile Installation
Diameter of Steel Piles (inches)	16	14	14	24	24	16	24
Pile Material	Steel	Steel	Timber	Steel	Steel	Steel	Steel
Type of Pile	Pipe	H-Pile	Round	Pipe	Pipe	Pipe	Pipe
# of Piles	60	75	100	20	20	26	52
Vibratory Pile Driving/In-Air							
Total Quantity	60	75	100	20	20	26	52
Max # Piles Vibrated Per Day	20	20	25	6	8	5	4
Vibratory Time Per Pile (minutes)	2	2	2	2	2	2	2
Vibratory Time Per Day	40	40	50	12	16	10	8
Number of Days	3	4	4	3	3	5	13
Vibratory Time Total	120	150	200	40	40	52	104
DTH Drilling							
Total Quantity	0	0	0	20	0	26	52
Max # Piles DTH Per Day	0	0	0	6	0	6	4
DTH Time Per Pile (minutes)	0	0	0	30	0	45	60
DTH Time Per Day	0	0	0	180	0	270	240
Number of Days	0	0	0	3	0	4	13
DTH Drilling Time Total	0	0	0	600	0	1170	3120

[1]The contractor estimates 90 percent of the existing piles will be successfully removed using the deadpull method. The table conservatively estimates it will take approximately 7 hours and 50 minutes to remove all existing piles; however, it is more likely to only take 47 minutes of vibratory work.

1.3 ACOUSTIC THRESHOLDS AND ENSONIFIED AREA

Vibratory pile driving and DTH drilling/socketing would generate in-water and in-air noise that may result in take of marine mammals.

National Marine Fisheries Service has developed acoustic thresholds that identify the level of underwater sound above which marine mammals, when exposed to, would be reasonably expected to be behaviorally harassed (Level B harassment) or to incur permanent threshold shift (PTS) to some degree (Level A harassment).

1.3.1 Level A Harassment

National Marine Fisheries Service's *Technical Guidance for Assessing the Effects of Anthropogenic Sounds on Marine Mammal Hearing* identifies criteria to assess auditory injury (Level A harassment) from exposure to noise from two sources (impulsive or non-impulsive) to five marine mammal groups based on hearing sensitivity (NMFS 2018). Trident's activity includes the use of impulsive (DTH drilling) and non-impulsive (vibratory hammer) noise sources. The thresholds for auditory injury to marine mammal species are provided in Table 3.

DTH systems employ percussive and drilling mechanisms to advance piles. As result, NMFS considers DTH systems as impulsive and continuous sounds. Due to limited data, NMFS has determined that Level A threshold calculations should consider DTH as an impulsive sound and Level B threshold calculations as continuous (NMFS 2022a).

Table 3. Thresholds Identifying the Onset of Permanent Threshold Shift

Hearing Group	PTS Onset Thresholds*(received level)	
	Impulsive (Impact Pile Driving and DTH Drilling)	**Non-impulsive (Vibratory Pile Driving)**
Low-Frequency (LF) Cetaceans	$L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	$L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	$L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	$L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	$L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	$L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds, Underwater	$L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	$L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds, Underwater	$L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	$L_{E,OW,24h}$: 219 dB

Adapted from: NMFS 2018

***** Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.
Note: Peak sound pressure has a reference value of 1 micropascal (µPa), and cumulative sound exposure level (L_E)has a reference value of 1µPa^{2}s. In this table, thresholds are abbreviated to reflect American National Standards Institute (ANSI) standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure and should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (low-frequency, mid-frequency, and high-frequency cetaceans, and phocid pinnipeds and otariid pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations and duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

1.3.2 Level B Harassment

National Marine Fisheries Service predicts that all marine mammals are likely to experience Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 decibels (dB) re 1µPa root mean square (RMS) (continuous).

1.3.3 Calculated Distances to Level A and Level B Thresholds

For this project, distances to the Level A and Level B thresholds pile driving activities were calculated based on various source levels, expressed in sound pressure level (SPL)[1] or sound exposure level (SEL)[2] for a given driving method and pile type. Appropriate source levels were input into the *NMFS User Spreadsheet Tool* and *NMFS Level B Spreadsheet* to model distances for each pile size, method, and activity scenario (Appendix C). Sound source levels for DTH drill were adjusted by -5 dB to account for the use of a bubble curtain during these activities.

Vibratory Hammer Installation/Removal

Level A distances for single pile driving activities were calculated using Tab A.1 of the *NMFS User Spreadsheet* tool. The NMFS recommended defaults for the weighting factor adjustment (WFA) and transmission loss coefficient (TLC) were used. The appropriate source level expressed in SPL, installation duration, and maximum piles per day were input into the spreadsheet for each pile size. Level B distances were also calculated using the *NMFS Level B Spreadsheet* using the appropriate SPL source level for each pile size.

Down-The-Hole Hammer Installation

Level A distances for single pile driving activities were calculated using Tab E.2 of the *NMFS User Spreadsheet* tool. The NMFS recommended defaults for the WFA and TLC were used. The appropriate source level expressed in SEL, strikes per second, installation duration, and maximum piles per day were input into the spreadsheet for each pile size. Level B distances were also calculated using the *NMFS Level B Spreadsheet* using the appropriate SPL source level for each pile size. As stated above, sound sources were adjusted by -5 dB to reflect the use of a bubble curtain.

A summary of sound source levels (SSL) and completed NMFS spreadsheets are in Table 4 and Appendix C.

[1] Sound pressure is the sound force per unit µPa, where 1 pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. Sound pressure level is expressed as the ratio of a measured sound pressure and a reference level. The commonly used reference pressure level in acoustics is 1 µPa, and the units for underwater sound pressure levels are decibels (dB) re 1 µPa (NMFS 2018).

[2] A measure of sound level that takes into account the duration of the signal (NMFS 2018).

Table 4. Trident Kodiak Bunkhouse Dock Replacement Project Sound Source Levels

Method and Pile Type	SSL at 10 meters		Literature Source
Vibratory Hammer	**dB rms**		
14-inch timber piles (removal)	162		Caltrans 2020
14-inch H-piles (removal)	150		Caltrans 2020
16-inch steel piles (removal and installation)	161		Naval Facilities Engineering Systems Command (NAVFAC) 2015 (used 24-inch piles)
24-inch steel piles (installation)	161		NAVFAC 2015
DTH[1]	**dB rms**	**dB SEL**	
16-inch steel piles (installation)	162 (167)	141 (146)	Heyvaert & Reyff 2021 (used 24-inch piles); Guan & Miner 2020
24-inch steel piles (installation)	162 (167)	154 (159)	Heyvaert & Reyff 2021
Vibratory In-air[2]	**dB rms**		
All Pile Sizes	96.5 dB		Laughlin 2010

[1]Sound source levels for DTH were adjusted -5 dB to reflect the use of a bubble curtain.

[2] Sound source levels for in-air were measured at 15 meters

1.3.4 Action Area

The action area, or the area near the project that will be directly affected by the action, is the area of water that will be ensonified above acoustic thresholds in a day. The action area for this project is centered at the new dock which is within the footprint of the existing dock along the western shore of Near Island Channel in downtown Kodiak in Southwest Alaska (see Section 1). In this case, the action area is where noise levels from DTH installation of any pile size (the farthest-reaching noise associated with the project) are expected to decline to 120 dB. As shown in Table 16 this area extends 6.3 km from the source. The action area would be truncated where land masses obstruct underwater sound transmission; thus, the action area extends into Near Island Channel and St. Paul Harbor. Due to the noise impacts of large vessels on the marine environment the expected transit route of the material and construction barges are also considered a part of the action area (Figure 5 And Figure 6).

Figure 5. Trident Kodiak Bunkhouse Dock Replacement Project Action Area

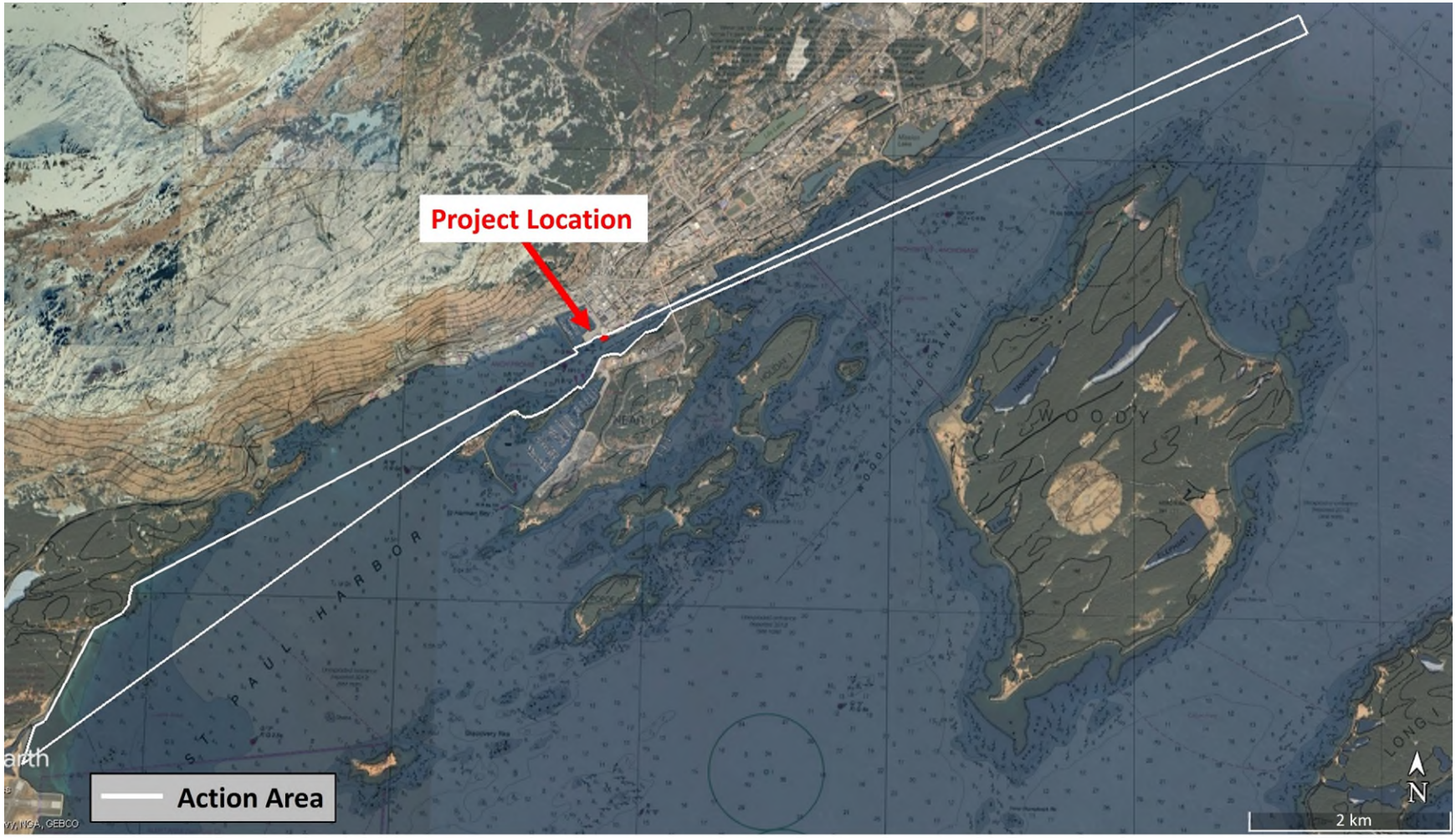
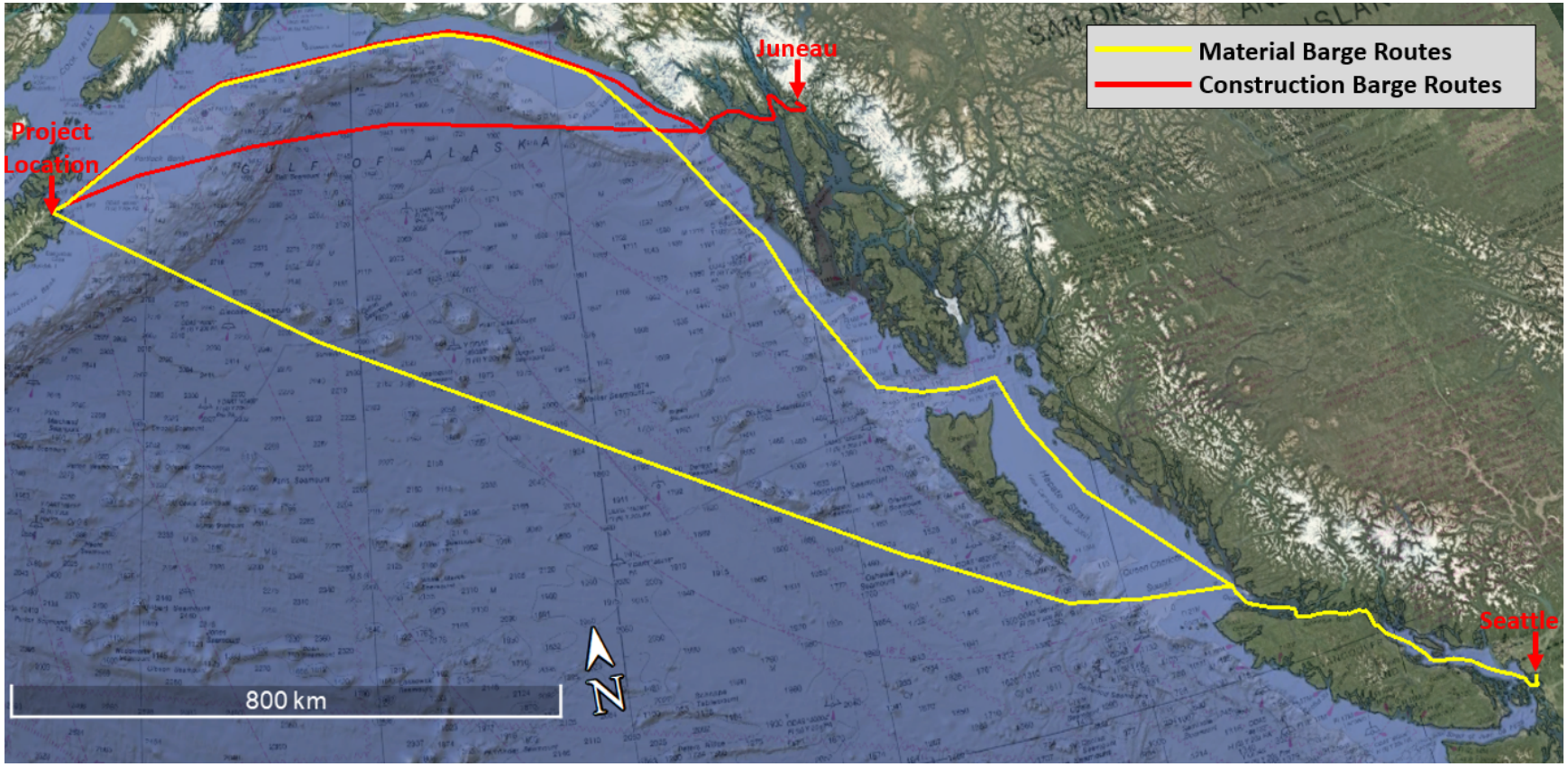


Figure 6. Trident Kodiak Bunkhouse Dock Replacement Project Expected Barge Routes



In addition to in-water noise, pinnipeds such as Steller sea lions and harbor seals can be adversely affected by in-air noise. Loud noises can cause hauled-out pinnipeds to flush back into the water, leading to disturbance and possible injury. NMFS has established an in-air noise disturbance threshold of 100 dB RMS for Steller sea lions and 90 dB RMS for harbor seals. Pile driving and removal associated with this project will generate in-air noise above ambient levels within Near Island Channel; however, the predicted distances to the in-air noise disturbance threshold for hauled-out Steller sea lions will not extend more than 10 meters and the threshold for harbors seals will not extend farther than 35 meters from any type of pile being vibrated or drilled.[3]

The nearest documented sea lion haulouts (Long Island and Kodiak/Cape Chiniak) are more than 10 km away (NMFS 2016; NMFS 2019); however, there are resident sea lions that haulout on a designated float in St. Herman Boat Harbor (approximately 792 meters away) (Alaska Department of Fish and Game [ADF&G] 2022). This is considerably outside the predicted distances to the in-air noise disturbance threshold, and no in-air disturbance to hauled-out individuals are anticipated as a result of the proposed project; thus, land area is not included in the action area.

To minimize impacts to protected species, shutdown and monitoring of harassment zones will be implemented to protect and document these species in the action area. Please see Table16 for calculated distances to the Level A and B thresholds, Appendix B for the Level A and B threshold distance calculation spreadsheets, and Section 11 for mitigation information and shutdown and monitoring zones and figures. The attached 4MP gives detailed mitigation, shutdown, and monitoring procedures (Appendix C).

[3] Predicted distances for in-air threshold distances. The Washington State Department of Transportation has documented un-weighted RMS levels for a vibratory hammer (30-inch pile) to an average 96.5 dB and a maximum of 103.2 dB at 15 meters (Laughlin 2010). Average levels were used to extrapolate distances for the project's largest (24-inch-diameter) piles.

2 DATES, DURATION, AND REGION OF ACTIVITY

The date(s) and duration of such activities and the specific geographical region where it will occur.

2.1 DATES AND DURATION

Construction would begin in March 2024 and span 8 weeks. Pile removal and installation activities would occur for approximately 94 hours over 55 not necessarily consecutive days. In-water work removing and installing piles with the vibratory hammer would occur over 35 days.

The construction timeline takes into account the mobilization of materials and potential delays due to delayed material deliveries, equipment maintenance, inclement weather, and shutdowns.

2.2 SPECIFIC GEOGRAPHIC REGION

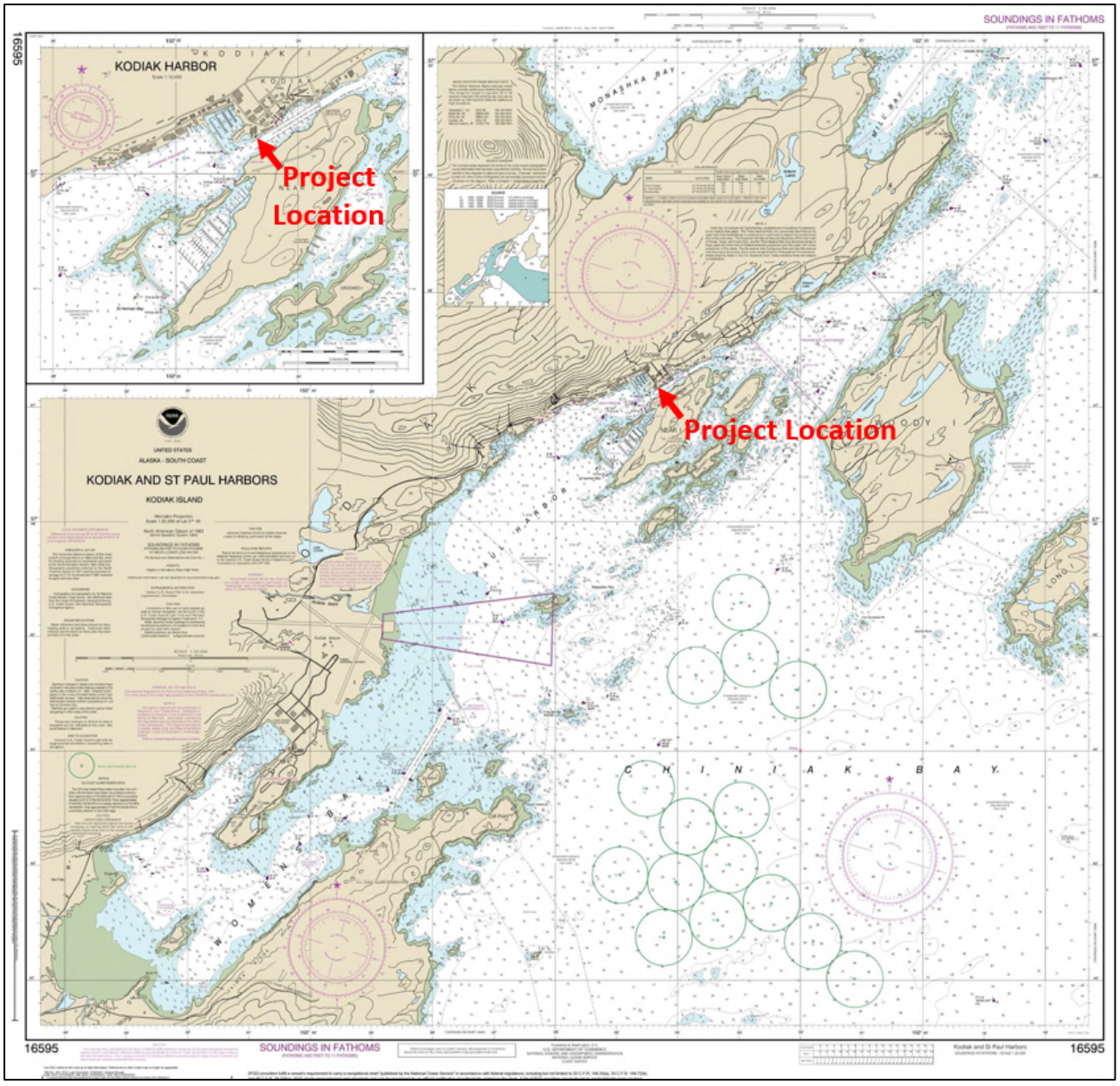
The action area is along the City of Kodiak's downtown working waterfront on the western shore of Near Island Channel in Southwest Alaska (see Section 1). Due to underwater sound transmission, the action area also extends into St. Paul Harbor.

2.2.1 Physical Environment

Near Island Channel is an approximately 1,400-meter-long navigation channel that separates Kodiak Island from Near Island. The channel is, on average, 61 meters wide and has a maintained depth of 7 meters below Mean Lower Low Water (MLLW) (USACE 2019). St. Paul Harbor is a naturally protected body of water (approximately 5 km long by 2.5 km wide) that extends to the southwest of Near Island Channel before joining Chiniak Bay (USACE 2019). To the northeast of Near Island Channel, the action area extends into Woody Island Channel. Woody Island Channel is a navigation channel that runs between Kodiak Island and Woody Island. The channel provides a northern route into Kodiak from Marmot Bay, but navigation can be challenging due to much of the channel being characterized by rocks and shoals (National Oceanic and Atmosphere Administration [NOAA] 2014; Figure 7).

The NMFS ShoreZone Mapper classifies the proposed project site as protected anthropogenic permeable habitat class and man-made permeable coastal class with a sheltered riprap environmental sensitivity index (NMFS 2022b).

Figure 7. Trident Kodiak Bunkhouse Dock Replacement Project Area and Bathymetry: Navigational Chart #16595



Source: NOAA 2022

2.3 SEASONAL ISSUES

Marine mammal species may occur year-round in the action area; however, concentrated numbers are most likely to occur during seasonal prey aggregations. Pacific herring, pollock, and five different types of salmon (Chinook, chum, coho, pink, and sockeye) are among the species that congregate ephemerally, and marine mammals tend to be more common in the action area in late spring through summer when these prey species tend to be more abundant. Biomass sampling around Kodiak Island indicates that herring and pollock make up the majority of the nearshore embayment biomass. Pollock densities in bays around Kodiak Island decrease in February due to offshore spawning and increase from May to August. Herring have been

observed in Kodiak waters year-round, but peak presence in the nearshore environment occurs starting in February through spring before they disperse in the summer (Loewen 2007; Thorne 2005). The five salmon species have overlapping presence near the action area, returning to spawning grounds in Kodiak from mid-to-late May through October (ADF&G 2023). Seasonal variation has been factored into take estimates, as construction is scheduled to occur from spring to early summer.

3 SPECIES AND NUMBER OF MARINE MAMMALS

The species and numbers of marine mammals likely to be found within the activity area.

Fourteen marine mammal species under NMFS jurisdiction may occur in the vicinity of the proposed project based on the NMFS Alaska Species Distribution Mapper (NMFS 2022c). Table 5 lists these species and summarizes key information regarding their stock status, distinct population segments (DPS), abundance, potential biological removal (PBR), annual mortality/serious injury (M/SI) rate, and potential to occur in the action area.

To more accurately determine species that may occur in the action area, the following information was reviewed and gathered:

- Documents associated with the Jewel Beach Outfall Replacement Project (U.S. Fish and Wildlife Service (USFWS) Consultation #: 07CAAN00-2016-I-0062; NMFS #: AKR-2016-9533; USACE #: KOD011).
- Documents associated with the USCG's request for Letters of Authorization (LOA) for the incidental harassment of marine mammals resulting from programmatic maintenance activities at eight facilities in Alaska (including Kodiak).
- Documents associated with the Ouzinkie Dolphin Installation Project (Ouzinkie 2021)
- Documents associated with the Kodiak Transient Float Construction Project (NMFS #: AKR-2016-9596)
- Documents associated with the Sun'aq Tribe Dock Project in Kodiak Inner Harbor (NMFS #: AKRO-2018-00052)
- Documents associated with the Kodiak Ferry Terminal (ABR 2016)
- Anecdotal evidence about marine mammal presence within waters around Kodiak Island

Information from these sources and a review of scientific literature indicate that humpback whales, Dall's porpoise, harbor porpoise, killer whales, harbor seals, and Steller sea lions could occur in the action area during construction. This IHA application requests take for these six species and assesses the potential impacts that may occur to them as a result of this project.

Take for other species is not requested because the animals are expected to spend little, if any, time in the action area. Shutdowns will be implemented only if these or any other marine mammal species not listed above appears likely to approach the Level B harassment zone during in-water work (Figure 14).

Table 5. Abundance Estimates for Marine Mammal Species Occurring in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Species [a]	Stock and Abundance Estimate [b]	ESA Status and DPS	MMPA Status	PBR	Annual M/SI	Timing and Occurrence in Action Area [c]
Gray Whale (*Eschrichtius robustus*)	Eastern North Pacific: 26,960	Not listed	Not strategic, non-depleted	801	131	Year-round; peak presence from April to June/Rare
North Pacific Right Whale (*Eubalaena japonica*)	Eastern North Pacific: 31	Endangered	Strategic, depleted	0.05	0	Rare
Minke Whale (*Balaenoptera acutorostrata*)	Alaska: Unknown	Not listed	Not strategic, non-depleted	Unknown	0	Year-round; Rare
Fin Whale (*Balaenoptera physalus*)	Northeast Pacific: 3,168	Endangered	Strategic, depleted	5.1	0.6	Year-round; peak presence in spring and summer/Rare
Humpback Whale (*Megaptera novaeangliae*)	California/Oregon/Washington: 4,973	Mexico DPS: Threatened	Strategic, depleted	28.7	48.3	Year-round; peak presence in spring and fall/Common
	Central North Pacific: 10,103	Hawaii DPS: Not listed		83	9.8	
Cuvier's Beaked Whale (*Ziphius cavirostris*)	Alaska: Unknown	-	-	-	-	Very Rare
Sperm Whale (*Physeter macrocephalus*)	North Pacific: 345	Endangered	Strategic, depleted	0.5	3.5	Very rare
Dall's Porpoise (*Phocoenoides dalli*)	Alaska: 13,110 [d]	Not listed	Not strategic, non-depleted	131	37	Year-round/Frequent
Harbor Porpoise (*Phocoena phocoena*)	Gulf of Alaska: 31,046	Not listed	Not strategic, non-depleted	Unknown	72	Year-round/Frequent
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	North Pacific: 26,880	Not listed	Not strategic, non-depleted	Unknown	0	Year-round/Rare
Killer Whale (*Orcinus orca*)	Alaska Resident: 2,347	Not listed	Not strategic, non-depleted	24	1	

Species [a]	Stock and Abundance Estimate [b]	ESA Status and DPS	MMPA Status	PBR	Annual M/SI	Timing and Occurrence in Action Area [c]
	Gulf of Alaska/Aleutian Islands/Bering Sea Transient: 587	Not listed	Not strategic, non-depleted	5.9	0.8	Year-round; peak presence in summer and early fall/Common
Harbor Seal (*Phoca vitulina*)	South Kodiak Island: 26,448	Not listed	Not strategic, non-depleted	939	127	Year-round/Common
Northern Fur Seal (*Callorhinus ursinus*)	Eastern Pacific: 626,618	Not listed	Strategic, depleted	11,403	373	Rare
Steller Sea Lion (*Eumetopias jubatus*)	Western U.S.: 52,932	Western DPS: Endangered	Strategic, depleted	318	254	Year-round/Common

[a] Species listed with ranges extending into the project area derived from the NMFS Species Distribution Mapper (NMFS 2022c) and review of scientific literature. Estimates are presented for either an entire stock or DPS known to be present in the action area.

[b] Abundance estimates are from the most recent stock assessment reports (Carretta et al. 2022 [gray whale, humpback whale California/Oregon/Washington stock]; Young et al. 2023 [all others]).

[c] Occurrence estimates are detailed in the Section 4. Common=multiple sightings every month, could occur each day; Frequent=multiple sightings every year, could occur each month; Infrequent=few sightings each year, could occur each month; Rare=no sightings in recent years; Very rare = not seen in the past 20 years.

[d] Population estimate based on surveys from the Gulf of Alaska only, as abundance estimates for the Alaska stock are more than eight years old and no longer considered reliable (Young et al. 2023).

4 AFFECTED SPECIES STATUS AND DISTRIBUTION

A description of the status and distribution of each species or stocks or marine mammals likely to be affected by the activity.

4.1 HUMPBACK WHALE

4.1.1 Behavior and Life History

With some of the longest annual migration routes of any marine mammals, humpbacks travel thousands of miles each year between low-latitude warm water breeding areas and high-latitude colder oceans for feeding. They prefer waters around the continental shelf but have been known to inhabit deeper offshore waters during migration and shallower waters for calving (International Whaling Commission 2022). Humpbacks do not eat during migration and winter breeding and calving, making the summer feeding period particularly important for building fat reserves for future fasting (Gabriele et al. 2017). They typically visit Alaska waters in the summer months to feed on euphausiids (krill) and small schooling fishes like herring. Humpback whales employ a variety of creative and complex feeding methods such as lunge feeding (Goldbogen et al. 2013), trap feeding (McMillan et al. 2019), and bubble net feeding (Friedlaender et al. 2011).

4.1.2 Hearing Ability and Communication

Humpback whales are classified by NMFS as low-frequency cetaceans with a generalized hearing range of 7 Hz to 35 kHz (NMFS 2018). However, because of the lack of captive subjects and logistical challenges of bringing experimental subjects into the laboratory, no direct measurements of Mysticete hearing are available. Consequently, hearing in Mysticetes is estimated based on other factors like vocalizations, anatomy, behavioral responses to sound, and nominal natural background noise conditions in their likely frequency ranges of hearing (Racicot 2021; Fournet 2018). The combined information from these and other sources strongly suggests that Mysticetes are likely most sensitive to sound from perhaps tens of hertz to ~10 kHz, and evidence suggests that humpbacks can hear sounds as low as 7 Hz (Southall et al. 2007), up to 24 kHz, and possibly as high as 30 kHz (Au et al. 2006; Ketten 2000).

Humpbacks communicate with each other through vocal signals (singing) and surface-generated signals such as breaching or tail slapping (Fournet et al. 2018a). Generally, humpback whales use communication networks that may extend for several miles with a diverse set of vocalizations and non-song acoustic communication during foraging, breeding, and other social interactions (Dunlop 2019). It has been suggested that they use vocalizations during feeding to coordinate feeding maneuvers or to stun or trap prey (National Park Service [NPS] 2020; Leighton et al. 2004).

4.1.3 Status

In 1970, the humpback whale was listed as endangered worldwide, under the Endangered Species Conservation Act (ESCA) of 1969 (35 FR 8491; June 2, 1970), primarily due to decimation from whaling. Congress replaced the ESCA with the ESA in 1973, and some stocks of humpback whales continued to be listed as threatened or endangered. Humpback whale numbers increased following the cessation of most legal whale harvesting.

The National Marine Fisheries Service conducted a global status review of humpback whales and changed the status of humpback whales under the ESA (Bettridge et al. 2015). The globally-listed species was divided into 14 DPSs; four are endangered, one is threatened, and the remaining nine are no longer listed under the ESA (81 FR 62260; September 8, 2016).

After the ESA established the 14 DPSs, NMFS reviewed stock structure and now recognizes five stocks of humpback whales in the North Pacific based on genetic analysis, photo identification, and migration patterns. Four of the five stocks are designated as depleted under the MMPA (Young et al. 2023).

Using fluke identification photographs from 2004 through 2006 from the Structure of Populations, Levels of Abundance, and Status of Humpbacks (SPLASH) study (Calambokidis et al. 2008), Barlow et al. (2011) estimates that the abundance of humpback whales in the North Pacific is 21,063 individuals. More recently, using a multi-strata analysis, Wade (2021) estimates the abundance of humpback whales in the North Pacific is 16,293 for the winter areas and 18,942 for the summer areas. The population in the North Pacific has increased substantially since the cessation of major commercial whaling operations, and the current abundance estimate exceeds some pre-whaling estimates. The overall trend for most humpback whale populations found in U.S. waters is positive and recovering (Muto et al. 2022).

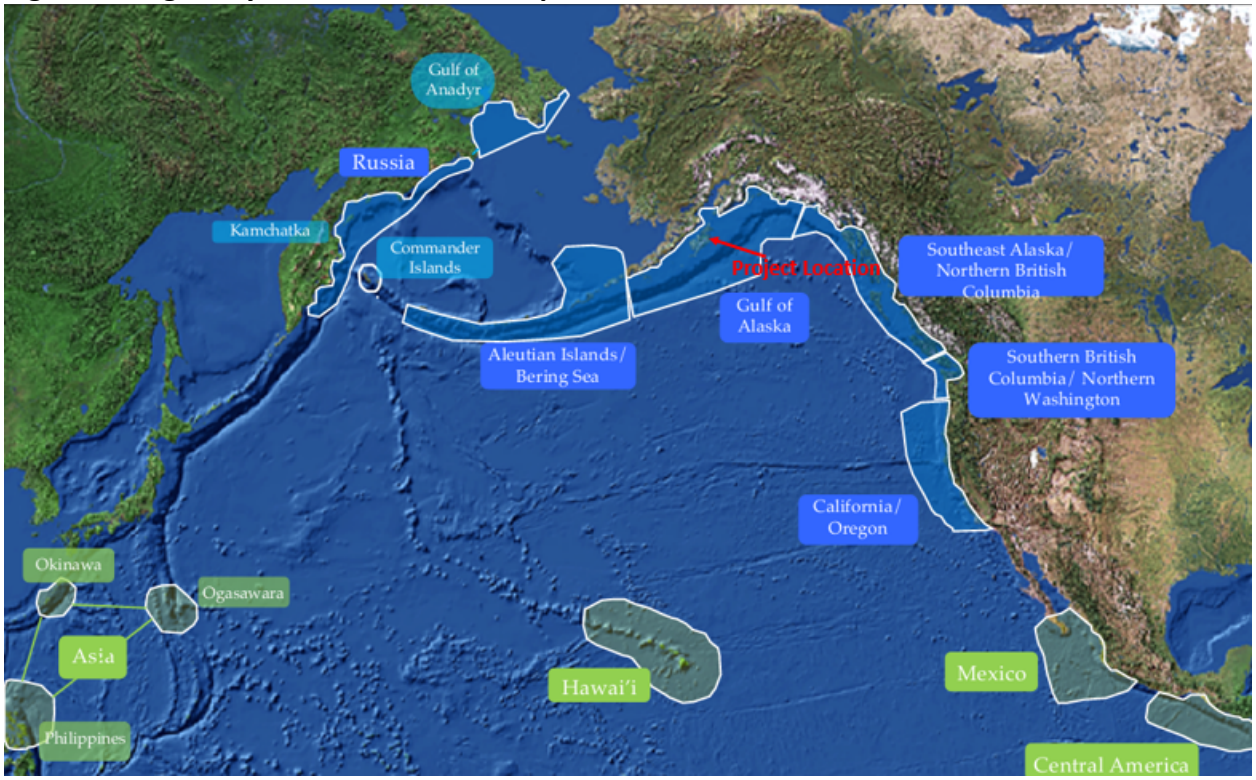
In 2015, a large whale UME was reported for the Western Gulf of Alaska and British Columbia which included 22 humpback whales in Alaska (NMFS 2023). A definitive cause for the UME was not determined, but was likely attributable to ecological factors (i.e., oceanographic changes driven by climate change) (Savage 2017).

4.1.4 Distribution

Humpback whales are distributed worldwide in all ocean basins with a broad geographical range from tropical to temperate waters in the Northern Hemisphere and from tropical to near-ice-edge waters in the Southern Hemisphere (Muto et al. 2022). Humpback whales migrate seasonally between warmer, tropical or sub-tropical waters in winter months, where they reproduce and give birth to calves, and cooler, temperate or sub-Arctic waters in summer months for feeding (Bettridge et al. 2015). Figure 8 below shows migratory destination for winter (green areas) and summer (blue areas) for humpback whales in the North Pacific Ocean (from Wade 2021).

Whales from three DPSs are present in Alaska. Whales from the Western North Pacific (WNP), Mexico, and Hawaii DPSs overlap on feeding grounds off Alaska and are not visually distinguishable. Based on an analysis of migration between winter mating/calving areas and summer feeding areas using photo-identification, Wade (2021) concluded that the humpback whales feeding in Alaska waters belong primarily (89 percent) to the recovered Hawaii DPS and with small contributions (11 percent) from the threatened Mexico DPS (NMFS 2021).

Figure 8. Migratory Destinations of Humpback Whales in the North Pacific Ocean



Source: Wade 2021

4.1.5 Presence in Project Area

Feeding aggregations of humpbacks in the North Pacific Ocean have been shown to be genetically distinct and isolated based on a calf's early maternal experience (Witteveen 2011). There are two distinct feeding aggregations of humpback whales in the Gulf of Alaska, the Southeast Alaska feeding group and the northern Gulf of Alaska feeding group, including areas off Kodiak Island, lower Cook Inlet, and within Prince William Sound (Witteveen 2011; Straley et al. 2018).

In 1999, a 17-year University of Alaska *Gulf Apex Predator-prey (GAP)* study began surveying waters around Kodiak Island. The study sighted a total of 2,173 humpback whales and identified 1,187 unique individuals in the Kodiak region with a 34% average rate of return (NMFS 2020; Witteveen and Wynn 2017). In the action area, it is likely that the majority of humpback whales (89%) will be from the recovered Hawaii DPS, about 11% will be from the threatened Mexico DPS, and about 1% will be from the endangered WNP DPS. The Mexico DPS is comprised of approximately 2,913 (Coefficient Variant= 0.07) animals with an unknown population trend, though likely to be in decline (81 FR 62260) (Wade 2021; Muto et al. 2022).

A review of a citizen science and research collaboration database of marine mammal sightings, specifically targeting humpback whale sightings, indicates that humpback whales are common throughout the action area (Happywhale 2022). While the majority of sightings occur outside of

Near Island Channel, a solo humpback whale was documented transiting the channel during construction at the Kodiak Ferry Terminal in March 2016 (NMFS 2017).

A summary of sightings and densities within the project area are provided in Table 6.

Table 6. Humpback Whale Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

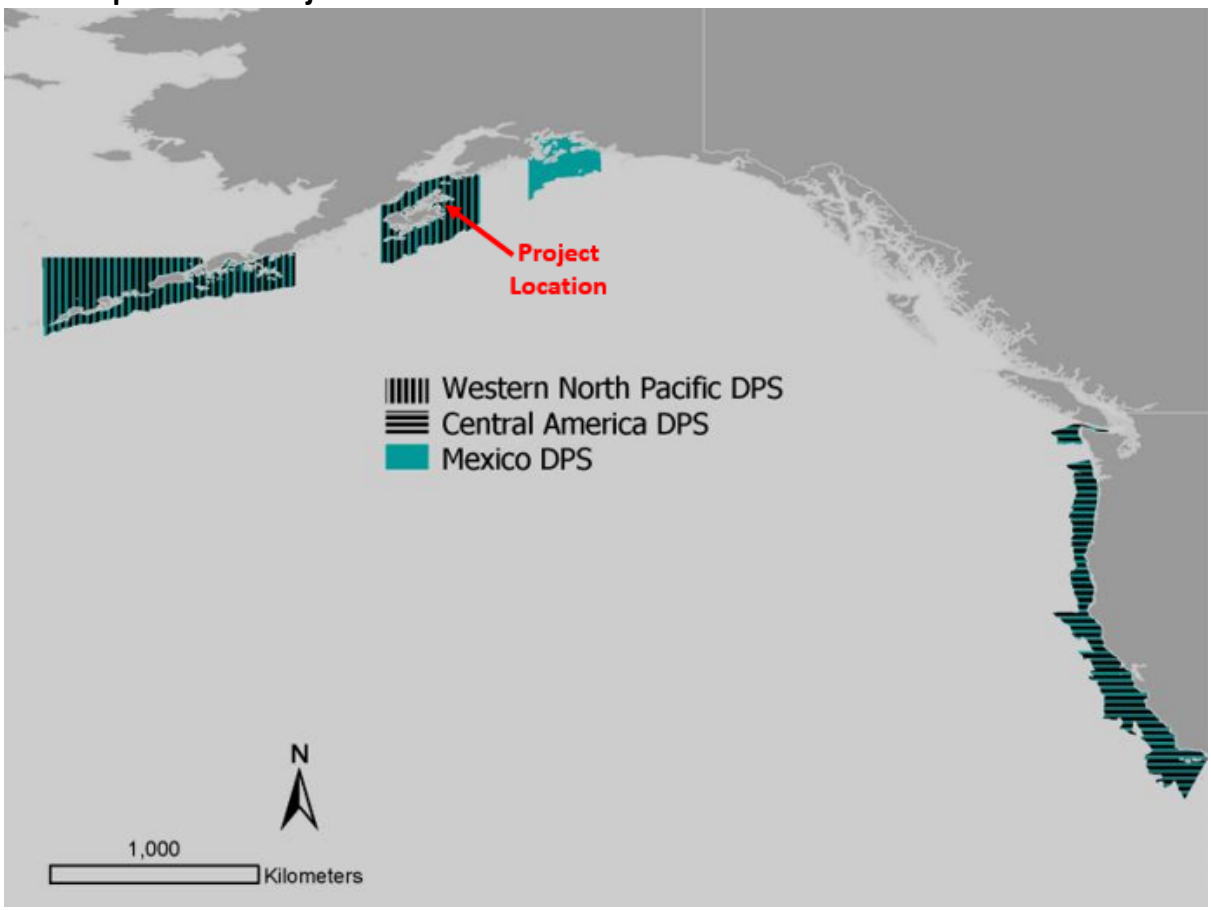
Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
1992-2022	1-24	Throughout	Halpin et al 2009
2015	0.005 individuals/ km^2	Marmot Bay	Rone et al. 2017
March 2016	1	Near Island Channel	ABR 2016
Year-round	0.093 individuals/km^2	Throughout	Halpin et al. 2009

4.1.6 Critical Habitat

The National Marine Fisheries Service designated critical habitat for threatened and endangered humpback whale DPSs (WNP, Mexico, and Central America) on April 21, 2021 (86 FR 21082). During the process of designating critical habitat, NMFS examined potential essential physical and biological features that are essential to the conservation of the species (16 U.S.C. 1532 (5)(A) and 50 CFR 424.02). The National Marine Fisheries Service determined that prey is the only essential feature that qualifies as essential to the conservation of ESA-listed humpback whales. Surveys conducted in the 19 units of critical habitat, from southern California to the eastern Aleutian Islands, were then reviewed to determine prey availability in each unit and subsequently the unit's conservation value (NMFS 2020).

Under this ruling, NMFS delineated specific coastal areas, or units, that meet the definition of critical habitat for one or more of the three DPSs of whales (Figure 9). Unit 5 is designated critical habitat around Kodiak Island and is important feeding grounds for the Mexico and WNP DPSs and contains the biological prey feature that is essential to their conservation. Unit 5 encompasses about 17,420 square nautical miles (59,749 square km) of marine habitat (extending from 154° 54' W eastward to 150° 40' W) and includes the BIA which covers all of Kodiak Island. All of Kodiak Island is within humpback whale critical habitat, including the proposed project action area.

Figure 9. Designated Critical Habitat for Humpback Whale Near the Trident Kodiak Bunkhouse Dock Replacement Project Area



Source: NMFS 2020

4.2 DALL'S PORPOISE

4.2.1 Description, Behavior, and Life History

Dall's porpoises are small black and white odontocetes (toothed whales) that are very fast swimmers and generally travel in small groups, but have been observed in larger groups of hundreds of animals. Playful and social, these animals sometimes group and swim alongside larger whales or the bow of transiting vessels. Dall's porpoises are known to feed on small fish, cephalopods, and crustaceans, with a tendency towards high-value prey such as herring and sardines. The life span of the Dall's porpoise is approximately 15 to 20 years. Calving generally occurs between June and September (NMFS 2023a).

4.2.2 Hearing Ability and Communication

Dall's porpoises are classified by NMFS as high-frequency cetaceans with a generalized hearing range of 275 Hz to 160 kHz (NMFS 2018). They emit a variety of intense, high-frequency clicks and whistles which are particularly important for echolocating prey and communication (Kyhn et al. 2013).

4.2.3 Status

Dall's porpoises are not listed as threatened or endangered under the ESA. The National Marine Fisheries Service currently recognizes a single stock of Dall's porpoises in Alaska waters and an estimate of 83,400 Dall's porpoises has been used by NMFS for the entire stock; however, surveys that determined this number are more than eight years old and are not considered reliable. The minimum population estimate for this stock has been adjusted to 13,110 animals, although this number is likely low since the survey study area represents only a small fraction of the species' range (Muto et al. 2022). There have been no UMEs declared for this species in recent years (NMFS 2023a).

4.2.4 Distribution

Dall's porpoises are widely distributed across the North Pacific Ocean and are one of the most common cetaceans in the Gulf of Alaska (Rone et al. 2017). They show some migration patterns, inshore and offshore and north and south, based on morphology and type, geography, and seasonality. Surveys conducted in the Gulf of Alaska from 2009 to 2015 indicate that Dall's porpoises inhabit all strata on the continental shelf, slope, and pelagic waters with the greatest densities occurring in deeper inshore and slope habitats (Rone et al. 2017).

4.2.5 Presence in Project Area

Dall's porpoises are consistently observed along the Kodiak Shelf, including in Marmot Bay. Surveys conducted in waters around Kodiak Island reported sightings of solo individuals and pairs within Marmot Bay (Halpin et al. 2009; Rone et al. 2017). Table 7 provides a summary of sightings and densities in the proposed project area.

Table 7. Dall's Porpoise Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
August 1992	2	Chiniak Bay	Halpin et al 2009
June 1998	1	Marmot Bay	Halpin et al. 2009
2015	0.0340 individuals/ km^2	Marmot Bay	Rone et al. 2017
Year-round	0.218 individuals/km^2	Marmot Bay	Marine Geospatial Ecology Lab 2021

4.3 HARBOR PORPOISE

4.3.1 Description, Behavior, and Life History

The harbor porpoise is a shy animal, that avoids vessels and does not engage in bow riding behavior like other porpoises. They are most often seen in groups of 2 or 3, but have been recorded in groups of up to 10 individuals (NMFS 2023b).

They prefer coastal areas and are most commonly found in bays, estuaries, harbors, and fjords. Their diet mainly consists of schooling fish, like herring and mackerel, but they will forage on

squid and octopus. Harbor porpoises are not known to migrate, but do move seasonally from inshore to offshore, likely due to prey availability (NMFS 2023b)

4.3.2 Hearing Ability and Communication

Harbor porpoises are classified by NMFS as high-frequency cetaceans with a generalized hearing range of 0.125 kHz to 150 kHz. Harbor porpoises have the highest upper-frequency limit of all odontocetes investigated. Kastelein et. Al. (2017) found that the range of best hearing was from 16 to 140 kHz, with a reduced sensitivity around 63 kHz. Maximum sensitivity (about 44 dB to 47 dB re 1 µPa) occurred at 125 kHz. This maximum sensitivity corresponds with the peak frequency of echolocation pulses produced by harbor porpoises (120–130 kHz) (Kastelein et al. 2017).

4.3.3 Status

In Alaska, harbor porpoises are currently divided based primarily on geography, into three stocks: the Bering Sea stock, the Southeast Alaska stock, and the Gulf of Alaska stock. In areas outside of Alaska, studies have shown that stock structure is more finely scaled than is reflected in the Alaska Stock Assessment Reports; however, no data are yet available to define stock structure for harbor porpoises on a finer scale in Alaska (Muto et al. 2022). Only the Gulf of Alaska stock is considered in this application because the other stocks occur outside the geographic area under consideration. In 1998, aerial surveys were conducted in the Gulf of Alaska and produced an abundance estimate of 31,046 individuals (Muto et al. 2022).

4.3.4 Distribution

The Gulf of Alaska stock ranges from the Cape Suckling to Unimak Pass. Harbor porpoises primarily occur in coastal waters with depths of 100 meters or less in Alaska, but can occur in deeper waters (Muto et al. 2022; Hobbs and Waite 2010).

4.3.5 Presence in Project Area

Harbor porpoises have been documented throughout the proposed project area. Since 1992, formal and citizen science surveys have documented solo individuals and groups of four in Marmot Bay and Chiniak Bay. During construction at the Kodiak Ferry Terminal, harbor porpoise solo individuals and groups of two were recorded on five days in March 2016 (ABR 2016). A summary of sightings and calculated densities are provided in Table 8.

Table 8. Harbor Porpoise Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
1992-1998	1-4	Marmot Bay and Chiniak Bay	Halpin et al 2009
March 2016	1-2	Near Island Channel	ABR 2016
Year-round	0.4547 individuals/km^2	Marmot Bay	Marine Geospatial Ecology Lab 2021

4.3.6 Critical Habitat

Critical habitat has not been proposed or designated for harbor porpoise.

4.4 KILLER WHALES

4.4.1 Description, Behavior, and Life History

Killer whales, members of the Delphinidae family (dolphins), are one of the most recognizable marine mammals because of their distinctive black and white bodies. They are highly social animals and apex predators, often traveling in social groups (pods) made up of 20 or more animals, and use coordinated feeding efforts to capture and also share prey with others in the pod. Killer whales have evolutionarily diverged into three distinct genetic ecotypes (resident, transient, and offshore) that somewhat overlap in distribution, but exhibit different vocalization patterns and prey preferences. They are opportunistic feeders and generally their diet is shaped by where they live, although favored prey are marine mammals, fish, squid, and even sharks (NMFS 2023c).

4.4.2 Hearing Ability and Communication

Killer whales are classified by NMFS as mid-frequency cetaceans with a generalized hearing range of 150Hz to 160 kHz (NMFS 2018). The hearing of killer whales is well developed. Szymanski et al. (1999) found that they responded to tones between 1 and 120 kHz, with the most sensitive range between 18 and 42 kHz. Their greatest sensitivity is at 20 kHz, which is lower than many other odontocetes, but it matches peak spectral energy reported for killer whale echolocation clicks. Killer whales use vocalizations in a variety of ways. Each pod employs a unique set of sounds, including clicks, whistles, and calls, for echolocation during foraging, communication with other pod members, and navigation (Myers et al. 2021).

4.4.3 Status

Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized within the Pacific U.S. Exclusive Economic Zone, seven of which occur in Alaska. The two stocks that are most likely to occur around Kodiak Island are the Alaska Resident stock and Gulf of Alaska/Aleutian Islands/Bering Sea Transient stock (Muto et al. 2022).

The populations that are known to occur around Kodiak Island are not strategic or depleted under the MMPA. The Alaska resident stock size is 1,920 (751 individuals documented near Kodiak Island) and the Gulf of Alaska/Aleutian Islands/Bering Sea transient stock population size is considered stable at 587 (136 individuals documented in the Gulf of Alaska). Long-term studies of pods belonging to the Alaska resident stock in the Gulf of Alaska indicate these populations are increasing at an estimated growth rate of approximately 3.4% (Matkin et al. 2014). However, AB pod experienced a large mortality event following the 1989 Exxon Valdez Oil spill. Prior to the spill, the pod consisted of 36 members; from 1989 to 1990, 14 whales disappeared from the pod. AB pod is considered recovering; however, due to slow reproduction rates only 28 individuals were observed in 2005 (Exxon Valdez Oil Spill Trustee Council 2021).

4.4.4 Distribution

Killer whales have been observed in all oceans and seas of the world, but the highest densities occur in colder and more productive waters found at high latitudes. Killer whales are found

throughout the North Pacific and occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (NMFS 2023c).

In the Gulf of Alaska, the offshore killer whale ecotype is found in pelagic waters off the Aleutian Islands to California and mainly prey on sharks; the resident ecotype (Alaska residents) ranges from Kodiak Island to Southeast Alaska and prefer to eat fish; and the Gulf of Alaska transient population occurs from Prince William Sound through the Aleutian Islands (Muto et al. 2020).

4.4.5 Presence in Project Area

There are seven pods (AD5, AF5, AF22, AG, AK6, AX, and AX48) from the Alaska resident stock that are known to frequent the waters around Kodiak Island. The AX pods from the Alaska resident stock have been well documented and appear to be the only pods that center their range on Kodiak Island (North Gulf Oceanic Society 2023). Since at least 1993, a pod of six Gulf of Alaska transient killer whales, deemed the "Kodiak Killers", have been documented hunting Steller sea lions in the Kodiak Harbor. Based on verbal and photographic reports this pod is estimated to consist of six individuals and consume four to six Steller sea lions per year, primarily from January to April (University of Alaska Fairbanks 2012). During construction at the Kodiak Ferry Terminal, three pods of killer whales were sighted on three days in March 2016 (ABR 2016). A summary of density estimates and sightings in the project area are provided in Table 9.

Table 9. Killer Whale Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
1992-2022	1-10	Throughout	Halpin et al 2009
March 2016	3-5	Near Island Channel	ABR 2016
Year-round	0.005 individuals/km^2	Throughout	Marine Geospatial Ecology Lab 2023

4.5 HARBOR SEAL

4.5.1 Description, Behavior, and Life History

Harbor seals are one of the most common marine mammals in Alaska. They haul out on rocks, reefs, beaches, and drifting glacial ice and feed in marine, estuarine, and occasionally fresh waters. Harbor seals are generally non-migratory with local movements associated with such factors as tide, weather, season, food availability and reproduction. They are often seen hauled out on beaches, sand bars, or glacial ice in groups for protection against larger predators such as transient killer whales. Harbor seals are able to dive to depths up to 500 meters and forage on fish, clams, mussels, and crustaceans. Harbor seals deviate from other pinniped species in that pupping may occur on a wide variety of haul-out sites rather than particular major rookeries (ADF&G 2023a).

4.5.2 Hearing Ability and Communication

Harbor seals are classified by NMFS as phocid pinnipeds with a generalized in-water hearing range of 50 Hz to 86 kHz (NMFS 2018). They respond to underwater sounds from approximately 1 to 180 kHz, with the functional high-frequency limit around 60 kHz and peak sensitivity at about 32 kHz. Their hearing ability in the air is greatly reduced (by 25 to 30 dB); they respond to sounds from 0.1 to 32.5 kHz, with a peak sensitivity of 3.2 kHz (Reichmuth et al. 2013).

Most harbor seal vocalizations are exhibited during breeding season by adult males in order to establish territory and attract females (Casey et al. 2016; Matthews et al. 2020). Vocalizations between mother/pup pairs are also important as female seals forage during the nursing period and use attraction calls to maintain contact with pups (Perry and Renouf 1988; Sauvé et al. 2015).

4.5.3 Status

Harbor seals are not listed as depleted under the MMPA or as threatened or endangered under the ESA. In 2010, harbor seals in Alaska were partitioned into 12 separate stocks based largely on genetic structure (Muto et al. 2022). The status of the 12 stocks relative to their optimum sustainable population size is unknown. The south Kodiak stock of harbor seals, the stock that would be expected in the project vicinity, is not classified as strategic.

The current statewide abundance estimate for Alaska harbor seals is 243,938 based on aerial survey data collected between 1996 and 2018 (Boveng et al. 2019). The abundance estimate for the south Kodiak stock is 26,448 (Muto et al. 2022). The current south Kodiak population trend shows an increase of 1,234 seals per year, with a 0.076 probability that the stock is decreasing (Muto et al. 2022).

4.5.4 Distribution

Harbor seals range from Baja California north, along the west coasts of Washington, Oregon, California, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands (Muto et al. 2022).

Distribution of the south Kodiak stock, the only stock considered in this application, range from Middle Cape on the west coast of Kodiak Island southwest to Chirikof Island and east along the south coast of Kodiak Island to Spruce Island, including the Trinity Islands, Tugidak Island, Sitkinak Island, Sundstrom Island, Aiaktalik Island, Geese Islands, Two Headed Island, Sitkalidak Island, Ugak Island, and Long Island (Muto et al. 2022).

4.5.5 Presence in Project Area

Harbor seals are regularly sighted in the proposed project action area and could occur on any given day. During construction at the Kodiak Ferry Terminal, solo individuals were sighted on 9 of the 29 days of monitoring. Density estimates and previous sightings are detailed in Table 10.

Table 10. Harbor Seal Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
December 2015-March 2016	1	Near Island Channel	ABR 2016
Year-round	0.1689 individuals/km^2	Throughout	Marine Geospatial Ecology Lab 2021

4.6 STELLER SEA LIONS

4.6.1 Description, Behavior, and Life History

Steller sea lions are social animals. They gather in large groups on land at rookeries for resting, breeding, and raising young pups. They are known to haul out on land, docks, buoys, and navigational markers. Different from rookeries, haulouts are more informal gathering locations used for resting and molting. In their aquatic habitat they are generally more solitary hunters and are excellent divers but often gather in large rafts, or clusters, at the surface.

Steller sea lions are opportunistic foraging feeders with diets consisting of a variety of fish and cephalopod species, depending on prey availability. Feeding habits vary with season. During spring, energetic demands are high for pregnant females and for males preparing for extended fasting. Beginning in May and throughout the breeding season, males may fast for up to two months while occupying and defending their rookery territory and breeding females forage closer to rookeries returning often to their nursing pups (NMFS 2023d).

4.6.2 Hearing Ability and Communication

Steller sea lions have a generalized in-water hearing range of 60 Hz to 39 kHz (NMFS 2018). The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. Sea lions have a range of vocalizations used on land and in water in conjunction with territorial behaviors, breeding, and communication between mother/pup pairs (Charrier 2021). Studies of Steller sea lion auditory sensitivities have found that this species detects sound underwater between 1 to 25 kHz (Kastelein et al. 2005) and in air between 30 Hz and 250 kHz (Mulsow and Reichmuth 2010).

4.6.3 Status

The Steller sea lion was listed as a threatened species under the ESA on November 26, 1990, due to significant population decline (55 FR 49204). Speculated causes of the decline included competition with commercial fisheries, environmental change, disease, predation, incidental take, and shooting (NMFS 2008). In 1997, NMFS reclassified Steller sea lions with two DPSs based on genetic studies and other information (62 FR 24345; May 7, 1997). At that time, the eastern DPS (EDPS; which includes animals born east of Cape Suckling, Alaska, at 144°W) was

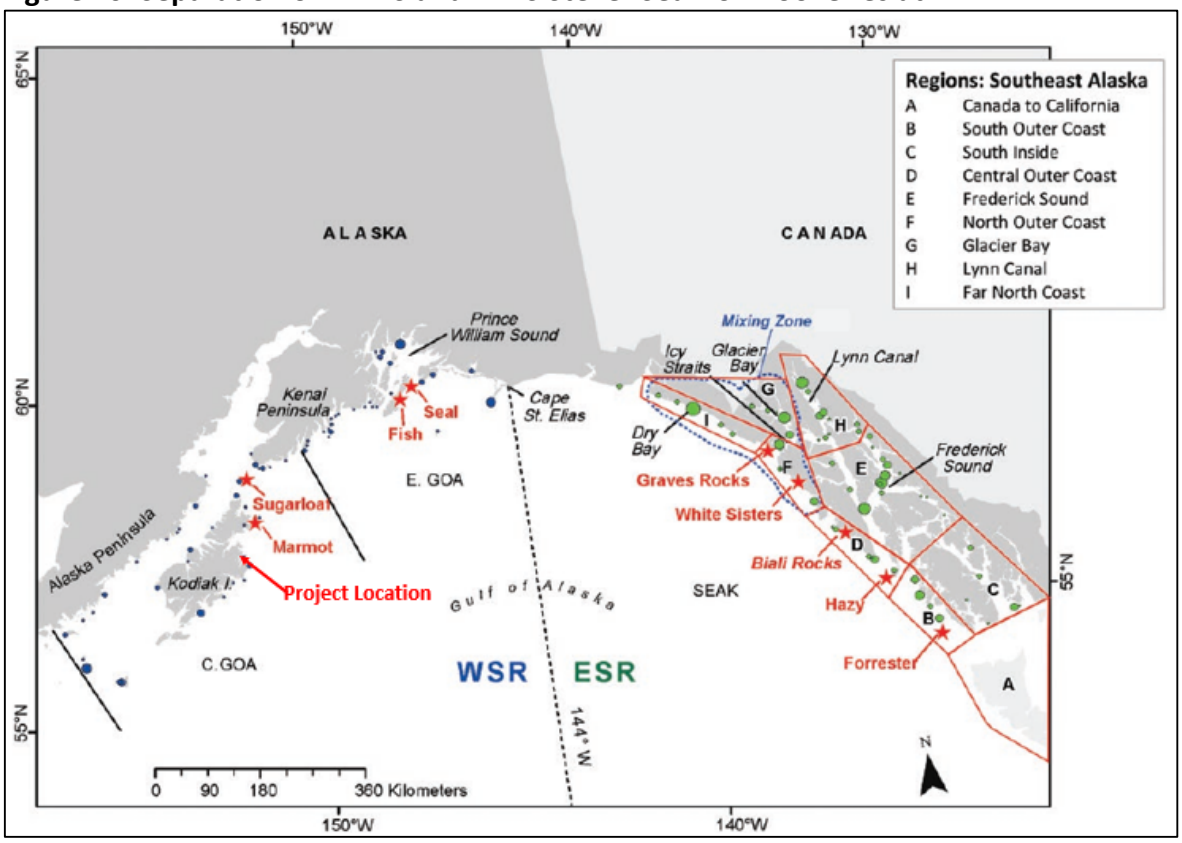
listed as threatened, and the western DPS (WDPS; which includes animals breeding west of Cape Suckling, both in Alaska and Russia) was listed as endangered. On November 4, 2013, the EDPS was removed from the endangered species list (78 FR 66140). The WDPS remains on the ESA's endangered list.

4.6.4 Distribution

Steller sea lions' range runs along the North Pacific Ocean from northern Japan to California, with centers of abundance in the Gulf of Alaska and Aleutian Islands (NMFS 2008). They are distributed mainly on the coastlines and coastal waters but can be found in pelagic waters (NMFS 2023d). Steller sea lions are not known to migrate annually, but individuals may disperse widely outside of the breeding season (Jemison et al. 2013; Allen and Angliss 2015).

Of the two Steller sea lion populations in Alaska, the WDPS includes sea lions born on rookeries at or west of Cape Suckling, and the EDPS includes sea lions born on rookeries from California north through Southeast Alaska. A dividing line, based on genetic studies, is established at 144°W as shown in Figure 10 (NMFS 2023d; Hastings et al. 2020). It is expected that only WDPS Steller sea lions are found within the project area (NMFS 2023d). Steller sea lions are not known to migrate annually, but individuals may disperse widely outside of the breeding season (late May to early July), leading to the intermixing of stocks. However, the project action area is outside of the known mixing area (Jemison et al. 2013).

Figure 10. Separation of WDPS and EDPS Steller Sea Lion Rookeries at 144°W



Source: Hastings et al. 2020

4.6.5 Presence in Project Area

Steller sea lions are distributed throughout Southwest Alaska, with patterns loosely correlated to aggregations of spawning and migrating prey species (Sinclair and Zeppelin 2002; Sinclair et al. 2013). Haulout and rookery sites in Southwest Alaska are documented through biennial aerial surveys and are shown in Figure 11 (Sweeney et al. 2022).

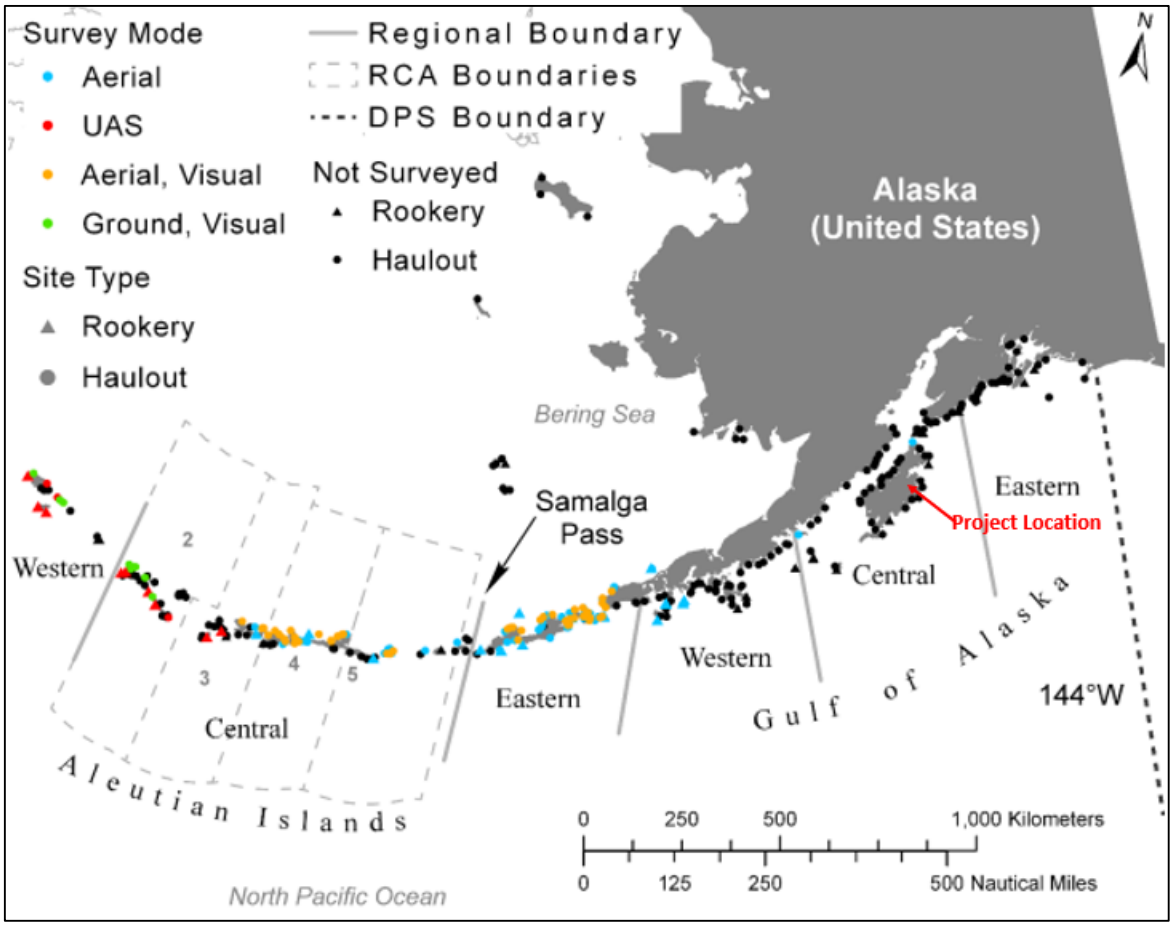
WDPS Steller sea lions frequent the action area. Many sea lions have become habituated to human activity in the project action area and use Dog Bay float in St. Herman Harbor, about 792 meters (2,600 ft) from the Bunkhouse Dock Replacement Project (Figure 1). In 2000, the Dog Bay float (section from an old floating breakwater) was relocated and dedicated as a sea lion haulout. Sea lions prefer this relatively undisturbed haulout, and it has proven effective in reducing sea lion-human conflicts in Kodiak's docks and harbors. However, Steller sea lion interactions still present problems for fishing vessels in and around Kodiak Harbor and at seafood processing plants. Seafood processing facilities in Kodiak are regularly visited by sea lions looking for food. Sea lions in the Kodiak harbor area are habituated to fishing vessels and skilled at gaining access to fish.

During construction at the Kodiak Ferry Terminal (approximately 270 meters from project site), they were encountered daily (82 FR 10894, February 26, 2017). Based on numbers at the Dog Bay float and sea lion behavior, it is estimated that about 40 unique individual sea lions likely pass by the project site each day (82 FR 10894, February 26, 2017).

Bi-weekly census of Steller sea lions at the Dog Bay float conducted from November 2015 to June 2016, in association with the Kodiak Ferry Terminal project, revealed maximum numbers (>100) from mid-March through mid-June, with 5,111 total observations from November 2015 to June 2016 (NMFS 2019a). The highest average hourly number (11-15/hour) of sea lions within the entire Kodiak Ferry Terminal observation area occurred from February through April 2016 (NMFS 2019a). July through October was outside the timeframe of the census conducted in association with the Kodiak Ferry Terminal, but presumably the number of Steller sea lions in the harbor pursuing fishing vessels would be higher during months salmon fishing is occurring and sea food processing plants within Near Island Channel are active.

A summary of density estimates and sighting data is provided in Table 11.

Figure 11. Steller Sea Lion Rookeries and Haulouts Map



Source: Sweeney et al. 2022

Table 11. Steller Sea Lion Presence in the Trident Kodiak Bunkhouse Dock Replacement Project Action Area

Survey Timing/Season	Observed Group Size/Density	Waterbody	Reference
November 2015-March 2016	1-13 (40 individuals/day)	Near Island Channel	ABR 2016; NMFS 2019a
Year-round	0.0678 individuals/km^2	Throughout	Marine Geospatial Ecology Lab 2021

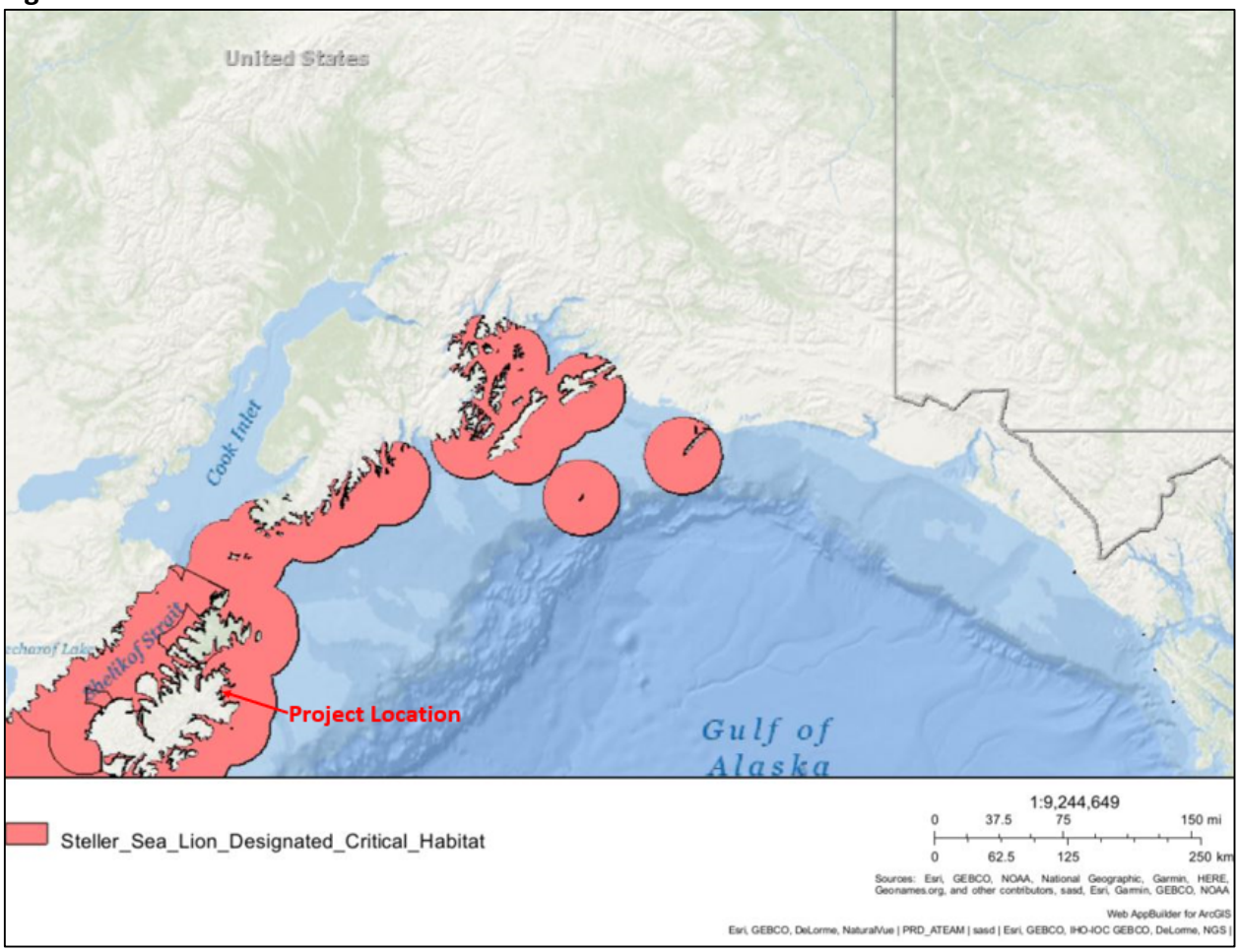
4.6.6 Critical Habitat

Critical habitat for Steller sea lions was designated by NMFS in 1993 based on the following essential physical and biological habitat features: terrestrial habitat (including rookeries and haulouts important for rest, reproduction, growth, social interactions) and aquatic habitat (including nearshore waters around rookeries and haulouts, free passage for migration, prey resources, and foraging habitats) (58 FR 45269). Specifically, designated critical habitat consists of a terrestrial buffer zone that extends 914 meters (3,000 ft) landward from each major sea lion rookery and haulout. The aquatic buffer zone extends 914 meters (3,000 ft) from major

rookeries and haulouts east of 144° W longitude (the dividing line for EDPS and WDPS Steller sea lions) and 37 km (20 nautical miles) from major rookeries and haulouts west of 144° W longitude (Figure 12).

The nearest rookery to the project area is located on Marmot Island in Marmot Bay, 38.7 km (20.9 nautical miles) northeast of the proposed project site. The nearest major haulouts are Long Island, approximately 11.4 km (6.2 nautical miles) southeast of the proposed project site and Kodiak/Cape Chiniak, approximately 23 km (12.4 nautical miles) southwest (Alaska Fisheries Science Center 2022). Since the ensonified action area encompasses Near Island Channel and St. Paul Harbor, it would intersect Steller sea lion designated critical habitat (Figure 12). Additionally, since all of Kodiak Island is within Steller sea lion critical habitat, material and equipment barges' routes would transit through critical habitat on the way to the project site.

Figure 12. Steller Sea Lion Critical Habitat around Kodiak Island



Source: NMFS 2022c

5 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury, and/or death) and the method of incidental taking.

Trident requests the issuance of an IHA pursuant to Section 101(a)(5) of the MMPA for incidental take by Level B harassment of six species (humpback whales, Dall's porpoise, harbor porpoise, killer whales, harbor seals, and Steller sea lions) and Level A take of 1 species (Steller sea lions) that may occur in the Trident Kodiak Bunkhouse Dock Replacement Project harassment zones during construction.

The activities outlined in Section 1 have the potential to take marine mammals through exposure to in-water sound. Level B take of the six species listed above will potentially result from noise associated with pile installation and removal using the methods mentioned above (vibrating and DTH drilling). Pile driving will be shut down if species enter or appear likely to enter shutdown zones for pile driving activities (see Table 16), thereby decreasing potential Level A take of marine mammals. Section 11 describes mitigation measures including shutdown zones and procedures that will prevent most Level A takes, except for some Steller sea lions which Level A is requested.

The applicant requests an IHA for incidental take of marine mammals described within this application for one year, beginning on March 1, 2024 (or the issuance date, whichever is later). Trident is not requesting a LOA at this time because the activities described herein are expected to be completed within one year from the date of authorization and are not expected to rise to the level of serious injury or mortality, which would require an LOA.

6 TAKE ESTIMATES FOR MARINE MAMMALS

The number of marine mammals (by species) that may be taken by each type of taking identified in Section 5, and the number of times such takings by each type of taking are likely to occur.

6.1 ESTIMATED TAKE

Incidental take is estimated for each species considering the following:

1) Acoustic thresholds above which NMFS believes marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment;
2) the size of the action area (the area of water that will be ensonified above acoustic thresholds in a day);
3) the density or occurrence of marine mammals in the action area;
4) the number of days of pile driving and removal activity.

Previous marine construction projects in the Kodiak Island area and available scientific literature are used to estimate the density or occurrence of marine mammals in the action area. Incidental take is being requested for each species whose occurrence in the action area is described as 'common', 'frequent', and 'infrequent'. Take of species whose occurrence in the action area is described as 'rare' or 'very rare' is not requested. See Table 5.

To obtain more accurate Level B take estimations, we estimated a daily occurrence probability based on the size of the harassment zone for the activity for each marine mammal species in the action area rather than a weekly or hourly estimation. Occurrence probability estimates are based on conservative density approximations for each species and factor in historic data of occurrence, seasonality, and group size in the project area.

To standardize observation estimates across species, densities were used unless area-specific groups sizes (Killer whales and Steller sea lions) provided a more accurate representation of individuals likely to be impacted during the project's in-water construction (Table 12).

For species with estimated densities that accurately represent the probability of their occurrence in the action area, the following equation was used to estimate take:

Estimated Level B take= (Activity Level B harassment area [km^2] x estimated density [individuals/ km^2]) x days of pile driving activity

For species with group sizes that accurately represent the probability of their occurrence in the action area, the following equation was used to estimate take:

Estimated Level B take= group size x days of pile driving activity

Level A take is also requested for Steller sea lions given their frequency in the action area and the project's proximity to seafood processing facilities, a known marine mammal foraging area. The Level A take calculation assumes that one Steller sea lion may occur in the Level A zone on days when it extends beyond 15 meters (20 days).

Estimated Level A take=1 Steller sea lion x days when the Level A zone is 15 meters or more (20 days)

After consultation with NMFS, the Level A shutdown zone was decreased for phocid pinnipeds.

Table 6 through Table 11 shows species occurrence information used to estimate take. Take calculations are provided in Table 12.

Table 12. Species Occurrence Information and Take Calculation for the Trident Kodiak Bunkhouse Dock Replacement Project

Activity	Level B Distance	Square Kilometers	Days	Species											
				Humpback		Steller Sea Lions		Harbor Seals		Killer whales		Harbor Porpoise		Dall's Porpoise	
				Density	Individuals	Group Size	Individuals	Density	Individuals	Pod Size	Individuals	Density	Individual	Density	Individual
Vibratory Hammer															
14-inch existing timber pile removal (100 piles; ~50 mins per day on 4 days)	6,310	2.83	4	0.093	1.05276	40	160	0.1689	1.911948	6	24	0.4547	5.147204	0.218	2.46776
14-inch existing H-pile removal (75 piles; ~40 mins per day on 4 days)	1,000	0.33	4	0.093	0.12276	40	160	0.1689	0.222948	6	24	0.4547	0.600204	0.218	0.28776
16-inch existing steel pile removal (60 piles; ~40 mins per day on 3 days)	5,415	2.65	3	0.093	0.73935	40	120	0.1689	1.342755	6	18	0.4547	3.614865	0.218	1.7331
16-inch steel pile permanent installation (26 piles; ~10 mins per day on 5 days)	5,415	2.65	5	0.093	1.23225	40	200	0.1689	2.237925	6	30	0.4547	6.024775	0.218	2.8885
24-inch steel pile temporary installation (20 piles; ~12 mins per day on 3 days)	5,415	2.65	3	0.093	0.73935	40	120	0.1689	1.342755	6	18	0.4547	3.614865	0.218	1.7331
24-inch steel pile temporary removal (20 piles; ~16 mins per day on 3 days)	5,415	2.65	3	0.093	0.73935	40	120	0.1689	1.342755	6	18	0.4547	3.614865	0.218	1.7331
24-inch steel pile permanent installation (52 piles; ~8 mins per day on 13 days)	5,415	2.65	13	0.093	3.20385	40	520	0.1689	5.818605	6	78	0.4547	15.664415	0.218	7.5101
DTH															
16-inch steel permanent installation (26 piles; ~270 mins per day on 4 days)	6,310	2.83	4	0.093	1.05276	40	160	0.1689	1.911948	6	24	0.4547	5.147204	0.218	2.46776
24-inch steel temporary installation (20 piles; ~180 mins per day on 3 days)	6,310	2.83	3	0.093	0.78957	40	120	0.1689	1.433961	6	18	0.4547	3.860403	0.218	1.85082
24-inch steel permanent installation (52 piles; ~240 mins per day on 13 days)	6,310	2.83	13	0.093	3.42147	40	520	0.1689	6.213831	6	78	0.4547	16.728413	0.218	8.02022
Estimated Level B Takes					**13.09347**		**2200**		**23.779431**		**330**		**64.017213**		**30.69222**

6.2 ALL MARINE MAMMAL TAKE REQUESTED

This analysis for the Trident Kodiak Bunkhouse Replacement Dock Project predicts Level B take of 14 humpback whales, 31 Dall's porpoises, 65 harbor porpoises, 330 killer whales, 24 harbor seals, and 2,200 Steller sea lions. All of these potential takes would be classified as Level B harassment under the MMPA. Potential Level A takes are predicted for 20 Steller sea lions. See Table 12 and Table 13.

Table 13. Trident Kodiak Bunkhouse Dock Replacement Project Take Requests for Marine Mammals and Percent of Stock

Species	Stock/DPS (N_{EST})[a]	Level A	Level B[b]	Percent of Stock[c]
Humpback Whale	Hawaii DPS (11,278)[d]	0	12	Less than 1
	Mexico North Pacific Stock/Mexico DPS (2,806)[e]	0	2	Less than 1
Dall's Porpoise	Alaska (13,110)[g]	0	31	Less than 1
Harbor Porpoise	Gulf of Alaska: 31,046	0	65	Less than 1
Killer Whale	Alaska Resident (1,920)	0	264	13.8
	Gulf of Alaska/Aleutian Islands/Bering Sea Transient (587)	0	66	11.2
Harbor Seal	South Kodiak Island (26,448)	0	24	Less than 1
Steller Sea Lion	Western U.S. (52,932)	20	2,200	4.2

[a] Stock estimate from Young et al. 2023; Appendix 2 unless otherwise noted.
[b] Take estimates are weighted based on calculated percentages of population for each distinct stock, assuming animals present would follow same probability of presence in project area
[c] Percent of stock refers to combined Level B and Level A take (if requested).
[d] Humpback whales are considered as five stocks. Using the stock assessment from Young et al. 2023 for the Hawaii DPS (11,278) and Mexico North Pacific Stock/Mexico DPS (not available); 89 percent of whales present in the Gulf of Alaska are expected to be from the Hawaii DPS and 11 percent from the Mexico DPS (Wade 2021).
[e] Mexico DPS estimate from 86 FR 21082.
[g] Population estimate based on surveys from western Prince William Sound only, as abundance estimates for the Alaska stock are more than eight years old and no longer considered reliable (Muto et al. 2022).

7 ANTICIPATED IMPACT OF THE ACTIVITY

The anticipated impact of the activity to the species or stock of marine mammal.

Trident is requesting authorization for Level A and Level B take of marine mammals. Table 13 shows take requests in relation to the overall stock size of each species. The calculations of stock take in Table 12 and Table 13 assume takes of individual animals, instead of repeated

takes of a smaller number of individuals; therefore, the stock take percentage calculations are conservative.

Incidental Level B take is expected to primarily result in short-term changes in behavior, such as avoidance of the project area, changes in swimming speed or direction, and changes in foraging behavior. Level B exposure could occur during the 55 days when pile driving and removal would occur. The proposed project would be unlikely to have any impact on stock recruitment or survival because of the limited time that marine mammals could be exposed to Level B harassment; therefore, the project would have a negligible impact on the stocks of these species.

Trident is requesting minimal Level A take for Steller sea lions that may occur during DTH drilling pile installation, when the Level A zone extends beyond about 15 meters (see Table 13). Incidental Level A take can cause injury including permanent partial or full hearing loss if marine mammals are exposed to underwater sounds exceeding their injury threshold. Marine mammals exposed to high sound levels may experience non-auditory physiological effects such as increased stress, neurological effects, bubble formation, resonance effects, and organ or tissue damage.

Because of the limited area Steller sea lions could experience Level A harassment (maximum 15 meters), it is not expected that there would be any impact on stock recruitment or survival; therefore, there would be no impact to the stocks of these species.

8 ANTICIPATED IMPACTS ON SUBSISTENCE USES

The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

Alaska Natives have used subsistence resources, including harbor seals and sea lions, in the Kodiak Archipelago for thousands of years. The Alutiiq people of Kodiak traditionally harvested marine mammals, land mammals, birds, shellfish, and fish (salmon, cod, halibut, and herring). Subsistence harvesting of terrestrial and marine resources is still prevalent and an important practice in the Kodiak Archipelago (ADF&G 2022; Sun'aq Tribe of Kodiak 2023).

The most recent subsistence harvest data for Kodiak Island was gathered during community surveys in 2011. Based on those surveys, 163 harbor seals (95 percent confidence range of between 126 and 208 animals) were harvested from waters around Kodiak Island. Harvests and hunting efforts took place during all months, but peak effort was in February and September to October. Steller sea lion harvests were much lower at 20 individuals (95 percent confidence range of between 15 to 28 animals) and occurred during all months, except July (Wolfe et al. 2012).

The proposed project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes or to impact subsistence harvest of marine mammals in the region because:

- construction activities are localized and temporary;

- mitigation measures will be implemented to minimize disturbance of marine mammals in the action area; and,
- the project will not result in significant changes to availability of subsistence resources.

9 ANTICIPATED IMPACTS ON HABITAT

The anticipated impact of the activity upon the habitat of the marine mammal populations and the likelihood of restoration of the affected habitat.

9.1 LOSS OF MARINE MAMMAL HABITAT DUE TO THE PROJECT FOOTPRINT

The Trident Kodiak Bunkhouse Dock Replacement Project would likely not impact any important marine mammal habitat since its proposed location is with the same footprint of the existing dock and within a heavily developed terrestrial and marine area. The area is also used year-round by the commercial marine and tourism industries.

9.2 LOSS OF MARINE MAMMAL HABITAT DUE TO TURBIDITY AND SEDIMENT

A temporary and localized increase in turbidity near the seafloor will occur in the immediate area surrounding dock during the estimated 94 hours of in-water project construction.

Temporary and localized turbidity associated with the proposed project may cause displacement of prey species from the construction area; however, such distribution shifts are likely to be temporary and it is expected that prey species will return after pile driving is complete. Construction-induced turbidity is unlikely to measurably impact marine mammal species or prey species in the action area. No indirect effects are anticipated that would cause an increase in turbidity in the action area.

9.3 NOISE

A temporary loss of marine mammal habitat may occur because of elevated noise levels in the action area. Displacement of marine mammals by construction noise is not expected to be permanent nor is it anticipated to have long-term effects on the species. Project activities are not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations, because pile driving and other construction-related noise sources will be temporary and intermittent. Additionally, the proposed project's purpose and need is to replace Trident's bunkhouse to continue to safely house workers and is not expected to increase vessel traffic or overall ambient noise levels in and near Kodiak.

9.4 CRITICAL HABITAT

There is designated critical habitat for Mexico DPS humpback whales and WDPS Steller sea lions throughout the action area. ESA-listed species could experience a temporary loss of suitable habitat in the action area for 1 to 5 hours per day over 55 days of construction, if elevated noise levels associated with in-water construction result in their displacement from the area. However, the project would not impact the essential physical and biological features that make the area critical habitat for WNP DPS and Mexico DPS humpback whales and WDPS Steller sea lions, such as good water quality, prey availability, or open space for transiting and foraging for more than 55 days. The area is already somewhat loud and busy with vessels transiting through

the area, and critical habitat features would not be permanent nor would it result long-term effects to the local population. No known rookeries or major haulouts would be impacted.

9.5 EFFECTS TO MARINE MAMMAL PREY SPECIES

Baleen whales (humpback whales) filter-feed on small crustaceans (mostly krill) and small fish. The impacts of underwater sound on fish are well understood; however, impacts on species further down the food chain (euphausiids) that are important prey species for cetaceans and fish are not as well studied.

A 2015 study examined the impacts of sound produced by seismic air guns on marine invertebrates, specifically zooplankton. Seismic air guns produce low frequency, high intensity underwater sound ranging from 156dB re 1 µPa2 s−1 to 183dB re 1 µPa2 s-1 approximately 509 meters to 658 meters from the source. The seismic air gun used in this study is within or below the range of pile installations equipment that will be deployed during the Trident Kodiak Bunkhouse Dock Replacement Project and results have been translated to assessments of pile-driving noise on marine species (Corbett 2019). The results indicate that there was an increased mortality in adult and larval zooplankton and total mortality of larval krill (adults were not present) (McCauley et al. 2017).

Fish populations and euphausiids in the project area that serve as marine mammal prey could be affected by noise or turbidity generated from in-water pile driving. It is expected that most fish will be able to move away from the proposed activity to avoid harm and will still be available to marine mammals as a food source. The quantity, quality, and availability of adequate food resources are therefore not likely to be reduced (due to the small area affected, mobility of fish, anticipated recolonization, and the temporary nature of the project).

Other prey species' marine habitat supported by the action area include anadromous fish, such as Pacific salmon (all five species) (NMFS 2022d). Table 14 details species with essential fish habitat (EFH) that may occur in the project area during at least one phase of their life cycle.

Table 14. EFH Species Present in the Kodiak Bunkhouse Dock Replacement Project Action Area

Species	Lifestage(s) Found at Location
Alaska Skate (*Bathyraja parmifera*)	Adult (Summer and Winter)
	Juvenile (Summer)
Arrowtooth Flounder (*Atheresthes stomias*)	Adult (Summer and Winter)
	Juvenile (Summer)
Bigmouth Sculpin (*Hemitripterus bolini*)	Adult (Spring, Summer, and Winter)
	Juvenile (Summer)
Blackspotted Rockfish (*Sebastes melanops*)	Adult (Summer)
	Juvenile (Summer)
Dark Rockfish (*S. ciliatus*)	Adult (Summer and Winter)
	Egg (Summer)
	Larvae (Summer)
Dusky Rockfish (*S. variabilis*)	Adult (Winter)
	Juvenile (Summer)
Flathead Sole (*Hippoglossoides elassodon*)	Adult (Year-round)
	Egg (Summer)
	Juvenile (Summer)
	Larvae (Summer)
Great Sculpin (*Myoxocephalus polyacanthocephalus*)	Adult (Summer)
Greenstriped Rockfish (*S. elongatus*)	Adult (Summer)
Harlequin Rockfish (*S. variegatus*)	Adult (Spring)
	Juvenile (Summer)
Longspine Thornyhead Rockfish (*Sebastolobus altivelis*)	Adult (Spring and Summer)
Northern Rock Sole (*Lepidopsetta polyxystra*)	Adult (Spring, Summer, and Winter)
	Larvae (Summer)
Northern Rockfish (*S. polyspinis*)	Adult (Winter)
	Juvenile (Summer)
Octopus (*Enteroctopus dofleini*)	Adult (Winter)
Pacific Cod (*Gadus macrocephalus*)	Adult (Summer and Winter)
	Juvenile (Summer)
	Larvae (Summer)
Pygmy Rockfish (*S. wilsoni*)	Adult (Summer)
Redbanded Rockfish (*S. wilsoni*)	Adult (Summer)

Rex Sole (*Glyptocephalus zachirus*)	Adult (Winter)
Species	**Lifestage(s) Found at Location**
Rougheye Rockfish (*S. aleutianus*)	Adult (Spring)
	Adult (Summer and Winter)
Sablefish (*Anoplopoma fimbria*)	Adult (Spring and Winter)
Sharpchin Rockfish (*S. zacentrus*)	Adult (Spring)
Southern Rock Sole (*Lepidopsetta bilineata*)	Adult (Summer)
	Juvenile (Summer)
	Larvae (Summer)
Walleye Pollock (*Gadus chalcogrammus*)	Adult (Spring, Summer, and Fall)
	Egg (Summer)
	Juvenile (Summer)
	Larvae (Summer)
Yellow Irish Lord (*Hemilepidotus jordani*)	Adult (Year-round)
	Juvenile (Summer)
Alaska Plaice (*Pleuronectes quadrituberculatus*)	Egg (Summer)
	Larvae (Summer)
Redstriped Rockfish (*S. proriger*)	Juvenile (Summer)
Silvergrey Rockfish (*S. proriger*)	Juvenile (Summer)
Yelloweye Rockfish (*S. ruberrimus*)	Juvenile (Summer)
Yellowfin Sole (*Limanda aspera*)	Juvenile (Summer)
Chinook Salmon (*Oncorhynchus tshawytscha*)	Marine Immature Adult
	Marine Mature Adult
Chum Salmon (*O. keta*)	Marine Mature Adult
	Marine Immature Adult
	Marine Juvenile
Pink Salmon (*O. gorbuscha*)	Marine Mature Adult
	Marine Juvenile
Sockeye Salmon (*O. nerka*)	Marine Mature Adult
	Marine Immature Adult
	Marine Juvenile
Coho Salmon (*O. kisutch*)	Marine Mature Adult
	Marine Juvenile

According to the ADF&G Anadromous Waters Catalog (AWC), there are three anadromous streams that flow into the action area that support at least one of the five Pacific Salmon species (Table 15) (ADF&G 2022a).

Table 15. Anadromous Streams Present within the Action Area

Name/ AWC Code	Species Present	Distance from Project (km)
Mission Creek (259-21-10090)	Coho Salmon (sr)	2.8 northeast
No Name (259-21-10100)	Coho Salmon (p)	2.4 northeast
Buskin River (259-21-10120)	Chum (sr) Coho (sr), Pink (sr), and Sockeye (sr) Salmon; Dolly Varden (sr); Steelhead (sr)	5.5 southwest
p-present; s-spawning; r-rearing		

Actions that could potentially cause impacts on EFH during the proposed project include in-water disturbance, increased turbidity, or water quality degradation. Increased sedimentation associated with the program would be localized and temporary and is not likely to have detectable effects on any krill or fish. The program would not include any work in or near the identified anadromous streams in the area. In addition, the effort does not include any activities that are toxic to krill or fish.

Krill and fish populations in the project area that serve as marine mammal prey could be affected by noise from in-water pile driving. Sound is particularly important for fish as other senses are muted underwater. High underwater sound pressure levels have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Popper and Hawkins 2019). Temporary and localized turbidity associated with the proposed project may cause displacement of small schooling fish from the construction area; however, such distribution shifts are likely to be temporary and it is expected that fish will return after pile driving is complete.

In general, impacts to marine mammal prey species are expected to be minor and temporary. The area impacted by the project is very small compared to the available habitat near Kodiak. The most likely impact to prey will be temporary behavioral avoidance of the immediate area. Fish and marine mammals are expected to temporarily move to nearby locations during pile driving and return to the area following cessation of in-water construction activities; therefore, indirect effects on marine mammal prey during construction are not expected to be substantial.

9.6 INDIRECT HABITAT IMPACTS

Indirect impacts to marine mammal habitat are not expected as a result of the Bunkhouse Dock Replacement Project.

10 ANTICIPATED EFFECT OF HABITAT IMPACTS ON MARINE MAMMALS

The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.

The Trident Kodiak Bunkhouse Dock Replacement Project would likely not impact any important marine mammal habitat since its proposed location is within the footprint of the existing dock and in close proximity to an area currently used by large passenger and shipping

vessels and two active boat harbors. The area is also used year-round by the commercial marine industry.

The most likely effects on marine mammal habitat from the project would be: temporary, short duration in-water noise; temporary prey (krill and fish) disturbance; and localized, temporary water quality effects from increased turbidity. The direct loss of marine mammal habitat during construction due to noise, water quality impacts, and general construction activity is expected to be short-term and minimal.

11 MITIGATION MEASURES

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Mitigation measures and construction techniques will be employed to minimize effects to marine mammal species and habitat. These measures are described below and presented in detail in the Trident Kodiak Bunkhouse Dock Replacement Project 4MP (Appendix C).

11.1 MITIGATION MEASURES DESIGNED TO REDUCE PROJECT IMPACTS

The project uses the most compact design possible while meeting the purpose and need of the facility.

- The project uses a design that will not use dredging or blasting.
- The project uses a design that minimizes pile diameters, amount of piles, and footprint to the greatest extent practicable.

11.2 OIL AND SPILL PREVENTION/TRASH DISPOSAL

- The contractor will provide and maintain a spill cleanup kit on-site at all times, to be implemented as part of the Oil Pollution Emergency Plan for oil spill prevention and response.
- Fuel hoses, oil drums, oil or fuel transfer valves and fittings, and similar equipment would be checked regularly for drips or leaks and maintained and stored properly to prevent spills.
- Oil booms will be readily available for oil or another containment should a release occur.
- All chemicals and petroleum products will be properly stored to prevent spills.
- No petroleum products, cement, chemicals, or other deleterious materials will be allowed to enter surface waters.
- Project-associated staff will cut all materials that form closed loops (e.g., plastic packing bands, rubber bands, and all other loops) prior to proper disposal in a closed and secured trash bin.
- Trash bins will be properly secured with locked or secured lids that cannot blow open, preventing trash from entering into the environment, thus reducing the risk of marine mammal entanglement should waste enter marine waters;

- Project-associated staff will properly secure all ropes, nets, and other marine mammal entanglement hazards to ensure they do not blow or wash overboard.

11.3 MITIGATION MEASURES DESIGNED TO REDUCE IMPACTS TO MARINE MAMMALS

- The contractor is required to conduct briefings for construction supervisors and crews and the monitoring team prior to the start of all pile driving activity, and upon hiring new personnel, to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
- The contractor is required to employ PSOs during all in-water construction activities.
- Marine mammal monitoring must take place starting 30 minutes prior to initiation of pile driving and ending 30 minutes after completion of pile driving activity. Pile driving may commence when observers have declared the shutdown zone clear of marine mammals. In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone (Table 16), their behavior must be monitored and documented until they leave of their own volition, at which point the activity may begin or resume.
- Pile driving must be halted or delayed if a marine mammal is observed entering or within an established shutdown zone (Table 16). Pile driving may not commence or resume until either: the animal has voluntarily left and has been visually confirmed beyond the shutdown zone; 15 minutes have passed without subsequent observations of small cetaceans and pinnipeds; or 30 minutes have passed without subsequent observations of large cetaceans.
- Pile installation and removal must be delayed or halted immediately if a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone (Table 16). Activities must not start or resume until the animal has been confirmed to have left the area or the observation time period, as indicated in the conditions above, has elapsed.
- A bubble curtain will be deployed during all DTH drilling activities.

11.4 SHUTDOWN AND MONITORING ZONES

Trident is requesting Level B take for humpback whales, Dall's porpoise, harbor porpoise, killer whales, harbor seals, and Steller sea lions. Trident is also requesting Level A take for Steller sea lions incidental to replacement of the Bunkhouse Dock due to their frequency near the project area. Trident is not requesting take for any other marine mammals. Shutdown and monitoring zones are described in the following sub-sections.

11.4.1 Level A Shutdown Zones

There will be a nominal 10-meter shutdown zone for construction-related activity where acoustic injury is not an issue. This type of work could include (but is not limited to) the following activities:

- movement of the barge to the pile location;
- positioning of the pile on the substrate via a crane (i.e., stabbing the pile); or

- the placement of sound attenuation devices around the piles.

For these activities, monitoring would take place from 15 minutes before initiation until the action is complete.

The contractor will implement additional shutdowns to protect marine mammals from Level A harassment and prevent auditory injury to all hearing groups during single pile installation and removal project activities as shown in Table 16 and Figure 13. Because of Steller sea lion presence within the project area and extent of shutdown distances, Level A take has been requested for this species in those instances in which they occur within the Level A shutdown zone and are not visualized in time for the project to be shut down (Figure 13; Table 16).

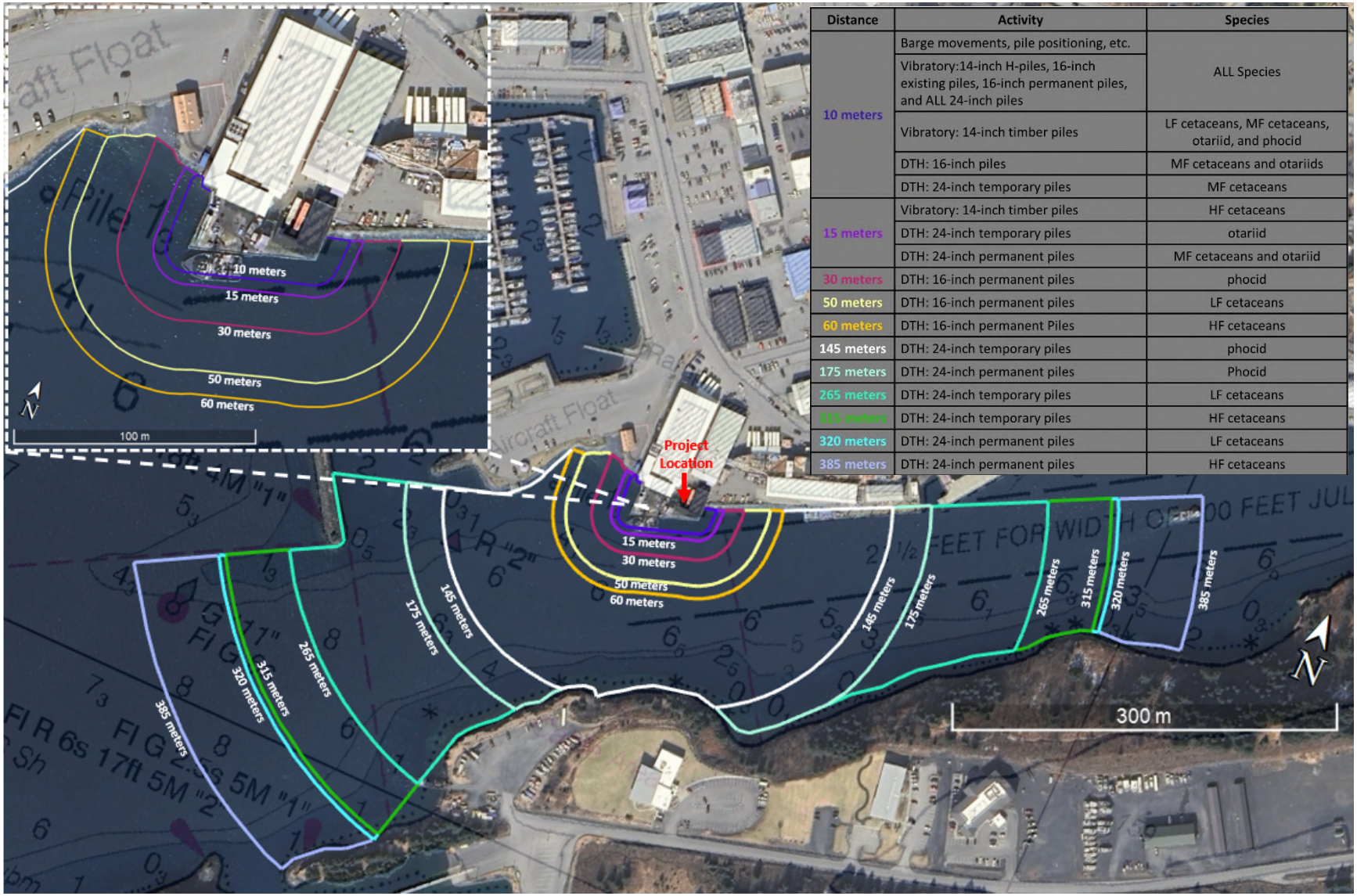
Table 16. Trident Kodiak Bunkhouse Dock Replacement Project Level A Shutdown Zones and Level B Monitoring Zones

Activity	Distance (in meters) to Level A and Level B Thresholds					
	Level A					Level B
	LF Cetacean	MF Cetacean	HF Cetacean	Otariid	Phocid	
In-water Activities						
Barge movements, pile positioning, etc. (throughout construction)	10	10	10	10	10	10
Vibratory Pile Driving/Removal						
14-inch existing timber pile removal (100 piles; ~50 mins per day on 4 days)	10	10	15	10	10	6,310
14-inch existing H-pile removal (75 piles; ~40 mins per day on 4 days)	10	10	10	10	10	1,000
16-inch existing steel pile removal (60 piles; ~40 mins per day on 3 days)	10	10	10	10	10	5,415
16-inch steel pile permanent installation (26 piles; ~10 mins per day on 5 days)	10	10	10	10	10	5,415
24-inch steel pile temporary installation (20 piles; ~12 mins per day on 3 days)	10	10	10	10	10	5,415
24-inch steel pile temporary removal (20 piles; ~16 mins per day on 3 days)	10	10	10	10	10	5,415
24-inch steel pile permanent installation (52 piles; ~8 mins per day on 13 days)	10	10	10	10	10	5,415
ALL Pile Sizes In-air	-	-	-	10	35	-
DTH[1] Drilling						
16-inch steel permanent installation (26 piles; ~270 mins per day on 4 days)	50	10	60	10	30	6,310
24-inch steel temporary installation (20 piles; ~180 mins per day on 3 days)	265	10	315	15	145	6,310
24-inch steel permanent installation (52 piles; ~240 mins per day on 13 days)	320	15	385	15	175	6,310

[1]A bubble curtain will be deployed during all DTH drilling activities and will result in a 5 dB reduction in sound

Note: A full summary of sound source levels used to calculate Level A thresholds is in Appendix B.

Figure 13. Trident Kodiak Bunkhouse Dock Replacement Project Level A Shutdown Distances



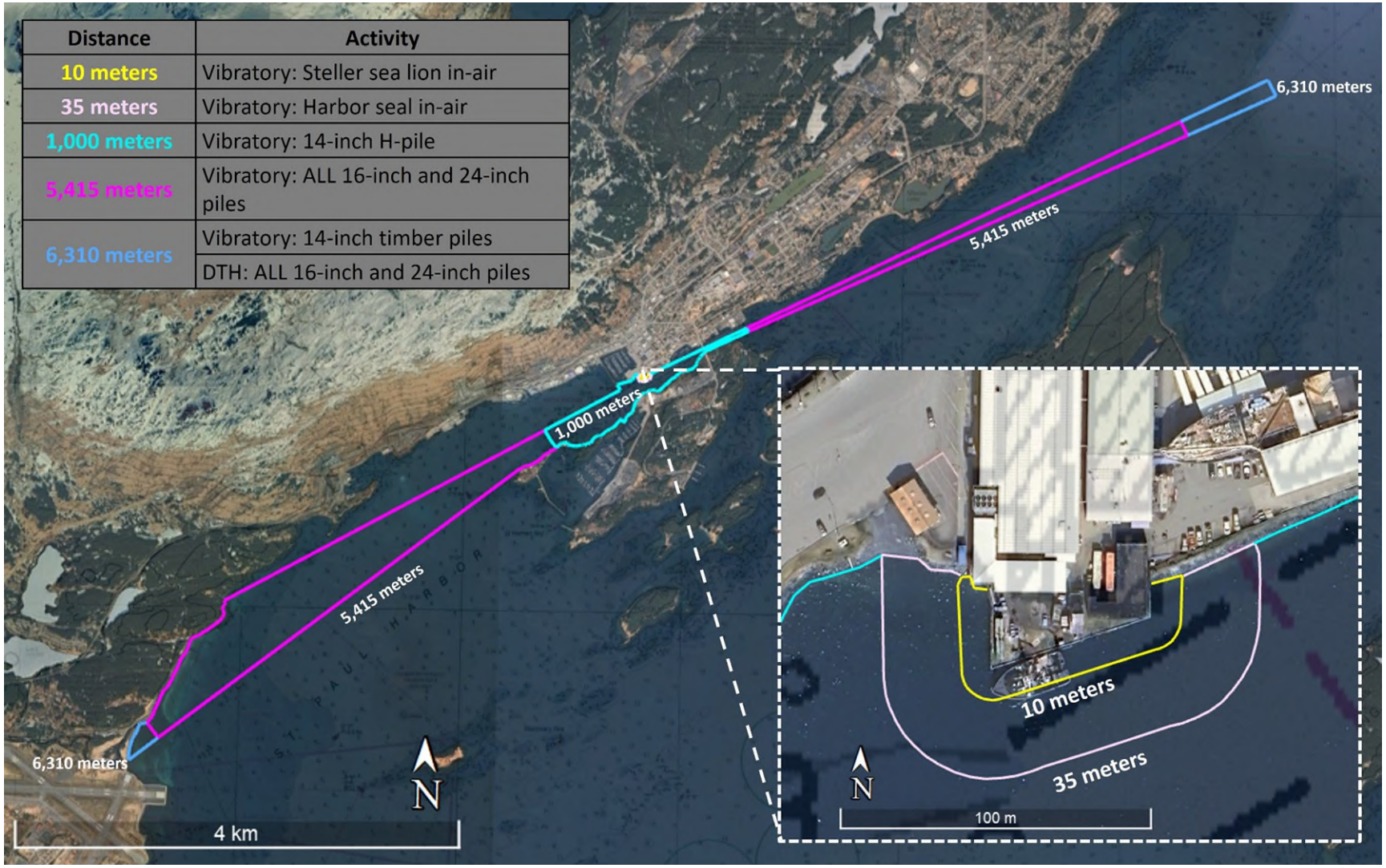
Distance	Activity	Species
10 meters	Barge movements, pile positioning, etc.	ALL Species
	Vibratory:14-inch H-piles, 16-inch existing piles, 16-inch permanent piles, and ALL 24-inch piles	
	Vibratory: 14-inch timber piles	LF cetaceans, MF cetaceans, otariid, and phocid
	DTH: 16-inch piles	MF cetaceans and otariids
	DTH: 24-inch temporary piles	MF cetaceans
15 meters	Vibratory: 14-inch timber piles	HF cetaceans
	DTH: 24-inch temporary piles	otariid
	DTH: 24-inch permanent piles	MF cetaceans and otariid
30 meters	DTH: 16-inch permanent piles	phocid
50 meters	DTH: 16-inch permanent piles	LF cetaceans
60 meters	DTH: 16-inch permanent Piles	HF cetaceans
145 meters	DTH: 24-inch temporary piles	phocid
175 meters	DTH: 24-inch permanent piles	Phocid
265 meters	DTH: 24-inch temporary piles	LF cetaceans
315 meters	DTH: 24-inch temporary piles	HF cetaceans
320 meters	DTH: 24-inch permanent piles	LF cetaceans
385 meters	DTH: 24-inch permanent piles	HF cetaceans

11.4.2 Level B Monitoring Zones

Trident is requesting level B take of humpback whales, Dall's porpoise, harbor porpoise, killer whales, harbor seals, and Steller sea lions incidental to replacing the Bunkhouse Dock. Shutdowns associated with Level B harassment of these species are not proposed. Calculated distances to Level B thresholds during pile driving activities will reach their full extent; however, where land masses block sound, transmission distances will be truncated. The monitoring zones associated with Level B disturbance are outlined in Table 16 and Figure 14.

If species other than those listed above approach or appear likely to enter the Level B area, in-water work would be shut down.

Figure 14. Trident Kodiak Bunkhouse Dock Replacement Project Level B Monitoring Zones



12 MITIGATION MEASURES TO PROTECT SUBSISTENCE USES

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, you must submit either a plan of cooperation (POC) or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses.

No activities associated with the proposed project would take place in or near traditional Arctic subsistence hunting areas. As described in Section 8, although there are subsistence uses and subsistence harvests of harbor seals and Steller sea lions near the community of Kodiak it is unlikely that activities associated with this will project will result in impacts to subsistence use.

13 MONITORING AND REPORTING

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

13.1 MONITORING PROTOCOLS

To minimize impacts of project activities on marine mammals, a detailed 4MP has been developed for the project and is included as Appendix C. Project shutdown and monitoring zones as outlined in Appendix C and Section 11.4 would be implemented during any in-water pile driving activities associated with the project. If the number of animals of a species exposed to Level A or B harassment approaches the number of takes allowed by the IHA, Trident will notify NMFS and seek further consultation.

13.2 MONITORING REPORT

13.2.1 Monthly Report

During construction, Trident will submit brief, monthly reports to the NMFS Alaska Region Protected Resources Division that summarize PSO observations and recorded takes. Monthly reporting will allow NMFS to track the amount of takes (including extrapolated takes) to allow for the timely reinitiating of consultation, if necessary. The monthly reports will be submitted by email to akr.section7@noaa.gov.

The reporting period for each monthly PSO report will be the entire calendar month and reports will be submitted by close of business on the fifteenth day of the month following the end of the reporting period (e.g., the monthly report covering March 1–30, 2023, would be submitted to the NMFS by close of business on April 15, 2023).

13.2.2 Final Report

Trident will submit a draft report to NMFS no later than 90 days following the end of construction activities or 60 days prior to the issuance of any subsequent IHA for the project.

Trident will provide a final report within 30 days following resolution of NMFS' comments on the draft report. Reports will contain, at minimum, the following:

- Date and time that monitored activity begins and ends for each day when monitoring is conducted (monitoring period);
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven;
- Deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Weather parameters in each monitoring period (e.g., wind speed, percent cloud cover, visibility);
- Water conditions in each monitoring period (e.g., sea state, tide state);
- For each marine mammal sighting:
  - Species, numbers, and, if possible, sex and age class of marine mammals
  - Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity
  - Type of construction activity that was taking place at the time of the sighting
  - Locations of marine mammals and their distance from pile driving activities and the observation point
  - Reason shutdown was implemented (if needed)
  - If shutdown was implemented, behavioral reactions noted and whether they occurred before or after shutdown
  - Estimated amount of time that the animals remained in the Level A or B zone;
- Description of implementation of mitigation measures within each monitoring period (e.g., shutdown or delay);
- Other human activity in the area within each monitoring period;
- And a summary of the following:
  - Total number of individuals of each species detected within the Level B Zone and estimated as taken
  - Total number of individuals of each species detected within the Level A Zone and estimated as taken
  - Daily average number of individuals of each species detected within the Level B Zone and estimated as taken.

Trident will also immediately report injured or dead marine mammals to NMFS; if the specified activity clearly causes the take of marine mammals in a manner prohibited by the IHA (e.g., serious injury or mortality), Trident will immediately cease pile activities and report the incident to NMFS by calling the NOAA Fisheries statewide 24-hour Stranding Hotline (877) 925-7773.

14 SUGGESTED MEANS OF COORDINATION

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

In-water and in-air noise generated by vibratory and DTH pile driving at the Trident Kodiak Bunkhouse Dock Replacement Project is the primary issue of concern to local marine mammals during this project. Potential impacts on marine mammals have been studied, with the results used to establish the noise criteria for evaluating take.

The data recorded during marine mammal monitoring for the proposed project will be provided to NMFS in the monitoring report (Section 13.2). The report will provide information on marine mammals' use of the action area, including numbers before, during, and after pile driving activities. The monitoring data may also inform NMFS and future permit applicants generally about the behavior of marine mammals during pile installation and removal for future projects of a similar nature.

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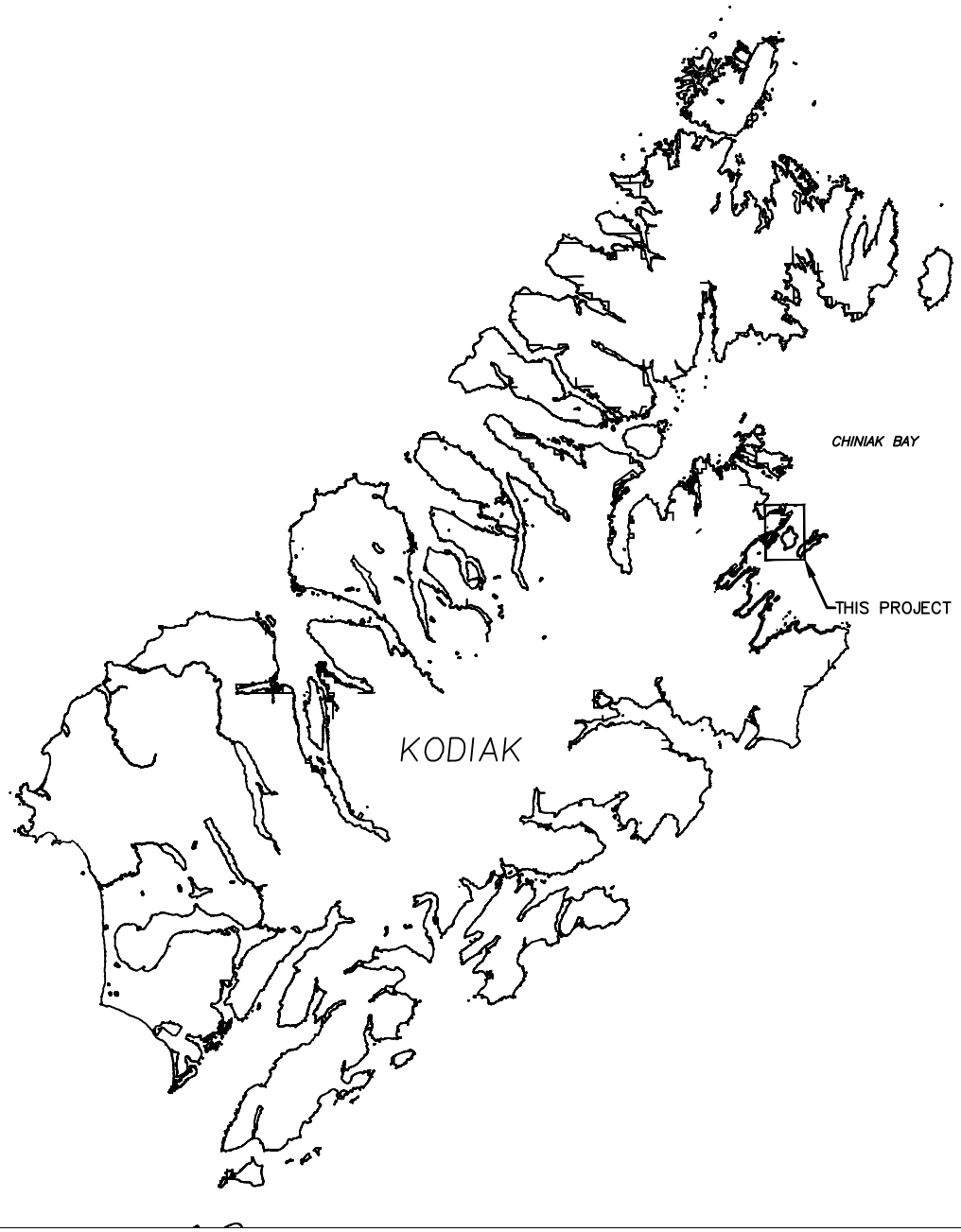
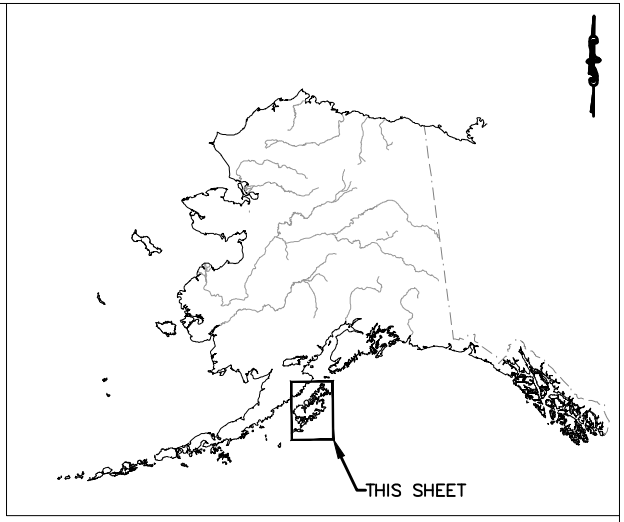
Appendix A: Project Drawings

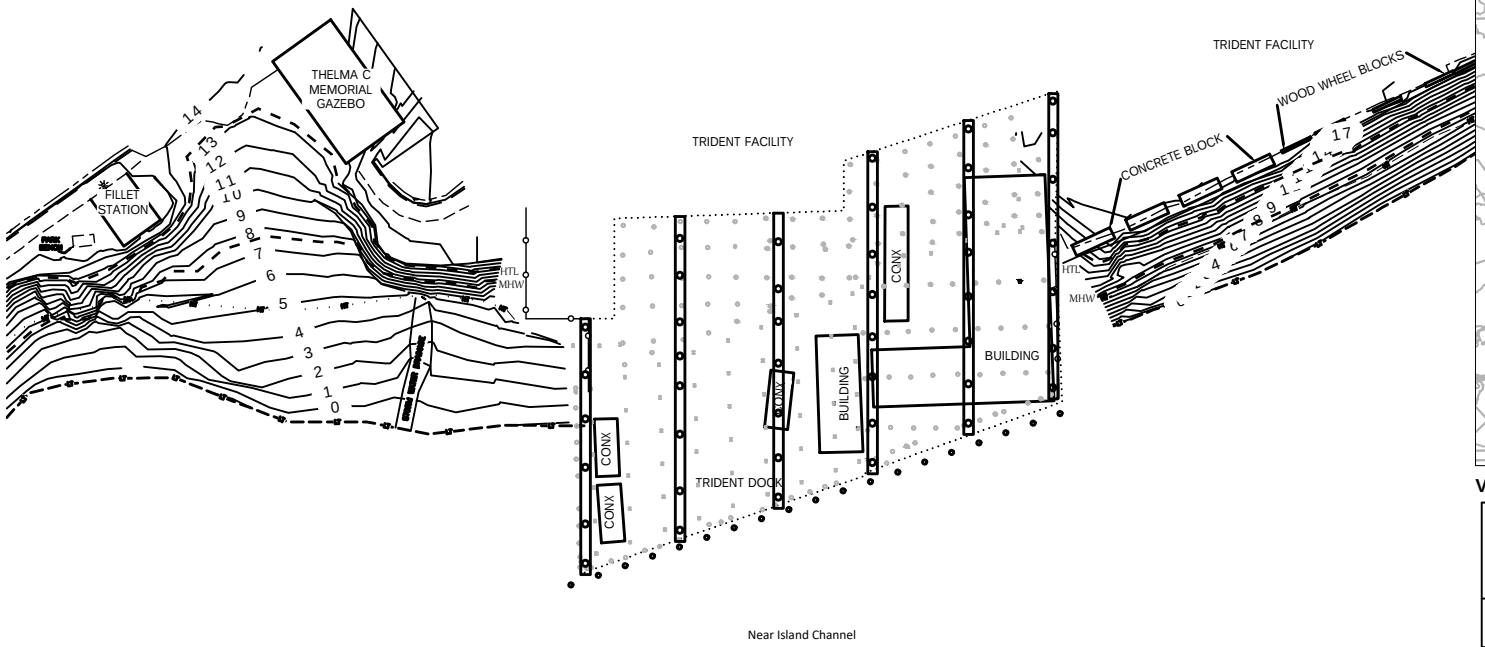




VICINITY MAP **NTS**

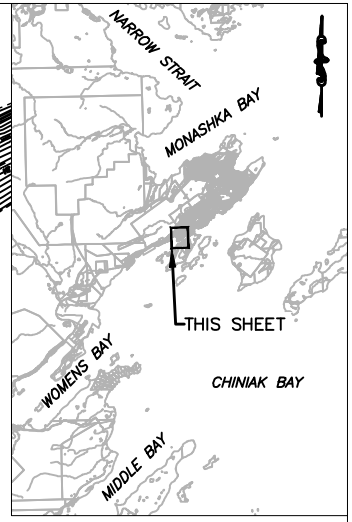
APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA–20XX–XXX

WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 1 of 6
DATE: October 2022



66 0 66

SCALE IN FEET



VICINITY MAP **NTS**

Tide Elevation Table (NAVD 88)	
HTL	13.4'
MHW	7.8'
MLLW	0.0'
ELW	−3.1'

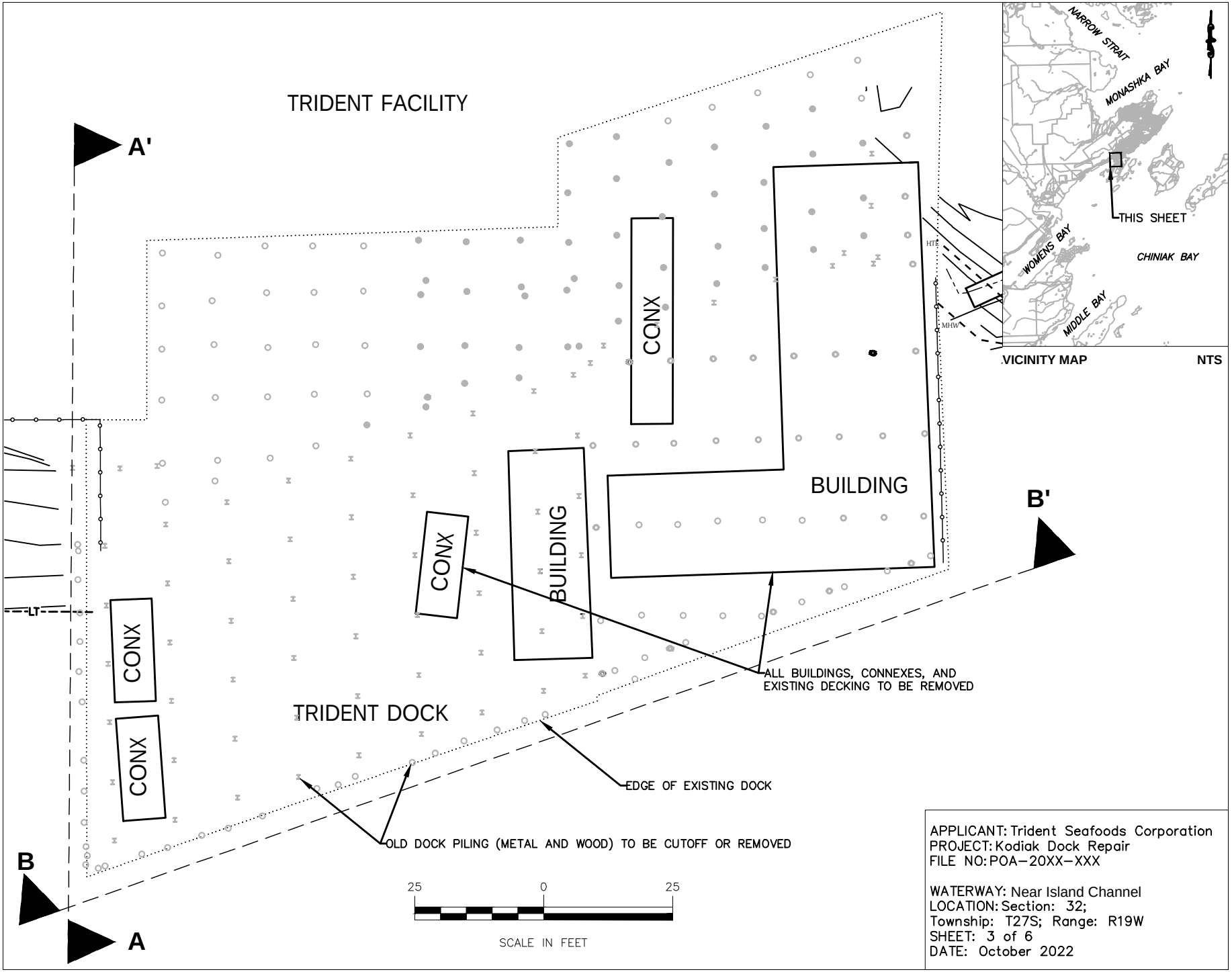
PERMANENT 16 INCH PILE	19
PERMANENT 24 INCH PILE	44
TEMPORARY 16 INCH PILE	20
TEMPORARY 24 INCH PILE	20

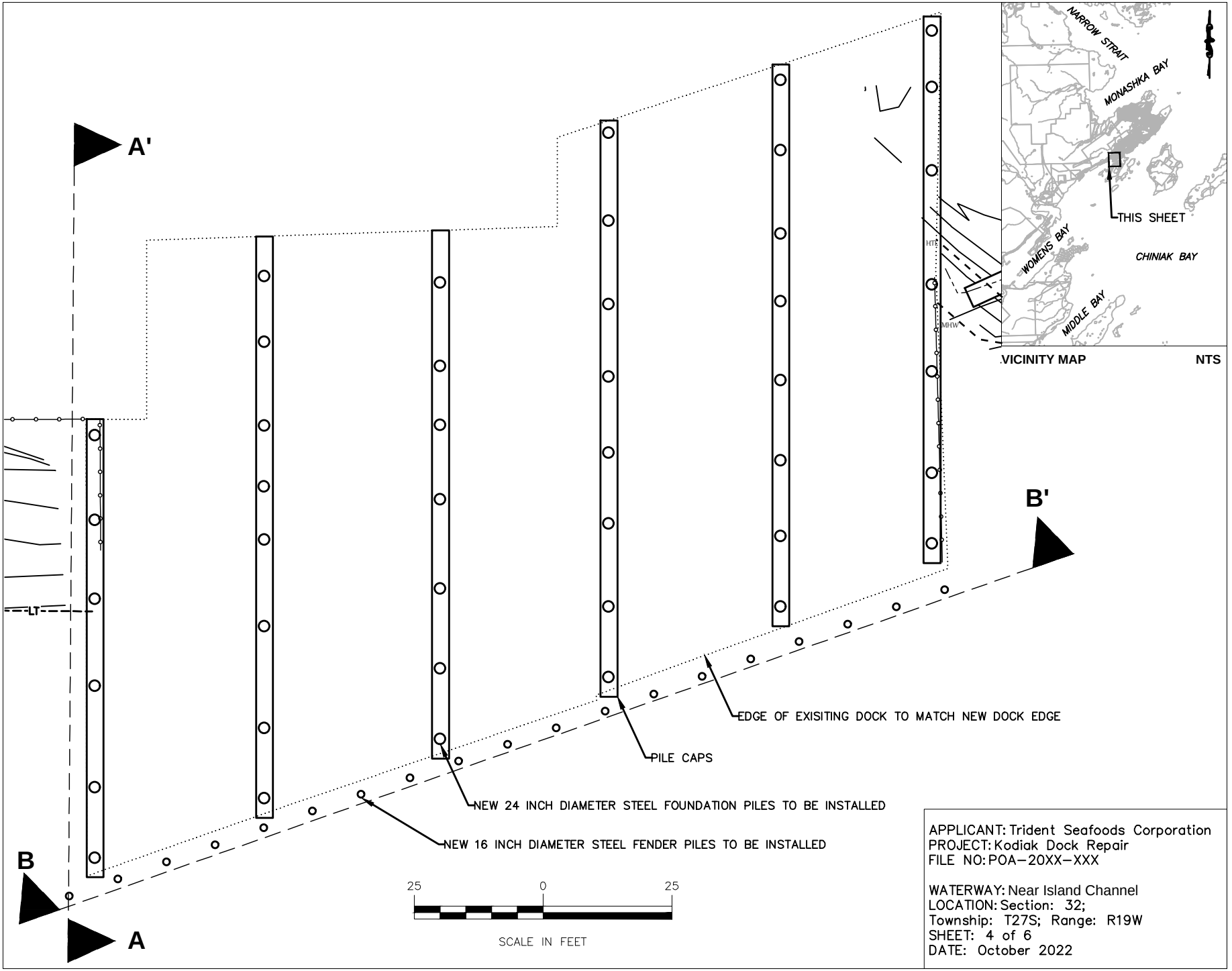
LEGEND

- EDGE PAVE
- TOP BACK OF CURB
- FLOW LINE OF CURB
- EDGE OF SIDEWALK
- LT LOW TIDE
- HT HIGH TIDE
- OCEAN RUN OFF
- CHAIN LINK FENCE
- EDGE OF DOCK
- BUILDING
- LIGHT
- TRIDENT DOCK EDGE

APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA−20XX−XXX

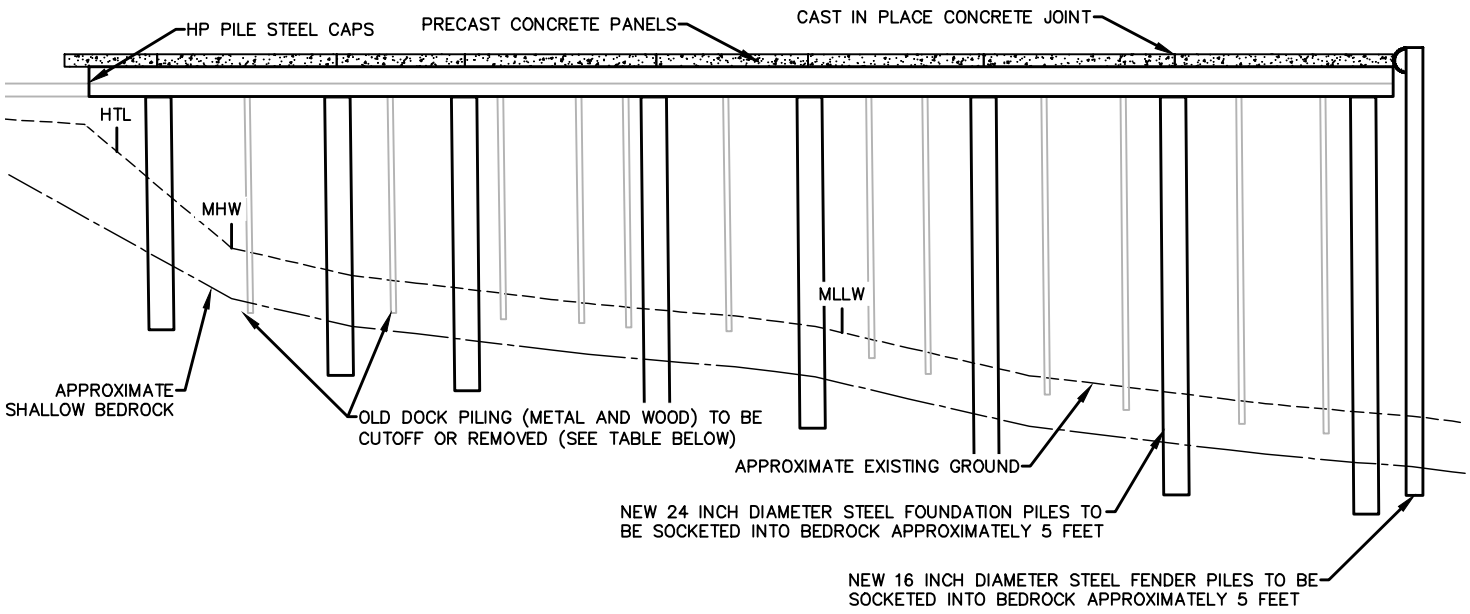
WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 2 of 6
DATE: October 2022

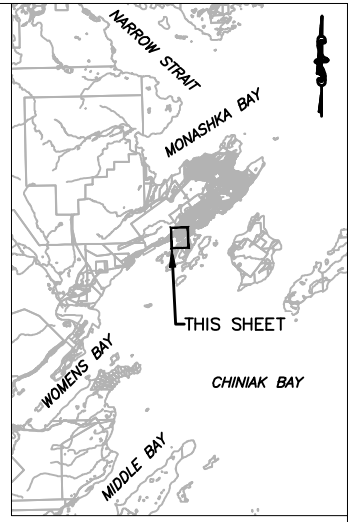

TRIDENT FACILITY
A'
CONX
BUILDING
B'
CONX
BUILDING
LT
CONX
CONX
TRIDENT DOCK
ALL BUILDINGS, CONNEXES, AND
EXISTING DECKING TO BE REMOVED
EDGE OF EXISTING DOCK
OLD DOCK PILING (METAL AND WOOD) TO BE CUTOFF OR REMOVED
B
A
25
0
25
SCALE IN FEET
NARROW STRAIT
MONASHKA BAY
THIS SHEET
WOMENS BAY
CHINIAK BAY
MIDDLE BAY
VICINITY MAP
NTS
APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA–20XX–XXX
WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 3 of 6
DATE: October 2022



APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA–20XX–XXX

WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 4 of 6
DATE: October 2022





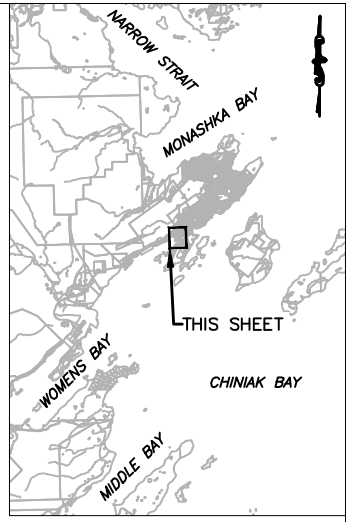
VICINITY MAP NTS

SECTION A–A'

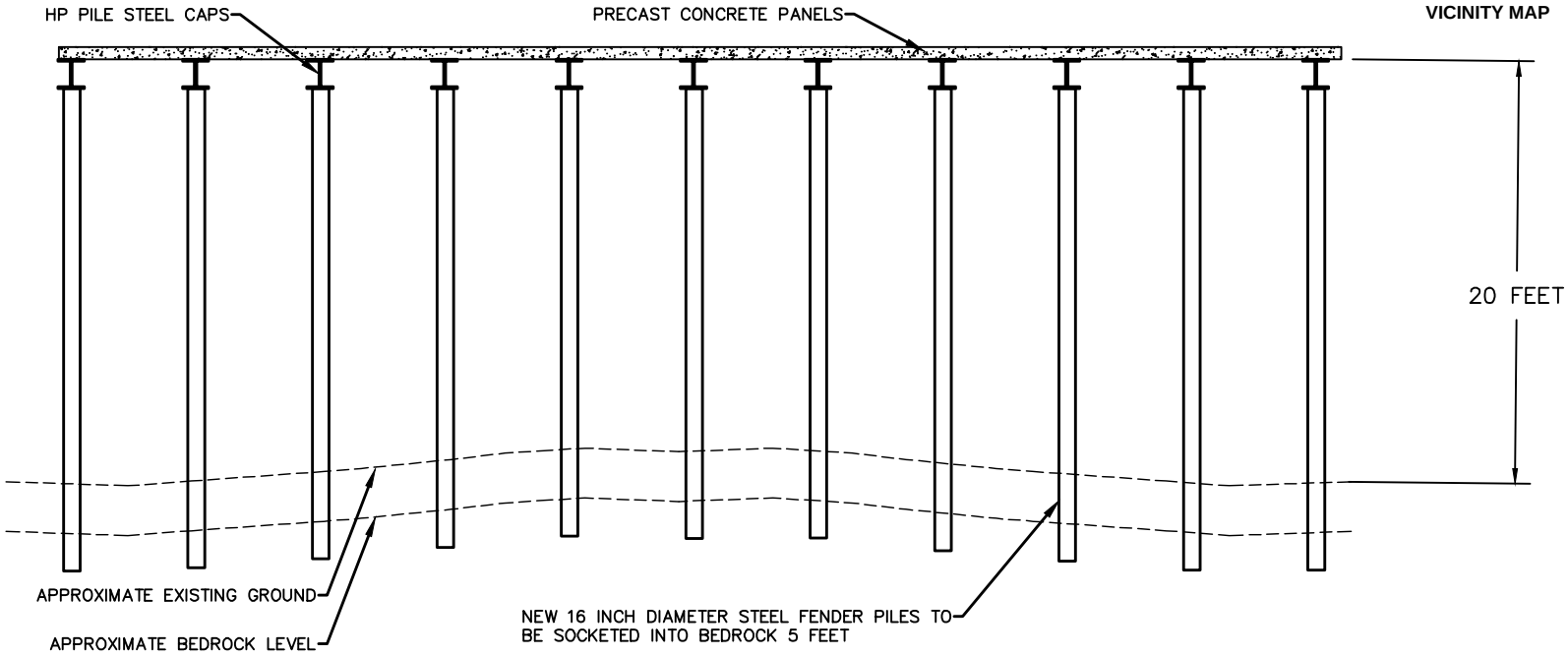
EXISTING PILES TO BE REMOVED	
16 INCH STEEL PIPE PILE	60
14 INCH STEEL H PILE	75
14 INCH TIMBER PILE	100

APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA–20XX–XXX

WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 5 of 6
DATE: October 2022



VICINITY MAP NTS



SECTION B–B'

APPLICANT: Trident Seafoods Corporation
PROJECT: Kodiak Dock Repair
FILE NO: POA–20XX–XXX

WATERWAY: Near Island Channel
LOCATION: Section: 32;
Township: T27S; Range: R19W
SHEET: 6 of 6
DATE: October 2022

Appendix B: Threshold Calculation Spreadsheets

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	For 14-inch timber piles. Proxy from timber piles at the Norfolk Naval Station in Norfolk, Virginia (Caltrans 2020; Table 1.2-1d)
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)[¥]	2.5	default

[¥] Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	162
Number of piles within 24-h period	25
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	3000
10 Log (duration of sound production)	34.77
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**7.1**	**0.6**	**10.4**	**4.3**	**0.3**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	18-inch Existing Removal w/ Vibratory Source: 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	161
Number of piles within 24-h period	20
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	2400
10 Log (duration of sound production)	33.80
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**5.2**	**0.5**	**7.7**	**3.2**	**0.2**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	For 14-inch H-piles. Proxy from 14-inch H-piles measured at the Chevron Long Warf in Richmond, California (Caltrans 2020; Table I.2 1b).
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	150
Number of piles within 24-h period	20
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	2400
10 Log (duration of sound production)	33.80
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**1.0**	**0.1**	**1.4**	**0.6**	**0.0**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	16-inch Permanent w/ Vibratory Source: 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (NAVFAC 2015)
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	161
Number of piles within 24-h period	5
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	600
10 Log (duration of sound production)	27.78
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**2.1**	**0.2**	**3.1**	**1.3**	**0.1**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	24-inch temp install w/ vibratory Source: 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (NAVFAC 2015)
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	161
Number of piles within 24-h period	6
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	720
10 Log (duration of sound production)	28.57
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**2.3**	**0.2**	**3.5**	**1.4**	**0.1**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	24-inch Temporary Removal w/ vibratory Source: 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	161
Number of piles within 24-h period	8
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	960
10 Log (duration of sound production)	29.82
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**2.8**	**0.3**	**4.2**	**1.7**	**0.1**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

A.1: Vibratory Pile Driving (STATIONARY SOURCE: Non-Impulsive, Continuous)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	24-inch Permanent w/ Vibratory Source: 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (NAVFAC 2015)
Please include any assumptions	
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)¥	2.5	default

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 48), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Sound Pressure Level (L_{rms}), specified at "x" meters (Cell B30)	161
Number of piles within 24-h period	4
Duration to drive a single pile (minutes)	2
Duration of Sound Production within 24-h period (seconds)	480
10 Log (duration of sound production)	26.81
Transmission loss coefficient	15
Distance of sound pressure level (L_{rms}) measurement (meters)	10

NOTE: The User Spreadsheet tool provides a means to estimates distances associated with the Technical Guidance's PTS onset thresholds. Mitigation and monitoring requirements associated with a Marine Mammal Protection Act (MMPA) authorization or an Endangered Species Act (ESA) consultation or permit are independent management decisions made in the context of the proposed activity and comprehensive effects analysis, and are beyond the scope of the Technical Guidance and the User Spreadsheet tool.

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**1.8**	**0.2**	**2.6**	**1.1**	**0.1**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

E.2: DTH PILE DRIVING/INSTALLATION (STATIONARY SOURCE: Impulsive, Intermittent)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	24-inch Temporary w/ DTH Source: 19 to 24-inch piles from Reyff & Heyvaert, 2019 (159 SEL -5dB for Bubble Curtain)

Please include any assumptions

PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value

Weighting Factor Adjustment (kHz)¥	2	default

¥ Broadband: 95% frequency contour percentile (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 50), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Unweighted $SEL_{cum\ (at\ measured\ distance)}$ = SEL_{ss} + 10 Log (# strikes)	**204.3**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,single\ strike}$) specified at "x" meters (Cell B30)	154
Strike rate (average strikes per second)	10
Duration to drive pile (minutes)	30
Number of piles per day	6
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,single\ strike}$) measurement (meters)	10
Total number of strikes in a 24-h period	108000

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G26)	
Distance of $L_{p,0\text{-}pk}$ measurement (meters)*	
$L_{p,0\text{-}pk}$ Source level	#NUM!

RESULTANT ISOPLETHS*

*Impulsive sounds have dual metric thresholds (SELcum & PK). Metric producing largest isopleth should be used.

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	**264.1**	**9.4**	**314.5**	**141.3**	**10.3**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**

"NA": PK source level is ≤ to the threshold for that marine mammal hearing group.

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.01**	**-19.74**	**-26.87**	**-2.08**	**-1.15**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2\sigma}}{[1+(f/f_1)^2]^a\,[1+(f/f_2)^2]^b}\right\}$$

E.2: DTH PILE DRIVING/INSTALLATION (STATIONARY SOURCE: Impulsive, Intermittent)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	16-inch Permanent w/ DTH Source: 9 to 18-inch piles from Guan & Miner 2020 (146 SEL - 5dB for Bubble Curtain)

Please include any assumptions

PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

		Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value
Weighting Factor Adjustment (kHz)[¥]	2	default

[¥] Broadband: 95% frequency contour percentile (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 50), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Unweighted $SEL_{cum\ (at\ measured\ distance)}$ = SEL_{ss} + 10 Log (# strikes)	**193.1**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,\ single\ strike}$) specified at "x" meters (Cell B30)	141
Strike rate (average strikes per second)	10
Duration to drive pile (minutes)	45
Number of piles per day	6
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,\ single\ strike}$) measurement (meters)	10
Total number of strikes in a 24-h period	162000

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G26)	
Distance of $L_{p,0\text{-}pk}$ measurement (meters)[+]	
$L_{p,0\text{-}pk}$ Source level	#NUM!

RESULTANT ISOPLETHS*

*Impulsive sounds have dual metric thresholds (SELcum & PK). Metric producing largest isopleth should be used.

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	**47.0**	**1.7**	**56.0**	**25.2**	**1.8**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**

"NA": PK source level is ≤ to the threshold for that marine mammal hearing group.

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.01**	**-19.74**	**-26.87**	**-2.08**	**-1.15**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

E.2: DTH PILE DRIVING/INSTALLATION (STATIONARY SOURCE: Impulsive, Intermittent)

VERSION 2.2: 2020

KEY

	Action Proponent Provided Information
	NMFS Provided Information (Technical Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bunkhouse Dock Replacement Project
PROJECT/SOURCE INFORMATION	24-inch Temporary w/ DTH Source: 19 to 24-inch piles from Reyff & Heyvaert, 2019 (159 SEL -5dB for Bubble Curtain)

Please include any assumptions

PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

STEP 2: WEIGHTING FACTOR ADJUSTMENT

Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value

Weighting Factor Adjustment (kHz)¥	2	default

¥Broadband: 95% frequency contour percentile (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 50), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

Unweighted SEL_{cum} (at measured distance) = SEL_{ss} + 10 Log (# strikes)	**205.6**
Single Strike SEL_{ss} ($L_{E,p,single\ strike}$) specified at "x" meters (Cell B30)	154
Strike rate (average strikes per second)	10
Duration to drive pile (minutes)	60
Number of piles per day	4
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,single\ strike}$) measurement (meters)	10
Total number of strikes in a 24-h period	144000

SEL_{cum}

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G26)	
Distance of $L_{p,0\text{-}pk}$ measurement (meters)+	
$L_{p,0\text{-}pk}$ Source level	#NUM!

RESULTANT ISOPLETHS*

*Impulsive sounds have dual metric thresholds (SELcum & PK). Metric producing largest isopleth should be used.

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	**319.9**	**11.4**	**381.0**	**171.2**	**12.5**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**

"NA": PK source level is < to the threshold for that marine mammal hearing group.

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (-dB)†	**-0.01**	**-19.74**	**-26.87**	**-2.08**	**-1.15**

NOTE: If user decided to override these Adjustment values, they need to make sure to download another copy to ensure the built-in calculations function properly.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a\,[1+(f/f_2)^2]^b}\right\}$$

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 14-inch timber piles. Proxy from timber piles at the Norfolk Naval Station in Norfolk, Virginia (Caltrans 2020; Table 1.2-1d)
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		162
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	40	dB = 20*log(R1/R2)	1	13	1259
Cylindrical spreading	0	158	dB = 10*log(R1/R2)	0	16	158489
Practical spreading	0	63	dB = 15*log(R1/R2)	1	14	6310

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 14-inch H-piles. Proxy from 14-inch H-piles measured at the Chevron Long Warf in Richmond, California (Caltrans 2020; Table I.2-1b).
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		150
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	10	dB = 20*log(R1/R2)	0	3	316
Cylindrical spreading	0	10	dB = 10*log(R1/R2)	0	1	10000
Practical spreading	0	10	dB = 15*log(R1/R2)	0	2	1000

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	16-inch Vibratory Source: from 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (NAVFAC 2015).
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		161
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	35	dB = 20*log(R1/R2)	1	11	1122
Cylindrical spreading	0	126	dB = 10*log(R1/R2)	0	13	125893
Practical spreading	0	54	dB = 15*log(R1/R2)	1	12	5412

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	24-inch Vibratory Source: from 24" steel piles driven at the Naval Base Kitsap in Bangor, Washington (Naval Facilities Engineering Systems Command [NAVFAC] 2013) and from acoustic modeling of nearshore marine pile driving at Navy installations in Puget Sound (NAVFAC 2015).
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		161
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	35	dB = 20*log(R1/R2)	1	11	1122
Cylindrical spreading	0	126	dB = 10*log(R1/R2)	0	13	125893
Practical spreading	0	54	dB = 15*log(R1/R2)	1	12	5412

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	16-inch DTH Source: 24-inch pile from Tenakee Springs Heyvaert & Reyff (2021) (SPL/RMS 167 -5dB for bubble curtain)
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		162
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	40	dB = 20*log(R1/R2)	1	13	1259
Cylindrical spreading	0	158	dB = 10*log(R1/R2)	0	16	158489
Practical spreading	0	63	dB = 15*log(R1/R2)	1	14	6310

PROJECT TITLE	Bunkhouse Dock Replacment Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	24-inch DTH Source: 24-inch pile from Tenakee Springs Heyvaert & Reyff (2021) (SPL/RMS 167 -5dB for bubble curtain)
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		162
Distance =		10

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	40	dB = 20*log(R1/R2)	1	13	1259
Cylindrical spreading	0	158	dB = 10*log(R1/R2)	0	16	158489
Practical spreading	0	63	dB = 15*log(R1/R2)	1	14	6310

GENERAL PROJECT INFORMATION

PROJECT TITLE	Kodiak Bunkhiuse Dock Replacement Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	In-air vibrating sound source is proxy from the Washington State Department of Transportation has documented un-weighted rms levels for a vibratory hammer (30-inch pile) to an average 96.5 dB and a maximum of 103.2 dB at 15 meters (Laughlin 2010). Average levels were used.
PROJECT CONTACT	Emma Kimball; emma@solsticeak.com

Fill in SPL and distances for peak and rms pressures, and read distance to threshold for appropriate model

Measured pressure	Peak	RMS
SPL =		96.5
Distance =		15

	Fish Meters to Threshold		Spreading Model	MarMam Meters to Threshold				
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB	RMS 90dB- harbor seal in air	RMS 100dB - sea lion in air
Spherical spreading	0	0	dB = 20*log(R1/R2)	0	0	1	31.70234	10.02516
Cylindrical spreading	0	0	dB = 10*log(R1/R2)	0	0	0		
Practical spreading	0	0	dB = 15*log(R1/R2)	0	0	0		

Fill in SPL and distance at which SPL was measured

Conversion	meters	feet	miles
	0	1.334779855	3E-04

Appendix C: Marine Mammal Monitoring and Mitigation Plan

Marine Mammal Monitoring and Mitigation Plan

Trident Seafoods Corporation
Bunkhouse Dock Replacement Project

Near Island Channel, Kodiak, Alaska

March 2023
Revised July 2023 and September 2023

Prepared for:
Trident Seafoods Corporation
5303 Shilshole Avenue NW
Seattle, Washington 98107

Prepared by:

2607 Fairbanks Street Suite B
Anchorage, Alaska 99503

Submitted to:
National Marine Fisheries Service and
U.S. Fish and Wildlife Service

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ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
BA	Biological Assessment
DPS	distinct population segment
ESA	Endangered Species Act
IHA	Incidental Harassment Authorization
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NMFS AKR	National Marine Fisheries Service Alaska Region
OPR	Office of Protected Resources (NMFS)
PSO	protected species observer
rms	root mean square
SPL	sound pressure level
Trident	Trident Seafoods Corporation
USACE	U.S. Army Corp of Engineers
USFWS	U.S. Fish and Wildlife Service
WDPS	western distinct population segment

INTRODUCTION

Trident Seafoods Corporation (Trident) proposes the following Marine Mammal Monitoring and Mitigation Plan (4MP) for use during pile installation/removal during construction of the Bunkhouse Dock Replacement Project in Kodiak, Alaska (Figure 1). The project is in waters of the U.S., within the ranges of marine mammals listed in the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA), and has the potential to generate noise that could exceed Level A and B harassment thresholds established by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). This 4MP supports Biological Assessments, in accordance with the ESA, and Incidental Harassment Authorization (IHA) applications, in accordance with the MMPA (Section 101(a)(5)(D) permitting) submitted to NMFS and USFWS. Monitoring and shutdown zones will be implemented to avoid Level A and minimize Level B harassment of marine mammals.

The goal of this 4MP is to ensure compliance with the ESA and the MMPA when implemented by the protected species observers (PSOs) at the project site. The project will comply with the terms and conditions outlined in the following requested permits and authorizations:

- U.S. Army Corp of Engineers (USACE), Section 10/404 permit for activities in Waters of the U.S. (requested)
- NMFS Office of Protected Resources (OPR) IHA (requested)
- NMFS Alaska Region, ESA Section 7(a)(2) Biological Opinion (requested)
- USFWS Marine Mammal Management IHA (requested)
- USFWS Southern Alaska Fish and Wildlife Field Office Ecological Services Branch, ESA Section 7(a)(2) Biological Opinion (requested)
- USFWS Southern Alaska Fish and Wildlife Field Office Ecological Services Branch, ESA Section 7(a)(2) Expedited Informal (requested)

PROJECT DESCRIPTION

Trident plans to remove and replace their Bunkhouse Dock on the western shore of Near Island Channel along the working waterfront in Kodiak, Alaska (Figure 1).

The dock replacement would allow Trident to continue to safely provide housing to workers and necessary services for commercial fish processing. Construction, which includes the removal of existing piles and installation of new piles, will take place in and over waters of the United States (Figure 2). No dredging, filling, or blasting is proposed as part of this project.

Construction would begin in March 2024 and occur for 94 hours over 55, not necessarily consecutive, days. Table 1 provides a more detailed overview of the project components.

Figure 1. Trident Kodiak Bunkhouse Dock Replacement Project Location and Action Area

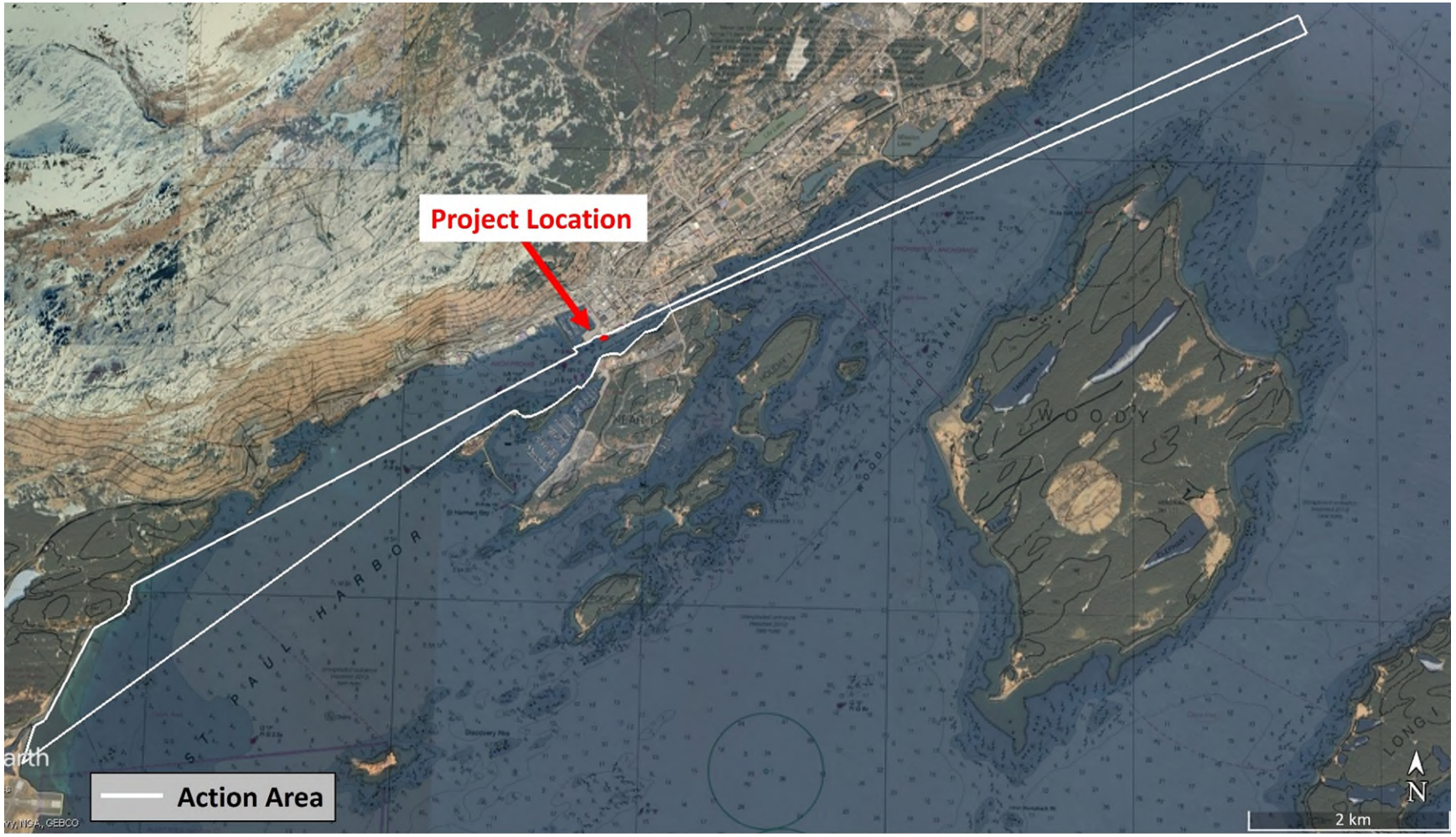


Figure 2. Trident Kodiak Bunkhouse Dock Replacement Project Site Plan

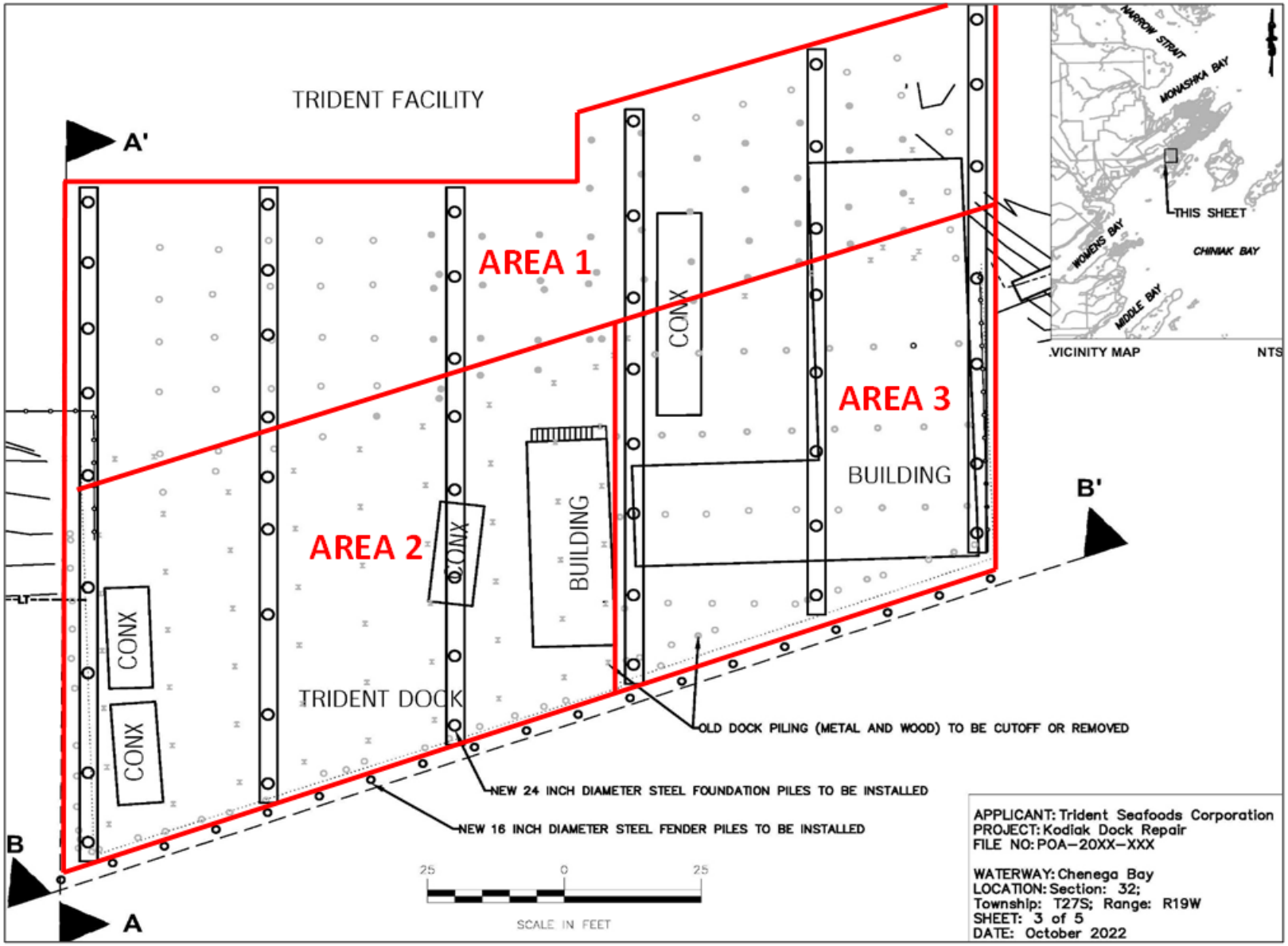


Table 1. Trident Kodiak Bunkhouse Dock Replacement Project Pile Size, Quantity, and Installation Method

Description	Project Component						
	Existing Pile Removal[1]	Existing Pile Removal[1]	Existing Pile Removal[1]	Temp Pile Installation	Temp Pile Removal	Perm Pile Installation	Perm Pile Installation
Diameter of Steel Piles (inches)	16	14	14	24	24	16	24
Pile Material	Steel	Steel	Timber	Steel	Steel	Steel	Steel
Type of Pile	Pipe	H-Pile	Round	Pipe	Pipe	Pipe	Pipe
# of Piles	60	75	100	20	20	26	52
Vibratory Pile Driving							
Total Quantity	60	75	100	20	20	26	52
Max # Piles Vibrated Per Day	20	20	25	6	8	5	4
Vibratory Time Per Pile (minutes)	2	2	2	2	2	2	2
Vibratory Time Per Day	40	40	50	12	16	10	8
Number of Days	3	4	4	3	3	5	13
Vibratory Time Total	120	150	200	40	40	52	104
DTH Drilling							
Total Quantity	0	0	0	20	0	26	52
Max # Piles DTH Per Day	0	0	0	6	0	6	4
DTH Time Per Pile (minutes)	0	0	0	30	0	45	60
DTH Time Per Day	0	0	0	180	0	270	240
Number of Days	0	0	0	3	0	4	13
DTH Drilling Time Total	0	0	0	600	0	1170	3120

[1]The contractor estimates 90 percent of the existing piles will be successfully removed using the deadpull method. The table conservatively estimates it will take approximately 7 hours and 50 minutes to remove all existing piles; however, it is more likely to only take 47 minutes of vibratory work.

SPECIES COVERED UNDER THE IHA

There are 14 species under NMFS jurisdiction and 3 species under USFWS jurisdiction that have ranges that extend into the project area. Take has been requested for the species known to frequent the area, broken down by stock or distinct population segment (DPS; Table 2).

The shutdown of work following Level B thresholds will occur if any other marine mammal or an ESA-listed avian species (i.e. Steller's eider) enters the project action area (Figure 1). Other species that may occur are listed in Appendix A.

Table 2. Species Known to Occur in Trident Kodiak Bunkhouse Dock Replacement Project Area and Requested Take Types and Numbers (may be updated following issuance of IHAs)

Hearing Group	Species	Stock/DPS Abundance	Level A	Level B
Low- Frequency	Humpback Whale (*Megaptera novaeangliae*)	Hawaii DPS: 11,278	0	12
		Mexico North Pacific Stock/ Mexico DPS: 2,806	0	2
High-Frequency	Dall's Porpoise (*Phocoenoides dalli*)	Alaska: 13,110	0	31
	Harbor Porpoise (*Phocoena phocoena*)	Gulf of Alaska: 31,046	0	65
Mid-Frequency	Killer Whale (*Orcinus orca*)	Alaska Resident: 1,920	0	264
		Gulf of Alaska/Aleutian Islands/Bering Sea Transient: 587	0	66
Phocid Pinnipeds	Harbor Seal (*Phoca vitulina*)	South Kodiak: 26,448	0	24
Otariid Pinnipeds	Steller Sea Lion (*Eumetopias jubatus*)	Western U.S.: 52,932	20	2,200
	Northern Sea Otter (*Enhydra lutris kenyoni)*	Southwest Alaska: 51,935	0	3,160

MONITORING AND SHUTDOWN ZONES

The harassment zones will be monitored throughout the permitted in-water or over-water construction activity. The following mitigation measures will be taken based on species, in-water activity, and distance of the mammalian or listed avian species from the project location:

- If a permitted marine mammal enters a Level B monitoring zone, a Level B take will be recorded and animal behaviors documented. Permitted construction activities would continue without cessation unless the animal approaches or enters a Level A shutdown zone or a raft of 50 or more otters are present.
- If a marine mammal approaches or appears in a Level A shutdown zone, all permitted construction activities will immediately halt until the marine mammal has left the

shutdown zone on its own accord or has not been sighted for 15 minutes (pinnipeds and small cetaceans) or 30 minutes (large cetaceans and sea otters).

- If a non-permitted marine mammal or a listed avian species approaches or appears in a Level B zone, all permitted construction activities will immediately halt until the animal has left the Level B zone on its own accord or has not been sighted for 15 minutes (pinnipeds, small cetaceans, and Steller's eider) or 30 minutes (large cetaceans and sea otters).

Takes, in the form of Level A or Level B harassment, of marine mammals other than permitted species are not authorized and will be avoided by shutting down construction activities before these species enter the Level B monitoring zone.

Because species are impacted differently by noise, species-specific monitoring and shutdown zones have been calculated for in-water activities associated with this project. These monitoring and shutdown zones are shown in Table 3 and Table 4 and Figure 3 through Figure 6.

Monitoring Zones

Level B monitoring zones have been determined based on in-water activity type. For NMFS species, Level B monitoring zones represent areas where the sound pressure levels (SPLs) generated from pile driving activities meet or exceed 120 dB root mean square (rms) during vibratory pile driving and drilling (Figure 3). Level B monitoring zones for USFWS species apply to northern sea otters and were established using the USFWS *Observer Protocols for Pile Driving, Dredging, and Placement of Fill* and the distance at which SPLs meet or exceed 160 dB rms (Figure 4).

These monitoring zones serve as an area within which instances of permitted marine mammal harassment (Level B take) will be documented, if in-water work is actively occurring. Alternatively, for non-permitted marine mammals and listed avian species, it acts as an area in which in-water work should cease if they approach or appear likely to enter. Additionally, to prevent impacts to northern sea otters, in-water work will be delayed or stopped if a raft of 50 or more are present in the Level B zone. These Level B zones also allow PSOs to be aware of the presence of permitted marine mammals as they near the shutdown zone and prepare for shutdowns if required.

Pile Driving Scenarios

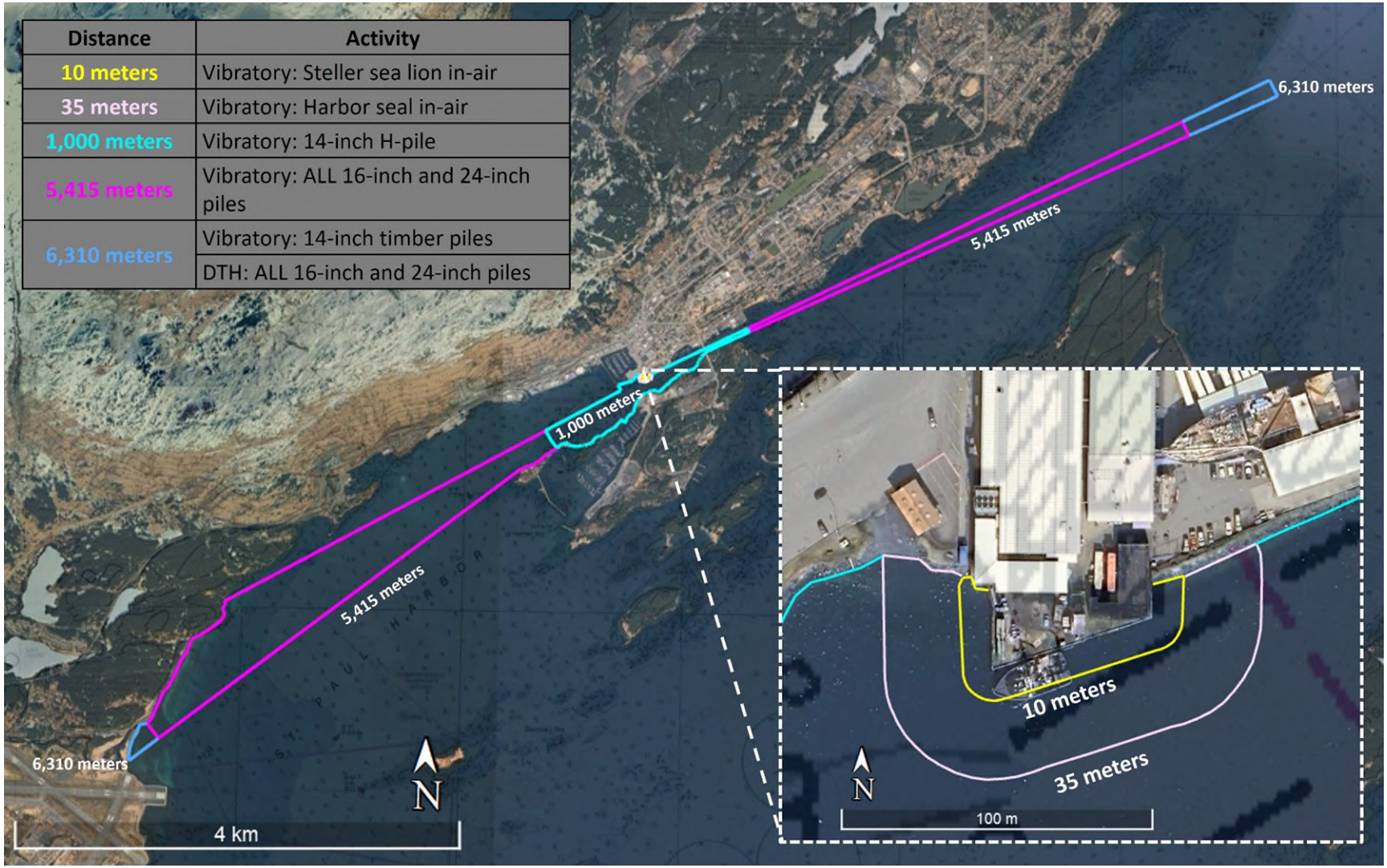
Single pile driving scenarios assume that only one pile installation or removal method will be used within the same time frame. Table 3 and Figure 3 and Figure 4. provide the distances to Level B thresholds during single pile driving scenarios for NMFS and USFWS species.

Table 3. Trident Kodiak Bunkhouse Dock Replacement Project Single Activity Level B Monitoring Zones

Activity	Distance (in meters) to Level B NMFS Species Thresholds (120dB)	Distance (in meters) to Level B Northern Sea Otter Thresholds (160dB)
In-water Activities		
Barge movements, pile positioning, etc. (throughout construction)	10	10
Vibratory Pile Driving/Removal		
14-inch existing timber pile removal (100 piles; ~50 mins per day on 4 days)	6,310	10
14-inch existing H-pile removal (75 piles; ~40 mins per day on 4 days)	1,000	10
16-inch existing steel pile removal (60 piles; ~40 mins per day on 3 days)	5,415	15
16-inch steel pile permanent installation (26 piles; ~10 mins per day on 5 days)	5,415	15
24-inch steel pile temporary installation (20 piles; ~12 mins per day on 3 days)	5,415	15
24-inch steel pile temporary removal (20 piles; ~16 mins per day on 3 days)	5,415	15
24-inch steel pile permanent installation (52 piles; ~8 mins per day on 13 days)	5,415	15
DTH[1]		
16-inch steel permanent installation (26 piles; ~270 mins per day on 4 days)	6,310	15
24-inch steel temporary installation (20 piles; ~180 mins per day on 3 days)	6,310	15
24-inch steel permanent installation (52 piles; ~240 mins per day on 13 days)	6,310	15

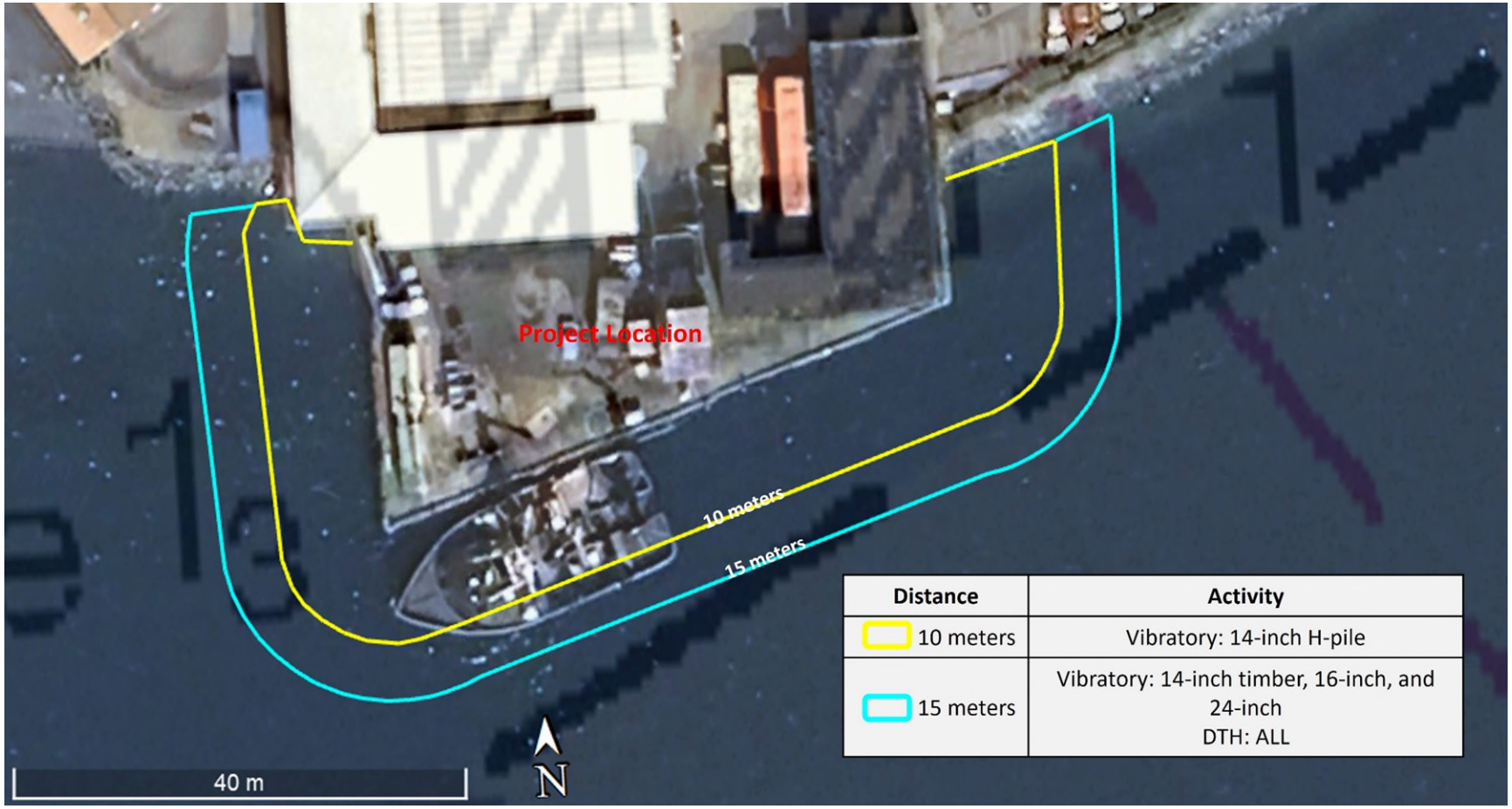
[1]A bubble curtain will be deployed during all DTH drilling activities and will result in a 5dB reduction in sound.
Note: See Table 2 for NMFS-managed species which would fall under this table.

Figure 3. Trident Kodiak Bunkhouse Dock Replacement Project Level B Monitoring Zones for NMFS Species



See Table 2 for NMFS-managed species which would fall under this table.

Figure 4. Trident Kodiak Bunkhouse Dock Replacement Project Level B Monitoring Zones for Northern Sea Otters



Shutdown Zones

Shutdown zones are defined as areas where SPLs meet or exceed the level that would cause auditory injury to marine mammals and listed avian species. Shutdown zones are intended to protect marine mammals and listed avian species from auditory injury. In-water activities would be halted upon the sighting of a marine mammal or listed avian species that is in (or anticipated to enter) the shutdown zone.

Further, there will be a nominal 10-meter shutdown zone for construction activity where acoustic injury is not the primary concern. This type of work could include (but is not limited to) the following activities: movement of the barge to the pile location; positioning of the pile on the substrate via a crane (i.e., stabbing the pile); and removal of the pile from the water column/substrate via a crane (i.e., deadpull). For these activities, monitoring would take place starting 15 minutes before initiation and ending when the action is complete. This can be monitored by the vessel operator when a PSO is not present.

Pile Driving Scenarios

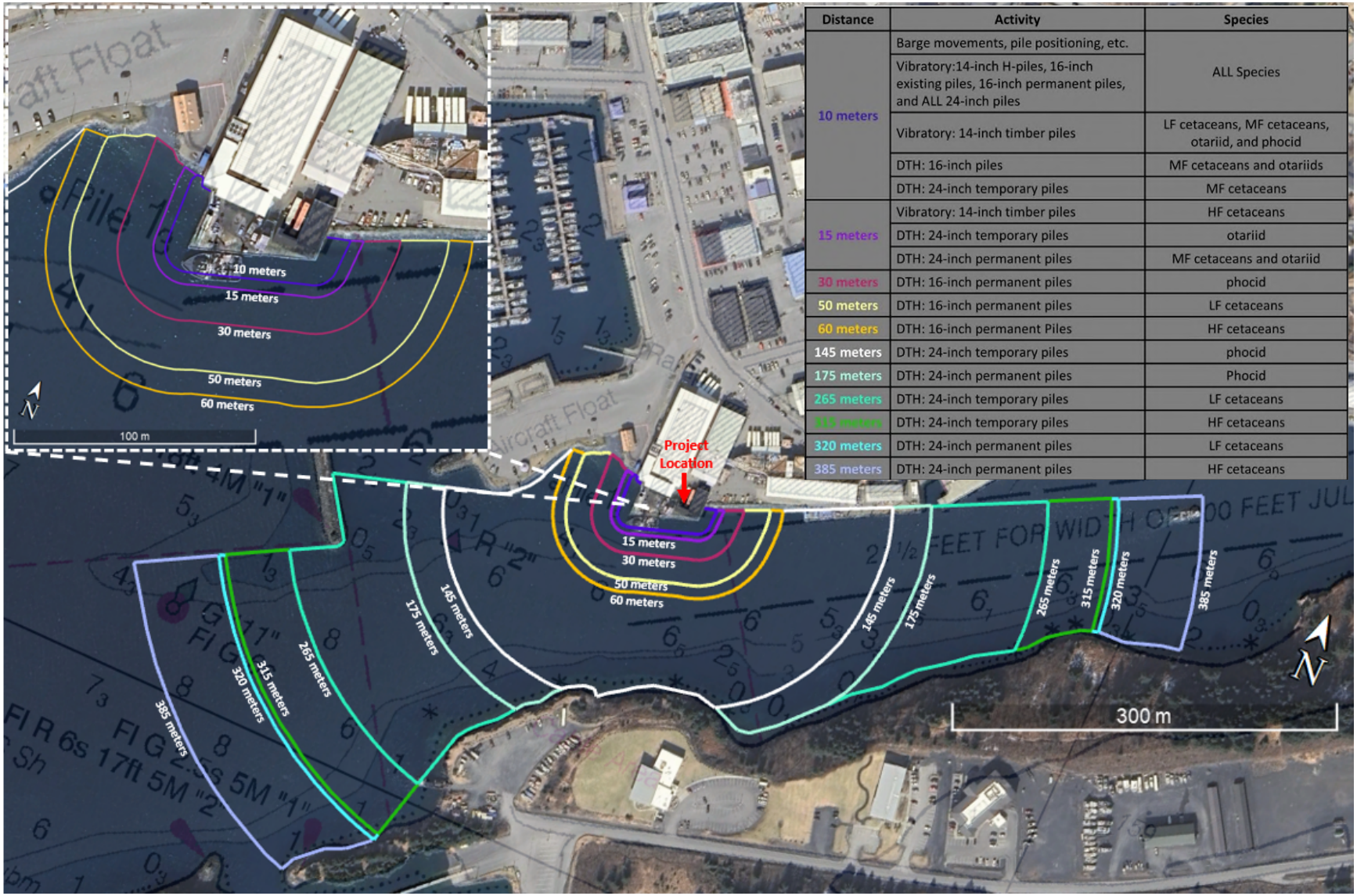
Radial distances to Level A shutdown zone boundaries during driving scenarios are defined in Table 4 shown in Figure 5 and Figure 6.

Table 4. Trident Kodiak Bunkhouse Dock Replacement Project Single Activity Distances to Level A Shutdown Zones

Activity	Distance (in meters) to Level A Thresholds					
	LF Cetacean	MF Cetacean	HF Cetacean	Otariid	Phocid	Northern Sea Otter
In-water Activities						
Barge movements, pile positioning, etc. (throughout construction)	10	10	10	10	10	10
Vibratory Pile Driving/Removal						
14-inch existing timber pile removal (100 piles; ~50 mins per day on 4 days)	10	10	15	10	10	10
14-inch existing H-pile removal (75 piles; ~40 mins per day on 4 days)	10	10	10	10	10	10
16-inch existing steel pile removal (60 piles; ~40 mins per day on 3 days)	10	10	10	10	10	10
16-inch steel pile permanent installation (26 piles; ~10 mins per day on 5 days)	10	10	10	10	10	10
24-inch steel pile temporary installation (20 piles; ~12 mins per day on 3 days)	10	10	10	10	10	10
24-inch steel pile temporary removal (20 piles; ~16 mins per day on 3 days)	10	10	10	10	10	10
24-inch steel pile permanent installation (52 piles; ~8 mins per day on 13 days)	10	10	10	10	10	10
DTH						
16-inch steel permanent installation (26 piles; ~270 mins per day on 4 days)	50	10	60	10	30	10
24-inch steel temporary installation (20 piles; ~180 mins per day on 3 days)	265	10	315	15	145	15
24-inch steel permanent installation (52 piles; ~240 mins per day on 13 days)	320	15	385	15	175	15

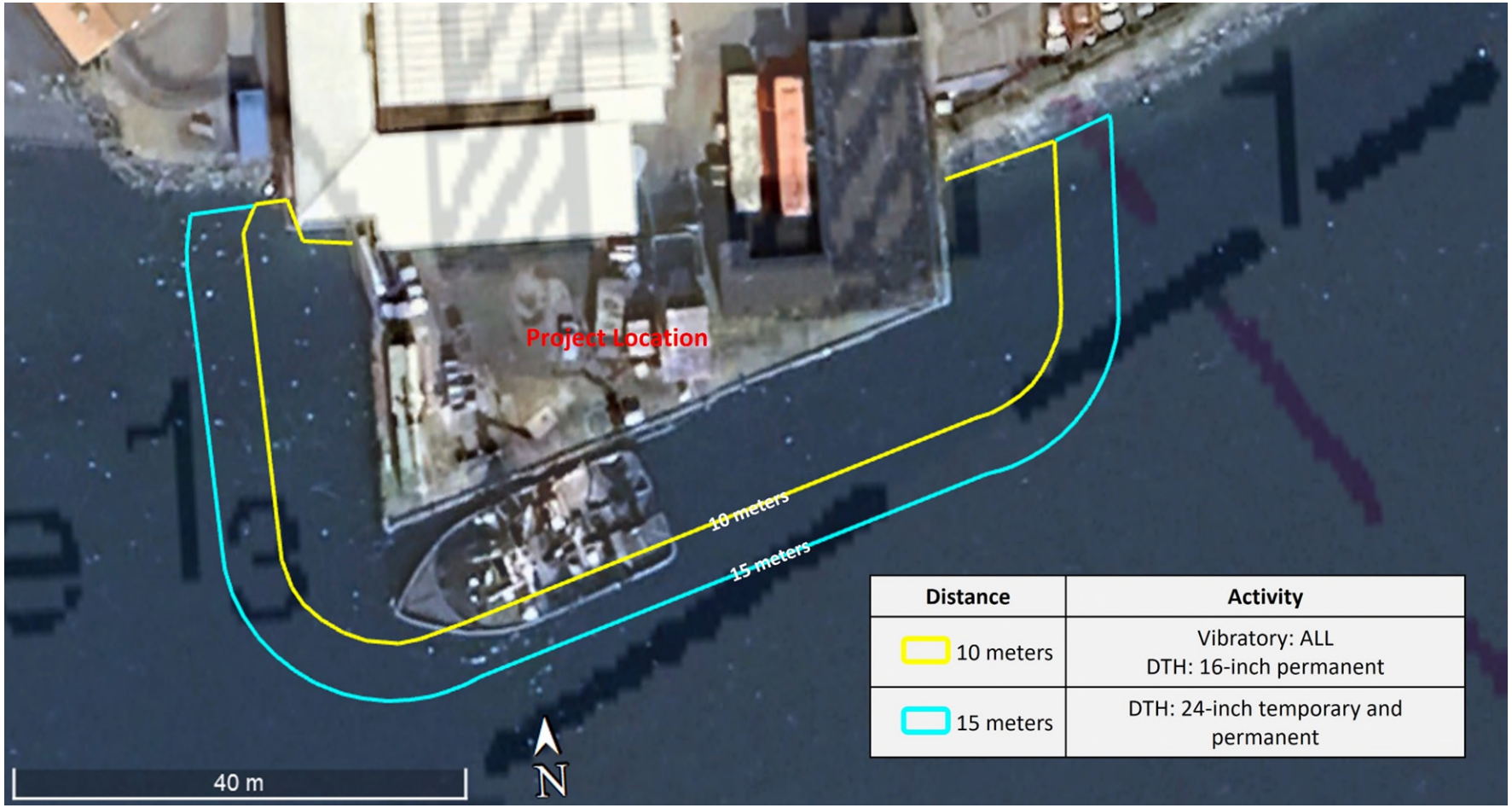
Note: See Table 2 for NMFS-managed species which would fall under this table. Shutdown zone distances refer to the maximum radius of the zone and are rounded. Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.

Figure 5. Trident Kodiak Bunkhouse Dock Replacement Project Single Activity Level A Shutdown Distances for NMFS Species



Distance	Activity	Species
10 meters	Barge movements, pile positioning, etc.	ALL Species
	Vibratory:14-inch H-piles, 16-inch existing piles, 16-inch permanent piles, and ALL 24-inch piles	
	Vibratory: 14-inch timber piles	LF cetaceans, MF cetaceans, otariid, and phocid
	DTH: 16-inch piles	MF cetaceans and otariids
	DTH: 24-inch temporary piles	MF cetaceans
15 meters	Vibratory: 14-inch timber piles	HF cetaceans
	DTH: 24-inch temporary piles	otariid
	DTH: 24-inch permanent piles	MF cetaceans and otariid
30 meters	DTH: 16-inch permanent piles	phocid
50 meters	DTH: 16-inch permanent piles	LF cetaceans
60 meters	DTH: 16-inch permanent Piles	HF cetaceans
145 meters	DTH: 24-inch temporary piles	phocid
175 meters	DTH: 24-inch permanent piles	Phocid
265 meters	DTH: 24-inch temporary piles	LF cetaceans
315 meters	DTH: 24-inch temporary piles	HF cetaceans
320 meters	DTH: 24-inch permanent piles	LF cetaceans
385 meters	DTH: 24-inch permanent piles	HF cetaceans

Figure 6. Trident Kodiak Bunkhouse Dock Replacement Project Level A Shutdown Zones for Northern Sea Otter (USFWS Species)



MITIGATION MEASURES

The purpose of a marine mammal monitoring plan is to observe for marine mammals and listed avian species in the area where potential sound effects may occur. Work will be stopped or delayed if a non-permitted marine mammal or listed avian species is sighted in the Level B monitoring area or Level A shutdown area. Work will not begin or resume until the marine mammal or listed avian species has moved out of the monitoring area on its own accord.

The following mitigation measures will be implemented during in-water activities to limit impacts to marine mammals and listed avian species, including ESA-listed species.

General Conditions and Requirements

- The contractor is required to conduct briefings for construction supervisors and crews and the monitoring team prior to the start of all pile driving activity, and upon hiring new personnel, to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
- The contractor is required to employ PSOs during all in-water construction activities.
- Marine mammal monitoring must take place starting 30 minutes prior to initiation of in-water work and ending 30 minutes after completion of in-water work. In-water work may commence when observers have declared the appropriate zones clear of marine mammals or listed avian species. In the event of a delay or shutdown of activity resulting from marine mammals or listed avian species in the shutdown zone (Table 4), their behavior must be monitored and documented until they leave of their own volition, at which point the activity may begin or resume.
- In-water work must be halted or delayed If a marine mammal or listed avian species is observed entering or within an established shutdown zone (Table 4). Pile driving may not commence or resume until either: the animal has voluntarily left and has been visually confirmed beyond the shutdown zone; 15 minutes have passed without subsequent observations of small cetaceans, pinnipeds, and Steller's eiders; or 30 minutes have passed without subsequent observations of large cetaceans or sea otter.
- In-water work must be delayed or halted immediately if a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone (Table 3). Activities must not start or resume until the animal has been confirmed to have left the area or the observation time period, as indicated in the conditions above, has elapsed.
- In-water work would only occur during daylight hours.
- If a raft of more than 50 sea otters are present within the largest Level B zone or skiff routes, in-water work will be delayed until the raft has dissipated or has moved outside of the zone.
- Should light or environmental conditions deteriorate such that marine mammals within the entire largest Level A shutdown zone would not be visible (e.g., fog, heavy rain), pile

driving and removal must be delayed until the PSOs are confident marine mammals or listed avian species within the shutdown zone could be detected.

- PSOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform PSO duties for more than 12 hours in a 24-hour period (to reduce PSO fatigue).
- If construction activities will occur outside of the time window specified, NMFS will be notified immediately of the situation, but at least 60 days prior to the end of the specified time window to allow for reinitiation of consultation.
- If there are any impediments to complying with the mitigation measures in this 4MP, NMFS will be notified immediately.

Observer Qualifications and Requirements

- Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface and ability to estimate target size and distance. Use of binoculars and/or spotting scope may be necessary to correctly identify the target.
- Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelor's degree or higher is preferred), or equivalent Alaska Native traditional knowledge. PSOs may substitute education or training for experience.
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Experience or training in field identification of marine mammals (cetaceans and pinnipeds).
- Training, knowledge of or experience with vessel operation and pile driving operations sufficient to provide personal safety during observations.
- Writing skills sufficient to prepare a report of observations. Reports should include: the number, type, and location of marine mammals observed; the behavior of marine mammals in the area of potential sound effects during construction; dates and times when observations and in-water construction activities were conducted; dates and times when in-water construction activities were suspended because of marine mammals; etc.
- Ability to communicate orally as needed, by radio or in person, with project personnel to provide real time information about marine mammals observed in the area.
- PSOs must be independent (*i.e.*, not construction personnel) and have no other assigned tasks during monitoring periods.
- At least one PSO will have prior experience performing the duties of a PSO during construction activity; When a team of three or more PSOs are required, a lead observer or monitoring coordinator will be designated. The contractor must submit PSO CVs for approval by NMFS and USFWS a minimum of one week prior to the onset of pile driving.

Data Collection

Environmental Conditions and Construction Activities

PSOs will use the environmental conditions and construction activities log to document the following (Appendix B):

- Environmental Conditions:
    - Environmental conditions will be recorded at the beginning and end of every monitoring period and as conditions change.
    - Recordings will include PSO names, location of the observation station, time and date of the observation, weather conditions, air temperature, sea state, cloud cover, visibility, glare, tide, and ice coverage (if applicable).
- Construction Activities:
    - PSOs will record the construction start times and construction stop times
    - PSOs will record the time that observations begin and end as well as the durations of shutdowns.
    - PSOs will document the reason for stopping work, time of shutdown, and type of pile installation or other in-water work taking place.
    - PSOs will document other, non-project-related activities that could disturb marine mammals in the area, such as the presence of large and small vessels.

PSOs will record all communications with the construction crew. The environmental conditions and construction activities log will be checked for quality assurance and quality control (QA/QC) by the lead PSO for submission at the end of every monitoring day. Upon request, the data will be submitted to NMFS and USFWS along with the final report.

Sightings

Observers will use an approved marine mammal sighting form and grid map (Appendices C and D) which will be completed by each observer for each survey day and location. Sighting forms will be used by observers to record the following:

- Date and time that permitted construction activity begins or ends;
- Weather parameters (e.g., percent cloud cover, percent glare, visibility) and sea state (determined by the Beaufort Wind Force Scale);
- Species, numbers, and, if possible, sex and age class of observed marine mammals;
- Construction activities occurring during each sighting;
- Behavioral patterns observed, including bearing and direction of travel;
- Behavioral reactions just prior to, or during, soft-start and shutdown procedures;
- The marine mammal's location, distance from the observer, and distance from pile removal activities;
- Whether mitigation measures, including shutdown procedures, were required by an observation, including the duration of each shutdown;
- Observer rotations including the time of rotation and the initials of the incoming observer.

- If possible, observations of humpback whales will be transmitted to AKR.section7@noaa.gov , including:
    - photographs (especially flukes) and video obtained.
    - geographic coordinates for the observed animals, with the position recorded using the most precise coordinates practicable (coordinates will be recorded in decimal degrees, or a similar standard).
    - Number of animals per observation event; and number of adults/juveniles/calves per observation event (if determinable).
    - Environmental conditions as they existed during each observation event, including sea conditions, weather conditions, visibility, lighting conditions, and percent ice cover.
- All observations of North Pacific right whales will be reported to NMFS within 24 hours. These observation reports will include the following information:
    - date, time, and geographic coordinates of the observation(s);
    - number of North Pacific right whales observed, including number of adults/juveniles/calves observed, if determinable;
    - Environmental conditions as they existed during each observation event, including sea conditions, weather conditions, visibility, lighting conditions, and percent ice cover.

The observation record forms will be checked for quality assurance and quality control (QA/QC) by the lead PSO for submission at the end of every monitoring day. Upon request, the data will be submitted to NMFS and USFWS along with the final report.

Equipment

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

- Appropriate personal protective equipment;
- Portable VHF radios for the observers to communicate with other observers and the pile driving supervisor;
- Cellular phone as backup for radio communication;
- Contact information for the other observers, the pile driving supervisor, and the NMFS and USFWS point of contact;
- Daily tide tables for the project area;
- Binoculars (quality 7 x 50 or better) and a rangefinder;
- Hand-held GPS unit or grid map to record locations of marine mammals;
- Copies of the 4MP, IHA, and other relevant permit requirement specifications in a sealed, clear, plastic cover;
- Notebook with pre-standardized monitoring observation record forms and grid map (Appendices C and D).

Number and Location of PSOs

The number of locations of PSOs are determined to ensure that there is full coverage of the entire action area during all in-water activities. Locations are chosen based on site accessibility and field of vision.

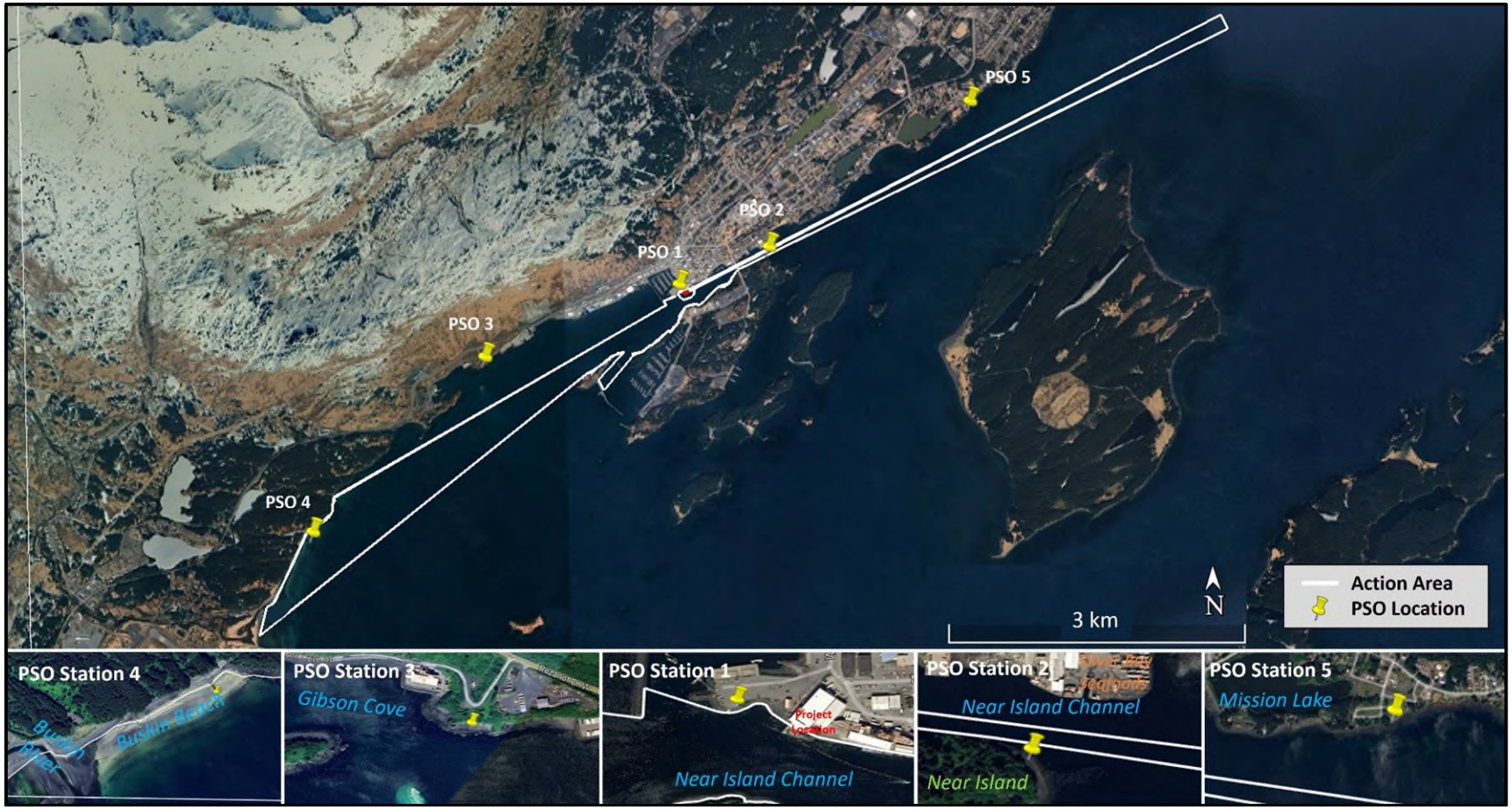
One to five PSOs will be onsite during in-water activities associated with the Trident Kodiak Bunkhouse Dock Replacement Project, stationed in the following locations (Figure 7):

- Station 1: stationed just to the west of the site on the shore.
- Station 2: stationed on the northern point of Near Island (via North End Trail).
- Station 3: stationed on beach at head of Gibson Cove.
- Station 4: stationed on Buskin Beach.
- Station 5: stationed on beach via Jackson Lane.

The number and locations of monitors will be based on the following in-water work scenarios:

- Scenario #1: In-water construction not involving pile driving; barge movements, etc.
    - One location: Station 1
- Scenario #2: Level B Zone less than or equal to 1,000 meters
    - Three Locations: Stations 1–3
- Scenario #3: Level B Zones of 1,000 meters to 6,310 meters
    - Five Locations: Stations 1-5

Figure 7. Trident Kodiak Bunkhouse Dock Replacement Project PSO Locations



Strike Avoidance

Vessels will adhere to the Alaska Humpback Whale Approach Regulations when transiting to and from the project site (see 50 CFR §§ 216.18, 223.214, and 224.103(b)). These regulations require that all vessels:

- Do not approach, or cause a vessel or object to approach, within 100 yards of a humpback whale;
- Do not obstruct the path of oncoming humpback whales causing them to surface within 100 yards of the vessel;
- Do not disrupt the normal behavior or prior activity of a whale; and
- Operate at a slow, safe speed when near a humpback whale (safe speed is defined in regulation 33 CFR § 83.06).

Vessels will follow the NMFS Marine Mammal Code of Conduct for other species of marine mammals, which recommend: maintaining a minimum distance of 100 yards; not encircling or trapping marine mammals between boats, or between boats and the shore; and putting engines in neutral if approached by a whale or other marine mammal to allow the animals to pass.

Monitoring Techniques

Pre-Activity Monitoring

The following monitoring methods will be implemented before permitted construction begins:

- The lead PSO and Contractor Superintendent will meet at the start of each day to discuss planned construction activities for the day and to conduct a radio/phone check.
- Prior to the start of permitted activities, observers will conduct a 30-minute pre-watch of the shutdown and monitoring zones. They will ensure that no marine mammals or listed avian species are present within the shutdown zone before permitted activities begin.
- The shutdown zone will be cleared when marine mammals have not been observed within the zone for the 30-minute pre-watch period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes (for pinnipeds) or 30 minutes (for cetaceans and sea otters).
- When all applicable harassment zones are clear, the observers will radio the pile driving supervisor. Permitted activities will not commence until the pile driving supervisor receives verbal confirmation that the zones are clear.
- If permitted species are present within the monitoring zone, work will not be delayed, but observers will monitor and document the behavior of individuals that remain in the monitoring zone.
- In case of fog or reduced visibility, observers must be able to see all of the shutdown zones before permitted activities can begin.

Soft Start Procedures

Soft start procedures will be used prior to periods of impact driving to allow marine mammals to leave the area prior to exposure to maximum noise levels. Soft start procedures for vibratory pile driving will not be implemented and are not required.

- The contractor will initiate approximately three strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would be repeated twice more.
- If work ceases for more than 30 minutes, soft start procedures must be used prior to continuing work.

During Activity Monitoring

If permitted species are observed within the monitoring zone during permitted activities, a Level B takes will be recorded and behaviors will be documented. Work will not stop unless an animal enters or appears likely to enter the shutdown zone.

Inclement Weather

The action area often experiences increased sea states and inclement weather. If inclement weather, limited visibility, or increased sea state restricts the observers' ability to make observations, in-water activities will not be initiated or continued until the largest Level A shutdown zone for the activity is visible.

If visibility is diminished, but the parameters for initiating or continuing work (referenced above) are met, the following should occur:

- All appropriate PSO locations for the planned in-water activities should be occupied for the entirety of the monitoring period regardless of visibility.
- All PSO locations should collectively determine what percentage of the Level B zone is visible for use in calculating extrapolations (take extrapolation will only occur for ESA-listed species authorized for take). The lead PSO should document this with time stamps as conditions change and this percentage should be adopted by all PSO locations.
- Extrapolate takes for ESA-listed species with authorized take using the equation below.

Number of individuals sighted in the visible portion of the Level B zone ÷ percentage of visible Level B zone = extrapolated takes for species

Shutdowns

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

- The observers will immediately alert the pile driving supervisor.
- All permitted activities will immediately halt.
- In the event of a shutdown, permitted pile installation or removal activities may resume only when the animal(s) within or approaching the shutdown zone has been visually confirmed beyond or heading away from the shutdown zone, or 15 minutes (for pinnipeds) or 30 minutes (for cetaceans and sea otters) have passed without

observation of the animal. Observers will contact the pile driving supervisor and inform them that activities can re-commence.

Breaks in Work

Shutdown and monitoring zones will continue to be monitored during an in-water construction delay. No exposures will be recorded for permitted species in the monitoring zone if permitted construction activities are not actively occurring.

If permitted activities cease for more than 30 minutes and monitoring has not continued, pre-activity monitoring and soft start procedures must recommence. This includes breaks due to scheduled or unforeseen construction practices or breaks due to permit-required shutdown. Work can begin following the 30-minute pre-watch monitoring protocols. Work cannot begin if an animal is within the shutdown zone or if visibility is not clear throughout the Level A shutdown zones.

Post Activity Monitoring

Monitoring of the shutdown and monitoring zones will continue for 30 minutes following completion of in-water activities. PSOs will continue to record observations during this post-watch period, with a focus on observing and reporting unusual or abnormal behaviors.

If construction were to resume during the post-watch period, PSOs will follow pre-watch protocols to ensure that that the shutdown and monitoring zones are clear prior to work resuming.

REPORTING

Notification of Intent to Commence Construction

The contractor will inform NMFS OPR, NMFS Alaska Region Protected Resources Division, and USFWS one week prior to commencing construction activities.

Weekly Sighting Counts

A summary of the following will be submitted to the construction project manager at the conclusion of each week of construction activity (Friday evening):

- Completed monitoring forms for the week
- Completed environmental conditions and construction activity logs for the week
- Preliminary counts of sightings and takes per species

Interim Monthly Reports

The contractor will submit brief, monthly reports to the NMFS Alaska Region Protected Resources Division and USFWS summarizing PSO observations and recorded takes during construction. Monthly reporting will allow NMFS and USFWS to track takes (including extrapolated takes) and reinitiate consultation in a timely manner, if necessary. Monthly reports will be submitted by email to akr.section7@noaa.gov and USFWS fw7_mmm_reports@fws.gov.

The reporting period for each monthly PSO report will be the entire calendar month, and reports will be submitted by the end of business hours on the tenth day of the month following the end of the reporting period (e.g., the monthly report covering September 1–30, 2023, would be submitted to the NMFS and USFWS by close of business on October 10, 2023).

Final Report

The contractor will submit a draft final report by email to akr.section7@noaa.gov and fw7_mmm_reports@fws.gov no later than 90 days following the end of construction activities. The contractor will provide a final report within 30 days following resolution of NMFS and USFWS's comments on the draft report. If no comments are received from the agencies within 30 days, the draft final report will be considered the final report.

The final reports will contain, at minimum, the following information:

- A summary of construction activities, including start and end dates.
- A description of pile types, average driving times, etc.
- A table summarizing all marine mammal sightings during the construction period, including:
    - dates, times, species, numbers, locations, and behaviors of any observed ESA-listed marine mammals, including all observed humpback whales and Steller sea lions;
    - daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B zones, and whether estimated as taken, if appropriate; and
    - the number of shut-downs throughout all monitoring activities.
- A brief description of any impediments to obtaining reliable observations during construction period.
- A description of any impediments to complying with these mitigation measures.
- Appendices containing all PSO daily logs and marine mammal sighting forms.

Reporting Injured or Dead Marine Mammals and Illegal Activities or Harassment

If it is clear that project activity has caused the take of a marine mammal in a manner prohibited by the (requested) IHA, such as unauthorized Level A harassment, serious injury, or mortality, the contractor shall immediately cease the specified activities and report the incident to NMFS OPR, the NMFS Alaska Region Protected Resources Division, and the NMFS statewide 24-hour Stranding Hotline (877) 925-7773. If a sea otter, report to the USFWS Marine Mammal Management Office at (800) 362–5148, or the Alaska SeaLife Center in Seward (888) 774–7325, or both.

The report must include the following:

- Time and date of the incident
- Description of the incident
- Environmental conditions (e.g., wind speed and direction, Beaufort Sea state, cloud cover and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;

- Fate of the animal(s); and;
- Photographs or video footage of the animal(s) (if available).

Activities will not resume until NMFS or USFWS is able to review the circumstances of the unauthorized take. NMFS or USFWS would work with the contractor to determine what measures are necessary to minimize the likelihood of further unauthorized take and ensure ESA and MMPA compliance. The contractor may not resume their activities until notified by NMFS or USFWS.

In the event that the contractor discovers an injured or dead marine mammal within the action area, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (e.g., in less than a moderate state of decomposition), the contractor will immediately report the incident to the USFWS or NMFS OPR, and the NMFS Alaska Regional Stranding Coordinator or Hotline.

The report must include the same information identified in the paragraph above. Activities may continue while NMFS or USFWS reviews the circumstances of the incident. NMFS or USFWS will work with the contractor to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that the contractor discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the contractor must report the incident to the NMFS OPR and the NMFS Alaska Regional Stranding Coordinator or Hotline within 24 hours of the discovery. If a sea otter, it must be reported to USFWS within 24 hours of the discovery to either the USFWS Marine Mammal Management Office at (800) 362–5148 (business hours), or the Alaska SeaLife Center in Seward (888) 774–7325 (24 hours a day), or both. The contractor will provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS or USFWS.

If PSOs observe marine mammals being disturbed, harassed, harmed, injured, or killed (e.g., feeding or unauthorized harassment), these activities will be reported to NMFS Office of Law Enforcement at (1-800-853-1964). Data submitted to NMFS will include date/time, location, description of the event, and any photos or videos taken.

Appendix A: List of Species with Ranges in the Project Action Area

Species and their Status Listed by the NMFS Mapper and USFWS IPaC Mapper that May Occur in the Project Vicinity

Common Name	Stock	Jurisdiction	Status	Additional Species Information
Northern Sea Otter (*Enhydra lutris kenyoni)*	Southwest	USFWS	Endangered	https://www.fws.gov/species/northern-sea-otter-enhydra-lutris-kenyoni
Steller Sea Lion (*Eumetopias jubatus)*	Western U.S.	NMFS	Endangered	https://www.fisheries.noaa.gov/species/steller-sea-lion
Northern Fur Seal (*Callorhinus ursinus)*	Eastern Pacific	NMFS	MMPA	https://www.fisheries.noaa.gov/species/northern-fur-seal
Harbor Seal (*Phoca vitulina)*	S. Kodiak, Prince William Sound, Cook Inlet/Shelikof Strait	NMFS	MMPA	https://www.fisheries.noaa.gov/species/harbor-seal
Killer Whale (*Orcinus orca)*	Eastern North Pacific Alaska Resident	NMFS	MMPA	https://www.fisheries.noaa.gov/species/killer-whale
	Eastern North Pacific Northern Resident	NMFS	MMPA	
	Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea Transient	NMFS	MMPA	
		NMFS	MMPA	
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	North Pacific	NMFS	MMPA	https://www.fisheries.noaa.gov/species/pacific-white-sided-dolphin
Harbor Porpoise (*Phocoena phocoena)*	Gulf of Alaska	NMFS	MMPA	https://www.fisheries.noaa.gov/species/harbor-porpoise
Dall's Porpoise (*Phocoenoides dalli)*	Alaska	NMFS	MMPA	https://www.fisheries.noaa.gov/species/dalls-porpoise
Sperm Whale (*Physeter macrocephalus)*	North Pacific	NMFS	Endangered	https://www.fisheries.noaa.gov/species/sperm-whale
Cuvier's Beaked Whale (*Ziphius cavirostris)*	Alaska	NMFS	MMPA	https://www.fisheries.noaa.gov/species/cuviers-beaked-whale
Humpback Whale (*Megaptera novaeangliae)*	Western North Pacific	NMFS	Endangered	https://www.fisheries.noaa.gov/species/humpback-whale
	Mexico	NMFS	Threatened	
	Hawaii	NMFS	MMPA	
	Central North Pacific	NMFS	MMPA	
Fin Whale (*Balaenoptera physalus)*	Northeast Pacific	NMFS	Endangered	https://www.fisheries.noaa.gov/species/fin-whale

Minke Whale (*B. acutorostrata)*	Alaska	NMFS	MMPA	https://www.fisheries.noaa.gov/species/minke-whale
North Pacific Right Whale (*Eubalaena japonica)*	Eastern North Pacific	NMFS	Endangered	https://www.fisheries.noaa.gov/species/north-pacific-right-whale
Gray Whale (*Eschrichtius robustus)*	Eastern North Pacific	NMFS	MMPA	https://www.fisheries.noaa.gov/species/gray-whale
Short-tailed Albatross (*Phoebastria albatrus)*	Range wide	USFWS	Endangered	https://www.fws.gov/species/short-tailed-albatross-phoebastria-albatrus
Steller's Eider (*Polysticta stelleri)*	Alaska Breeding	USFWS	Threatened	https://fws.gov/species/stellers-eider-polysticta-stelleri

Appendix B: Construction Activity and Communication Log

Construction Activity and Communication Log

Project:_____ Location: _____ Observer(s): _____ Date:_____

Time	Pile Size	Pile Type	Construction Type	Obs.	Construction Personnel	Communication/Comments

Filling Out Construction Activity and Communication Logs	
Data Columns	**Definition and How to Record**
General Information *(top of form)*	
Project	Time that monitoring by MMOs/PSOs began and ended, without interruption (military time)
Project Name	Trident Kodiak Bunkhouse Dock Replacement
Monitoring Location	See 4MP
Observer	Names of Observers at each location
Date	MM/DD/YYYY
Construction and Communication Activities	
Time of event	Time that construction activities and all communications between MMOs/PSOs and construction crews take place
Type of construction activity	Type of construction activity occurring, including ramp up, startup, shutdown, type of pile installation technique, pile size, and pile type (permanent or temporary)
Communication	Information communicated between MMOs/PSOs and construction crew

Appendix C: Marine Mammal Sighting Form

MARINE MAMMAL OBSERVATION RECORD

Project Name: ____________________
Monitoring Location: ____________________
Date: ____________________
Time Effort Initiated: ____________________
Time Effort Completed: ____________________
Page ________ of ________

Time	Visibility	Glare	Weather Condition	Wave Height	BSS	Wind	Swell
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W
:	B – P – M – G – E	%	S – PC – L – R – F – OC – SN – HR	Lt/Mod/Hvy		N S E W	N S E W

Event Code	Sight # (1 or 1.1 if re-sight)	Time/Dur (Start/End time if cont.)	WP/ Grid #/ DIR of travel	Distance from Pile	Obs.	Sighting Cue	Species	Group Size	Behavior Code (see code sheet)	Construction Type	Mitigation Type	Exposure (Y/N)	Behavior Change/ Response to Activity/Comments/Human Activity/Vessel Hull # or Name/ Visibility Notes
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		
E ON PRE/POST CON S M OR E OFF		: :	____ Grid N or S W or E			BL BO BR DF SA OTHER		Min: Max: Best:		DR I V OWC NOWC NONE	DE SD None		

Filling Out Sighting Forms	
Data Columns	**Definition and How to Record Data**
General Information *(Top of Form)*	
Project Name	Trident Kodiak Bunkhouse Dock Replacement
Monitoring Location	See 4MP
Date	MM/DD/YYYY
Time effort initiated and completed	Time started pre-watch and time post-watch ended (military time). If there is more than one monitoring period in a day, start a new form for each period.
Environmental Conditions	
Environmental Conditions	Record at the start of monitoring period, when changes, and at the end of monitoring period.
Visibility	B-bad, P-poor, M-moderate, G-good, and E-excellent
Glare	Amount of water obstructed by glare (0–100%) and direction of glare (from south, north, or another direction)
Weather conditions	Dominant weather conditions: sunny (S), partly cloudy (PC), light rain (LR), steady rain (R), fog (F), overcast (OC), light snow (LS), snow (SN)
Wave Height	Lt-light, Mod-moderate, Hvy-heavy
Wind and Swell direction	From the north (N), northeast (NE), east (E), southeast (SE), south (S), southwest (SW), west (W), northwest (NW)
Beaufort Sea State	Scale 1-12. See BSS sheet.
Sightings	
Event Code	Indicates what events are happening at the time of the sighting, what events may have occurred due to the sighting, and observer rotations.
Time/Duration	Time first sighted and time of last sighting (military time).
Sighting Number	Chronological (1,2,3, etc.) If the same marine mammal is resighted at a distance greater than 25 meters from the original sighting location record as a resight (Ex. 1.1- same marine mammal as sighting 1, but sighted for a second time in different location)
WP/Grid #/DIR of Travel	Grid number that marine mammal was sighted in and direction of travel. Format should be ***grid map letter-grid*** (Example: If a marine mammal is sighted in grid **2B** on **Grid Map B** this should be denoted by **B-2B**).
Distance from pile	Distance in meters from in-water work

Observer (Obs.)	Initials of the Observer who sighted the marine mammal or who is coming on shift during a rotation
Sighting Cue	How was the marine mammal sighted
Species	Appropriate species abbreviation from code sheet
Group Size	Record the minimum and maximum number of individuals that were sighted. Then determine and record the best number of individuals.
Behavior	Behaviors observed using appropriate abbreviations from code sheet
Construction Type	Circle construction type that is actively occurring at the time and for the duration of the sighting.
Mitigation Type	Circle mitigation type, if any. Based upon monitoring and shutdown zones does a delay of work (pre-watch and post-watch) or a shutdown (monitoring period) need to occur.
Exposure	If a marine mammal enters its Level A or Level B distance and work is actively occurring it will be an exposure indicate yes (Y). If no work is actively occurring indicate no (N)

Marine Mammal Observation Record – Sighting Codes

Behavior Codes

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

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

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

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

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

Event

Code	Activity Type
E ON	Effort On
E OFF	Effort Off
PRE	Pre-Construction Watch
POST	Post-Construction Watch
CON	Construction (see types)
S	Sighting
M	Mitigation
OR	Observer Rotation

Sighting Cues

Code	Distance Visible
BL	Blow
BO	Body
BR	Breach
DF	Dorsal Fin
SA	Surface Activity
OTHR	Other

Marine Mammal Species

Code	Marine Mammal Species
STSL	Steller Sea Lion
HPBK	Humpback Whale
HAPO	Harbor Porpoise
DAPO	Dall's Porpoise
PSWD	Pacific white-sided dolphin
SO	Sea Otter
SE	Steller's eider
HSEA	Harbor Seal
MINKE	Minke Whale
GRW	Gray Whale
FW	Fin Whale
ORCA	Killer Whale
NFS	Northern Fur Seal

Construction Type

Code	Activity Type
OWC	Over-Water Construction
NOWC	No Over-Water Construction
V	Vibratory Hammer
I	Impact Hammer
DR	Drilling
NONE	No Construction

Mitigation Codes

Code	Activity Type
DE	Delay onset of In-Water Work
SD	Shutdown In-Water Work

Visibility

Code	Distance Visible
B	Bad (<0.5km)
P	Poor (0.5-0.9km)
M	Moderate (0.9-3km)
G	Good (3-10km)
E	Excellent (>10km)

Weather Conditions

Code	Weather Condition
S	Sunny
PC	Partly Cloudy
L	Light Rain
R	Steady Rain
F	FOG
OC	Overcast
SN	Snow
HR	Heavy Rain

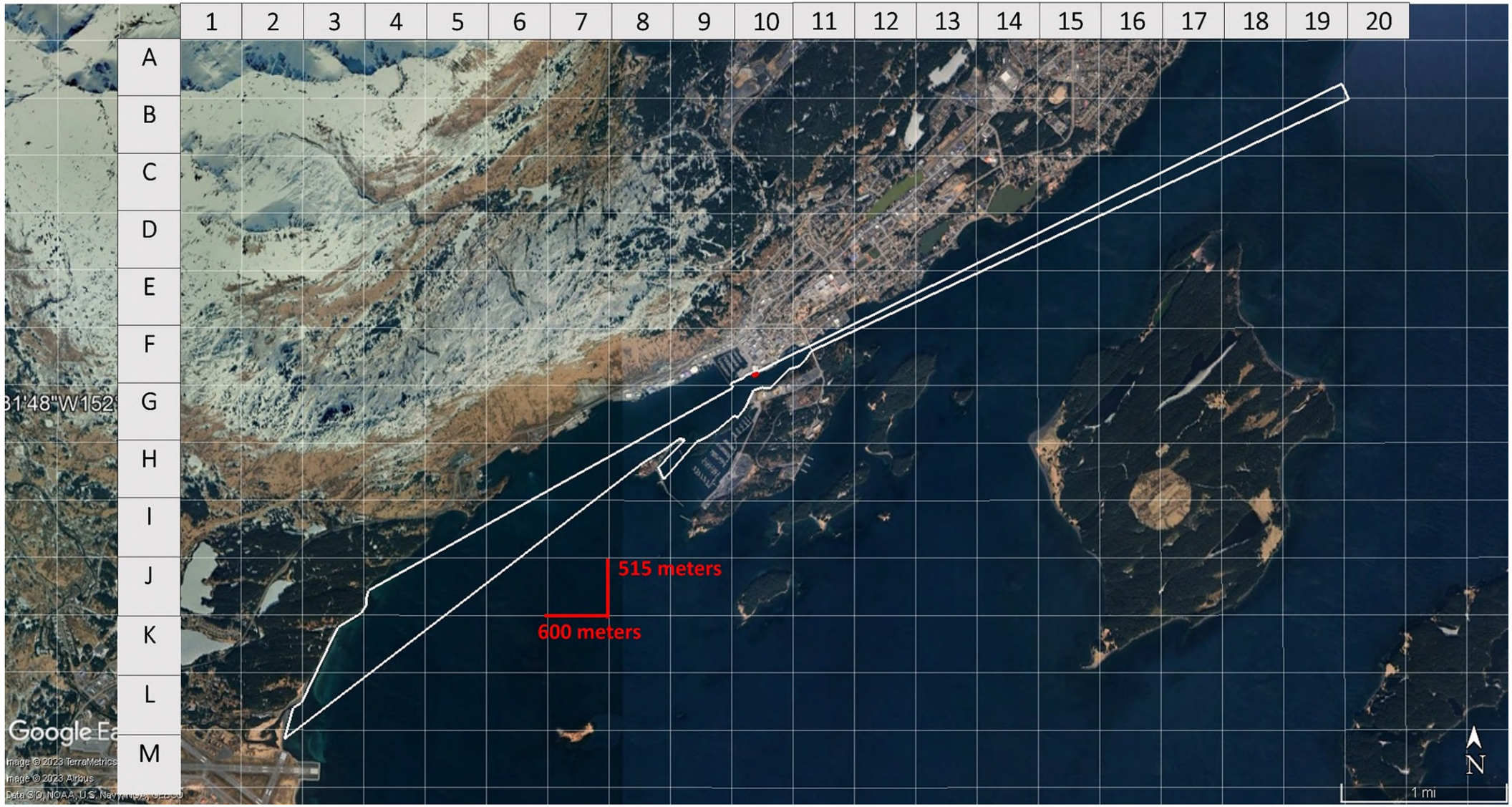
Wave Height

Code	Wave Height
Light	0-3 ft
Moderate	4-6 ft
Heavy	>6 ft

Estimating Wind Speed and Sea State with Visual Clues

Beaufort number	Wind Description	Wind Speed	Wave Height	Visual Clues
0	Calm	0 knots	0 feet	Sea is like a mirror. Smoke rises vertically.
1	Light Air	1-3 kts	< 1/2	Ripples with the appearance of scales are formed, but without foam crests. Smoke drifts from funnel.
2	Light breeze	4-6 kts	1/2 ft (max 1)	Small wavelets, still short but more pronounced, crests have glassy appearance and do not break. Wind felt on face. Smoke rises at about 80 degrees.
3	Gentle Breeze	7-10 kts	2 ft (max 3)	Large wavelets, crests begin to break. Foam of glassy appearance. Perhaps scattered white horses (white caps). Wind extends light flag and pennants. Smoke rises at about 70 deg.
4	Moderate Breeze	11-16 kts	3 ft (max 5)	Small waves, becoming longer. Fairly frequent white horses (white caps). Wind raises dust and loose paper on deck. Smoke rises at about 50 deg. No noticeable sound in the rigging. Slack halyards curve and sway. Heavy flag flaps limply.
5	Fresh Breeze	17-21kts	6 ft (max 8)	Moderate waves, taking more pronounced long form. Many white horses (white caps) are formed (chance of some spray). Wind felt strongly on face. Smoke rises at about 30 deg. Slack halyards whip while bending continuously to leeward. Taut halyards maintain slightly bent position. Low whistle in the rigging. Heavy flag doesn't extended but flaps over entire length.
6	Strong Breeze	22-27 kts	9 ft (max 12)	Large waves begin to form. White foam crests are more extensive everywhere (probably some spray). Wind stings face in temperatures below 35 deg F (2C). Slight effort in maintaining balance against wind. Smoke rises at about 15 deg. Both slack and taut halyards whip slightly in bent position. Low moaning, rather than whistle, in the rigging. Heavy flag extends and flaps more vigorous.
7	Near Gale	28-33 kts	13 ft (max 19)	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of wind. Necessary to lean slightly into the wind to maintain balance. Smoke rises at about 5 to 10 deg. Higher pitched moaning and whistling heard from rigging. Halyards still whip slightly. Heavy flag extends fully and flaps only at the end. Oilskins and loose clothing inflate and pull against the body.
8	Gale	34-40 kts	18 ft (max 25)	Moderately high waves of greater length. Edges of crests begin to break into the spindrift. The foam is blown in well-marked streaks along the direction of the wind. Head pushed back by the force of the wind if allowed to relax. Oilskins and loose clothing inflate and pull strongly. Halyards rigidly bent. Loud whistle from rigging. Heavy flag straight out and whipping.
9	Strong Gale	41-47 kts	23 ft (max 32)	High waves. Dense streaks of foam along direction of wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility.
10	Storm	48-55 kts	29 ft (max 41)	Very high waves with long overhanging crests. The resulting foam, in great patches is blown in dense streaks along the direction of the wind. On the whole, the sea takes on a whitish appearance. Tumbling of the sea becomes heavy and shock-like. Visibility affected.
11	Violent Storm	56-63 kts	37 ft (max 52)	Exceptionally high waves (small and medium-sized ships might be for time lost to view behind the waves). The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere, the edges of the wave crests are blown into froth. Visibility greatly affected.
12	Hurricane	64+ kts	45+ ft	The air is filled with foam and spray. The sea is completely white with driving spray. Visibility is seriously affected.

Appendix D: Grid Map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