Request for an Incidental Harassment Authorization
City and Borough of Sitka
Sitka Seaplane Base
Sitka Channel, Sitka, Alaska

August 2023

Revised October 2023

Prepared for:

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
µPa	microPascal
ADF&G	Alaska Department of Fish and Game
ANSI	American National Standards Institute
BMP	best management practice
CBS	City and Borough of Sitka
CY	cubic
dB	decibels
DPS	distinct population segment
DTH	down-the-hole
EDPS	Eastern distinct population segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HF	high-frequency
hp	horsepower
HTL	high tide line
Hz	hertz
GPIP	Gary Paxton Industrial Park
IHA	Incidental Harassment Authorization
kHz	kilohertz
LF	low-frequency

L_E	cumulative sound exposure level
Lpk	peak sound pressure level
MF	mid-frequency
MHW	mean high water
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OW	otariid
PBR	potential biological removal
PSO	Protected Species Observer
PTS	permanent threshold shift
PW	phocid
rms	root mean square
SEL	sound exposure level
SPB	Seaplane Base
SPL	sound pressure level
Turnagain	Turnagain Marine Construction
TS	threshold shift
TTS	temporary threshold shift
UME	Unusual Mortality Event
USCG	U.S. Coast Guard
WDPS	Western distinct population segment
WNP	Western North Pacific
Windward	Windward Project Solutions

1 Description of Specific 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

The City and Borough of Sitka (CBS) is proposing to construct a new seaplane base (SPB) in Sitka Channel on the northern shore of Japonski Island in Sitka, Alaska. The new SPB will replace the existing SPB (Federal Aviation Administration [FAA] identifier A29) currently located on the eastern shore of Sitka Channel, near Eliason Harbor and downtown Sitka. The new SPB would address existing capacity, safety, and condition deficiencies for critical seaplane operations, and allow seaplanes to transit Sitka Channel more safely.

The existing Sitka SPB located off Katlian Street, A29, is at the end of its useful life and has several shortcomings, including limited docking capacity. A29 has only eight spaces, four of which cannot be accessed during low tide. The facility is expensive to maintain, has wildlife conflicts with a nearby seafood processing plant, and requires pilots to navigate a busy channel with heavy ship traffic. The new SPB would improve the safety of seaplane operation by reducing traffic and congestion in Sitka Channel. The project would consist of several components, completed over two phases. Once both phases are complete, the proposed SPB would provide 14 permanent slips, a drive-down ramp, and upland seaplane storage and car parking.

The following components are proposed for Phase I (construction from July 2024 through July 2025):

- Seaplane ramp float
- Drive-down float
- Pedestrian and vehicle transfer bridge
- Approach dock
- Uplands approach, storage area, and parking

The following components are proposed for Phase II (construction from July 2025 through July 2026):

- Transient seaplane float
- Turnaround float
- Expanded uplands approach, storage area, and parking
- Drive-down launch ramp

Constructing the proposed project would require pile installation using vibratory hammer, down-the-hole (DTH) drill, and impact hammer pile removal using vibratory hammer, and placement of fill. The project would occur in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) prohibits the taking of marine mammals; take is defined as “to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill,” except under certain situations. Section 101 (a)(5)(D) allows for the issuance of an IHA, provided an activity results in negligible impacts on marine mammals and would not adversely affect subsistence use of these animals.

Under the jurisdiction of National Atmospheric and Oceanic Administration (NOAA) National Marine Fisheries Service (NMFS), a total of fourteen marine mammal species have the potential to have habitat in the ensonified area (NMFS 2023). The CBS is requesting an IHA for Level B take of seven marine mammal species that may occur in the ensonified area during construction. The species for which Level B take is requested are: gray whale (*Eschrichtius robustus*), humpback whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), harbor porpoise (*Phocoena phocoena*), harbor seal (*Phoca vitulina*), and Steller sea lion (*Eumetopias jubatus*). Level A take is requested for harbor porpoise, harbor seal, and Steller sea lion.

Fin whale (*B. physalus*), North Pacific right whale (*Eubalaena japonica*), sperm whale (*Physeter macrocephalus*), Cuvier's beaked whale (*Ziphius cavirostris*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), Dall's porpoise (*Phocoenoides dalli*), and northern fur seal (*Callorhinus ursinus*) also have ranges that are documented to extend into the project area. However, take is not requested for these species and shutdown zones will be used to prevent unauthorized take.

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

1.2 DETAILED DESCRIPTION OF SPECIFIC ACTIVITIES

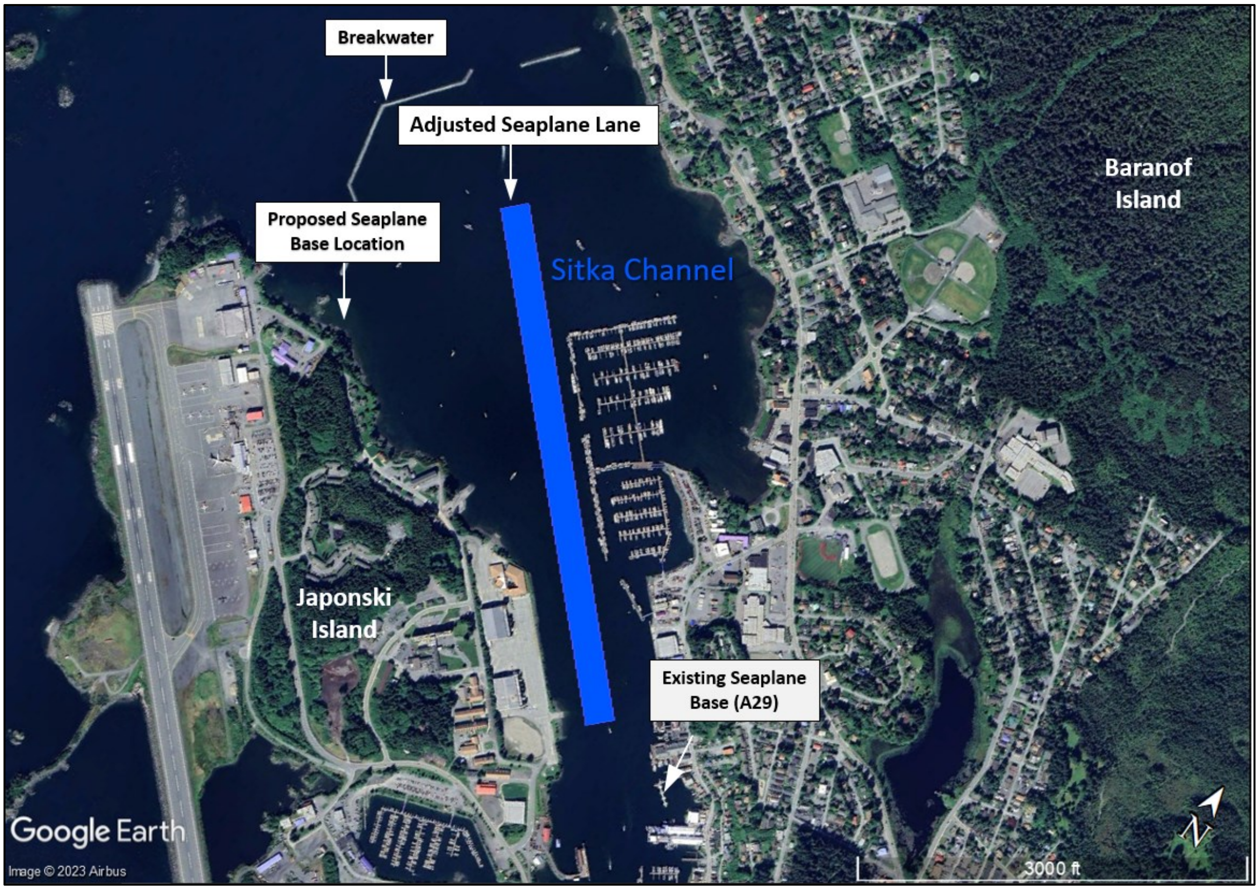
1.2.1 LOCATION

The proposed CBS SPB would be located on the north shore of Japonski Island, along the western side of Sitka Channel, approximately 1.5 miles north of downtown Sitka in Southeast Alaska. The project is located in Township 55S, Range 63E, Sections 34 and 35, Copper River Meridian, and within U.S. Geologic Survey Quad Map Sitka A at latitude 57.0568 and longitude -135.3595 (Figure 1; Figure 2; Earthpoint 2020). Sitka Channel is the main route to access Sitka by boat, a commonly used method of transportation in Southeast Alaska, and experiences high levels of marine traffic daily.

The proposed project would be located within the Channel Rock Breakwaters in the Sitka Channel spanning between Japonski Island and Baranof Island. The Channel Rock Breakwaters provide protection for the harbor and other facilities and structures located throughout the channel. Sitka Channel connects to the larger Sitka Sound, an active fishery and transportation corridor.

Figure 1. Sitka SPB Project Vicinity

Figure 2. Sitka SPB Project Location



1.2.2 PURPOSE AND NEED

The purpose of this project is to construct a new SPB to address capacity, safety, operational, and condition deficiencies at the existing Sitka SPB. This project is needed to support critical seaplane operations and transportation in Southeast Alaska, to resolve existing seaplane and boat conflicts, and to replace the existing base (A29) which is 65 years old and in poor condition.

Since Sitka is not connected to the larger road system, Sitka's intrastate transportation infrastructure includes the Alaska Marine Highway System, the Sitka Airport, and seaplanes and other charter options (CBS 2020). Sitka functions as a central transit hub for more remote communities in Southeast Alaska, and seaplanes are an essential element of transportation for that system. Some communities in the southern portion of Southeast Alaska are without land runways and only have seaplane bases for aviation infrastructure. Within this subregional network of airports, A29 serves as an access hub to essential medical services, facilitates access to a statewide aviation system through Sitka Rocky Gutierrez Airport, and expands retail opportunities for multiple communities (DOWL 2016). Transportation infrastructure is essential for the safety and security of these communities, and deficiencies at the existing SPB are limiting the efficient use of seaplane resources in and around Sitka.

The first SPB in Alaska was established in 1937 on Japonski Island and built by the U.S. Navy (CBS 2018). With a long history in the region, seaplanes continue to serve Sitka's local economy, particularly the fishery and tourism sectors. As a vibrant community only accessible by water or air, seaplanes facilitate both local and regional transportation. Forecasted growth of seaplane traffic in Sitka projects continued seaplane use and associated facility demands (DOWL 2016). Demand for the existing SPB exceeds capacity, and at times, the facility has had a multi-year waitlist with up to seven additional pilots seeking slip access (DOWL 2016). Given the deteriorated condition of the docks, only some slips are desirable to lease. Pilots have been concerned for multiple years over the condition of the dock, and some minimize use of the facility over concerns that unstable structures could damage aircraft.

CBS identified the need for a new SPB in 2002, and the planning process progressed as conditions at the facility continued to degrade. In 2002, CBS completed a Sitka Seaplane Base Master Plan to assess the need for a new SPB and identify a new facility and location (HDR Alaska, Inc. 2002). In 2012, CBS completed a siting analysis to reevaluate SPB sites; CBS confirmed Japonski Island as the recommended location (DOWL HKM 2012). In 2016, CBS conducted another siting analysis which confirmed aviation stakeholder interest, resolved FAA funding concerns, and provided an economic impact study (DOWL 2016). CBS has now received funding for planning and environmental review for the new SPB (CBS 2019).

The existing Sitka SPB, A29, is at the end of its useful life and has several shortcomings, including limited docking capacity. A29 has only eight spaces, four of which cannot be accessed during low tide. The facility is deteriorating after pilings collapsed and temporarily closed the SPB in January 2016 requiring costly municipal maintenance (DOWL 2016). The facility is expensive to maintain and its location introduces wildlife conflicts with a nearby seafood processing plant and requires pilots to navigate a channel busy with ship traffic. Additionally, A29 lacks essential SPB infrastructure and is inadequate for commercial traffic because it lacks sufficient vehicle parking and on-site aircraft maintenance, and does not have a drive-down ramp, passenger shelter, or equipment storage (DOWL 2016).

Both commercial and non-commercial seaplanes need expanded base access. Currently, there is competition for slip access between commercial and non-commercial operators. Given current capacity limitations, commercial operators require approval from the Harbormaster to pick up passengers at A29 (DOWL 2016). There is only one slip accessible to transient pilots; all other slips are leased full time. Occasionally, boats are tied to the dock and float ramp, further impeding seaplane access to the base (AirNav 2020).

In addition to demand exceeding current capacity, A29 lacks an adequate sea lane for landing and takeoff hindering aircraft operation and causing boat traffic safety concerns. The existing site’s proximity to Sitka Sound Seafoods fish processing plant has created additional wildlife conflicts. The failing docks also pose a safety hazard to pilots and passengers during loading, unloading, and walking to shore.

The project’s proposed location would resolve many of these existing obstacles. While the A29 SPB is located adjacent to a fish processing plant, the proposed SPB location on Japonski Island is over 3,000 feet away, reducing conflicts with seabirds that congregate in the vicinity of fish processing plants (DOWL 2016). The proposed SPB location should also reduce conflicts with marine vessels during landing and takeoff since takeoff, landing, and taxi operations would be relocated to a wider, less congested section of Sitka Channel than the existing sea lane. The proposed SPB would improve safety by relocating seaplane operations away from downtown and out of the heaviest traffic area of Sitka Channel.

1.2.3 PROPOSED ACTION

The two construction phases of Sitka SPB Project are detailed below (see also the figures provided in Appendix A).

Under Phase I (Figure 3; Table 1), the proposed project would:

- Construct and install the following pile-supported components:
  - 80-foot by 24-foot approach dock
  - 120-foot by 12-foot pedestrian and vehicle transfer bridge
  - 128-foot by 68-foot drive-down float
  - 417-foot by 46-foot seaplane ramp float to support 10 Cessna and 4 Beaver seaplane berths
- Install and remove 12 temporary 16-inch-diameter steel piles as templates to guide proper installation of permanent piles (these temporary piles would be removed prior to project completion) (Table 2).
- Install 10 permanent 16-inch-diameter galvanized steel piles and 16 permanent 24-inch-diameter galvanized steel piles to support the approach dock, pedestrian and vehicle transfer bridge, bridge landing and drive-down float, and seaplane ramp float (Table 2).
- Install other SPB float components such as electricity connections, waterlines, lighting, passenger walkway, hand rail, and mast lights.
- Conduct rock blasting and excavation of about 10,100 cubic yards (CY) of material extending from about 16 to 60 vertical feet above mean lower low water (MLLW; 0.00 datum) located at the end of the Seward Avenue in the southwest corner of the project uplands.
  - All blasting and excavating would occur above HTL (+13 feet).
  - Rock blasting and excavation would extend approximately 200 horizontal feet inland.
  - One blasting event per day on 47 days (not consecutive) at an estimated 90 decibels (dB; at the blast center) per event (Southeast Earth Movers 2020).
- Construct 2.6 acres of uplands including bridge abutment, vehicle turnaround, parking, basic amenities, curb, vehicle driveway, security fencing, and landscape buffer (Figure 5).
  - Discharge of 0.03 acres of fill between mean high water (MHW; +9.16 feet) and HTL (+13 feet) and 1.3 acres below MHW.
    - Side slopes of fill would have ratio of 2 horizontal to 1 vertical (2H:1V) slopes with heavy open graded armor rock and interstitial spaces.

Under Phase II (Figure 4; Table 1), the proposed project would:

- Construct and install the following pile-supported components:
  - 56-foot by 32-foot vehicle turnaround float
  - 144-foot by 56-foot transient float to support 5 transient seaplane berths
- Install and remove 6 temporary 16-inch-diameter steel piles as templates to guide proper installation of permanent piles (these temporary piles would be removed prior to project completion) (Table 2).

- Install 6 permanent 24-inch-diameter galvanized steel piles to support the vehicle turnaround float and transient float (Table 2).
- Install other SPB float components such as bull rail, floating fenders, mooring cleats, electricity connections, waterlines, lighting, passenger walkway, hand rail, and mast lights.
- Add an additional 1.2 acres of supporting infrastructure with the addition of a 183-foot by 34-foot seaplane haul-out ramp, seaplane staging areas, expanded parking, curb, security fencing, landscape buffer, and a covered shelter (Figure 5).
    - Discharge of 0.5 acres of fill between MHW (+9.16 feet) and HTL (+13 feet) and 0.8 acres below MHW.
        - Side slopes of fill would have ratio of 2 horizontal to 1 vertical (2H:1V) slopes with heavy open graded armor rock and interstitial spaces.

Table 1. Sitka SPB Project Construction Components

Construction Component	Material	Dimensions (feet)
Phase I		
Approach Dock	Treated timber and galvanized steel	80 x 24
Pedestrian and Vehicle Transfer Bridge	Painted steel w/ galvanized steel grating	120 x 12
Drive-Down Float	Treated timber, galvanized steel, coated polystyrene billets, and polyethylene floatation tubs	128 x 68
Seaplane Ramp Float	Treated timber, galvanized steel, coated polystyrene billets, and polyethylene floatation tubs	417 x 46
Upland Parking Area	Gravel, concrete, riprap	2.6 (acres)
Piles	Galvanized Steel	See Table 2
Phase II		
Vehicle Turn Around Float	Treated timber, galvanized steel, coated polystyrene billets, and polyethylene floatation tubs	32 x 56
Seaplane Transient Float	Treated timber, galvanized steel, coated polystyrene billets, and polyethylene floatation tubs	144 x 56
Seaplane Haul Out Ramp	Gravel, concrete, riprap	183 x 34
Upland Parking Area	Gravel, concrete, riprap	1.2 (acres)
Piles	Galvanized Steel	See Table 2

Table 2. Sitka SPB Project Pile Installation and Removal Summary

Project Component	Temp. Pile Install (Steel)	Temp. Pile Remove (Steel)	Permanent Pile Install (Steel)	
Diameter of Piles (inches)	16	16	16	24
Phase I				
Approach Dock	12	12	6	--
Bridge Abutment			4	--
Drive-Down Float			--	6
Seaplane Ramp Float			--	10
Phase I Total	**12**	**12**	**10**	**16**
Phase II				
Vehicle Turnaround Float	6	6	--	2
Transient Float			--	4
Phase II Total	**6**	**6**	**0**	**6**
Total number of Piles	**18**	**18**	**10**	**22**

Figure 3. Sitka SPB Project Proposed Action – Phase I

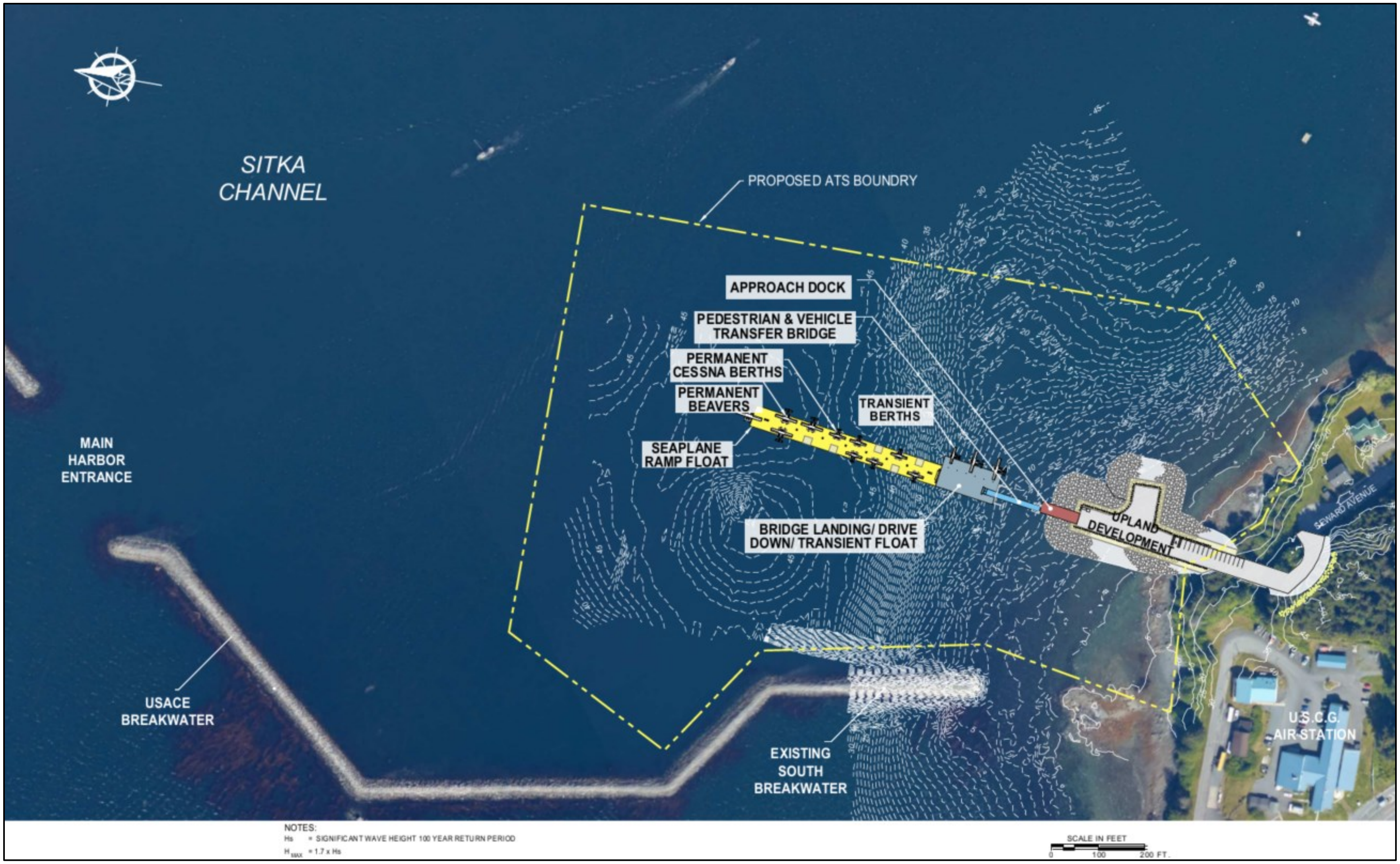


Figure 4. Sitka SPB Project Proposed Action – Phase II

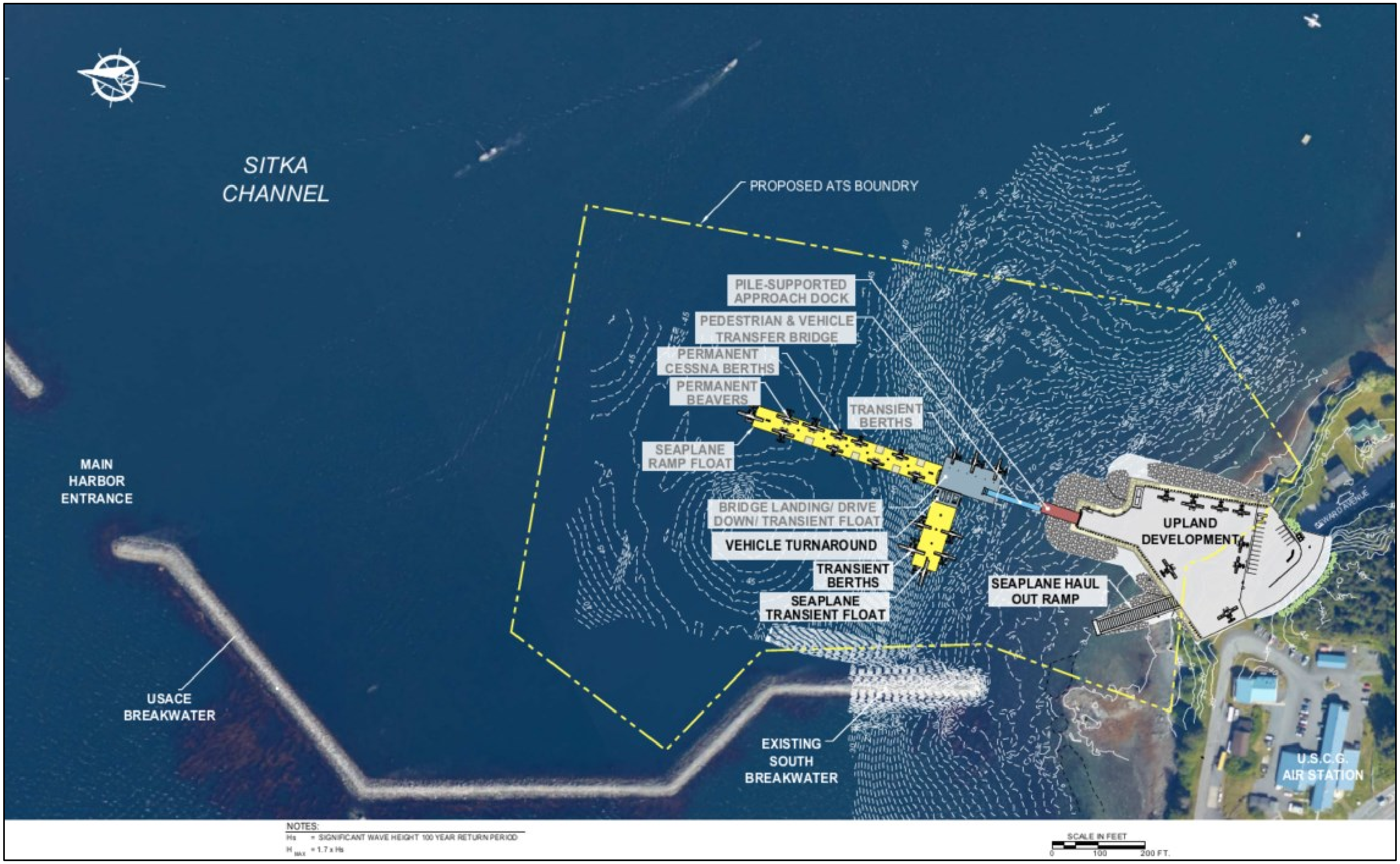
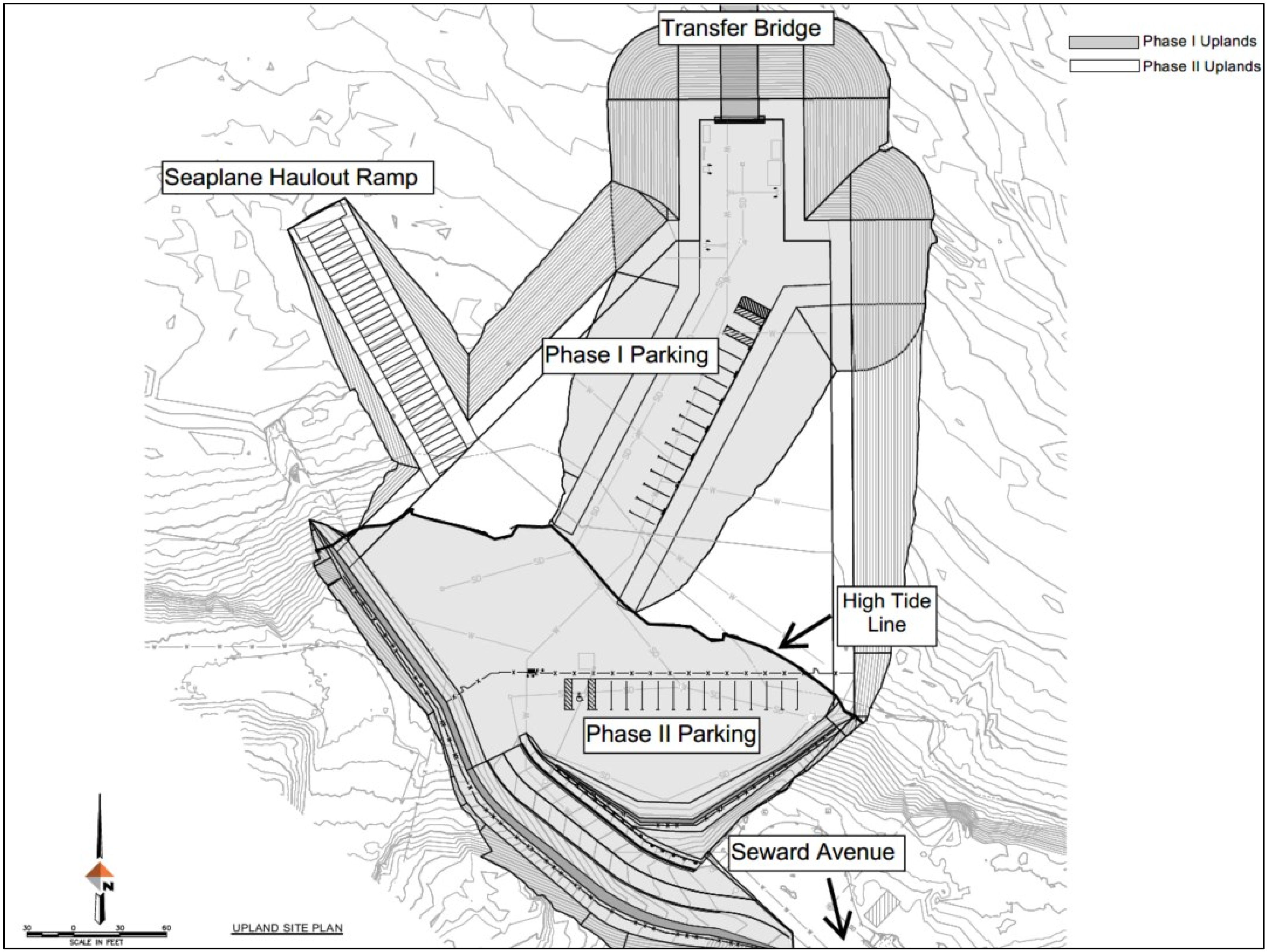


Figure 5. Sitka SPB Project Proposed Action – Phase I & II Uplands



1.2.4 CONSTRUCTION METHODS

1.2.4.1 Pile Installation Methods

Installation and Removal of Temporary (Template) Piles
A maximum of 12 temporary 16-inch-diameter piles would be installed and removed using a vibratory hammer and impacting hammer (installation only) to construct the approach dock, bridge abutment, and floats. A maximum of 6 temporary 16-inch-diameter piles would be installed and removed using a vibratory hammer and impacting hammer (installation only) in constructing the project floats during Phase II.

Installation of Permanent Piles
All permanent 16-inch-diameter and 24-inch-diameter piles would be initially installed with a vibratory hammer. After vibratory driving, piles would be socketed into the bedrock with DTH drilling equipment. Finally, piles would be driven the final few inches of embedment with an impact hammer.

Piles at the end of the seaplane ramp float and the corners of the drive-down float would be installed as a steel pipe pile frame for added stability and reinforcement. Please see Table 3 for a conservative estimate of the amount of time required for pile installation and removal.

Table 3. Sitka SPB Project Pile Installation and Removal Summary – Phase I and Phase II

Project Component	Temp Install	Temp Remove	Perm Install	Perm Install	Total	Temp Install	Temp Remove	Perm Install	Total	Total
	Phase I					Phase II				I & II
Diameter of Steel Pipe Piles (inches)	16	16	16	24	--	16	16	24	--	--
Total # of Piles	12	12	10	16	--	6	6	6	--	--
Vibratory Pile Driving[1]										
Total Quantity	12	12	10	16	--	6	6	6	--	--
Max # Piles Vibrated Per Day	6	6	6	6	--	6	6	6	--	--
Vibratory Time Per Pile (minutes)	10	10	10	10	--	10	10	10	--	--
Vibratory Time Per Day (minutes)	60	60	60	60	--	60	60	60	--	--
Number of Days	2.0	2.0	1.7	2.7	**8.4**	1.0	1.0	1.0	**3.0**	**11.4**
Vibratory Time Total (hours)	2.0	2.0	1.7	2.7	**8.4**	1.0	1.0	1.0	**3.0**	**11.4**
DTH Pile Drilling										
Total Quantity	--	--	10	16	--	--	--	6	--	--
Max # of Piles Installed per Day	--	--	2	2	--	--	--	2	--	--
# of Strikes Per Pile	--	--	36,000	54,000	--	--	--	54,000	--	--
# of Strikes Per Second	--	--	10	10	--	--	--	10	--	--
Actual Drilling Time Per Pile (minutes)	--	--	60	90	--	--	--	90	--	--
Time per Day (minutes)	--	--	120	180	--	--	--	180	--	--
Number of Days	--	--	5.0	8.0	**13.0**	--	--	3.0	**3.0**	**16.0**
DTH Drilling Time Total (hours)	--	--	10.0	24.0	**34.0**	--	--	9.0	**9.0**	**43.0**

Project Component	Temp Install	Temp Remove	Perm Install	Perm Install	Total	Temp Install	Temp Remove	Perm Install	Total	Total
	Phase I					Phase II				I & II
Impact Pile Driving										
Total Quantity	12	--	10	16	--	6	--	6	--	--
Max # Piles Impacted Per Day	4	--	4	4	--	4	--	4	--	--
# of Strikes Per Pile	175	--	175	175	--	175	--	175	--	--
Impact Time Per Pile (minutes)	5	--	5	5	--	5	--	5	--	--
Impact Time Per Day (minutes)	20	--	20	20	--	20	--	20	--	--
Number of Days	3.0	--	2.5	4.0	**9.5**	1.5	--	1.5	**3.0**	**12.5**
Impact Time Total (hours)	1.0	--	0.8	1.3	**3.1**	0.5	--	0.5	**1.0**	**4.1**

[1] The total number of days and total time in hours are the same for vibratory pile driving because this IHA request assumes a maximum of 60 minutes (1 hour) of vibratory pile driving per day.

1.2.4.2 Blasting, Excavating, and Filling Methods

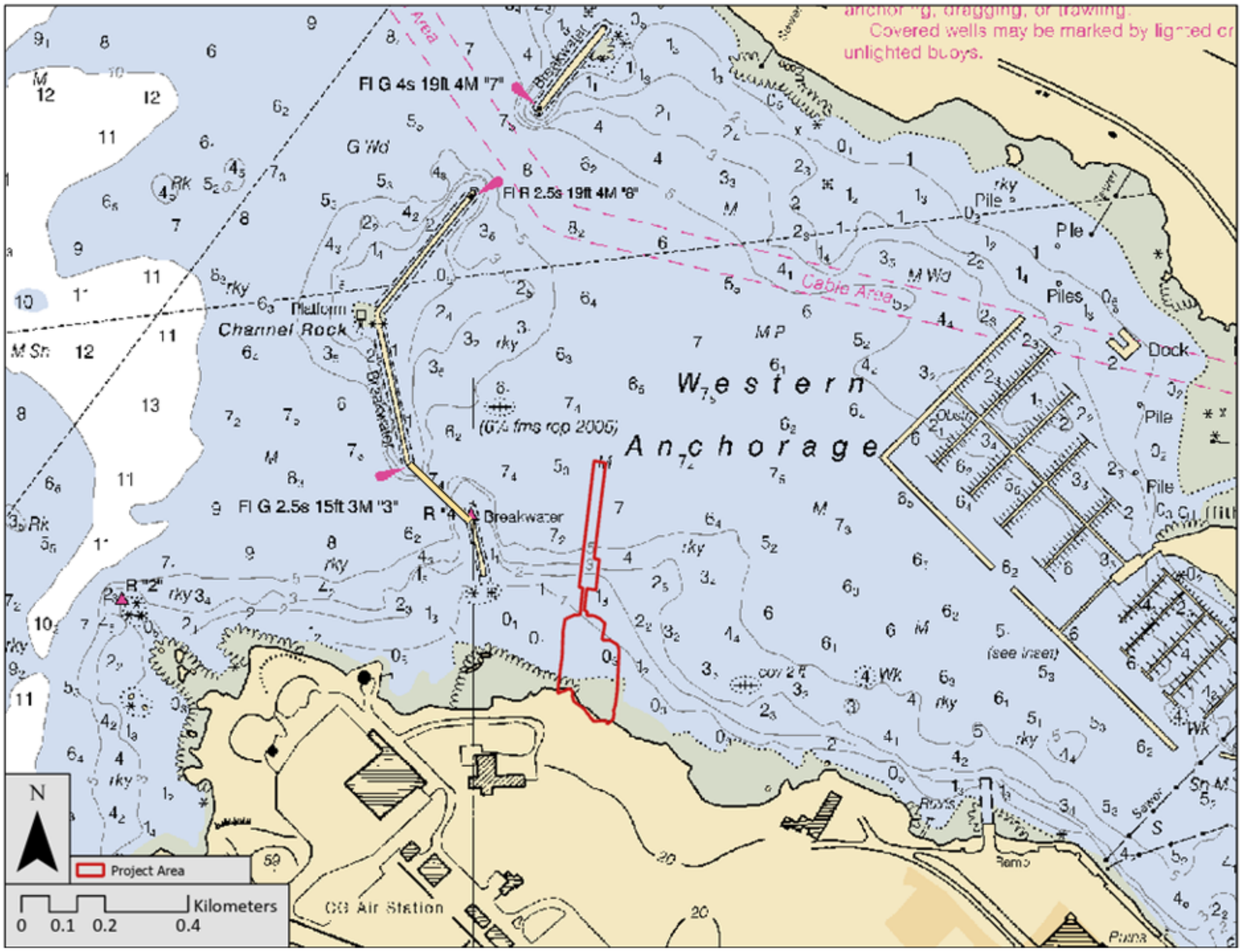
To develop the SPB uplands, the project would require rock blasting 9,500 CY above high tide line (HTL; +13 feet) and excavating an additional 5,925 CY of rock, gravel, and sediment above HTL (Table 4). Drilling and blasting would be expected to occur for 564 hours over 47 days (12 hours per day). Material would be excavated from the supratidal shoreline (+16 to +60 feet above MLLW, Figure 6). Excavated soils would be stored at an upland location to dry before being used as fill within the proposed uplands.

Following blasting and excavating, excavated materials, armor rock, and underlayment would be placed above and below HTL to develop the SPB uplands including the bridge abutment, approach, vehicle turnaround, parking, basic amenities, curb, and vehicle driveway totaling 34,650 CY. The fill would be placed using an excavator and dozer and then compacted using a vibratory soil compactor.

Table 4. Sitka SPB Project Groundwork Summary

Phase	Total Area (acre)	Volume (CY)	Time (hours)	Days
Phase I	**Blasting**			
	1.3	9,500	564	47.0
	Excavating			
	1.4	5,925	178	14.8
	Entire footprint (includes areas above HTL)			
	2.6	34,650	1,041	86.7
	Fill in intertidal waters (area between MHW and HTL)			
	0.03	21,340	641	53.4
	Fill in marine waters (area below MHW)			
	1.3	360	11	0.9
Phase II	**Entire footprint (includes areas above HTL)**			
	1.3	22,000	661	55.1
	Fill in intertidal waters (area between MHW and HTL)			
	0.5	1,690	51	4.2
	Fill in marine waters (area below MHW)			
	0.8	7,810	235	19.5

Figure 6. Sitka SPB in Relation to Sitka Channel Bathymetry



1.2.4.3 Project Operation Activities

The new SPB includes designation and operation of a new seaplane takeoff and landing lane and taxi path in Sitka Channel, which would not require any construction. The new sea lane would be located north of the existing sea lane, away from the O'Connell Bridge and seafood processing facilities. The new sea lane would be 4,000 feet long by 200 feet wide.

Use and operation of the SPB float would include seaplane loading, unloading, and general maintenance. The SPB float would provide utility connections for water and electric power. SPB uplands would include an access ramp for hauling out seaplanes, vehicle parking, general storage, and covered shelter for passenger waiting.

SPB operation protocols will incorporate best management practices (BMPs) to prevent or minimize contamination from seaplane accidents, general maintenance, fueling, and nonpoint source contaminants from upland facilities.

1.2.4.4 Construction Equipment

Several acoustic sources are associated with the SPB project including: vibratory pile driving, DTH hammering, and impact pile driving. Each of these elements generates in-water and in-air noise. The equipment listed in Table 5, or similar, is expected to be used. A final determination would be made by the selected contractor.

Table 5. Sitka SPB Project Construction Equipment

Driving Mechanism	Pile driver/Equipment Type	Properties
Vibratory Pile Driving	ICE 44B/static weight 12,250 pounds	202 tons centrifugal force 207 tons driving force
	APE 200-6/static weight 19,000 pounds	255 tons driving force
Impact Pile Driving	Diesel Delmag D19-32	Max energy: 42,800 feet-pounds; speed (blows per minute): 34-53
	Diesel Delmag ICE-425	Max energy: 42,000 feet-pounds; speed (blows per minute): 34-53
DTH Drilling	Drilling shaft drill: Holte top drive with DTH hammer and bit	2,400 feet-pounds
Fill Placement	CAT D4 and D6 dozer	130 horsepower (hp)/215 hp
	CAT 349 excavator	295 kW/396 hp net power
Soil Compaction	CAT CS64B vibratory soil compactor	29,900 pound to 52,600 pound centrifugal force; 30.5 hertz (Hz) vibratory frequency

Construction Vessels and Movements
The following vessels are expected to be used to support construction:

- One material barge (approximately 250 feet by 76 feet by 15.5 feet) to transport materials from Washington to the project site and to be used onsite as a staging area during construction.
- One construction barge (crane barge 280 feet by 76 feet by 16 feet) to transport materials from coastal Alaska to the project site and to be used onsite to support construction.
- 1 skiff (25-foot skiff with a 125-250 hp outboard motor) transported to the project site on the material barge or acquired locally in Sitka to support construction activities.

1.2.4.5 Transport of Materials and Equipment

It is expected that prior to each phase of construction, the material barge would transport materials from Washington state and the construction barge would travel from coastal Alaska to the project site (Figure 7 and Figure 8).

The barges would travel at a rate of approximately 6 knots. These types of barges frequently travel this route to, from, and around Southeast Alaska. Once at the project site, the construction barge would be secured in place by four mooring anchors. The anchors would be below the surface and would not be a hazard to navigation. The material barge would be tied to the existing harbor structure, and materials would be moved from the material barge to the construction barge and project site by a crane on the construction barge. Local barge moves to the next pile installation area (in approximately 100-foot increments) would occur at a speed of less than 2 miles per hour.

Figure 7. Sitka SPB Project Expected Construction Barge Route

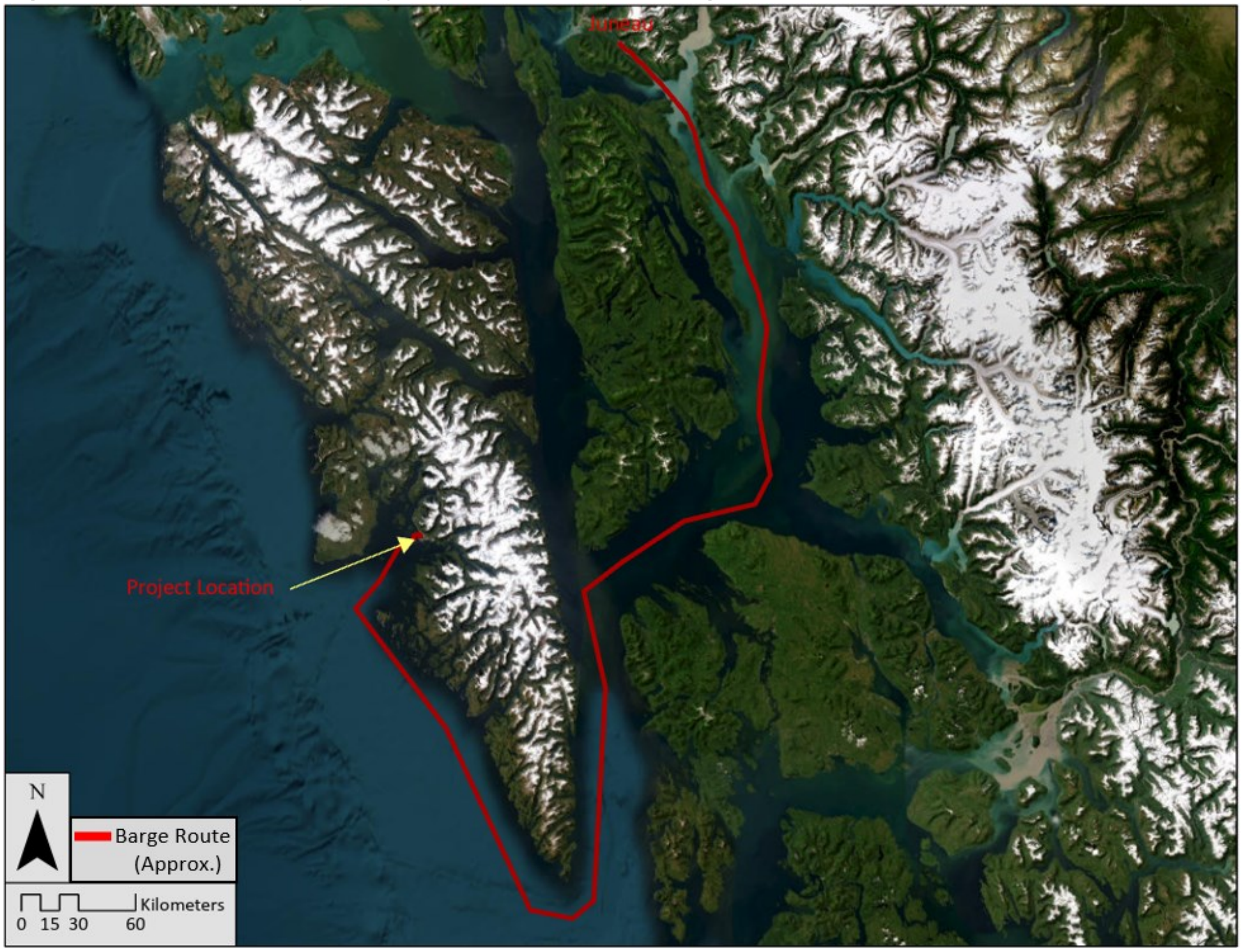
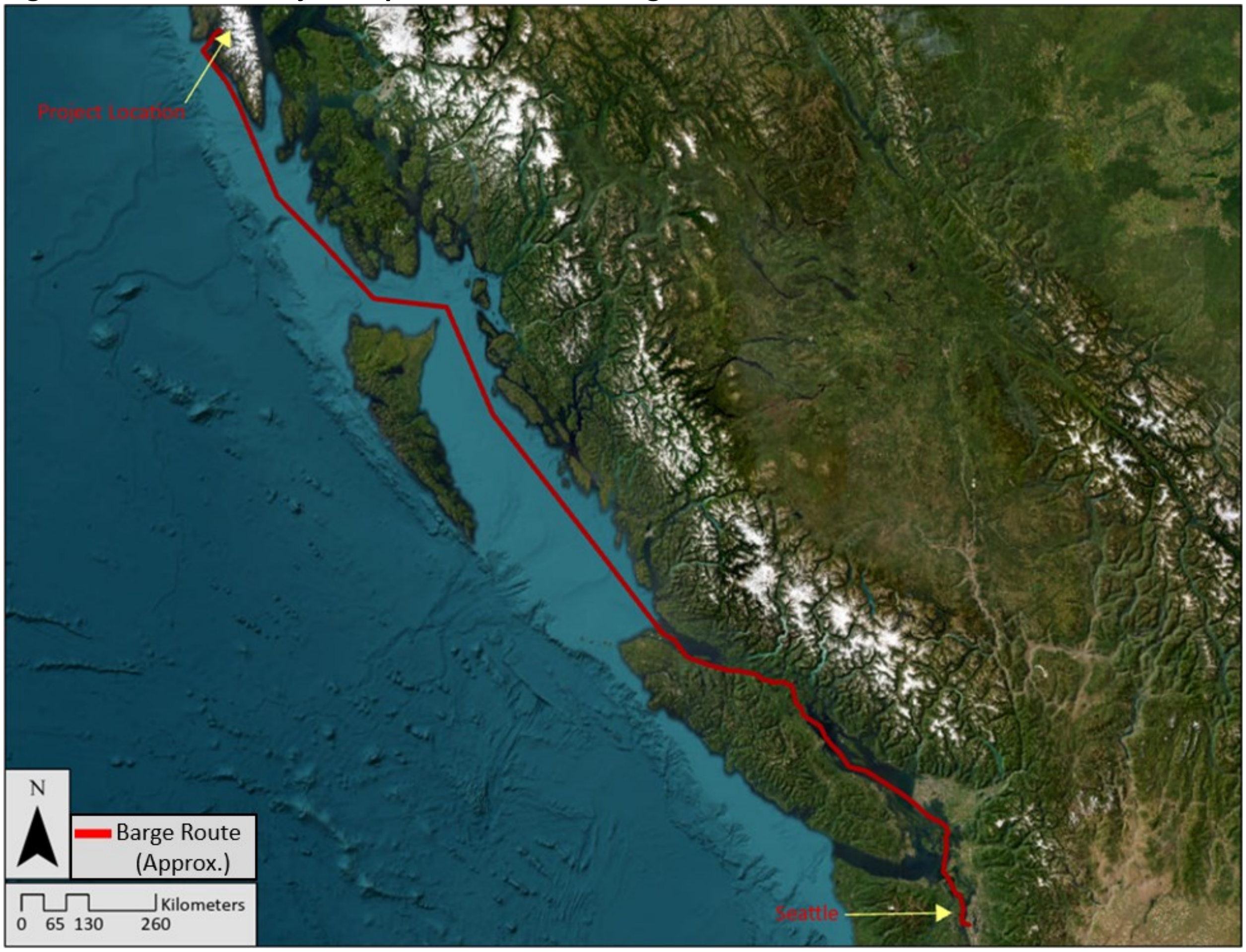


Figure 8. Sitka SPB Project Expected Material Barge Route



1.2.4.6 Transport of Workers to and from Work Platform

Construction workers would be transported from shore to the barge work platform by 90 hp skiffs travelling at approximately 5 knots during both phases of construction. The travel distance would be less than 300 feet. There could be multiple shore-to-barge trips during the day; however, the area of travel would be relatively small and close to shore.

1.2.4.7 Other In-water Construction and Heavy Machinery Activities

In addition to the activities described above, the proposed action would involve other in-water construction and heavy machinery activities. Examples of other types of activities include using standard barges, tug boats, or other equipment to place and position piles on the substrate via a crane (i.e., "stabbing the pile").

The seaplane floats (constructed elsewhere) would consist of treated timber and galvanized steel fasteners. The submerged timber structural elements of the floats will be pressure treated with creosote because it is the only effective preservative for wood that will always remain wet. All other timber components that will not be fully submerged will be pressure treated with ammoniacal copper zinc arsenate. All preservative treatment will be in accordance with BMPs set forth by the Western Wood Preservers Institute. Floatation includes closed cell expanded polystyrene billets covered with 100-percent solid polyurethane and/or polyethylene floatation tubs to protect from physical damage, water absorption, colonization by encrusting organisms, and other factors.

1.2.4.8 Construction Sequence

Although actual construction sequencing would be developed by the contractor, it is expected that in-water construction for Phase I would begin as early as July 2024 and be completed by July 2025. Construction of Phase II would begin in July 2025 and continue to July 2026.

In-water construction of the SPB would begin with installation of the approach dock and pedestrian and vehicle transfer bridge. Once these pieces are constructed, floats would be constructed. In-water construction would use the following sequence:

1) Vibrate 12 temporary 16-inch-diameter piles for the approach dock and transfer bridge with a minimum of ten feet into overburden to create a template to guide installation of permanent piles.
2) Weld a frame around the temporary piles.
3) Within the frame, vibrate, DTH drill (if needed), and impact piles into place for the approach dock and transfer bridge.
4) Remove the frame and temporary piles and reinstall in the next location. This process would be repeated for installation of all permanent piles.

After all piles are installed, construction would proceed with installation of the seaplane ramp float, transfer bridge, mechanical systems, connections for electricity, water, and lighting (listed in Section 1.2.3).

During Phase I, in-water (pile driving) construction activities are expected to occur for a total of approximately 45 hours over 31 days (not necessarily consecutive). Most of the in-water work time would be spent DTH pile driving (34 hours). Construction of Phase II would follow a similar sequence with in-water work (pile driving) occurring for approximately 13 hours over 9 days (not necessarily consecutive). Most of the in-water work time would be spent DTH pile driving (9 hours). Please see Table 3 for a conservative estimate of the amount of time required for pile installation and removal.

Uplands would be completed independently of pile supported structures. Uplands project construction would begin with clearing the uplands area, blasting, and excavating. Excavated materials would be placed on uplands to be used as fill. Placement of fill would create 2.6 acres for Phase I (includes 1.3 acres of fill below HTL) and an additional 1.2 acres during Phase II (includes 1.3 acres of fill below HTL). Please see Table 4 for a conservative estimate of quantities involved in blasting, excavating, and placement of fill.

The total construction duration accounts for the time required to construct the project. The duration of IHA requested for each phase of the project (one year) also accounts for potential delays in material deliveries, equipment maintenance, inclement weather, and shutdowns that may occur to prevent impacts to marine mammals.

1.3 ACOUSTIC THRESHOLDS AND ENSONIFIED AREA

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

NMFS 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

NMFS' *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). CBS's activity includes the use of impulsive (impact pile driving and DTH drilling) and non-impulsive (vibratory pile driving) noise sources which could affect marine mammals in the action area. The thresholds for auditory injury to Endangered Species Act (ESA)-listed and MMPA protected species are provided in Table 6.

Table 6. 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 (PW), Underwater	$L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	$L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW), 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 $1µPa^2s$. In this table, thresholds are abbreviated to reflect American National Standards Institute (ANSI) standards (ANSI 2013). However, peak sound pressure level (L_{pk}) is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (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, 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

NMFS predicts that all marine mammals are likely to experience Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1µPa root mean square (rms; continuous) and above 160 dB re 1µPa RMS (non-explosive impulsive sources).

1.3.3 CALCULATED DISTANCES TO LEVEL A AND LEVEL B THRESHOLDS

For this project, distances to the Level A and Level B thresholds were calculated based on various sound source levels expressed in sound pressure level (SPL)[1] or sound exposure level (SEL)[2] for a given activity and pile type using the practical spreading model in the spreadsheet tool developed by NMFS (Table 7; Appendix B). For Level A harassment, the maximum duration of that activity per day was also accounted for using the NMFS model. Distances to thresholds are provided in Section 11.5 and range from approximately 10 meters (33 feet) to 13.6 kilometers (8.5 miles).

Table 7. Sound Source Summary

Method and Pile Type	Sound Source Level at 10 meters			Literature Source
Barge	**dB rms**			
Barge movements, pile positioning, etc. (throughout construction)	171-176			Richardson et al. 1995; Kipple and Gabriele 2004
Vibratory Hammer	**dB rms**			
16-inch steel piles	161			Naval Facilities Engineering Systems Command (NAVFAC) 2015, Table 2-2
24-inch steel piles	161			NAVFAC 2015, Table 2-2
DTH Drill	**dB rms**	**dB SEL**	**dB peak**	
16-inch steel piles	167	146	172	Heyvaert and Reyff 2021, Guan and Miner 2020
24-inch steel piles	167	159	184	Heyvaert and Reyff 2021
Impact Hammer	**dB rms**	**dB SEL**	**dB peak**	
16-inch steel piles	185	175	200	NMFS 2023a
24-inch steel piles	190	177	203	NMFS 2023a

1.4 ACTION AREA

The vicinity of the project area that would be affected directly by the action, referred to as the action area in this document, has been determined to be the area of water that would be ensonified above acoustic thresholds in a day. In this case, the action area is the area where received noise levels from in-water pile installation and removal are expected to decline to 120 dB. As shown in Table 16 and in Table 17, the project action area extends 13.6 kilometers (8.5 miles) from the construction site during Phase I and Phase II.

[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 re 1 µPa (NMFS 2018).
[2] A measure of sound level that takes into account the duration of the signal (NMFS 2018).

The ensonified area (action area) is truncated where land masses obstruct underwater sound transmission, thus, the action area is largely confined to marine waters within the northern half of Sitka Channel, although there are a few narrow areas where sound extends north past the breakwaters and south past the end of Sitka channel. Sound would extend approximately 6.0 kilometers (3.7 miles) from the western opening in the Channel Rock Breakwaters, 7.0 kilometers (4.3 miles) from the eastern opening in the Channel Rock Breakwaters, and 13.6 kilometers (8.5 miles) from the south end of Sitka Channel (Figure 9). Note, this document also refers to the project vicinity. This term refers to an area larger than the action area, which includes the waters surrounding Japonski Island and eastern Sitka Sound. This term is used because some of the information available about marine mammals is based on sightings in the general vicinity of Sitka Sound. The transit routes to be taken by the material and construction barges are also considered a part of the project vicinity area due to the potential impacts of large vessels on the marine environment (Figure 7 and Figure 8).

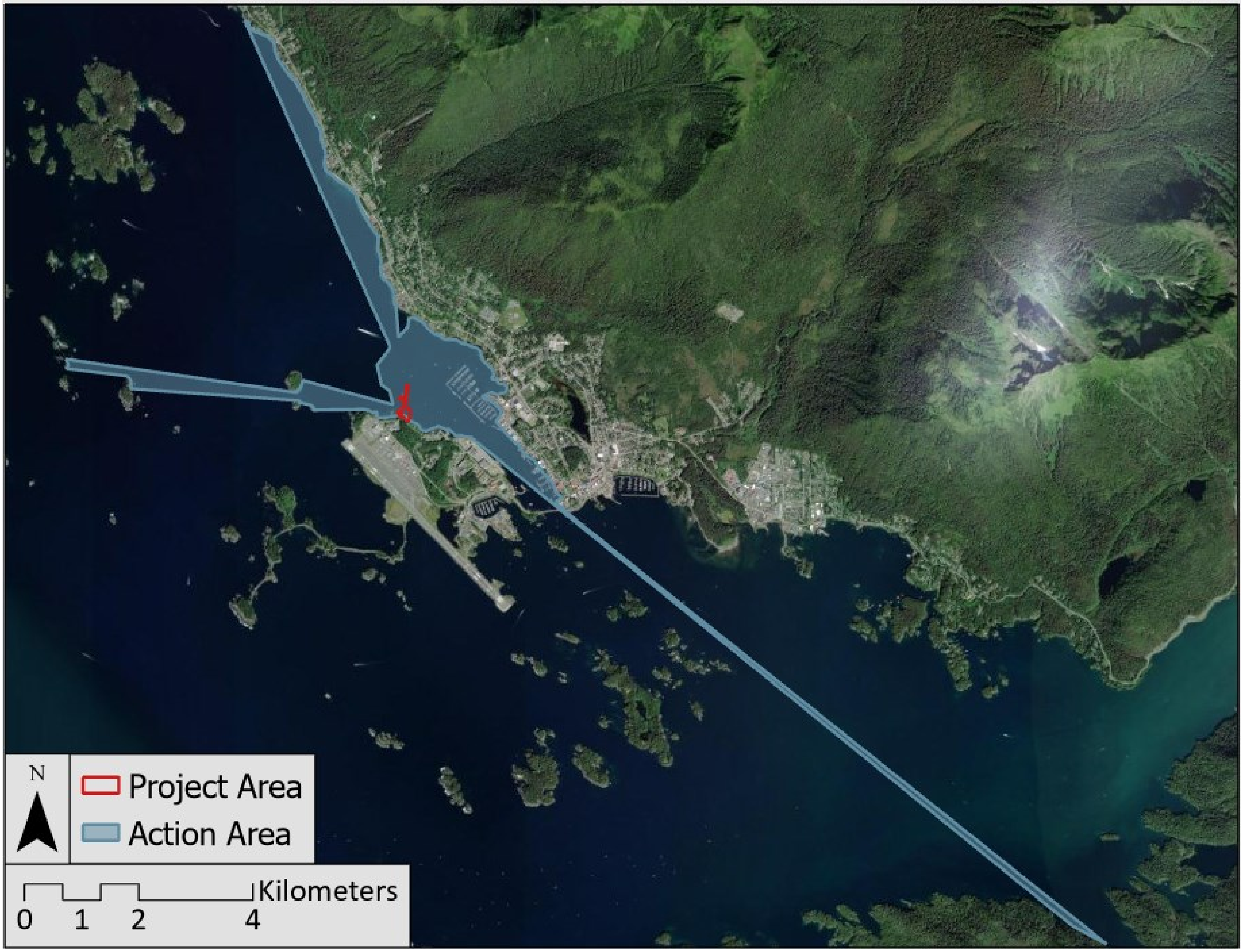
In addition to in-water noise, pinnipeds such as Steller sea lions and harbor seals can be adversely affected by in-air noise. Loud noises can cause hauled-out pinnipeds to flush back into the water, leading to disturbance and possible injury. NMFS has established an in-air noise disturbance threshold 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 the action area; however, the predicted distances to the in-air noise disturbance threshold for hauled-out Steller sea lions will not extend more than 30 meters (99 ft) and the threshold for harbors seals will not extend farther than 100 meters (330 ft) from any type of pile being vibrated or impacted.[3]

According to the blasting plan (Southeast Earthmovers 2020), uplands rock blasting would not to exceed 90 dB at the center of the blast, which is below the in-air noise disturbance threshold for hauled out marine mammals. Given that there are no documented Steller sea lion haulouts in the action area, 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 marine mammals monitoring of shutdown and harassment zones would be implemented to protect and document listed marine mammals in the action area. Please see Appendix B for calculated distances to the Level A and B thresholds, Section 11 for mitigation information, shutdown and monitoring zones and figures, and the Marine Mammal Monitoring and Mitigation Plan (4MP) for more details on 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). The sound source level for an impact hammer is 106 dB rms at 15 m, the median value during impact installation of 24 to 48-inch-diameter steel piles at Naval Base Kitsap Bangor (Illingworth and Rodkin, Inc. 2012).

Figure 9. Sitka SPB Project Action Area and Project Area – Phase I and II



2 Dates, Duration, and Region of Activity

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

2.1 DATES AND DURATION

Construction for Phase I would begin in July 2024 and continue until July 2025 and construction for Phase II would begin in July 2025 and continue until July 2026. During Phase I, in-water construction activities are expected to occur for a total of approximately 45 hours over 31 days (not necessarily consecutive). Most of the in-water work time would be spent DTH pile driving (34 hours). Construction of Phase II would follow a similar sequence with in-water work occurring for approximately 13 hours over 9 days (not necessarily consecutive). Most of the in-water work time would be spent DTH pile driving (9 hours). Please see Table 3 for the specific amount of time required to remove existing piles and install piles.

The total in-water construction duration accounts for potential delays in material deliveries, equipment maintenance, inclement weather, and shutdowns that may occur to prevent impacts to marine mammals. The total construction duration could be longer, to account for the time required to mobilize materials and resources, and construct the project.

2.2 SPECIFIC GEOGRAPHIC REGION

The project is located in Southeast Alaska where numerous islands form a coastal mountain range. These mountains rise steeply to mainland mountains to the east and open to the Gulf of Alaska to the west. The project area experiences a maritime climate, characterized by mild temperature fluctuations and wet conditions.

2.3 PHYSICAL ENVIRONMENT

The Sitka SPB Project is located on the north shore of Japonski Island (1.467 square kilometers) in the Sitka Channel near the Sitka Rocky Gutierrez Airport Terminal and a U.S. Coast Guard (USCG) Air Station. Sitka Channel separates Japonski Island from Sitka Harbor and downtown Sitka on the much larger Baranof Island (4,160 square kilometers). The mean tide range in the Sitka Channel is 7.7 feet, the diurnal tide range is 9.94 feet, and the extreme range is 18.98 feet (NOAA 2020a).

The Sitka Channel is located on the eastern shore of Sitka Sound, west of Crescent Bay and adjacent to Whiting Harbor. Sitka Channel is bookended by the Channel Rock Breakwaters to the north and the James O’Connell Bridge to the south, a distance of about 2,200 meters. Sitka Channel is approximately 150 feet wide and about 22 feet deep at its narrowest (NOAA 2020).

The majority of the project footprint is previously undisturbed, but the project site is proximal to recent construction on the Channel Rock Breakwaters (approximately 500 feet away). Currently there is no infrastructure or active development at the site. Facilities associated with the Mt. Edgecumbe Medical Center and the Southeast Alaska Regional Health Consortium are immediately to the south of the project site. The USCG Air Station Sitka is located due west of the project site, beside the Sitka Rocky Gutierrez Airport Terminal.

The channel is characterized by multiple marine habitats that support a wide variety of fish and wildlife species. Habitats in the channel range from calm protected embayments to high energy wave-swept exposed coastlines. Much of the developed Sitka waterfront area (on both Japonski Island and Baranof Island) has a rocky shoreline (U.S. Army Corps of Engineers 2012). The seafloor in the channel contains a mosaic of bottom types including a mixed-soft bottom (mixture of silt, sand, pebbles, cobbles, boulders, and shell) and bedrock outcrops.

According to the ShoreZone Mapper (ShoreZone 2020), the project intertidal area has a semi-protected/partially mobile/sediment or rock and sediment habitat class and a sand and gravel flat or fan coastal class. The area has a semi-protected biological wave exposure, a narrow splash zone, and a sheltered tidal flats environmental sensitivity index. According to the website, the oil residency index is month to years (moderate persistence).

2.4 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. Eulachon, Pacific herring, Dolly Varden, 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 early spring through summer when these prey species tend to be more abundant. In Southeast Alaska, eulachon spawn from mid-March or April through May and attract marine mammals that feed on the oily fish, including Steller sea lions and harbor seals (Alaska Department of Fish and Game [ADF&G] 2023; Womble et al. 2005). Pacific herring are also a primary prey species for Steller sea lions. Herring are present throughout Southeast Alaska year-round, utilizing various habitats for rearing and moving to deeper water within Southeast in the winter time. Herring spawning aggregations in 2023 occurred primarily along Kruzof Island shoreline (14.5 kilometers west of the project site), extending from Cape Edgecumbe to Shoals Point and farther towards Fred's Creek from mid-March to late April (ADF&G 2023a). The five salmon species have overlapping presence near the action area, returning to spawning grounds in rivers and streams via Sitka Sound from June through October (ADF&G 2020). Seasonal variation has been factored into take estimates, as construction could occur year-round.

3 Species and Numbers of Marine Mammals

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

Nine marine mammal species under NMFS jurisdiction may occur in the vicinity of the proposed action based on the NMFS Alaska Species Distribution Mapper (NMFS 2023). Table 8 lists these species and summarizes key information regarding their stock status, distinct population segments (DPS), abundance, potential biological removal (PBR), annual mortality/serious injury rate (M/SI), and potential to occur in the action area.

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

- NMFS Alaska Species Distribution Mapper (NMFS 2023).
- NMFS Stock Assessment Reports for stock status and abundance and groups size information (Young et al. 2023).
- Documented 2018 discussions with Sitka harbormaster Stan Eliason. He has corroborated that sea otters and sea lions are common species near Sitka Channel (Eliason 2018).
- Contracted summary report by Professor Jan Straley summarizing marine mammal occurrence in the project vicinity. Between September and May from 1994 to 2002, Straley's group conducted weekly land-based surveys of marine mammals from Sitka's Whale Park, located on the western edge of Eastern Channel at the entrance to Silver Bay, approximately 7.5 kilometers south of the proposed project (Straley and Pendell 2017).
- Marine mammal observation logs from construction at the Gary Paxton Industrial Park (GPIP) Dock in Silver Bay in October and November 2017. The logs recorded marine mammal sightings from the north end of Eastern Channel/mouth of Silver Bay to the end of Silver Bay (Turnagain Marine Construction [Turnagain] 2017).
- Final marine mammal observation report from the Petro Marine Dock construction at the south end of Sitka Channel in 2017. The report documented 8 days of monitoring between January 11 and 23, 2017 (Windward Project Solutions [Windward] 2017).
- Monthly marine mammal observation reports from the Biorka Dock Replacement Project on Biorka Island in Sitka Sound, north of Sitka Channel. The reports documented sightings on 55 days between June and September 2018 (Turnagain 2018).
- Final marine mammal observation report completed for the O'Connell Bridge Lightering Float project from 4 days of monitoring at the south end of Sitka Channel in June 2019 (Solstice Alaska Consulting, Inc. [SolsticeAK] 2019).
- Final marine mammal monitoring report for the Crescent Harbor Float Replacement Project from 39 days of monitoring at the south end of Sitka Channel between January and March 2020 (SolsticeAK 2020).
- Monthly marine mammal monitoring logs for the Old Sitka Dock North Dolphins Expansion Project from 25 days of monitoring in Sitka Sound north of Sitka Channel between January and June 2021 (Halibut Point Marine Services 2021).

- Final marine mammal monitoring report for the Sitka Seaplane Base geotechnical survey from 5 days of monitoring at the project site in March 2022 (SolsticeAK 2022).

Straley et al.’s summary report, recent marine mammal monitoring reports from the Sitka area, discussions with Straley, and discussions with others who worked near the project area all indicate that humpback whales, harbor seals, and Steller sea lions are frequently sighted in the project vicinity (Straley and Pendell 2017; Eliason 2018). Gray whales, killer whales, and harbor porpoise are also occasionally seen within the project vicinity. Exposure of these species to project impacts is likely and their take is requested.

The other species listed in Table 8 have ranges that extend to Sitka Channel but are rare in the project vicinity. The following species have not been observed during any recent monitoring efforts (listed above) in the project vicinity: North Pacific right whale, sperm whale, Cuvier’s beaked whale, Dall’s porpoise, and northern fur seal. Only seven Pacific white sided dolphins were observed during Straley’s eight years of surveys and minke whales have only been observed during one monitoring effort. Therefore, exposure of these species to project impacts is considered unlikely and they are not discussed in this document.

Based on the above information, it is assumed that that gray whales, humpback whales, killer whales, harbor porpoises, harbor seals, and Steller sea lions could occur in the action area during construction. This IHA application is limited to and assesses the potential impacts of the project on these species, which are discussed more fully in Section 4. Take of other species is not requested because the animals are not expected to spend much, if any, time in the action area. The project will implement shutdowns during pile driving if any other marine mammal species appears likely to approach the Level B harassment zone (Figure 20).

Table 8. Abundance Estimates for Marine Mammal Species Occurring in Sitka Sound

Species [a]	Stock and Abundance Estimate [b]	Endangered Species Act (ESA) Status	MMPA Status	PBR	Annual M/SI	Occurrence in Project Area [c]
N. Pacific Right Whale (*Eubalaena japonica*)	Eastern North Pacific: 31	Endangered	Strategic, depleted	N/A	0	Rare
Gray Whale (*Eschrichtius robustus*)	Eastern North Pacific: 26,960	Not listed	Not strategic, non-depleted	801	131	Infrequent
Minke Whale (*Balaenoptera acutorostrata*)	Alaska: N/A	Not listed	Not strategic, non-depleted	N/A	0	Infrequent
Fin Whale (B. *physalus*)	Northeast Pacific: N/A	Endangered	Strategic, depleted	N/A	0.6	Rare
Humpback Whale (*Megaptera novaeangliae*)	Hawaii DPS: 11,278	Not listed	Strategic, depleted	127	27.1	Frequent
	Mexico DPS: N/A	Threatened	Strategic, depleted	N/A	0.6	Frequent
Sperm Whale (*Physeter macrocephalus*)	North Pacific: N/A	Endangered	Strategic, depleted	N/A	3.5	Rare
Cuvier's Beaked Whale (*Ziphius cavirostris*)	Alaska: N/A	Not listed	Not strategic, non-depleted	N/A	0	Rare
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	North Pacific: 26,880	Not listed	Not strategic, non-depleted	N/A	0	Rare
Killer Whale (*Orcinus orca*)	West Coast Transient: 349	Not listed	Not strategic, non-depleted	3.5	0.4	Frequent
	Gulf, Aleutian, Bering Transient: 587	Not listed	Not strategic, non-depleted	5.9	0.8	Frequent

Species [a]	Stock and Abundance Estimate [b]	Endangered Species Act (ESA) Status	MMPA Status	PBR	Annual M/SI	Occurrence in Project Area [c]
	Northern Resident (BC): 302	Not listed	Not strategic, non-depleted	2.2	0.2	Rare
	Alaska Resident: 1,920	Not listed	Not strategic, non-depleted	19	1.3	Rare
Harbor Porpoise (*Phocoena phocoena*)	Northern Southeast Alaska: 1,619	Not listed	Strategic, non-depleted	6.1	7.4	Infrequent
Dall's Porpoise (*Phocoenoides dalli*)	Southeast Alaska (Inland): 1,637[d]	Not listed	Not strategic, non-depleted	N/A	37	Rare
Harbor Seal (*Phoca vitulina*)	Sitka/Chatham Strait: 13,289	Not listed	Not strategic, non-depleted	356	77	Common
Northern Fur Seal (*Callorhinus ursinus*)	Eastern Pacific 626,618	Not listed	Strategic, depleted	11,403	373	Rare
Steller Sea Lion (*Eumetopias jubatus)*	Eastern DPS: 43,201	Not listed	Strategic, depleted	2,592	112	Common
	Western DPS: 52,932	Endangered	Strategic, depleted	318	254	Infrequent

[a] Species listed with ranges extending into the proposed action area derived from the NMFS Species Distribution Mapper (NMFS 2023) 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 (all come from Young et al. 2023 except for gray whales [Carretta et al. 2023]).
[c] Occurrence estimates based on marine mammal monitoring conducted in the project vicinity during the Silver Bay Project (Straley and Pendell 2017), GPIP Multipurpose Dock Project (Turnagain 2017), Biorka Island Dock Replacement (Turnagain 2018), O'Connell Bridge Lightering Float Pile Replacement Project (SolsticeAK 2019), Crescent Harbor Float Replacement Project (SolsticeAK 2020), Old Sitka Dock North Dolphins Expansion Project (Halibut Point Marine Services 2021), and Sitka SPB Geotechnical Project (SolsticeAK 2022). Common: species has been observed commonly in action area, could occur each day; Frequent: have been observed in Sitka Channel and Sitka Sound, sightings could occur each week; Infrequent: multiple sightings each year, could occur twice a month; Rare: no or very few sightings in the proposed action area in recent years.
[d] Dall's porpoises are considered one stock in Alaska (13,110), so individual stock estimates are not available. Estimates for the Alaska stock are more than eight years old and no longer considered reliable (Young et al. 2023). However, abundance estimates for Dall's porpoises in inland waters of Southeast Alaska are provided in Young et al. 2023 based on surveys from Jefferson et al. 2019. To be conservative, the lowest abundance estimate was used (1,637).

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 GRAY WHALE

4.1.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Similar to other baleen whales, gray whales typically travel alone or in small, unstable groups. Large aggregations have been documented on feeding and breeding grounds, but are otherwise rare (NMFS 2023b; University of Alaska Fairbanks 2012).

Gray whales primarily feed on benthic and epibenthic invertebrates. During foraging, gray whales roll onto their sides and swim slowly along the seafloor as they suck up sediment and food. This technique results in long trails of mud and “feeding pits” on the seafloor (NMFS 2023b; University of Alaska Fairbanks 2012).

4.1.2 HEARING ABILITY

Gray whales are classified by NMFS as low-frequency cetaceans, with an estimated hearing range of approximately 10 Hz to 30 kHz (kilohertz; NMFS 2018).

4.1.3 STATUS

There are two recognized gray whale stocks in the Pacific Ocean. The endangered Western North Pacific stock largely migrates along the Russian coastline and is unlikely to be found in Southeast Alaska. The Eastern North Pacific stock is found in Southeast Alaska. At one time, the Eastern North Pacific stock of gray whales was also listed as endangered under the ESA but was removed from the list in 1994. Today this stock is abundant, with a population estimated to be near 27,000 whales (NMFS 2023b). An unusual mortality event (UME) of gray whale strandings has been occurring along the west coast of North America since January 1, 2019. As of August 17, 2023, a total of 139 gray whale strandings have occurred in Alaska, out of 680 documented strandings associated with the UME (NMFS 2023c)

4.1.4 DISTRIBUTION

Gray whales are found exclusively in the North Pacific Ocean. The Eastern North Pacific stock of gray whales inhabit the Chukchi, Beaufort, and Bering Seas in northern Alaska in the summer and fall and California and Mexico in the winter months, with a migration route along the coastal waters of Southeast Alaska. Gray whales have also been observed feeding in waters off Southeast Alaska during the summer and fall months (NMFS 2023b; Calambokidis et al. 2010).

4.1.5 PRESENCE IN PROJECT AREA

The migration pattern of gray whales appears to follow a route along the western coast of Southeast Alaska, traveling northward from British Columbia through Hecate Strait and Dixon Entrance, passing the west coast of Chichagof Island from late March to May (Jones et al. 1984; Ford et al. 2013). During 190 hours of observation from 1994 to 2002 from Sitka’s Whale Park, a total of 3 gray whales were observed (Straley and Pendell 2017). During recent marine mammal surveys conducted in the vicinity of the project action area, no gray whales were sighted, and these species are not known or expected to occur near or within Sitka Channel (Windward 2017; Turnagain 2017; Straley and Pendell 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK

2020; Halibut Point Marine Services 2021; SolsticeAK 2022). It is unlikely there will be any gray whales sighted during project construction; however, the possibility exists.

4.2 MINKE WHALE

4.2.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

As the smallest baleen whale in North America, minke whales can reach up to 35 feet and weigh 20,000 pounds. They are known for their tall, sickle-shaped dorsal fin two-thirds down their back. They are dark gray with a white underside and calves can be darker in color than adults. Additionally, females can be larger than males. They feed by side-lunging into schools of prey and taking in large volumes of waters. They are opportunistic feeders, feeing on crustaceans, plankton, and small schooling fish. Minke whales are relatively vocal, using clicks, grunts, pulse trains, ratchets, thumps, and “boings”. Vocalizations vary geographically (NMFS 2020).

4.2.2 HEARING ABILITY

Minke whales are classified by NMFS as low-frequency cetaceans with a generalized hearing range of 7 Hz to 35 kHz (NMFS 2018).

4.2.3 STATUS

No estimates have been made for the number of minke whales or population trends in the entire North Pacific.

4.2.4 DISTRIBUTION

Northern minke whales have a widespread distribution in the Northern Hemisphere and are found throughout the northern Atlantic and Pacific Oceans. Their range extends from the ice edge in the Arctic during the summer to close to the equator during winter (NMFS 2020).

4.2.5 PRESENCE IN PROJECT AREA

Minke whales are rare in the action area, but they could be encountered during any given day of construction. Minke whales are observed in Alaska’s nearshore waters during the summer months. Minke whales are usually sighted individually or in small groups of 2-3, but there are reports of loose aggregations of hundreds of animals (NMFS 2020). During 190 hours of observation from 1994 to 2002 from Sitka’s Whale Park, no minke whales were observed (Straley and Pendall 2018). During recent marine mammal surveys conducted in the vicinity of the project action area, no minke whales were sighted except for sightings during the Petro Marine Services Fuel Float Replacement Project (Windward 2017). It is unlikely there will be any minke whales sighted during project construction; however, the possibility exists.

4.3 HUMPBACK WHALE

4.3.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Humpback whales are classified in the cetacean suborder Mysticeti, whales characterized by having baleen plates for filtering food from water. The humpback whale is one of the larger baleen whales, weighing up to 25-40 tons (50,000-80,000 pounds) and measuring up to 60 feet long, with females growing larger than males. Newborns are about 15 feet long and weigh about 1 ton (2,000 pounds). Humpback whales reach sexual maturity at 4 to 7 years, and their lifespan is around 50 years or more. The species is known for long pectoral fins, which can be up to 15 feet long. The body coloration is primarily dark grey, but individuals have varying amounts of white on their pectoral fins and belly. This variation is so distinctive that tail fluke pigmentation patterns are used to identify individual whales, analogous to human fingerprints (NOAA 2011).

Humpback whales filter feed on tiny crustaceans (mostly krill), plankton, and small fish and can consume up to 3,000 pounds of food per day. Well-documented North Pacific humpback whale prey include: krill, Pacific herring, juvenile salmon, capelin, Pacific sandlance, juvenile walleye pollock, eulachon, Pacific sandfish, surf smelt, and lanternfish (NMFS 2023d). Hunting methods involve using air bubbles to herd, corral, or disorient fish (Wiley et al. 2011).

4.3.2 HEARING ABILITY

Humpback whales are classified by NMFS as LF cetaceans with a generalized hearing range of 7 Hz to 35 kHz (NMFS 2018). No direct measurement of whale hearing is available due the lack of captive subjects and logistical challenges of bringing experimental subjects into a laboratory. Consequently, hearing in Mysticetes is estimated based on other means such as vocalizations, anatomy, behavioral responses to sound, and nominal natural background noise conditions in their likely frequency ranges of hearing (Racicot 2021; Fournet et al. 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 about 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 1997).

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 2010). It has been suggested that they use vocalizations during feeding to coordinate feeding maneuvers or to stun or trap prey (National Park Service 2020; Leighton et al. 2004).

4.3.3 STATUS

In 1970, the humpback whale was listed as endangered worldwide under the ECSA 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. Following the cessation of most legal whale harvesting, humpback whale numbers increased.

On September 8, 2016, NMFS published a final decision changing the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. Previously, humpback whales were listed under the ESA as an endangered species worldwide. In the 2016 decision, NMFS recognized the existence of 14 DPSs, classified four of those as endangered and one as threatened, and determined that the remaining nine DPSs do not warrant protection under the ESA.

NMFS recently updated humpback whale stocks. In the 2022 marine mammal stock assessment, NMFS defined five stocks that are present in the North Pacific based on genetic analysis, photo identification, and migration patterns (Young et al. 2023). They are the Central America/Southern Mexico-California/Oregon/Washington stock (Central America to the west coast of the U.S.; includes the Central America DPS), the Mainland Mexico-California/Oregon/Washington stock (Mexico to the west coast of the U.S., Alaska, and Russia; includes the Mexico DPS), the Hawaii stock (Hawaii to the west coast of the U.S., Alaska, and Russia; includes the Hawaii DPS), the Mexico-North Pacific stock (Mexico to the west coast of the U.S.; includes the Mexico DPS), and the Western North Pacific (WNP) stock (Asia to Russia and Western Alaska/Bering Sea; includes the WNP DPS) (Young et al. 2023). Four of the stocks (the Central America/Southern Mexico-California/Oregon/Washington, Mexico-North Pacific, Mainland Mexico-California/Oregon/Washington, and WNP) are designated as depleted under the MMPA. The Hawaii stock is not listed as depleted under the MMPA (Young et al. 2023).

In 2015, a large whale UME was reported for the western Gulf of Alaska and British Columbia which included 22 humpback whales in Alaska. 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).

4.3.4 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 (Allen and Angliss 2015).

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 (where they feed) (Bettridge et al. 2015). Figure 10 shows migratory destination for winter (green areas) and summer (blue areas) for humpback whales in the North Pacific Ocean (Wade 2016). Patterns of occurrence likely follow the spatial and temporal changes in prey abundance and distribution with humpback whales adjusting their foraging locations to areas of high prey density (NMFS 2012). Historical studies found that humpback whales are frequently sighted in the northern reaches of the Gulf of Alaska and off the Aleutian Islands following prey in the spring and then move south to Southeast Alaska in early fall to feed on krill (Krieger and Wing 1986). However, based on more recent sightings, it is also likely that some humpback whales stay in the Gulf of Alaska to feed in the winter (Straley et al. 2018).

Three DPSs of humpback whales occur in waters off the coast of Alaska: the WNP DPS which is listed as endangered under the ESA; the Mexico DPS which is listed as threatened under the ESA; and the Hawaii DPS which is not protected under the ESA. Whales from these three DPSs overlap to some extent on feeding grounds off Alaska (Figure 10).

Humpback whales may be seen at any time of year in Alaska, but most winter in temperate or tropical waters near Mexico, Hawaii, and in the western Pacific near Japan. In the spring, the animals migrate back to Alaska where food is abundant. They tend to concentrate in several areas, including Southeast Alaska, Prince William Sound, near Kodiak Island, the Barren Islands at the mouth of Cook Inlet, and along the Aleutian Islands. The Chukchi Sea is generally the northernmost of the summer range for humpbacks; although, in 2007, humpbacks were seen in the Beaufort Sea east of Barrow, suggesting a northward expansion of their feeding grounds (Zimmerman and Karpovich 2008).

4.3.5 PRESENCE IN PROJECT AREA

Based on an analysis of migration between winter mating/calving areas and summer feeding areas using photo-identification, Wade et al. (2016) concluded that humpback whales feeding in Alaska waters belong primarily to the Hawaii DPS (now recovered), with small contributions of Mexico DPS (threatened) and WNP DPS (endangered) individuals. In the action area most humpback whales are likely to be from the recovered Hawaii DPS (98%), with the remainder likely to be from the threatened Mexico DPS (2%; NMFS 2021).

Within Southeast Alaska, humpback whales are found throughout all major waterways and in a variety of habitats, including open-ocean entrances, open-strait environments, near-shore waters, area with strong tidal currents, and secluded bays and inlets. They tend to concentrate in several areas, including northern Southeast Alaska. Patterns of occurrence likely follow the spatial and temporal changes in prey abundance and distribution with humpback whales adjusting their foraging locations to areas of high prey density (Allen and Angliss 2012). Humpback whale diets are dominated by euphausiid species and small pelagic fish, including Pacific herring which are found in the project action area. Pacific herring serve an important ecological role within Sitka Sound and are known to spawn on intertidal and subtidal substrates within the project area in spring (ADF&G 2019).

During 190 hours of observation from 1994 to 2002 from Sitka’s Whale Park, 440 humpback whales were observed (Straley and Pendell 2017). During 21 days of monitoring during the construction of GPIP Dock between October 9 and November 9, 2017, 39 humpback whales were observed (Turnagain 2017). No humpback whales were observed within Sitka Channel during the eight days of monitoring in January 2017 during the construction of the Sitka Petro Dock (Windward 2017). Near Biorka Island, about 25 kilometers south of the project, humpback whales were sighted in June (22 whales), July (3 whales), and September (2 whales) 2018 (Turnagain 2018). No whales were sighted in August during the Biorka Island monitoring effort. Humpback whales were not observed during recent monitoring conducted for short periods over eight days in September 2018 within a 400-meter radius surrounding the O’Connell Bridge Lightering Float (SolsticeAK 2019). During 39 days of monitoring in January through March 2020 for the Crescent Harbor Float Rebuild Project, no humpbacks were observed. Humpback whales were not observed during five days of monitoring in March 2022 during the geotechnical survey for this project (SolsticeAK 2022).

Given their widespread range and their opportunistic foraging strategies, humpback whales may be in the project vicinity year-round but are more likely to occur in the summer months.

Using fluke identification photographs from 2004 through 2006, Barlow et al. (2011) estimated that there are 21,063 humpback whales in the North Pacific. More recently, using a multi-strata analysis, Wade (2021) estimated that the abundance of humpback whales in the North Pacific using the multi-state model is 16,293 for the winter areas and 18,942 for the summer areas.

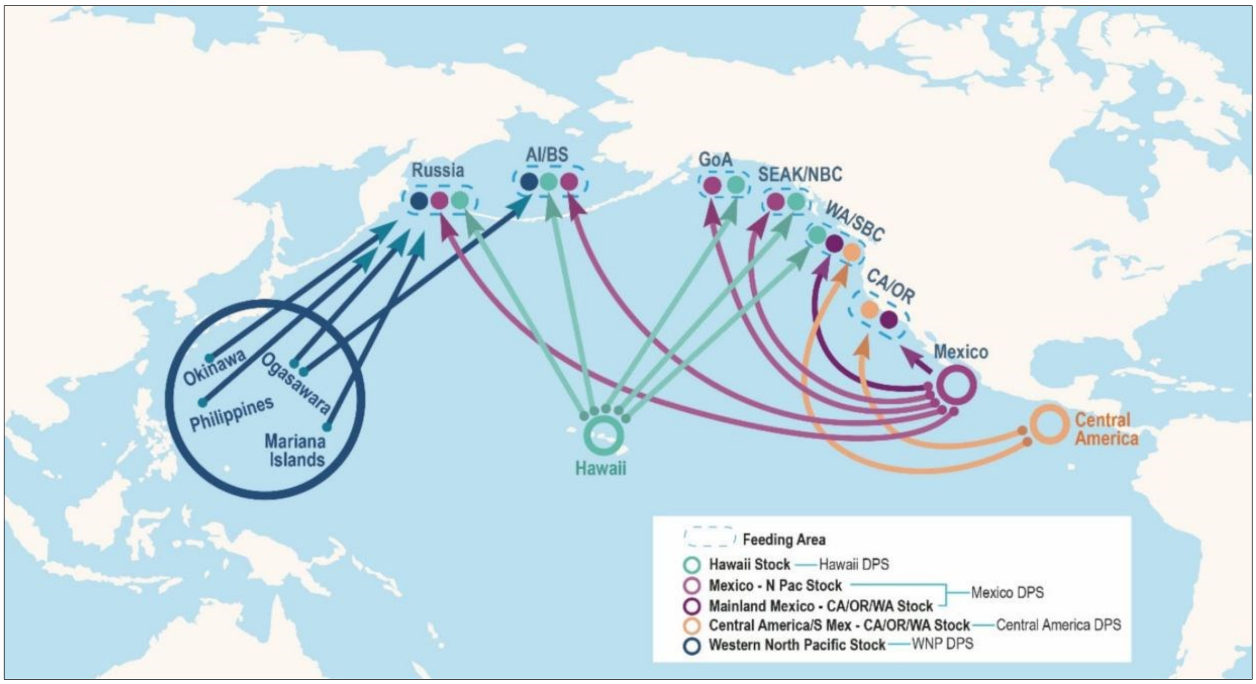
The humpback whale population in the North Pacific has increased substantially since the cessation of major commercial whaling operations, and the current abundance estimate exceeds some pre-whaling estimates. According to the Structure of Populations, Levels of Abundance, and Status of Humpbacks report, the Gulf of Alaska abundance estimates range from approximately 3,000 to 5,000 animals, depending on the modeling approach employed (Calambokidis et al. 2008).

Table 9. Estimated Humpback Whale DPS Occurrence in Southeast Alaska

Humpback Whale DPS	Status	Percentage[1]
Hawaii	Not Listed	98
Mexico	Threatened	2

[1] Source: NMFS 2021, adopted from Wade et al. 2016

Figure 10. Migratory Destinations of Humpback Whales in the North Pacific Ocean

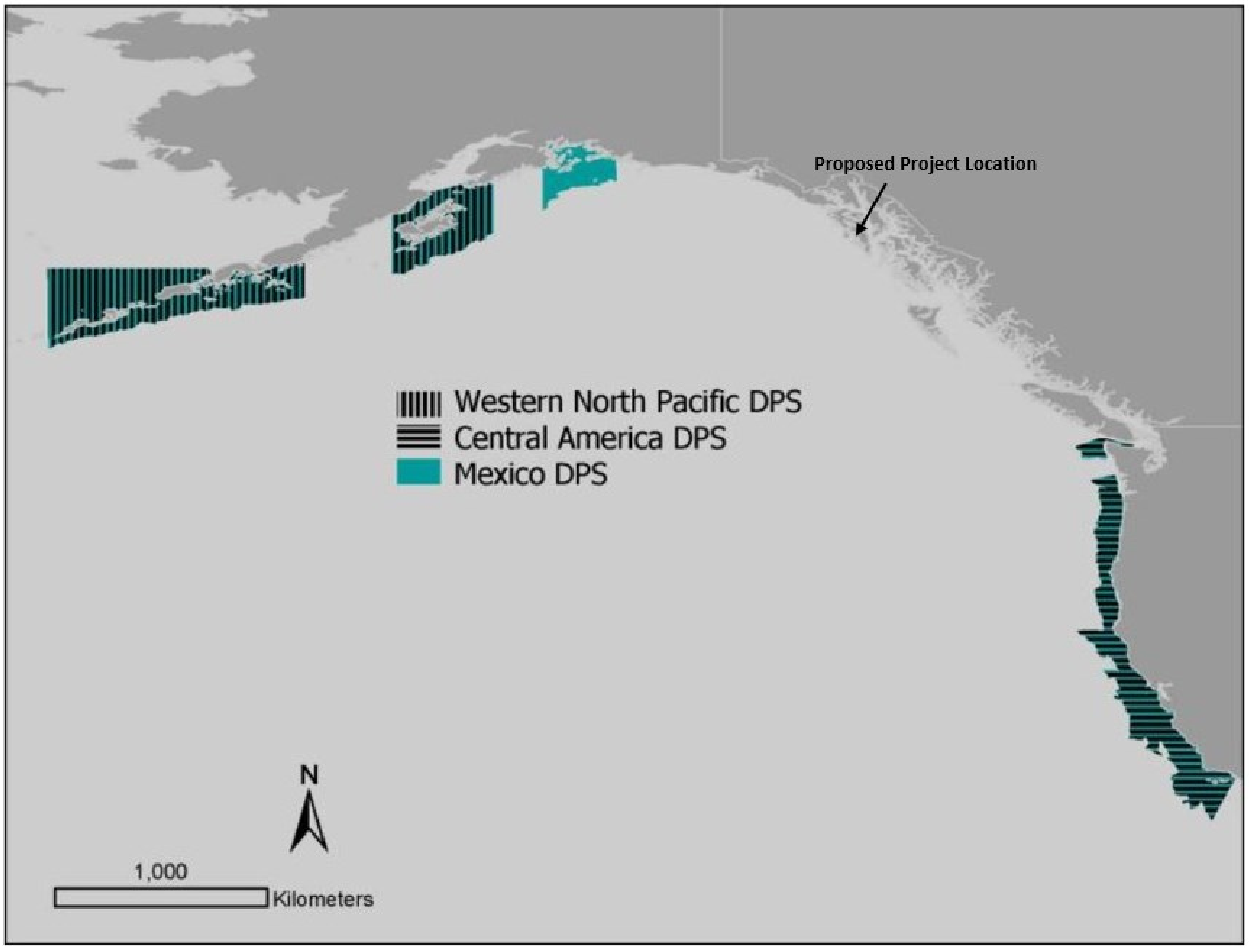


Source: Young et al. 2023

4.3.6 HUMPBACK WHALE CRITICAL HABITAT

Critical habitat for humpback whales was finalized on April 21, 2021, and became effective on May 21, 2021 (86 FR 21082). There is no humpback whale critical habitat designated in Southeast Alaska (NMFS 2023e). The nearest critical habitat for humpback whales is in Prince William Sound, more than 600 kilometers (380 miles) north of the project (Figure 11). The project would have **no effect on humpback whale critical habitat**.

Figure 11. Humpback Whale Critical Habitat



Source: NMFS 2023f

4.4 KILLER WHALE

4.4.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Killer whales, members of the Delphinidae (dolphin) family, are one of the most recognizable marine mammals, with 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 share prey with others in the pod. Killer whales have diverged evolutionarily into three distinct genetic ecotypes (offshore, resident, and transient) that overlap in distribution somewhat 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 2023f).

4.4.2 HEARING ABILITY

Killer whales are classified by NMFS as MF cetaceans with a generalized hearing range of 150 Hz 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.

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 three stocks that are most likely to occur in Sitka Sound are the Eastern North Pacific Alaska Resident stock, Eastern North Pacific Northern Resident stock, and the West Coast Transient stock (Young et al. 2023).

The populations that are known to occur in Sitka Sound are not strategic or depleted under the MMPA. The Alaska Resident stock size is 2,347 (121 individuals documented in Southeast Alaska). The Northern Resident stock size is 302. The West Coast Transient stock size is 349 (Young et al. 2023). Population trend data for the component of the Alaska Resident stock in Southeast Alaska is unavailable. The Northern Resident population increased from the mid-1970s to the mid-1990s, declined from 1998 to 2001, then began to increase again after 2001. The West Coast Transient population increased rapidly from the 1970s to the 1990s, slowed, and then began to increase again (Young et al. 2023).

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 2023f).

In Southeast Alaska, the offshore killer whale ecotype is found in pelagic waters off the Aleutian Islands to California and mainly prey on sharks; the two resident ecotypes (Alaska Residents and Northern Residents) range from the Aleutian Islands to Washington State and prefer to eat fish; and the transient population (West Coast Transients) prefer marine mammals and are found from California to Southeast Alaska (Young et al. 2023; Myers et al. 2021). During a 16-year study of marine mammals in Southeast Alaska, Dahlheim et al. (2009) found that transient and resident killer whales were present in all major waterways, and in various environments including open straits, near-shore waters, protected bays and inlets, and in icy waters near tidewater glaciers. Offshore killer whales were observed only four times in Southeast Alaska over the course of the study, all of which were documented in southern Southeast Alaska.

4.4.5 PRESENCE IN PROJECT AREA

During 190 hours of observation from 1994 to 2002 from Sitka's Whale Park, 44 killer whales were observed (Straley and Pendell 2017). Straley's survey data indicates a typical killer whale group size between four and eight and a maximum group size of eight whales in the area (Straley and Pendell 2017). No killer whales were observed during 21 days of monitoring during the construction of GPIP Dock between October 9 and November 9, 2017 (Turnagain 2017). A pod of three killer whales were observed within Sitka Channel during the eight days of monitoring in January 2017 during the construction of the Sitka Petro Dock (Windward 2017). Near Biorka Island, about 25 kilometers south of the project, seven killer whales were sighted in June but none were observed in July through September 2018 (Turnagain 2018). Killer whales were not observed during recent monitoring conducted for short periods over eight days in September 2018 within a 400-meter radius surrounding the O'Connell Bridge Lightering Float (SolsticeAK 2019). During 39 days of monitoring in January through March 2020 for the Crescent Harbor Float Rebuild Project, no humpbacks were observed. A pod of 10 orcas were observed on one occasion in February during 25 days of monitoring between January and June 2021 (Halibut Point Marine Services 2021). Killer whales were not observed during five days of monitoring in March 2022 during the geotechnical survey for this project (SolsticeAK 2022).

Straley and Pendell (2017) states that transient killer whales, primarily from the West Coast Transient stock, occur most frequently in the project area. Less often, whales from the Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stocks occur in the project area. Because of their transient nature, it is difficult to predict when killer whales will be present in the area. Whales from the Alaska Resident stock and the Northern Resident stock do occur in Southeast Alaska; however, they are rare in the project area (Straley and Pendell 2017).

4.5 HARBOR PORPOISE

4.5.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Harbor porpoises are small members of the Phocoenidae family, reaching up to 5 or 6 feet in length and weighing a maximum of 170 pounds. They are shy and prefer coastal habitats, including bays, estuaries, fjords, and harbors (NMFS 2023g). Harbor porpoises are found throughout Alaska and feed on cod, herring, pollock, sardines, whiting, squid, and octopus, and can dive up to 200 feet. They primarily travel alone, or in groups of less than ten individuals (ADF&G 2023b). Harbor porpoises' movements are likely influenced by prey availability, and they may travel from inshore areas to offshore areas following prey (NMFS 2023g). They are primarily found in waters less than 100 meters (328 feet) deep (Young et al. 2023).

4.5.2 HEARING ABILITY

Harbor porpoises are classified by NMFS as HF cetaceans with a generalized hearing range of 275 Hz to 160 kHz (NMFS 2018). They produce buzzing sounds for echolocation to locate prey. Though less social in comparison to other marine mammals and thought to produce sounds that are inadequate for communication, research suggests that harbor porpoises use sound to communicate over short distances with conspecifics (Sørensen et al. 2018).

4.5.3 STATUS

Harbor porpoises are not listed as depleted under the MMPA or as threatened or endangered under the ESA. In Alaska they are divided into three stocks: the Bering Sea stock, Gulf of Alaska stock, and Southeast Alaska stock. In Southeast Alaska, harbor porpoises are further divided into three stocks, the Northern Southeast Alaska Inland Waters stock, the Southern Southeast stock, and the Yakutat/Southeast stock. Abundance of the Northern Southeast stock, the only stock expected in the action area, is 1,619 individuals. (Young et al. 2023).

A 22-year study documented a decline in harbor porpoise abundance in Southeast Alaska during the early 2000s followed by an increase in the early 2010s. However, it is unknown whether this change was due to harbor porpoises moving in and out of the area in response to shifting prey availability, or if an actual decline occurred (Dahlheim et al. 2015).

4.5.4 DISTRIBUTION

Harbor porpoises are distributed widely throughout the world. In the Pacific Ocean they are found from Point Conception in Central California, throughout Western Alaska, north to the Chukchi Sea, and west to Japan (NMFS 2023g). In Southeast Alaska, they are most common in Cross Sound, the Glacier Bay/Icy Strait region, Frederick Sound, Wrangell Island, Zarembo Islands, and Sumner Strait (Young et al. 2023; Zerbini et al. 2022).

4.5.5 PRESENCE IN PROJECT AREA

Harbor porpoises commonly frequent nearshore waters, but are not common in the project vicinity. Monthly tallies from observations from Sitka's Whale Park show harbor porpoises occurring infrequently in or near the action area in March, April, and October between 1994 to 2002 (Straley and Pendell 2017). Survey data indicates a typical group size of five porpoises and a maximum group size of eight porpoises. Harbor porpoises were not observed during any other recent monitoring efforts in the project vicinity.

4.6 HARBOR SEAL

4.6.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Harbor seals are one of the most common marine mammals in Alaska. Harbor seals are generally non-migratory, with local movements associated with such factors as tide, weather, season, food availability, and reproduction. Harbor seals dive to depths up to 500 meters (1,640 feet) and forage on fish, clams, mussels, and crustaceans. They haul out on rocks, reefs, beaches, and drifting glacial ice and feed in marine, estuarine, and occasionally fresh waters. They are often seen hauled out in groups for protection against larger predators such as killer whales. 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 2023c).

4.6.2 HEARING ABILITY

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).

4.6.3 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 (Young et al. 2023). The status of the 12 stocks relative to their optimum sustainable population size is unknown. The stock that would be expected in the project vicinity (Sitka/Chatham Strait stock) is not classified as strategic under the MMPA.

The current statewide abundance estimate for Alaskan harbor seals is 243,938 based on aerial survey data collected between 1996 and 2018 (Boveng et al. 2019). The abundance estimate for the Sitka/Chatham Strait Passage stock is 13,289 (Young et al. 2023). The current 8-year estimate of the Sitka/Chatham Strait Passage population is an increase of 71 seals per year, with a 0.41 probability that the stock is decreasing (Young et al. 2023).

4.6.4 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.

Distribution of the Sitka/Chatham Strait Stock, the only stock considered in this application, ranges from the northern reaches of the western shores of Baranoff, Admiralty, and Kuiu Islands and the northwest shore of Kuprenof Island to Stephens Passage, including Chatham Strait and Sitka Sound (Young et al. 2023).

4.6.5 PRESENCE IN PROJECT AREA

Harbor seals are common in the inside waters of Southeast Alaska, including in the vicinity of the Sitka SPB. The species was seen during most months of monitoring (September through May) from Whale Park between 1994 and 2002, except in December and May (Straley and Pendell 2017). Harbor seals were seen on 10 out of the 21 days of monitoring for GPIP dock construction between October and November 2017, and 2 out of 8 days of monitoring for the Petro Marine dock in January 2017 (Turnagain 2017; Windward 2017). During monitoring for construction of the Biorka Dock, 70 individual harbor seals were sighted in June 2018; 58 harbor seals were sighted in July 2018; 82 harbor seals were sighted in August 2018; and 45 were sighted in September 2018 (Turnagain 2018). During recent observations from the O'Connell Bridge Lightering Float, three harbor seals were sighted on three occasions over seven-day monitoring period (SolsticeAK 2019). Harbor seals were also observed during monitoring for the Crescent Harbor Float Replacement Project (SolsticeAK 2020), the Old Sitka Dock North Dolphins Expansion Project (Halibut Point Marine Services 2021) and the Sitka SPB Geotechnical Project (SolsticeAK 2022).

According to the Alaska Fisheries Science Center's list of harbor seal haul-out locations, the closest listed haulout (CE49A) is located in Sitka Sound approximately 5.5 kilometers west of the project site, beyond Japonski Island (Alaska Fisheries Science Center 2023).

4.7 STELLER SEA LION

4.7.1 DESCRIPTION, BEHAVIOR, AND LIFE HISTORY

Steller sea lions are pinnipeds and members of the Otariidae or "eared seals" family. They are the largest of the eared seals, with males measuring up to 2,500 pounds and 11 feet long. Females of the species are slightly smaller, weighing up to 800 pounds. They are characterized by light blonde to reddish brown coats and long white whiskers on their muzzles used to sense prey and navigate within the water. They have long front flippers that are used to propel themselves in water and shorter back flippers that can be turned for walking on land (NMFS 2023h). As 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 Steller sea lions are generally solitary hunters and excellent divers and 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 and return often to their nursing pups (NMFS 2023h).

4.7.2 HEARING ABILITY

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. 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).

4.7.3 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 2016). 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. The most recent population assessment for the U.S. portion of the WDPS Steller sea lion stocks is 52,932 animals, based on aerial photographic and land-based survey data (Young et al. 2023). There have been no UMEs declared for this species in recent years (NMFS 2023i); however, an anomalous warming event was reported in the North Pacific Ocean in 2014-2016 and 2018-2019 which may have caused abnormal declines in sea lion counts observed in the Gulf of Alaska in subsequent years (Sweeney et al. 2022).

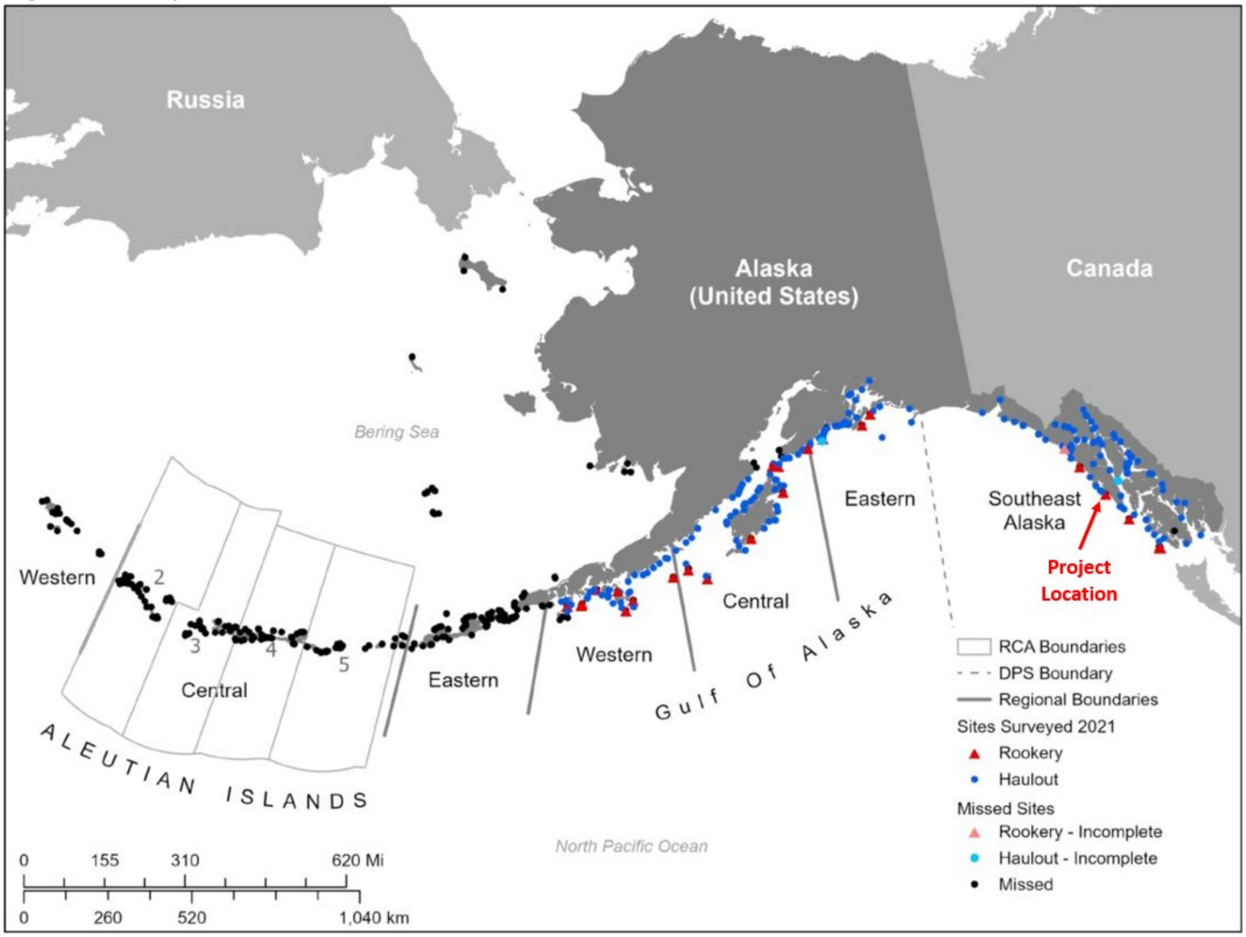
4.7.4 DISTRIBUTION

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. They are distributed mainly on the coastlines and coastal waters but can be found in pelagic waters (NMFS 2023h). 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 12 (Hastings et al. 2020).

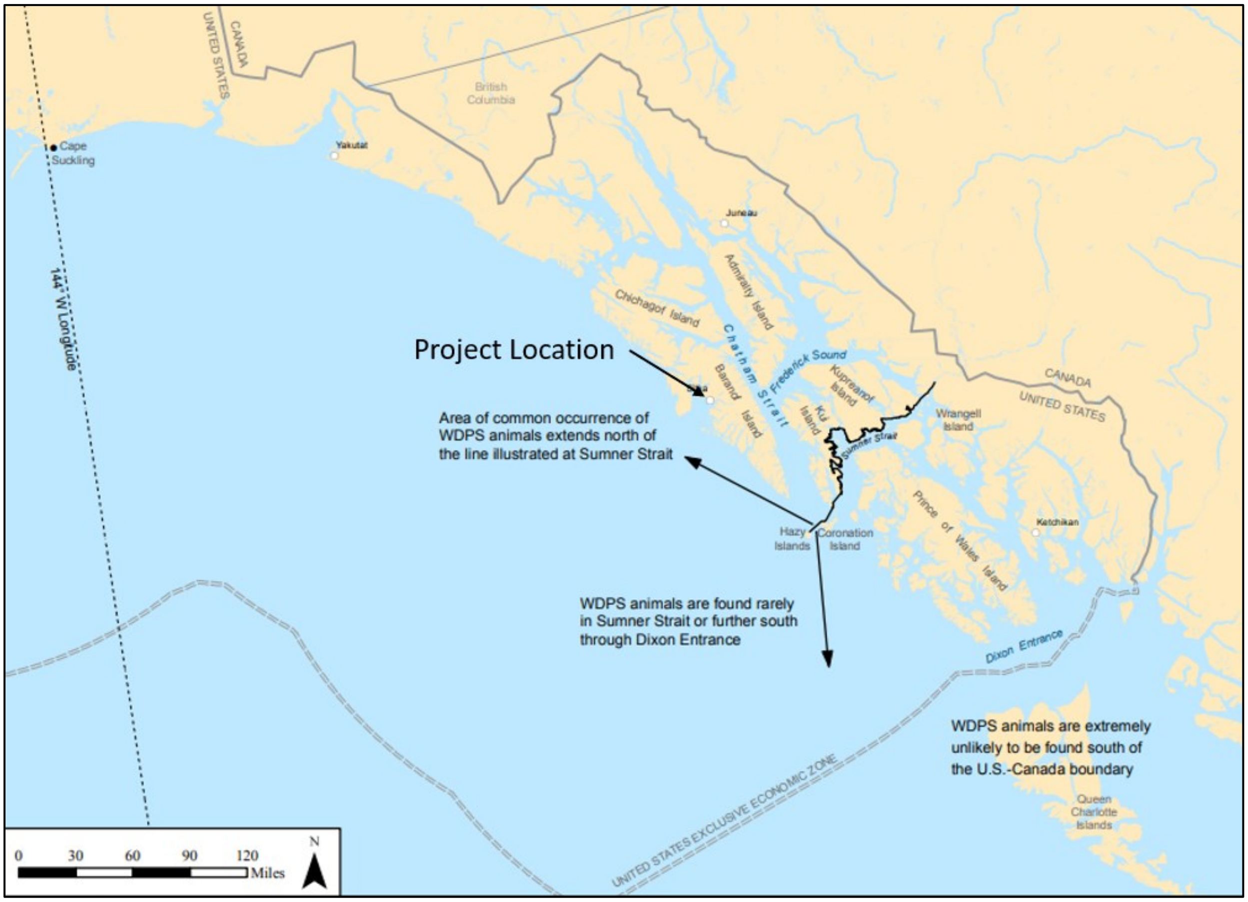
While it is expected that mainly EDPS Steller sea lions are found within the project area (NMFS 2023h), Jemison et al. (2013) found that there is regular movement of WDPS Steller sea lions across the 144°W boundary (Figure 13). Most of the cross-boundary movements are temporary with individuals returning to their natal DPS for breeding, but some females from the WDPS have likely emigrated permanently and have given birth to pups at White Sisters and Graves Rocks rookeries. Most confirmed sightings of WDPS animals have been in northern areas of Southeast Alaska, north of Sumner Strait (Jemison et al. 2013; NMFS 2013).

Figure 12. Separation of WDPS and EDPS Steller Sea Lion Rookeries and Haulouts at 144°W



Source: Hasting et al. 2020

Figure 13. Area of Occurrence of WDPS Steller Sea Lions North and South of Summer Strait



Source: NMFS 2013

4.7.5 PRESENCE IN PROJECT AREA

Steller sea lions occur year-round in the project area. Most are expected to be from the EDPS; however, it is likely that some Steller sea lions in the action area are from the WDPS (Jemison et al. 2013; NMFS 2013). Jemison et al. (2013) estimated an average annual breeding season movement of 917 WDPS Steller sea lions to Southeast Alaska. Based on surveys and analysis conducted by Hastings et al. (2020), an estimated 2.2 percent of Steller sea lions in the vicinity of the project are WDPS Steller sea lions.

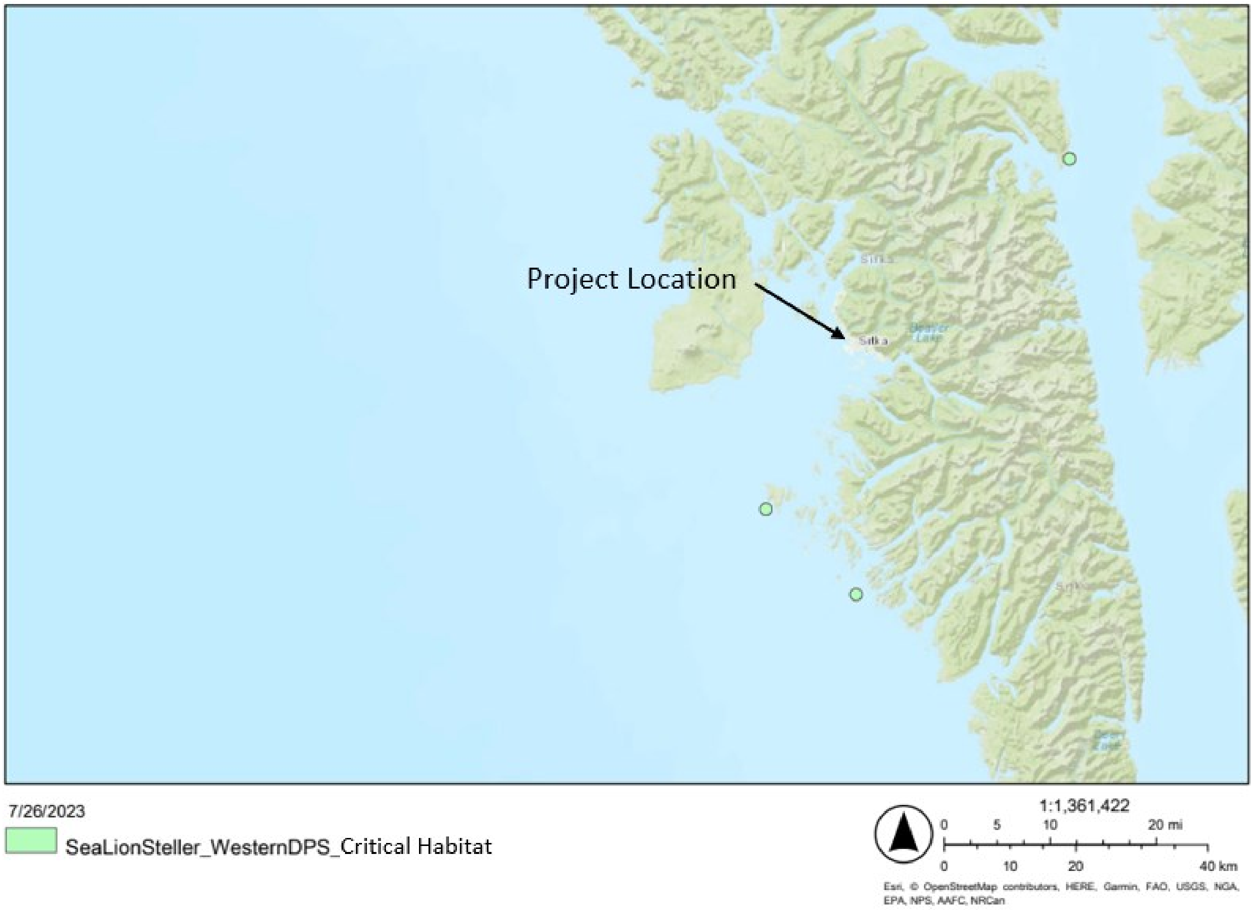
Based on Straley's Whale Park surveys and other vessel-based surveys conducted from 1994 to 2016, Steller sea lion numbers are highest near the project area in January and February. January was the most abundant month with about 190 Steller sea lions spotted. February and November were next with about 170 and 120 Steller sea lions spotted, respectively. The fewest Steller sea lions were spotted in the month of May (1995-2002).

Individual sea lions were seen on 19 of 21 days in Silver Bay and Easter Channel during monitoring for GPIP dock construction between October and November 2017 (Turnagain 2017). Near Biorka Island, sea lions were seen infrequently; sea lions were sighted in June (6 animals), July (2 animals), and no sea lions were seen in August 2018 (Turnagain 2018). During 8 days of monitoring in January 2017 for the Petro Marine dock, about 1.6 kilometers (1 mile) southwest of the Sitka SPB, individual sea lions were seen on 3 days (Windward 2017). Steller sea lions were observed 5 of 8 days during monitoring conducted for 15-minute periods in September 2018 for the O'Connell Bridge Lightering Float (SolsticeAK 2019). During in-water construction work for the O'Connell Bridge Lightering Float Pile Replacement Project between June 9 and June 12, 2019, 42 Steller sea lions were sighted (SolsticeAK 2019). During 39 days of marine mammal monitoring for the Crescent Harbor Float Replacement Project in January and February 2020, 6 sea lions were observed southwest of Sitka Channel (SolsticeAK 2020). Steller sea lions were most often observed alone or in small groups of 2 or 3 during these monitoring efforts; however, a group of more than 100 was sighted on at least one occasion (Straley et al. 2018; Windward 2017; SolsticeAK 2019; SolsticeAK 2020).

4.7.6 STELLER SEA LION CRITICAL HABITAT

NMFS designated critical habitat for the Steller sea lion on August 27, 1993 (58 FR 45269). The project action area does not overlap Steller sea lion critical habitat. The Biorka Island haul out (over 20 kilometers [12 miles] southwest of the proposed action area) is the closest haulout, and is designated critical habitat; however, it is well outside the action area (Figure 14). Steller sea lions also haul out on buoys and navigational markers in Sitka Sound and along the rocky shores of Sugarloaf Mountain south of the project site. These haulouts are far beyond the in-water and in-air noise disturbance thresholds for hauled-out pinnipeds as described in Section 1.3. The project will have **no effect on Steller sea lion critical habitat.**

Figure 14. Steller Sea Lion Critical Habitat near Sitka Sound



NMFS 2023j

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.

The CBS requests the issuance of an IHA pursuant to Section 101(a)(5) of the MMPA for incidental take by Level A of harbor porpoise, harbor seal, and Steller sea lion and Level B take of gray whale, humpback whale, minke whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion that may occur in the Sitka SPB project harassment zones during construction.

The activities outlined in Section 1 have the potential to take marine mammals by exposure to in-water sound. Level A and B take will potentially result from noise associated with pile installation (and temporary pile removal) using the methods mentioned above. Please see Section 11 for a description of mitigation measures including shutdown zones and procedures.

CBS requests two IHAs for incidental take of marine mammals described within this application. For Phase I, CBS requests an IHA for 1 year, beginning on July 1, 2024. For Phase II, the applicant requests an additional IHA for 1 year, beginning July 1, 2025. CBS is not requesting a Letter of Authorization at this time because the activities described herein for each phase are expected to be completed within 1 year from the date of their respective authorizations and are not expected to rise to the level of serious injury or mortality, which would require a Letter of Authorization.

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.

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 (previously summarized in Section 3);
4) the number of days of pile driving and removal activity.

As summarized in Section 3, reports from multiple monitoring efforts in the project vicinity were used to estimate the occurrence and average group size 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', or 'infrequent'. Species sighted consistently during all monitoring efforts in the project vicinity are considered 'common'; species sighted with some consistency during most monitoring efforts in the project vicinity are considered 'frequent'; and species sighted occasionally during a few monitoring efforts in the project vicinity are considered 'infrequent'. Take of species whose occurrence in the action area is described as 'rare' is not requested (Table 8). Monitoring data was used to determine average group size and groups per day.

Expected occurrence in the project area was estimated as follows:

- Common: one to two groups per day
- Frequent: one group per week
- Infrequent: one group per two weeks

Level A and Level B take are calculated independently in the table below using the same method. Group size was multiplied by groups per day and by the number of days of each type of pile driving activity.

Estimated take =
Group size x Expected occurrence x Days of pile driving activity

Other assumptions:

- Humpback whales, gray whales, and harbor porpoise are not expected within the channel breakwaters at the same frequency as they are expected to be observed in Sitka Sound. As a result, Level B take is only requested for these species for vibratory and DTH drilling methods due to the large monitoring zones.

- For species that take by Level A harassment is requested, take is only requested for construction methods that have Level A harassment zones greater than 20 meters.[4]

6.1 ESTIMATED TAKE

6.1.1 PHASE I

For construction of Phase I, CBS is requesting take by Level A harassment of harbor porpoise, harbor seal, and Steller sea lion and take by Level B harassment of humpback whale, gray whale, minke whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion. Table 10 shows species occurrence information used to estimate take and take calculations for Phase I.

[4] Take is not requested for pile driving methods with a Level A harassment zone less than 20 meters to reduce impacts to marine mammals. These methods include vibratory pile driving for any hearing groups and all impact hammering or DTH drilling of 16-inch piles for sea lions and killer whales. Marine mammals are not expected to frequently be present within 20 meters of pile installation, so it is feasible for the project to implement shutdowns at 20 meters for the methods listed above without requesting Level A take.

Table 10. Sitka SPB Project Species Occurrence Information and Take Calculation – Phase I

Species	Frequency	Group Size Range[1]	Average Group Size[2]	Expected Occurrence[3]	Pile Driving Method	Pile Size	Total Days[4]	Take Calculation	Total Take[5]
Level A									
Harbor Porpoise	Infrequent	1-8	5.0	1 group/ 2 weeks	DTH	24	8.0	5.0 individuals/group X 1 group/2 weeks X 8.0 days	5[6]
Harbor Seal	Common	1-4	2.1	1 group/ day	DTH	16 & 24	13.0	2.1 individuals/group X 1 group/day X 22.5 days	48
					Impact		9.5		
Steller Sea Lion	Common	1-8	2.0	1 group/ day	DTH	24	8.0	2.0 individuals/group X 1 group/day X 8.0 days	16
Level B									
Humpback Whale	Frequent	1-10	3.4	1 group/ week	Vibratory	16 & 24	8.4	3.4 individuals/group X 1 group/week X 21.4 days	11
					DTH		13.0		
Gray Whale	Infrequent	3-4	3.5	1 group/ 2 weeks	Vibratory	16 & 24	8.4	3.5 individuals/group X 1 group/2 weeks X 21.4 days	6
					DTH		13.0		
Minke Whale	Infrequent	3-4	3.5	1 group/ 2 weeks	Vibratory	16 & 24	8.4	3.5 individuals/group X 1 group/2 weeks X 21.4 days	6
					DTH		13.0		
Killer Whale	Frequent	4-10	6.6	1 group/ week	Vibratory	16 & 24	8.4	6.6 individuals/group X 1 group/week X 30.9 days	30
					DTH		13.0		
					Impact		9.5		
Harbor Porpoise	Infrequent	1-8	5.0	1 group/ 2 weeks	Vibratory	16 & 24	8.4	5.0 individuals/group X 1 group/2 weeks X 21.4 days	8
					DTH		13.0		
Harbor Seal	Common	1-4	2.1	2 groups/ day	Vibratory	16 & 24	8.4	4.2 individuals/group X 1 group/day X 30.9 days	130
					DTH		13.0		
					Impact		9.5		
Steller Sea Lion	Common	1-8	2.0	2 groups/ day	Vibratory	16 & 24	8.4	4.0 individuals/group X 1 group/day X 30.9 days	124
					DTH		13.0		
					Impact		9.5		

[1] Ranges of group size and average group size were derived from marine mammal observations from the following references:

- Killer whale: Straley and Pendell 2017; Windward 2017; Turnagain 2018; Halibut Point Marine Services 2021
- Harbor seal: Straley and Pendell 2017; Windward 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Steller sea lion: Straley and Pendell 2017; Windward 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Humpback whale: Straley and Pendell 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Gray whale: Straley and Pendell 2017; Turnagain 2018
- Harbor porpoise: Straley and Pendell 2017

[2] Average group size was calculated by determining the mean group size for a given species during monitoring efforts that observed that species and taking an average of all mean group sizes from applicable monitoring efforts.

[3] Expected occurrences in the Level A harassment zone considers occurrence of groups of that mammal in the Level A harassment zone only and not in Sitka Channel as a whole. Expected occurrence in the Level B harassment zone considers the occurrence in the Level B harassment zone and Sitka Channel, excluding the Level A harassment zone. In this way, Level A and Level B takes are not double counted.

[4] Number of days come from Table 3.

[5] Total take is rounded up to a whole number.

[6] Wherever the calculated total take estimate was smaller than the average group size, the take estimate is rounded up to the average group size.

6.1.2 PHASE II

For construction of Phase II, CBS is requesting take by Level A harassment of harbor porpoise, harbor seal, and Steller sea lion and take by Level B harassment of humpback whale, gray whale, minke whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion. Table 11 shows species occurrence information used to estimate take and take calculations for Phase II.

Table 11. Sitka SPB Project Species Occurrence Information and Take Calculation – Phase II

Species	Frequency	Group Size [1]	Group Size [2]	Expected Occurrence [3]	Pile Driving Method	Pile Size	Total Days [4]	Take Calculation	Total Take[5]
Level A									
Harbor Porpoise	Infrequent	1-8	5.0	1 group/ 2 weeks	DTH	24	3.0	5.0 individuals/group X 1 group/2 weeks X 3.0 days	5[6]
Harbor Seal	Common	1-4	2.1	1 group/ day	DTH	24	3.0	2.1 individuals/group X 1 group/day X 6.0 days	13
					Impact		3.0		
Steller Sea Lion	Common	1-8	2.0	1 group/ day	DTH	24	3.0	2.0 individuals/group X 1 group/day X 3.0 days	6
Level B									
Humpback Whale	Frequent	1-10	3.4	1 group/ week	Vibratory	16 & 24	3.0	3.4 individuals/group X 1 group/week X 6.0 days	4[6]
					DTH	24	3.0		
Gray Whale	Infrequent	3-4	3.5	1 group/ 2 weeks	Vibratory	16 & 24	3.0	3.5 individuals/group X 1 group/week X 6.0 days	4[6]
					DTH	24	3.0		
Minke Whale	Infrequent	3-4	3.5	1 group/ 2 weeks	Vibratory	16 & 24	3.0	3.5 individuals/group X 1 group/week X 6.0 days	4[6]
					DTH	24	3.0		
Killer Whale	Frequent	4-10	6.6	1 group/ week	Vibratory	16 & 24	3.0	6.6 individuals/group X 1 group/week X 9.0 days	9
					DTH	24	3.0		
					Impact		3.0		
Harbor Porpoise	Infrequent	1-8	5.0	1 group/ 2 weeks	Vibratory	16 & 24	3.0	5.0 individuals/group X 1 group/2 weeks X 9.0 days	5[6]
					DTH	24	3.0		
					Impact		3.0		
Harbor Seal	Common	1-4	2.1	2 groups/ day	Vibratory	16 & 24	3.0	2.1 individuals/group X 1 group/day X 9.0 days	38
					DTH	24	3.0		
					Impact		3.0		
Steller Sea Lion	Common	1-8	2.0	2 groups/ day	Vibratory	16 & 24	3.0	2.0 individuals/group X 1 group/day X 9.0 days	36
					DTH	24	3.0		
					Impact		3.0		

[1] Ranges of group size and average group size were derived from marine mammal observations from the following references:

- Killer whale: Straley and Pendell 2017; Windward 2017; Turnagain 2018; Halibut Point Marine Services 2021
- Harbor seal: Straley and Pendell 2017; Windward 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Steller sea lion: Straley and Pendell 2017; Windward 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Humpback whale: Straley and Pendell 2017; Turnagain 2017; Turnagain 2018; SolsticeAK 2019; SolsticeAK 2020; Halibut Point Marine Services 2021; SolsticeAK 2022
- Gray whale: Straley and Pendell 2017; Turnagain 2018
- Harbor porpoise: Straley and Pendell 2017

[2] Average group size was calculated by determining the mean group size for a given species during monitoring efforts that observed that species and taking an average of all mean group sizes from applicable monitoring efforts.

[3] Expected occurrences in the Level A harassment zone considers occurrence of groups of that mammal in the Level A harassment zone only and not in Sitka Channel as a whole. Expected occurrence in the Level B harassment zone considers the occurrence in the Level B harassment zone and Sitka Channel, excluding the Level A harassment zone. In this way, Level A and Level B takes are not double counted.

[4] Number of days come from Table 3.

[5] Total take is rounded up to a whole number.

[6] Wherever the calculated total take estimate was smaller than the average group size, the take estimate is rounded up to the average group size.

6.2 ALL MARINE MAMMAL TAKES REQUESTED

For Phase I, this analysis for the Sitka SPB Project requests 5 takes of harbor porpoise, 48 takes of harbor seals, and 16 takes of Steller sea lions by Level A harassment. This analysis also requests the following potential takes by Level B harassment: 11 takes of humpback whales, 6 takes of gray whales, 6 takes of minke whales, 30 takes of killer whales, 8 takes of harbor porpoise, 130 takes of harbor seals, and 124 takes of Steller sea lions.

For Phase II, this analysis for the Sitka SPB Project requests 5 takes of harbor porpoise, 13 takes of harbor seals, and 6 takes of Steller sea lions by Level A harassment. This analysis also requests the following potential takes by Level B harassment: 4 takes of humpback whales, 4 takes of gray whales, 4 takes of minke whales, 9 takes of killer whales, 5 takes of harbor porpoise, 38 takes of harbor seals, and 36 takes of Steller sea lions.

For the construction of the entire Sitka SPB Project, CBS requests 14 takes of harbor porpoise, 61 takes of harbor seals, and 22 takes of Steller sea lion by Level A harassment. This analysis also requests the following potential takes by Level B harassment: 15 takes of humpback whales, 10 takes of gray whales, 10 takes of minke whales, 38 takes of killer whales, 13 takes of harbor porpoise, 168 takes of harbor seals, and 160 takes of Steller sea lions.

Table 12 presents Level A and B take requests and percent of marine mammal stocks by Phase I, Phase II, and the entire project.

Table 12. Take Requests for Marine Mammals and Percent of Stock

Species	Stock/DPS (N_{EST}) [a]	Phase I			Phase II			Project Total
		Level A	Level B [b]	Percent of Stock [c]	Level A	Level B [b]	Percent of Stock [c]	Percent of Stock [c]
Humpback Whale	Hawaii DPS (11,278)	0	10.8	0.1	0	3.9	0.0	0.1
	Mexico DPS (2,806) [d]	0	0.2	0.0	0	0.1	0.0	0.0
Gray Whale	Eastern North Pacific (26,960)	0	6	0.0	0	4	0.0	0.0
Minke Whale	Alaska (N/A)	0	6	N/A	0	4	N/A	N/A
Killer Whale	West Coast Transient (349)	0	3.3	0.9	0	1.0	0.3	1.2
	Gulf, Aleutian, Bering Transient (587)	0	5.6	0.9	0	1.7	0.3	1.2
	Northern Resident (302)	0	2.9	0.9	0	0.9	0.3	1.2
	Alaska Resident (1,920)	0	18.2	0.9	0	5.5	0.3	1.2
Harbor Porpoise	Northern Southeast Alaska (1,619)	5	8	0.9	5	5	0.7	1.7
Harbor Seal	Sitka/Chatham Strait (13,289)	48	130	1.3	13	38	0.4	1.7
Steller Sea Lion	Eastern U.S. (43,201)	15.6	121.3	0.3	5.9	35.2	0.1	0.4
	Western U.S. (52,932)	0.4	2.7	0.0	0.1	0.8	0.0	0.0

[a] Stock estimate from Young et al. 2023

[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. Humpback whale probability by stock based on Southeast Alaska estimates from NMFS 2021 (98% Hawaii DPS; 2% Mexico DPS).

[c] Percent of stock refers to combined Level B and Level A take (if requested)

[d] Mexico DPS estimate from 86 FR 21082

7 Anticipated Impact of the Activity

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

CBS is requesting authorization for take of harbor porpoise, harbor seal, and Steller sea lion by Level A harassment and take of humpback whale, gray whale, minke whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion by Level B harassment. Incidental takes will likely be multiple takes of individuals, rather than single takes of unique individuals. The stock take calculation in Table 12 assumes 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 result primarily 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 on all days when pile driving and removal (see Section 2.1 for project dates and duration). Because of the limited time that marine mammals could be exposed to Level B harassment, the Sitka SPB project would be unlikely to have any impact on stock recruitment or survival, and therefore, would have a negligible impact on the stocks of these species.

Incidental Level A take can cause injury including permanent, partial, or full hearing loss if marine mammals are exposed to underwater sounds exceeding the injury threshold, which vary by species. Marine mammals exposed to high received sound levels may experience non-auditory physiological effect such as increased stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage. Shutdowns would be implemented for any marine mammals other than those authorized (harbor porpoise, harbor seal, and Steller sea lion) to prevent any unauthorized take.

Because of the limited number of Level A takes requested for harbor porpoise, harbor seal, and Steller sea lion and the implementation of shutdown zones, it is not expected that there would be any impact on stock recruitment or survival, and therefore, there would be no impact on 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 saltwater and anadromous fish, shellfish, marine mammals, and plants in Southeast Alaska for thousands of years. Sitka Channel and other nearby areas are within the traditional territory of the Sheet'ká Ḵwáan. Salmon and eulachon were especially important to the Tlingit for food, oil, and trade. Today the majority of subsistence species used in the region include salmon, vegetation, berries, halibut, marine invertebrates, land mammals, rockfish, crab, and herring (ADF&G 2023d).

Alaska Natives have traditionally harvested subsistence resources, including harbor seals and Steller sea lions, in Southeast Alaska for hundreds of years. ADF&G reports that in 2013 (the most recent data set available), about 11% of Sitka households used subsistence-caught marine mammals. ADF&G has not conducted a subsistence survey in Sitka since 2013 (ADF&G 2023d).

In September 2018, the Alaska Harbor Seal Commission, the Alaska Sea Otter and Steller Sea Lion Commission, and the Sitka Tribe of Alaska were contacted to discuss a project in Sitka Channel and request comments. Jeff Feldpausch, Resource Protection Director for the Sitka Tribe of Alaska, relayed questions related to subsistence to the tribe. Specific questions and responses are listed below (Feldpausch 2021).

> ***What species of subsistence marine mammals are important to Sitka tribal members within Sitka Sound?***
>
> Seal, sea lion, and sea otter were identified as the most important subsistence marine mammals.
>
> ***Are there concerns related to the project's impacts on subsistence marine mammals?***
>
> There were no concerns about the impact on subsistence marine mammals or their harvest by hunters within the area of this project. The Tribe requested that no pile driving occur between March 15 and May 31 to protect herring, as has been the case for past permitting in Sitka Sound.
>
> ***Are there questions regarding the project, particularly related to subsistence marine mammals, that CBS need to address?***
>
> The Tribe asked whether marine mammal monitors would be utilized during construction? If so, the Tribe requested that tribal members be hired to fill those positions.
>
> CBS responded with contactor contact information for monitoring positions and NMFS' PSO requirements.

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

- Construction activities are temporary and localized primarily within Sitka Channel, an active marine transportation corridor with established industrial development.
- Mitigation measures will be implemented to minimize disturbance of marine mammals in the action area.
- Construction will not take place during the herring spawning season (approximately March 15 to April 30).
- The project is not expected to result in significant changes to availability of subsistence resources, including from the relocated sea lane and seaplane operations.

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 PROJECT FOOTPRINT

The construction of the Sitka SPB would cause some permanent loss of habitat available to marine mammals. The area lost would be small, including about 1.3 acres of fill below HTL during Phase I and an additional 1.3 acres of fill below HTL during Phase II, in addition to the area occupied by the SPB float docks and associated pile placements. The area lost has been previously industrialized and is already in an active marine industrial area. Loss of habitat is anticipated to be minor and has been minimized by use of a floating, pile-supported float design with some placement of fill but no dredging. The proposed design would not impede migration through the action area.

The minor loss of habitat due to proposed project's footprint is unlikely to measurably affect marine mammal habitat in the area.

9.2 LOSS OF MARINE MAMMAL HABITAT DUE TO TURBIDITY/SEDIMENT

A localized and temporary increase in turbidity would occur near the seafloor during the estimated 46 hours of pile driving during Phase I and an additional 13 hours during Phase II. A portion of the in-water work would involve DTH drilling which would release drill cuttings from the top of the piles into the marine environment and increase turbidity in the immediate area during pile driving. Discharging of fill to develop project uplands may also have a temporary impact on turbidity and sedimentation. A sediment curtain would be employed during the placement of fill and all DTH drilling activities. Given the mitigation measures that will be implemented and the localized nature of the impacts, turbidity and sediment disturbance from pile driving and discharging of fill is unlikely to have an impact on marine mammals or marine mammal prey in the project vicinity. Temporary sediment suspension would be brief and limited to a small area within Sitka Channel, and is unlikely to measurably affect marine mammals or their prey in the area.

9.3 LOSS OF MARINE MAMMAL HABITAT DUE TO NOISE

The project could cause a temporary loss of habitat because of elevated construction noise levels that may cause marine mammals to avoid the 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, intermittent, and mostly contained within Sitka Channel.

9.4 INDIRECT HABITAT IMPACTS

This project minimally increases seaplane moorage in Sitka Channel. As a result, there are no indirect habitat impacts anticipated as a result of this project. Because the purpose of the project is to replace existing deteriorating infrastructure and help reduce congestion in a high activity area in Sitka Channel, operation of the new SPB is not expected to induce development of new congestion. Any minor increases in seaplane traffic would be minimal compared to the overall level of vessel activity in Sitka Channel.

9.5 ANIMAL AVOIDANCE OR ABANDONMENT

As previously mentioned, marine mammals could experience a temporary loss of suitable habitat within the action area if elevated noise levels associated with in-water construction result in their displacement from the area. However, avoidance of the area because of noise is expected to be temporary and will not result in long-term effects to the local populations of marine mammals.

Another potential impact on marine mammals associated with the project could be a temporary loss of habitat because of elevated noise levels due to construction support vessels. Tugs, barges, and small skiffs would be used during construction. For tugs and barges broadband source levels have been measured at 145 to 170 dB re: 1 µPa, and for small ships and supply vessels broadband source levels have been measured at 170 to 180 dB re: 1µPa (Richardson et al. 1995). Noise from seaplane operations can vary, with most models operating below 100 dB (Faegre 2002).

Numerous studies of interaction between surface vessels and marine mammals have demonstrated that free-ranging marine mammals engage in avoidance behavior when surface vessels move toward them. Many authors suggest that vessel generated noise is a factor in that avoidance behavior (NMFS 2018). As described above, construction related vessels would produce marine vessel noise. This noise would be introduced to an action area that already experiences vessel noise due to existing high volumes of vessel traffic accessing Sitka Channel and the associated Sitka area harbors. Marine mammals that occur in the action are likely habituated to vessel noise.

Acoustic disturbance from vessel noise is not anticipated to negatively impact marine mammals given the following conditions:

- Construction vessel noise associated with this project would be temporary and the expected increase in seaplane traffic follow project completion is not expected to impact marine mammals in a marine transportation corridor that experiences high levels of traffic.
- Marine mammals in the project vicinity are likely habituated to regular vessel traffic.
- Sitka Channel is a no-wake zone for marine vessel operation speeds.

Therefore, impacts on marine mammals associated with vessel noise from this project would be too small to detect or measure and therefore are insignificant.

10 Anticipated Effects of Habitat Impacts on Marine Mammals

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

10.1 PERMANENT HABITAT REMOVAL IMPACT ON MARINE MAMMALS

Approximately 1.3 acres of fill would be discharged below HTL during Phase I and an additional 1.3 acres of fill would be discharged below HTL during Phase II for developing project uplands. This area will be permanently lost but represents minimal territory available to marine mammals in Sitka Channel and Sitka Sound and is considered negligible.

10.2 TURBIDITY IMPACTS ON MARINE MAMMALS

A temporary and localized increase in turbidity near the seafloor will occur in the immediate area surrounding the proposed SPB area during an estimated 45 hours of pile driving and 652 hours of placement of fill below HTL during Phase I and an estimated 13 hours of pile driving and 285 hours of placement of fill before HTL during Phase II. A portion of the in-water work will involve DTH hammering which would also release drill cuttings (seafloor) into the marine environment from the top of the piles and increase turbidity in the immediate area during pile driving.

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 of pile driving is complete. Although prey species such as herring and salmon can congregate in Sitka Sound, the project site does not support a consistent abundance of prey for humpback whales or Steller sea lions.

A sediment curtain would be employed during the placement of fill and all DTH drilling activities; therefore, the temporary and localized turbidity associated with the SPB project is unlikely to measurably affect marine mammals or their prey in the action area. No indirect effects are anticipated that would cause an increase in turbidity in the action area.

10.3 CONSTRUCTION NOISE IMPACTS ON MARINE MAMMALS

As explained in Section 1.4, underwater and in-air noise from pile driving and removal is anticipated to rise above ambient noise levels and radiate into Sitka Channel from the construction of the proposed SPB.

If a sound is loud enough, it may cause discomfort or tissue damage to auditory or other systems of all animals, including humans. Marine species exposed repeatedly or for prolonged periods to high intensity sound can experience a hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges. A TS can be PTS, in which case hearing sensitivity is not recoverable, or temporary (TTS), in which case the animal's hearing threshold can recover over time (Southall et al. 2007).

Marine species depend on acoustic cues for vital biological functions (e.g., orientation, communication, finding prey, avoiding predators); thus, TTS may result in reduced fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which it occurs (Kastak et al. 2005). A TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Although repeated TTS sound exposure could cause PTS, which constitutes injury. NMFS classifies TTS as a disturbance (Level B) harassment (Southall et al. 2007; NMFS 2018).

Direct impacts of noise to marine species depend not only on sound magnitude but also on the species receiving the sound, exposure type (e.g., continuous vs. pulse), duration, site characteristics, and individual animal characteristics such as habituation, season, or motivation (Ellison et al. 2012). Some of the in-water sound source levels from pile installation and removal from the proposed action will generate noise loud enough to harm or harass marine mammals at certain distances. Possible impacts include injury and disturbance ranging from mild (e.g., startle response or masking of species relevant sounds) to severe (e.g., abandonment of habitat).

Auditory interference, or masking, occurs when an interfering noise is similar in frequency and volume to (or is louder than) the auditory signal received by an animal while it is processing echolocation signals or listening for acoustic information from other animals. Masking can interfere with an animal's ability to gather acoustic information about its environment, such as predators, prey, conspecifics, and other environmental cues (Francis and Barber 2013). The impacts of masking may be greater for cetaceans, which produce complex vocalizations such as whistling, echolocation click production, calling, and singing for different purposes and across multiple modes. Exposure to anthropogenic noise may result in changes to cetacean vocalization behavior. For example, in the presence of potentially masking signals, humpback whales have been observed to increase the length of their songs in areas of increased anthropogenic noise (Fristrup et al. 2003).

Construction activities for the proposed project could mask vocalizations or other important acoustic information for marine species present in the action area. This could affect communication among individuals or affect their ability to receive information from their environment. However, the primary effects of project activities will occur in an active waterway, where masking from other vessel sounds and harbor activity is likely (Erbe et al. 2019). Masking from noise external to the project would be more pronounced during the summer months when marine traffic is at its peak in Sitka Sound.

Marine mammals could experience a temporary loss of suitable habitat in the action area if elevated noise levels associated with in-water construction results in their displacement from the area. The area is already somewhat loud and busy, and displacement of marine mammals or their prey by noise would not be permanent nor would it result long-term effects to the local population. No known rookeries or major haulouts would be impacted. The nearest designated critical habitat for Steller sea lions is approximately 20 nautical miles southwest on Biorka Island. The project action area does not extend to this critical habitat and therefore the project would not impact the essential physical and biological features that make the area critical habitat for WDPS Steller sea lions, such as good water quality, prey availability, or open space for transiting and foraging.

10.4 IMPACTS ON MARINE MAMMAL PREY HABITAT

Humpback and gray whales filter-feed on small crustaceans (mostly krill) and small fish. The impacts of underwater sound on some fish are well understood; however, impacts on species further down the food chain (such as 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 156 dB re 1 μPa^2s^{-1} to 183 dB re 1 μPa^2s^{-1} approximately 509 meters (1,670 feet) to 658 meters (2,160 feet) from the source. The seismic air gun used in this study is within or below the range of pile installation equipment that will be deployed during the proposed action (Corbett 2019). The results indicate that there was an increased mortality in adult and larval zooplankton and total mortality of larval krill from this type of noise (adults were not present) (McCauley et al. 2017).

Fish populations and euphausiids in the proposed action area that serve as marine mammal prey could be affected by noise or turbidity generated from in-water pile driving and the placement of fill associated with this project. 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 in the project vicinity. The quantity, quality, and availability of adequate marine mammal food resources are therefore not likely to be reduced as a result of this project due to the small area affected, mobility of fish, anticipated recolonization, and the temporary nature of the proposed action.

Other prey species' marine habitat supported by the action area include anadromous fish, such as Pacific salmon (all five species) (ADF&G 2020). Table 13 details species with essential fish habitat (EFH) that may occur near the proposed action during at least one phase of their life cycle.

There is one anadromous stream across Sitka Channel from the action area. Peterson Creek is anadromous (AWC #113-41-10185), providing habitat for all five species of salmon and Dolly Varden and is located along the eastern perimeter of the action area (ADF&G 2020).

An EFH Assessment has been drafted for this project and was submitted for review on December 12, 2020. Concurrence by NMFS Habitat Division in Anchorage, Alaska was completed in January 2021. The EFH Assessment details the potential impacts to fish, including salmon and other species that are marine mammal prey as summarized below.

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

Krill and fish populations in the vicinity of the proposed action 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 action may cause displacement of small schooling fish from the construction area; however, such distribution shifts are likely to be temporary and localized and it is expected that fish will return to the immediate area 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 proposed action is very small compared to the available habitat in the Sitka Sound. 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 or sustained.

Table 13. EFH Species Present in Sitka Channel

Species	Life stage(s) Found at Project Location
Alaska plaice (*Pleuronectes quadrituberculatus*)	adult
Aleutian skate (*Bathyraja aleutica*)	adult
Arrowtooth flounder (*Atheresthes stomias*)	late juvenile and adult
Bigmouth sculpin (*Hemitripterus bolini*)	late juvenile and adult
Black rockfish (*Sebastes melonops*)	adult
Chinook salmon (*Oncorhynchus tshawytscha*)	immature and adult (marine)
Chum salmon (*O. keta*)	immature and adult (marine)
Coho salmon (*O. kisutch*)	juvenile (marine) and adult (marine)
Dover sole (*Microstomus pacificus*)	larvae and late juvenile
Dusky rockfish (*S. ciliatus*)	late juvenile
Great sculpin (*Myoxocephalus polyacanthocephalus*)	late juvenile and adult
Northern rock sole (*Lepidopsetta polyxystra*)	adult
Octopus (undefined)	adult
Pacific cod (*Gadus macrocephalus*)	late juvenile and adult
Pacific Ocean perch (*S. alutus*)	larvae
Pink salmon (*O. gorbuscha*)	juvenile (marine) and adult (marine)
Quillback rockfish (*S. maliger)*	adult
Redbanded rockfish (*S. babcocki*)	late juvenile
Redstriped rockfish (*S. proriger*)	late juvenile
Rosethorn rockfish (*S. helvomaculatus*)	late juvenile and adult
Sablefish (*Anoplopoma fimbria*)	larvae
Shortraker rockfish (*S. borealis*)	late juvenile
Shortspine thornyhead rockfish (*Sebastolobus alascanus*)	adult
Sockeye salmon (*O. nerka*)	immature, juvenile (marine), and adult (marine)

Species	Life stage(s) Found at Project Location
Silvergray rockfish (*S. brevispinis*)	late juvenile
Walleye pollock (*Gadus chalcogrammus*)	egg and adult
Yellow Irish lord (*Hemilepidotus jordani*)	adult
Yellowfin sole (*Limanda aspera*)	egg and adult

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 Sitka Seaplane Base Marine Mammal Monitoring and Mitigation Plan (Appendix A).

11.1 MITIGATION MEASURES DESIGNED TO REDUCE PROJECT IMPACTS

The project uses the most compact design possible, while meeting the demands of the seaplanes that would use the facility.

- The project uses a design that does not require dredging or in-water blasting and, to the extent possible given project requirements, minimizes fill and on-land blasting.
- The project uses a design that incorporates the smallest diameter piles practicable while still minimizing the overall number of piles.
- The float will be located in deep water to avoid light limitation and grounding impacts to the intertidal or shallow subtidal zones.
- Floats or barges will not be grounded at any tidal stage.
- Construction will be suspended during the likely start of the herring spawning season and will not resume until after the spawning season concludes (anticipated March 15 to April 30).

11.2 OIL AND SPILL PREVENTION

- The contractor will provide and maintain a spill cleanup kit on-site at all times, to be implemented as part of the Shipboard Oil Pollution Emergency Plan for oil spill prevention and response.
- Fuel hoses, oil drums, oil or fuel transfer valves and fittings, and similar equipment will be checked regularly for drips or leaks, and would be maintained and stored properly to prevent spills.
- Oil booms will be readily available for oil or other fuel spill containment should any 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.

11.3 MITIGATION MEASURES DESIGNED TO REDUCE IMPACTS TO ESA-LISTED SPECIES AND MARINE MAMMALS

- Pile driving softening material will be used to minimize noise during vibratory and impact pile driving. Much of the noise generated during pile installation comes from contact between the pile being driven and the steel template used to hold the pile in place. The contractor will use high-density polyethylene or ultra-high-molecular-weight polyethylene softening material on all templates to eliminate steel on steel noise generation.

- Ramp-up (soft start) procedures will be applied prior to beginning pile driving activities each day and/or when pile driving hammers have been idle for more than 30 minutes:
  - For impact pile driving, contractors will be required to provide an initial set of three strikes from the hammer at 40 percent energy, followed by a 30-second waiting period. This procedure will be repeated twice more prior to operational impact pile driving.
- A sediment curtain will be employed during the placement of fill and all DTH-drilling activities to contain fill and drill spoils as much as possible to allow them to settle to the sea floor in the immediate area rather than increasing turbidity over a wider area.
- One to three (depending on in-water activity) NMFS-approved protected species observers (PSOs), able to accurately identify and distinguish species of Alaska marine mammals, will be present before and during all in-water construction activities (Appendix C).
- The contractor is required to conduct briefings for construction supervisors and crews, the PSO team, and CBS staff prior to the start of all pile driving activity and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
- Prior to pile driving, the action area would be surveyed for marine mammal presence for 30 minutes. If any marine mammal is sighted within a shutdown zone during this 30-minute survey period prior to pile driving, or during the soft-start, CBS would delay pile driving/removal until the animal(s) is confirmed to have moved outside of and on a path away from the area or if 15 minutes (for pinnipeds or small cetaceans) or 30 minutes (for large cetaceans and sea otters) have elapsed since the last sighting of the marine mammal within the shutdown zone.
  - 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: (1) movement of the barge to the pile location; (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile); (3) removal of the pile from the water column/substrate via a crane (i.e., deadpull); (4) the placement of sound attenuation devices around the piles; or (5) placement of fill. For these activities, monitoring would take place from 15 minutes prior to initiation until the action is complete.
- To ensure that the action area has been surveyed for marine mammal presence, pile driving/removal would not begin until a PSO has given a notice to proceed.
- PSOs will be approved by NMFS prior to deployment. PSO resumes will be provided to the NMFS consultation biologist for approval at least one week prior to the start of in-water work. The agency will provide a brief explanation in instances where a PSO is not approved.
- Prior to in-water construction activities, a shutdown zone will be established (Figure 15 through Figure 20). For this project, the exclusion zone includes all marine waters within an established distance from the sound source.
- Prior to commencing in-water work or at changes in watch, PSOs will establish a point of contact with the construction crew. The PSO will brief the point of contact as to the

shutdown procedures if listed species are observed likely to enter or within the shutdown zone, and will request that the point of contact instruct the crew to notify the PSO when a marine mammal is observed. If the point of contact goes "off shift" and delegates his duties, the PSO must be informed and brief the new point of contact.

- PSOs will be positioned such that they can collectively monitor the entirety of each activity's shutdown zone and adjacent waters. PSO locations will be coordinated with NMFS prior to PSO deployment.
- PSOs will have no other primary duties beyond watching for, acting on, and reporting events related to listed species.
- PSOs will work in shifts lasting no longer than four hours with at least a one-hour break from monitoring duties between shifts. PSOs will not perform PSO duties for more than 12 hours in a 24-hour period.
- The on-duty PSOs will continuously monitor the shutdown zone and adjacent waters for the presence of listed species during all in-water operations.
- In-water activities will take place only:
    a. between civil dawn and civil dusk when PSOs can effectively monitor for the presence of marine mammals;
    b. during conditions with a Beaufort Sea State of 4 or less;
    c. when the entire shutdown zone and adjacent waters are visible (e.g., monitoring effectiveness is not reduced due to rain, fog, snow, volcanic ash, etc.).
- If visibility degrades to where the PSO cannot ensure that the entire largest Level A shutdown zone remains devoid of listed species during in-water work, the crew will cease in-water work until the entire largest Level A shutdown zone is visible and the PSO has indicated that the zone has remained devoid of listed species for 30 minutes.
- PSOs will have the ability and authority to initiate appropriate mitigation responses, including shutdowns, to avoid takes of listed species.
- The PSO will order the in-water activities to immediately cease if one or more listed species has entered, or appears likely to enter, the associated shutdown zone.
- If in-water activities are shut down for less than 30 minutes due to the presence of listed species in the shutdown zone, in-water work may commence when the PSO provides assurance that listed species were observed exiting the shutdown zone. Otherwise, the activities may only commence after the PSO provides assurance that listed species have not been seen in the shutdown zone for 30 minutes (for cetaceans) or 15 minutes (for pinnipeds).
- Following a lapse of in-water activities of more than 30 minutes, the PSO will authorize resumption of activities (using soft-start procedures for impact pile driving activities) only after assuring that listed species have not been present in the shutdown zone for at least 30 minutes.
- If a listed species is harassed, harmed, injured, or disturbed due to non-construction related activities, PSOs will immediately report that occurrence to the NMFS Office of Law Enforcement (AK Hotline): 1-800-853-1964.

- To determine the location of observed marine mammal species, take action if marine mammal species enter the exclusion zone, and record these events, PSO(s) will use the following:
  a. Binoculars (7x50 or higher magnification)
  b. Range finder
  c. Tide table
  d. Watch or chronometer
  e. GPS
  f. Stand-alone compass
  g. Grid map
  h. Legible copy of the NMFS's biological opinion for this project and all appendices
  i. Legible and fillable observation record form allowing for required PSO data entry
  j. Two-way radio communication with construction foreman/superintendent
  k. A log book of all activities which will be made available to NMFS upon request
- All in-water work will be completed within approximately 1,559 hours over 166 days (not consecutive).
- If a listed marine mammal is determined by the PSO to have been disturbed, harassed, harmed, injured, or killed (e.g., a listed marine mammal(s) is injured or killed or is observed entering a shutdown zone before operations can be shut down [unauthorized takes]), it will be reported to NMFS at akr.section7@noaa.gov within one business day. These PSO reports will include:
  a. information to be provided in the final report (see Mitigation Measures under the *Data Collecting and Reporting* heading below);
  b. the number and species of listed animals affected;
  c. the date, time, and location of each event (with geographic coordinates or identified grid from the grid map);
  d. a description of the event;
  e. the time the mammal(s) was first observed or entered the shutdown zone, and, if known, the time the animal was last seen or exited the zone, and the fate of the animal;
  f. mitigation measures implemented before and after the animal was taken;
  g. if a vessel struck a marine mammal, the contact information for the PSO on duty, or the contact information for the individual piloting the vessel if there was no PSO on duty; and
  h. photographs or video footage of the animal(s), if available.
- If PSOs observe an injured, sick, or dead marine mammal (i.e., stranded marine mammal), they will notify the Alaska Marine Mammal Stranding Hotline at 877-925-7773. The PSOs will submit photos and data that will aid NMFS in determining how to respond to the stranded animal. Data submitted to NMFS in response to stranded marine mammals will include date/time, the location of stranded marine mammal, the species and number of stranded marine mammals, a description of the stranded marine

mammal's condition, event type (e.g., entanglement, dead, floating), and the behavior of live-stranded marine mammals.

- 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).
  a. Data submitted to NMFS will include date/time, location, description of the event, and any photos or videos taken.
- Lines attached to heavy items on the ocean bottom (e.g., anchors, traps, instruments) will incorporate weak links at the point of connection that can be broken by entangled whales.

11.4 STRIKE AVOIDANCE AND VESSEL TRANSIT MITIGATION MEASURES

- Vessel (skiff and barge) operators will take reasonable precautions to avoid interaction with listed marine mammals by taking the following actions:
  a. Vessel operators will maintain a watch for listed marine mammals at all times while underway.
  b. Vessels will stay at least 91 meters (100 yards) away from listed marine mammals, or 460 meters (500 yards) from endangered North Pacific right whales (50 CFR § 224.103(d)).
  c. Operators will reduce vessel speed to less than 5 knots (9 kilometers/hour) when within 274 meters (300 yards) of a whale.
  d. Unless necessary to reduce the risk of collision, vessel operators will avoid changes in direction and speed when within 274 meters (300 yards) of whales.
  e. Vessel operators will not position vessel(s) in the path of whales, and will not cut in front of whales in a way or at a distance that causes the cetaceans to change their direction of travel or behavior (including breathing/surfacing pattern).
  f. Operate vessel(s) to avoid causing a whale to make changes in direction.
  g. Check the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.
  h. Reducing vessel speed to 10 knots or less when weather conditions reduce visibility to 1.6 kilometers (1 mile) or less.
- If a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 meters (100 yards) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel. Vessels will remain 460 meters (500 yards) from North Pacific right whales (50 CFR § 224.103(d)).
- If the vessel is taken out of gear, vessel crew will ensure that no whales are within 50 meters of the vessel when propellers are re-engaged, minimizing risk of marine mammal injury.
- Vessels will take reasonable steps to alert other vessels in the area to the presence of whales in the vicinity.
- Vessels will not allow lines to remain in the water, and no trash or other debris will be thrown overboard, thereby reducing the potential for marine mammal entanglement.

- The transit route for the vessels will avoid designated critical habitat to the extent practicable.
- For North Pacific right whales vessels will:
    a. remain 460 meters (500 yards) from North Pacific right whales (50 CFR § 224.103(d); or
    b. avoid traveling within or through North Pacific right whale critical habitat (73 FR 19000). If travel within or through North Pacific right whale critical habitat cannot be avoided:
    c. vessels will travel through North Pacific right whale critical habitat at 5 knots or less; or
    d. vessels will travel through North Pacific right whale critical habitat at 10 knots or less while PSOs maintain a constant watch for marine mammals from the bridge;
    e. vessel speed while within North Pacific right whale critical habitat will not exceed 10 knots; and
    f. operators will maintain a ship log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat.
- For WDPS Steller Sea Lions:
    a. vessels will not approach within 5.5 kilometers (3 nautical miles) of rookery sites listed in (50 CFR § 224.103(d)); and
    b. vessels will avoid approaching within 914 meters (3,000 feet) of any Steller sea lion haulout or rookery.

11.5 MONITORING AND SHUTDOWN AREAS

For species where take is permitted, Level A and Level B harassment zones will be implemented as monitoring areas with a 10-meter shutdown area for approved construction activities. For species where take is not permitted, Level B harassment zones will be implemented as shutdown areas for all applicable construction activities.

11.5.1 LEVEL A HARASSMENT ZONES

CBS is requesting take by Level A harassment of harbor porpoise, harbor seal, and Steller sea lion. The CBS will implement shutdowns to protect marine mammals without authorized take from incurring Level A harassment as shown in Table 14 for Phase I and Table 15 for Phase II. Figure 15 through Figure 19 show the Level A harassment zones by sound for Phase I and Phase II. These shutdowns will prevent auditory injury during in-water pile driving activities.

Table 14. Sitka SPB Project Level A Harassment Zones — Phase I

Activity	Level A Harassment Zones (meters; Area [sq km])[1,2]				
	LF	MF	HF	PW (min. shutdown)	OW
In-Water Activities					
Barge movements, pile positioning, etc. (throughout construction)[3]	10 (0.02)	10 (0.02)	10 (0.02)	10 (0.02)	10 (0.02)
Vibratory Pile Removal/Installation					
16-inch steel temporary installation 12 piles, 60 minutes/day (2.0 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
16-inch steel temporary removal 12 piles, 60 minutes/day (2.0 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
16-inch steel permanent installation 10 piles, 60 minutes/day (1.7 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
24-inch steel permanent installation 16 piles, 60 minutes/day (2.7 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
DTH Pile Installation					
16-inch steel permanent installation 10 piles, 2.0 hours/day (5.0 days)	60 (0.04)	10 (0.02)	75 (0.05)	35 (0.03)	10 (0.02)
24-inch steel permanent installation 16 piles, 3.0 hours/day (8.0 days)	570 (0.36)	30 (0.03)	680 (0.44)	305 (0.17) *125[2,4]	30 (0.03)
Impacting Pile Installation					
16-inch steel temporary installation 12 piles, 20 minutes/day (3.0 days)	235 (0.13)	10 (0.02)	275 (0.16)	125 (0.07)	10 (0.02)
16-inch steel permanent installation 10 piles, 20 minutes/day (2.5 days)	235 (0.13)	10 (0.02)	275 (0.16)	125 (0.07)	10 (0.02)
24-inch steel permanent installation 16 piles, 20 minutes/day (4.0 days)	315 (0.18)	20 (0.02)	375 (0.22)	170 (0.09) *125[2,4]	20 (0.02)

[1] Level A harassment zone distances refer to the maximum radius of the zone and are rounded.
[2] Area within the harassment zone isopleth is provided in parentheses for each distance, rounded to the nearest 5 meters. For species with a smaller shutdown zone isopleth in addition to the harassment zone isopleth, area is provided for the larger harassment zone isopleth. The smaller shutdown zone isopleth distance is indicated with an asterisk (*).
[3] Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.
[4] CBS is requesting a 125-meter minimum shutdown zone for large Level A distances for PW pinnipeds. 125 meters was selected because that is mostly within the channel breakwaters and because it is similar to values used for other projects.

Table 15. Sitka SPB Project Level A Harassment Zones — Phase II

Activity	Level A Harassment Zones (meters; Area [sq km])[1, 2]				
	LF	MF	HF	PW (min. shutdown)	OW
In-Water Activities					
Barge movements, pile positioning, etc. (throughout construction)[3]	10 (0.02)	10 (0.02)	10 (0.02)	10 (0.02)	10 (0.02)
Vibratory Pile Removal/Installation					
16-inch steel temporary installation 6 piles, 60 minutes/day (1.0 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
16-inch steel temporary removal 6 piles, 60 minutes/day (1.0 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
24-inch steel permanent installation 6 piles, 60 minutes/day (1.0 days)	10 (0.02)	10 (0.02)	20 (0.02)	10 (0.02)	10 (0.02)
DTH Pile Installation					
24-inch steel permanent installation 6 piles, 4 hours/day (3.0 days)	570 (0.36)	30 (0.03)	680 (0.44)	305 (0.17) *125[2,4]	30 (0.03)
Impacting Pile Installation					
16-inch steel temporary installation 6 piles, 20 minutes/day (1.5 days)	235 (0.13)	10 (0.02)	275 (0.16)	125 (0.07)	10 (0.02)
24-inch steel permanent installation 6 piles, 20 minutes/day (1.5 days)	315 (0.18)	20 (0.02)	375 (0.22)	170 (0.09) *125[2,4]	20 (0.02)

[1] Level A harassment zone distances refer to the maximum radius of the zone and are rounded.
[2] Area within the harassment zone isopleth is provided in parentheses for each distance, rounded to the nearest 5 meters. For species with a smaller shutdown zone isopleth in addition to the harassment zone isopleth, area is provided for the larger harassment zone isopleth. The smaller shutdown zone isopleth distance is indicated with an asterisk (*).
[3] Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.
[4] CBS is requesting a 125-meter minimum shutdown zone for large Level A distances for PW pinnipeds. 125 meters was selected because that is mostly within the channel breakwaters and because it is similar to values used for other projects.

Figure 15. Sitka SPB Project Level A LF Harassment Zones – Phase I & II

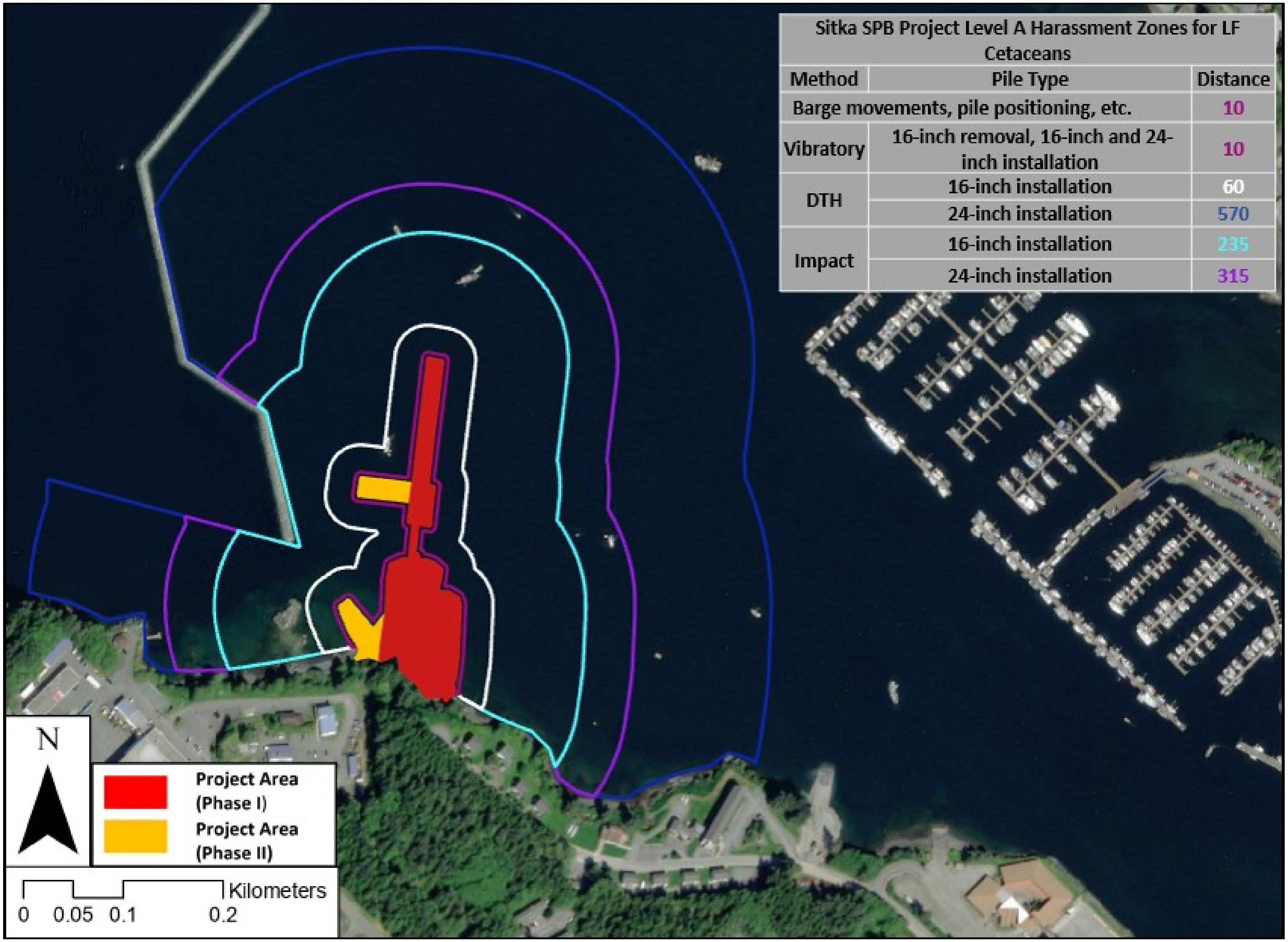
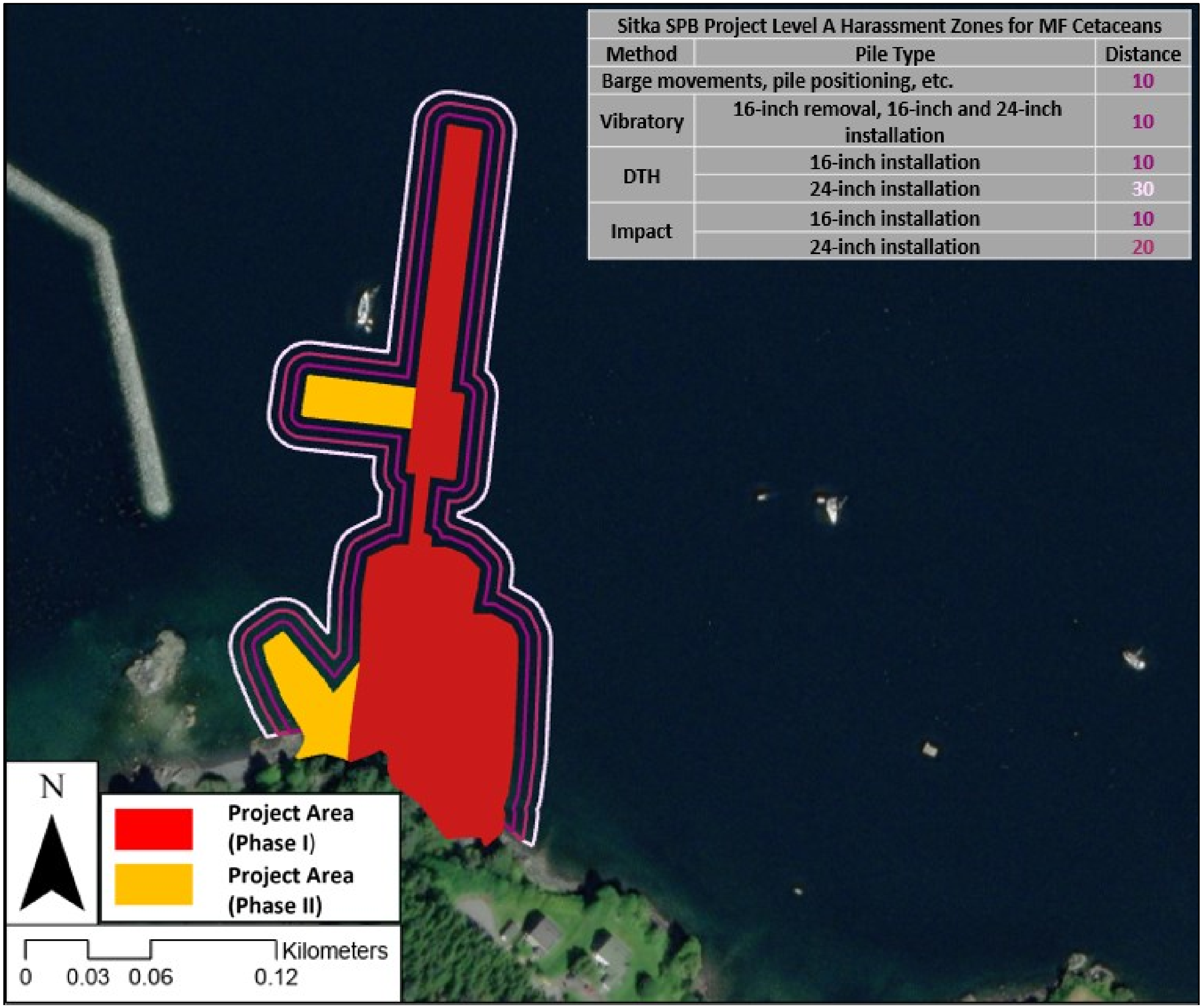


Figure 16. Sitka SPB Project Level A MF Harassment Zones – Phase I & II



Sitka SPB Project Level A Harassment Zones for MF Cetaceans		
Method	Pile Type	Distance
Barge movements, pile positioning, etc.		10
Vibratory	16-inch removal, 16-inch and 24-inch installation	10
DTH	16-inch installation	10
	24-inch installation	30
Impact	16-inch installation	10
	24-inch installation	20

Figure 17. Sitka SPB Project Level A HF Harassment Zones – Phase I & II

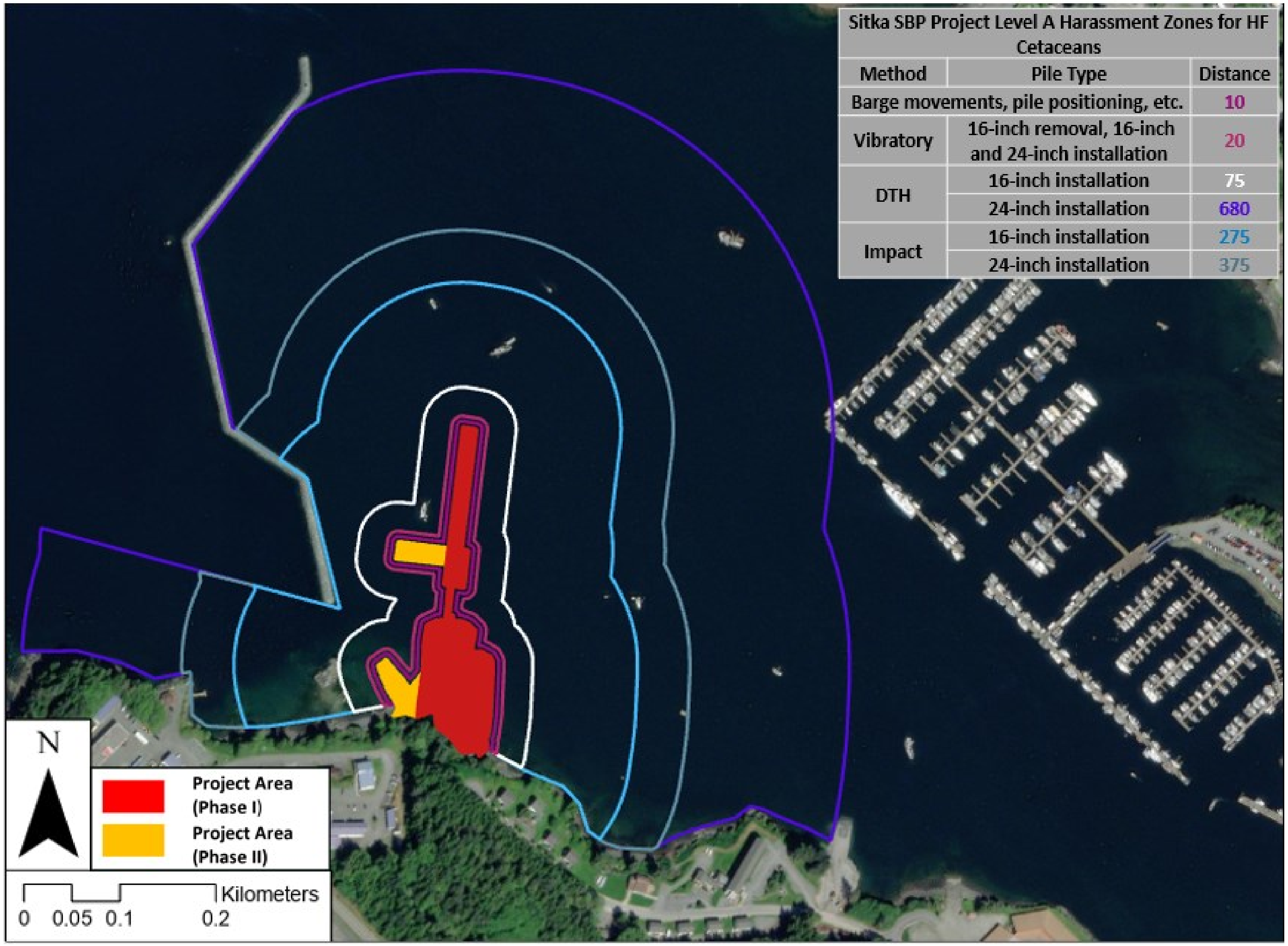


Figure 18. Sitka SPB Project Level A PW Harassment Zones – Phase I & II

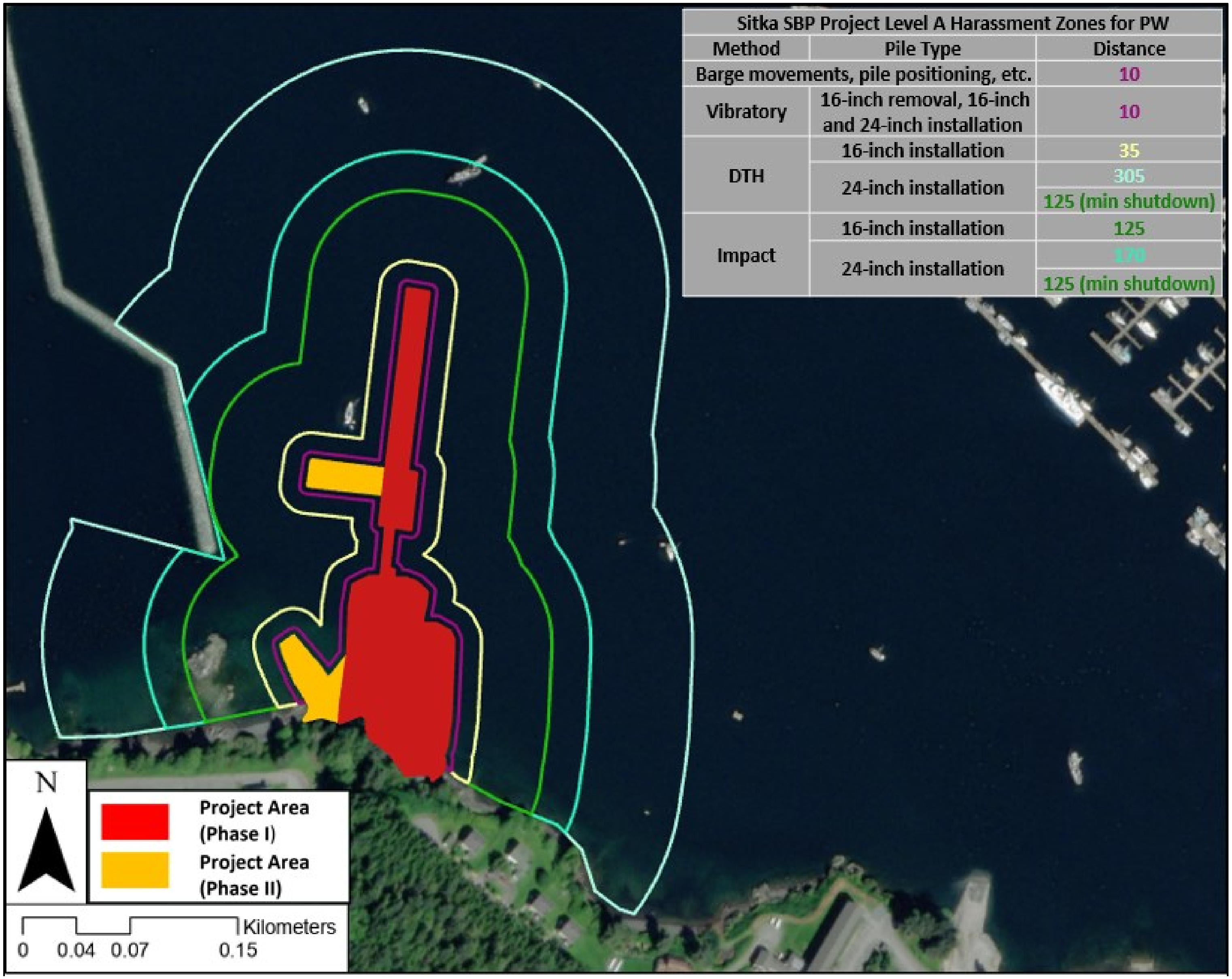
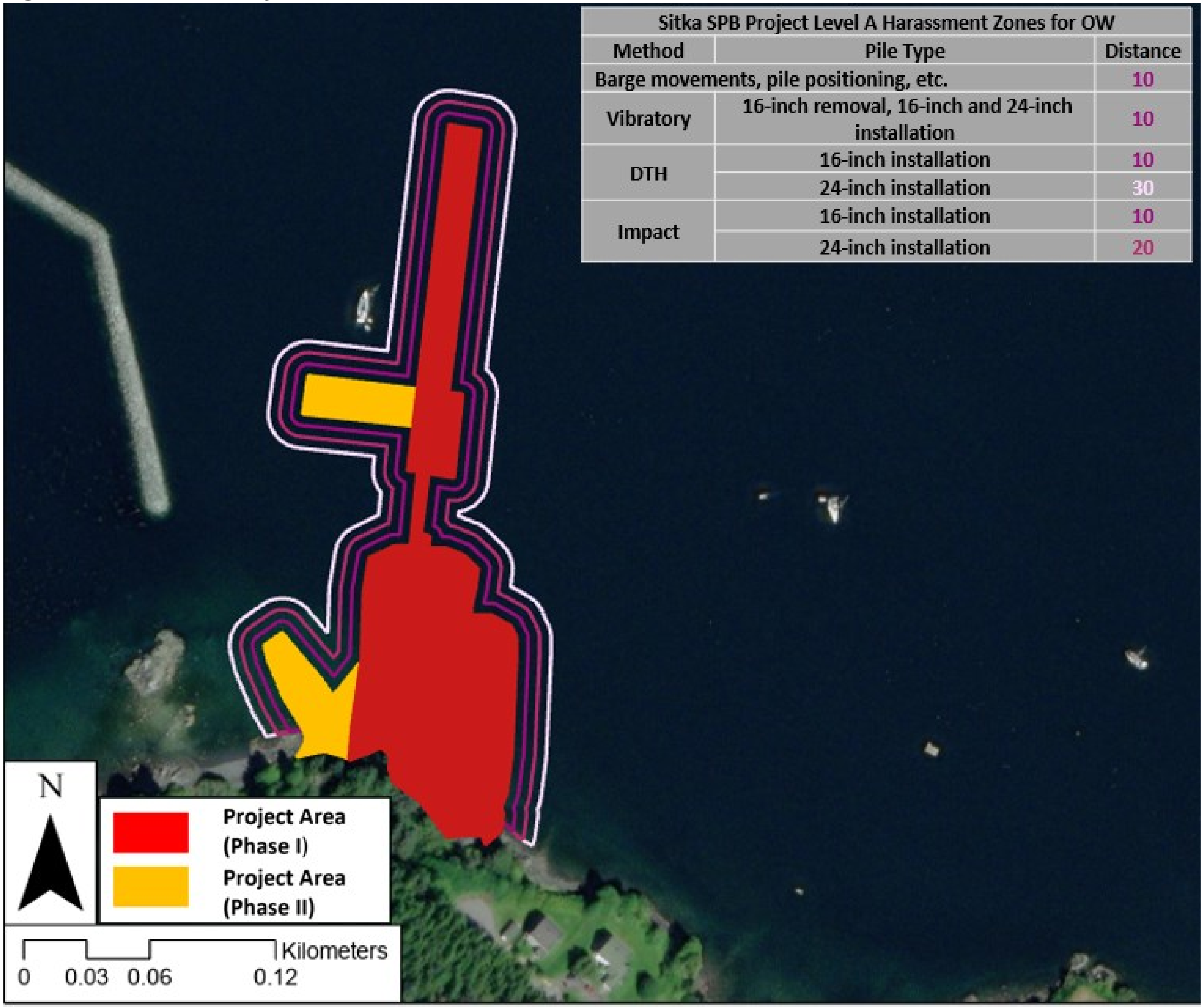


Figure 19. Sitka SPB Project Level A OW Harassment Zones – Phase I & II



11.5.2 LEVEL B HARASSMENT ZONES

The CBS is requesting Level B take of humpback whale, gray whale, minke whale, killer whale, harbor porpoise, harbor seal, and Steller sea lion incidental to constructing the new SPB. The harassment zones associated with Level B disturbance are outlined in Table 16 for Phase I and Table 17 for Phase II. Figure 20 shows the Level B harassment zones by sound for Phase I and Phase II.

In the unlikely event that a marine mammal species other than those addressed in this IHA were to enter the action area, in-water work would be shut down as summarized below to avoid Level B take of those species.

Table 16. Sitka SPB Project Level B Harassment Zones – Phase I

Source	Level B Harassment Zones (meters; Area [sq km])[1]
Vibratory Pile Removal/Installation	
16-inch steel temporary installation 10 piles, 60 minutes/day (2.0 days)	5,415 (2.07)
16-inch steel temporary removal 10 piles, 60 minutes/day (2.0 days)	5,415 (2.07)
16-inch steel permanent installation 10 piles, 60 minutes/day (1.7 days)	5,415 (2.07)
24-inch steel permanent installation 16 piles, 60 minutes/day (2.7 days)	5,415 (2.07)
DTH Pile Installation	
16-inch steel permanent installation 10 piles, 2.0 hours/day (5.0 days)	13,600[2] (2.40; Stopped at 8,500 meters)
24-inch steel permanent installation 16 piles, 3.0 hours/day (8.0 days)	13,600[2] (2.40; Stopped at 8,500 meters)
Impacting Pile Installation	
16-inch steel temporary installation 12 piles, 20 minutes/day (3.0 days)	465 (0.28)
16-inch steel permanent installation 10 piles, 20 minutes/day (2.5 days)	465 (0.28)
24-inch steel permanent installation 16 piles, 20 minutes/day (4.0 days)	1,000 (0.70)

[1]Level B harassment zone distances, in meters, refer to the maximum radius of the zone and are rounded (see Appendix B for calculated distances). Areas are provided for the harassment isopleth rounded to the nearest 5 meters.

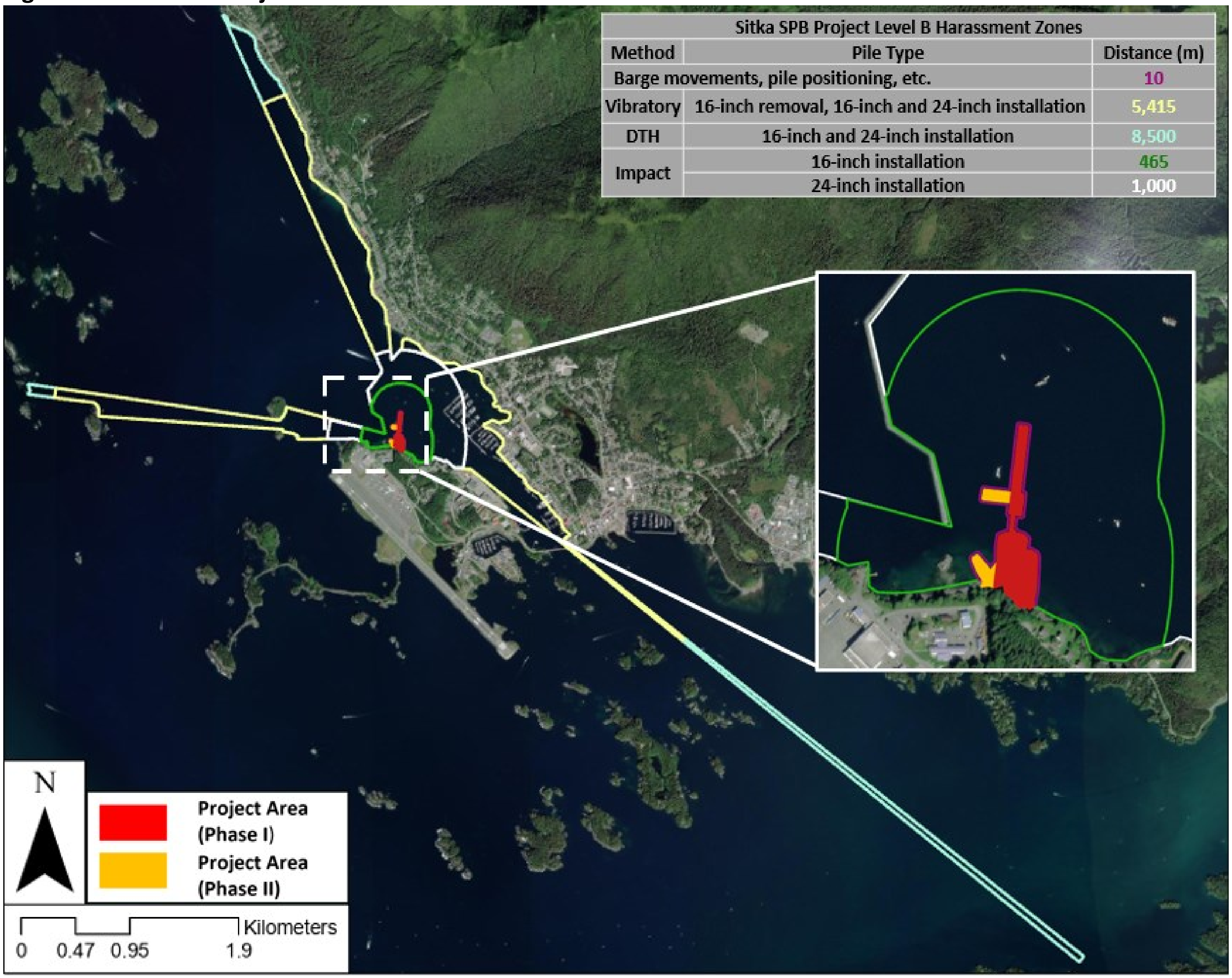
[2]The farthest distance that sound will transmit from the source is 8,500 meters before transmission is stopped by land masses. See Appendix B for calculated distances based on the practical spreading model. Since land masses prevent sound transmission, area is only provided for 8,500 meter zone

Table 17. Sitka SPB Project Level B Harassment Zones – Phase II

Source	Level B Harassment Zones (meters; Area [sq km])[1]
Vibratory Pile Removal/Installation	
16-inch steel temporary installation 6 piles, 60 minutes/day (1.0 days)	5,415 (2.07)
16-inch steel temporary removal 6 piles, 60 minutes/day (1.0 days)	5,415 (2.07)
24-inch steel permanent installation 6 piles, 60 minutes/day (1.0 days)	5,415 (2.07)
DTH Pile Installation	
24-inch steel permanent installation 6 piles, 4 hours/day (3.0 days)	13,600[2] (2.40; Stopped at 8,500 meters)
Impacting Pile Installation	
16-inch steel temporary installation 6 piles, 20 minutes/day (1.5 days)	465 (0.28)
24-inch steel permanent installation 6 piles, 20 minutes/day (1.5 days)	1,000 (0.70)

[1]Level B harassment zones, in meters, refer to the maximum radius of the zone and are rounded (see Appendix B for calculated distances). Areas are provided for the harassment isopleth rounded to the nearest 5 meters.
[2]The farthest distance that sound will transmit from the source is 8,500 meters before transmission is stopped by land masses. See Appendix B for calculated distances based on the practical spreading model. Since land masses prevent sound transmission, area is only provided for 8,500 meter zone.

Figure 20. Sitka SPB Project Level B Harassment Zones – Phase I & II



12 Arctic Plan of Coordination

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, submit either a plan of cooperation 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. (This requirement is applicable only for activities that occur in Alaskan waters north of 60° North latitude.)

Although the action area is located south of 60° north, the latitude NMFS regulations consider Arctic waters, and no activities will take place in or near traditional Arctic subsistence hunting areas, there are subsistence uses of marine mammals in Southeast Alaska including the community of Sitka. Alaska Natives have traditionally harvested subsistence resources, including marine mammals, in Southeast Alaska for hundreds of years.

Section 11 describes mitigation measures designed to reduce project impacts and Section 8 details subsistence information and consultations with subsistence users in the project vicinity.

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 Marine Mammal Monitoring and Mitigation Plan has been developed for the project and is included as Appendix C. Project shutdown and monitoring zones as outlined in Appendix B and Section 11.5 would be implemented during any in-water construction 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, CBS will notify NMFS and seek further consultation.

13.2 MONITORING REPORT

CBS will submit a draft report to NMFS not later than 90 days following the end of construction activities or 60 days prior to the issuance of any subsequent IHA for the project. CBS 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 conducted (monitoring period);
- Construction activities occurring during each daily observation period, including how many and what type of piles 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 sighting;
    - Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
    - Reason why shutdown was implemented (if needed);
    - If shutdown was implemented, behavioral reactions noted and if 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;

- A summary of the following:
  - Total number of individuals of each species detected within the Level B zone.
  - Total number of individuals of each species detected within the Level A zone and the average amount of time that they remained in that zone.
  - Daily average number of individuals of each species detected within the Level B zone, and estimated as taken, if appropriate.

CBS will also immediately report injured or dead marine mammals to NMFS, and if the specified activity clearly causes the take of marine mammals in a manner prohibited by the IHA (e.g., serious injury or mortality), CBS will immediately cease pile activities and report the incident to NMFS.

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 pile driving at the Sitka SPB site 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 Sitka Channel and Sitka Sound, 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: Sitka Seaplane Base Project Drawings

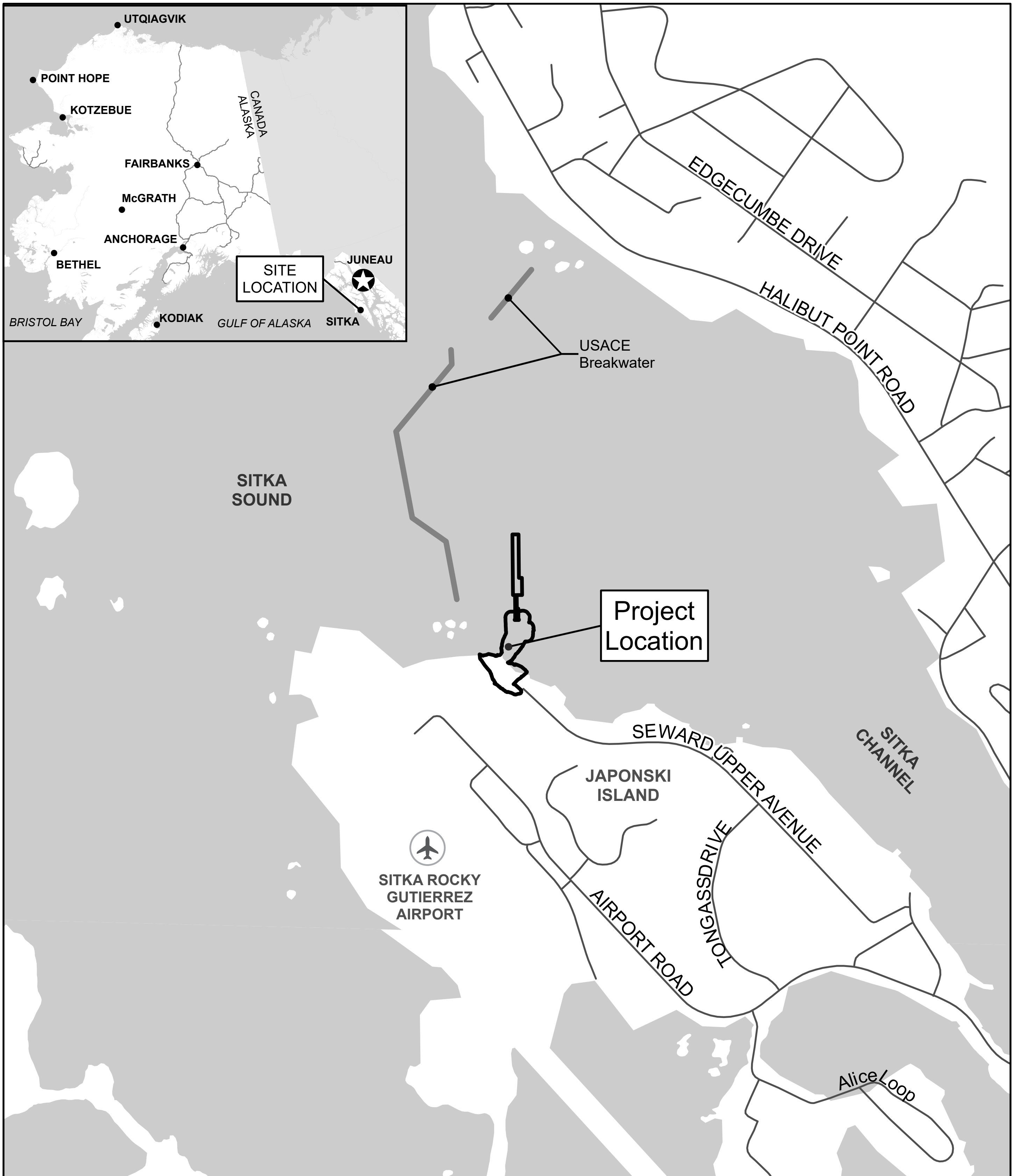

FIGURE 1: Vicinity Map

POA-2020-00370
Applicant: City and Borough of Sitka
Proposed Activity: Sitka Seaplane Base
Section 34-35 T 55 S, R 63 E Copper River Meridian USGS
Lat.: 57.055868° N Long.: 135.364283° W
Sheet: 1 of 6 Date: 7/6/2023

Project Outline
DOT&PF Road

N
0 0.1 0.2 Mile

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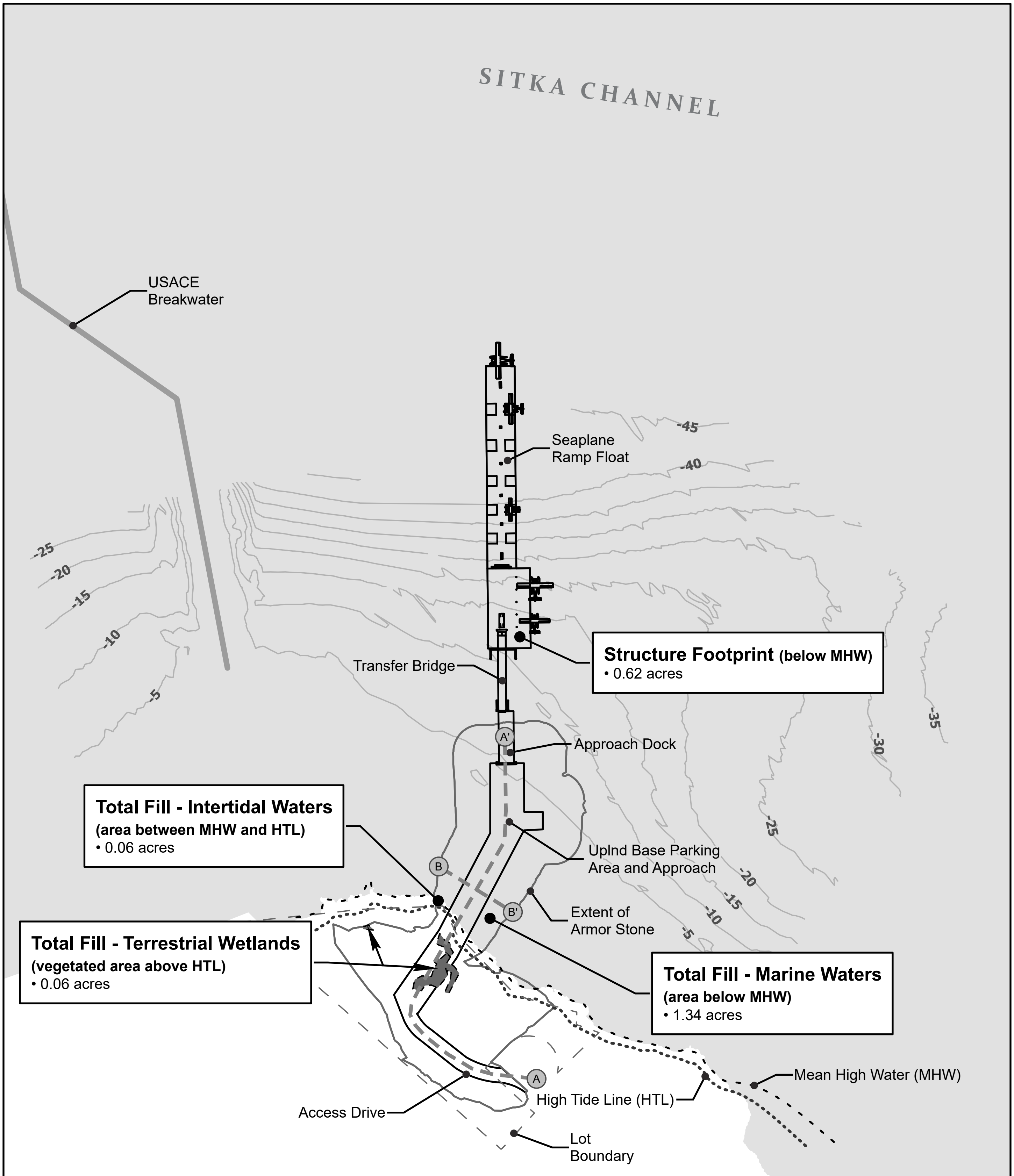

FIGURE 2: Plan View - Proposed

POA-2020-00370
Applicant: City and Borough of Sitka
Proposed Activity: Sitka Seaplane Base
Section 34-35 T 55 S, R 63 E Copper River Meridian USGS
Lat.: 57.055868° N Long.: 135.364283° W
Sheet: 2 of 6 Date: 7/6/2023

Lot Boundary
Waterbody
Wetland Impact
High Tide Line (HTL)
Mean High Water (MHW)
Water Depth (feet)

N

Feet
0 100 200

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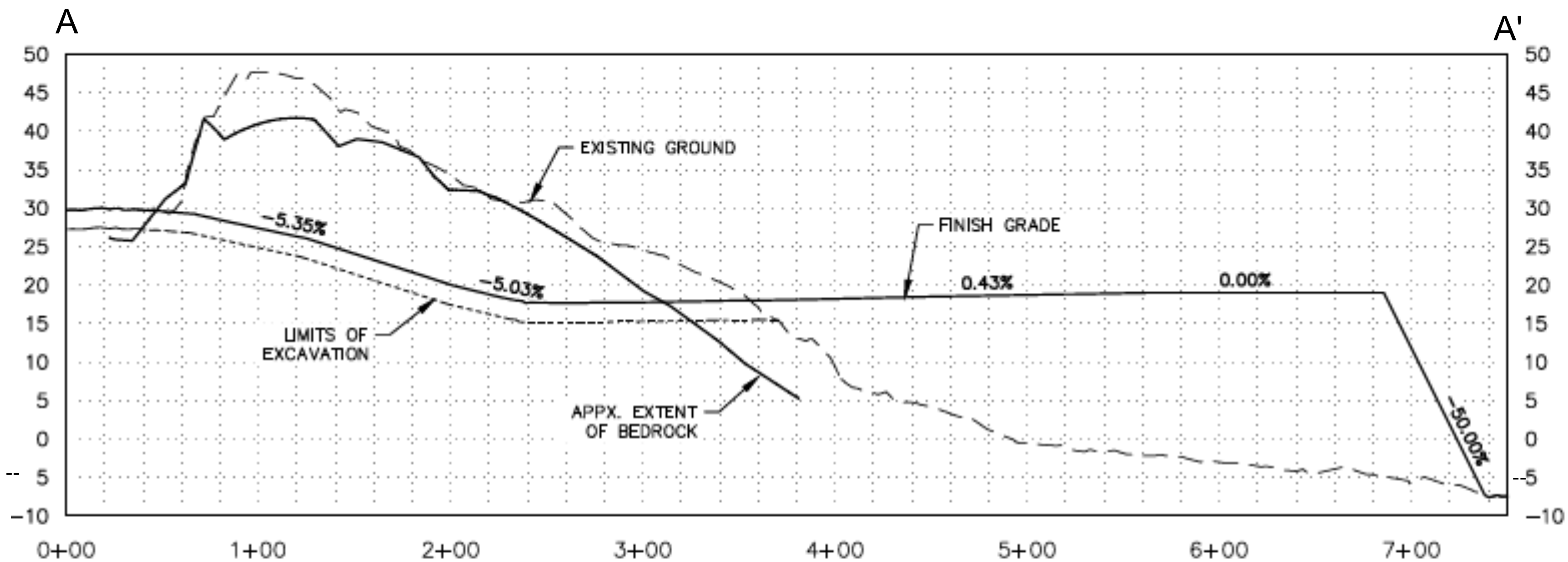
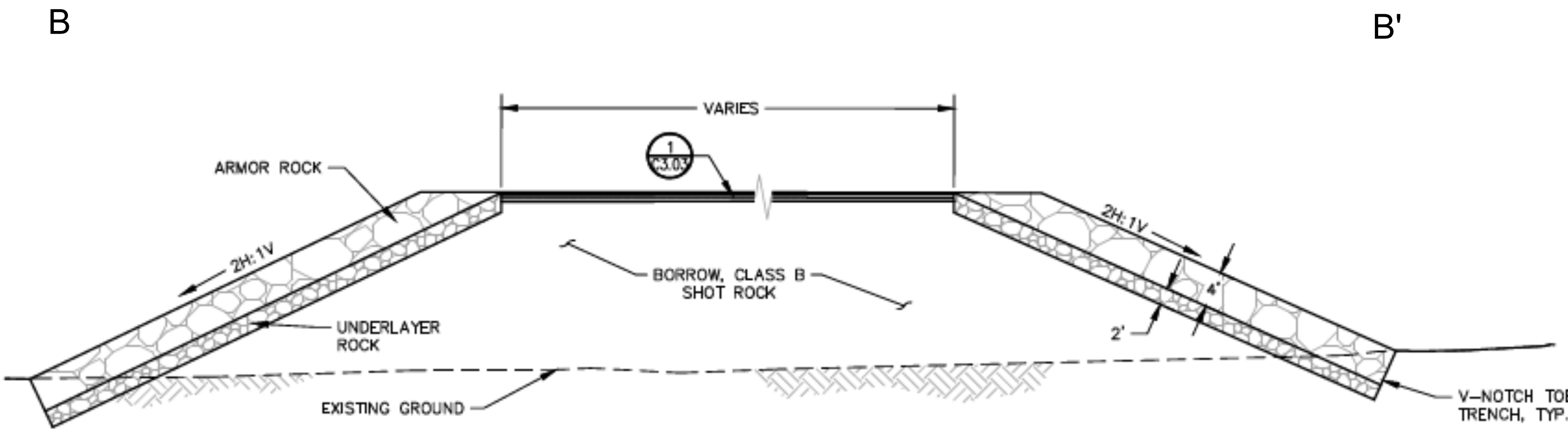


Site Centerline (A-A')

FIGURE 3A: Elevation View

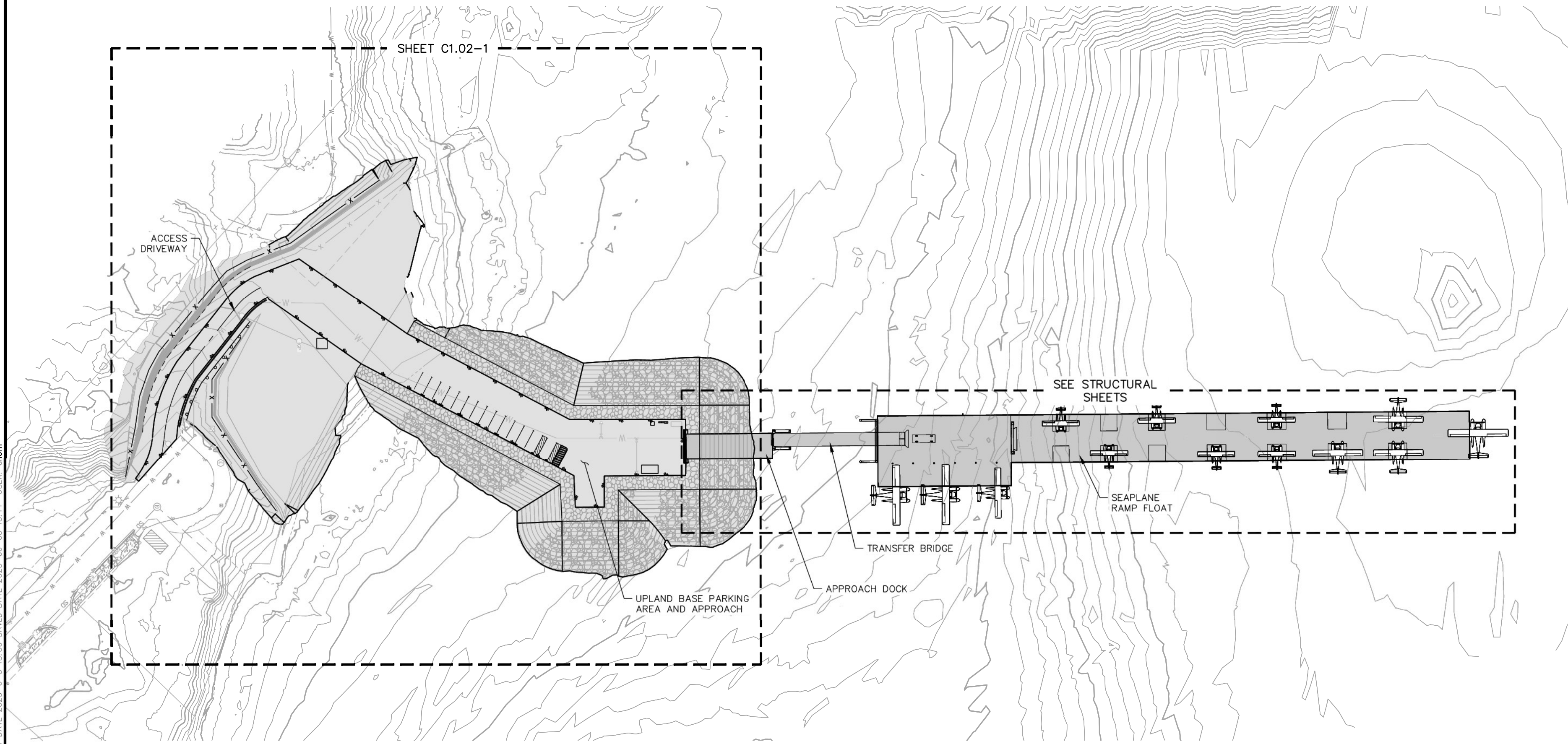
POA-2020-00370
Applicant: City and Borough of Sitka
Proposed Activity: Sitka Seaplane Base
Section 34-35 T 55 S, R 63 E Copper River Meridian USGS
Lat.: 57.055868° N Long.: 135.364283° W
Sheet: 3 of 6 Date: 7/6/2023



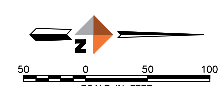
Uplands Section - Typical (B-B')

FIGURE 3B: Elevation View

POA-2020-00370
Applicant: City and Borough of Sitka
Proposed Activity: Sitka Seaplane Base
Section 34-35 T 55 S, R 63 E Copper River Meridian USGS
Lat.: 57.055868° N Long.: 135.364283° W
Sheet: 4 of 6 Date: 7/6/2023



OVERALL SITE PLAN - PHASE 1



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AECL848

NEW SITKA SEAPLANE BASE
SEWARD AVENUE, JAPONSKI ISLAND

OVERALL SITE PLAN - PHASE 1

1190 SEWARD AVENUE
CITY AND BOROUGH OF SITKA, ALASKA

PROJECT 2023.15127.01
DATE 6/5/2023

SHEET
C1.01-1

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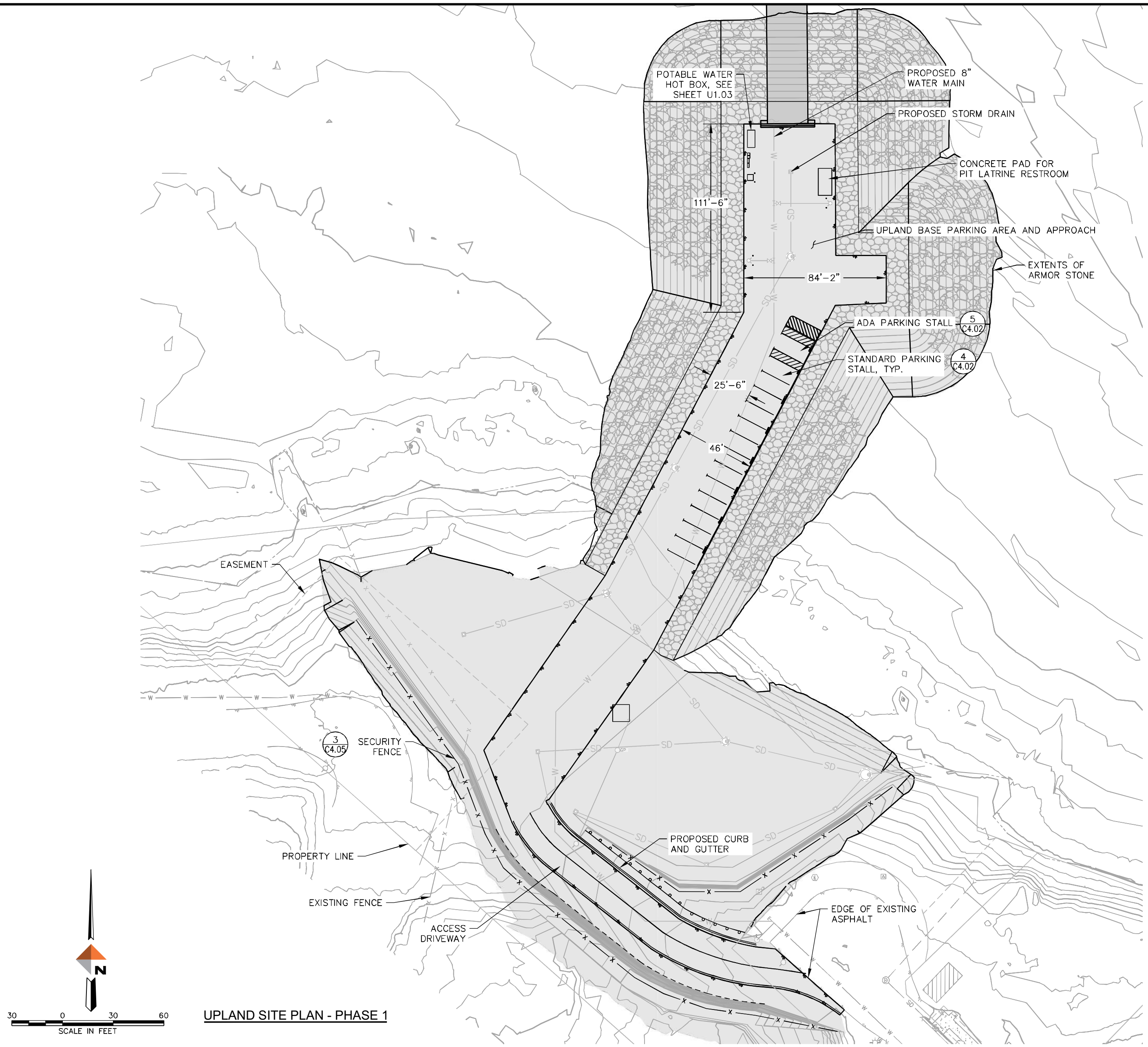

UPLAND SITE PLAN - PHASE 1

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UPLANDS SITE PLAN - PHASE 1

1190 SEWARD AVENUE
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PROJECT 2023.15127.01
DATE 6/5/2023

SHEET
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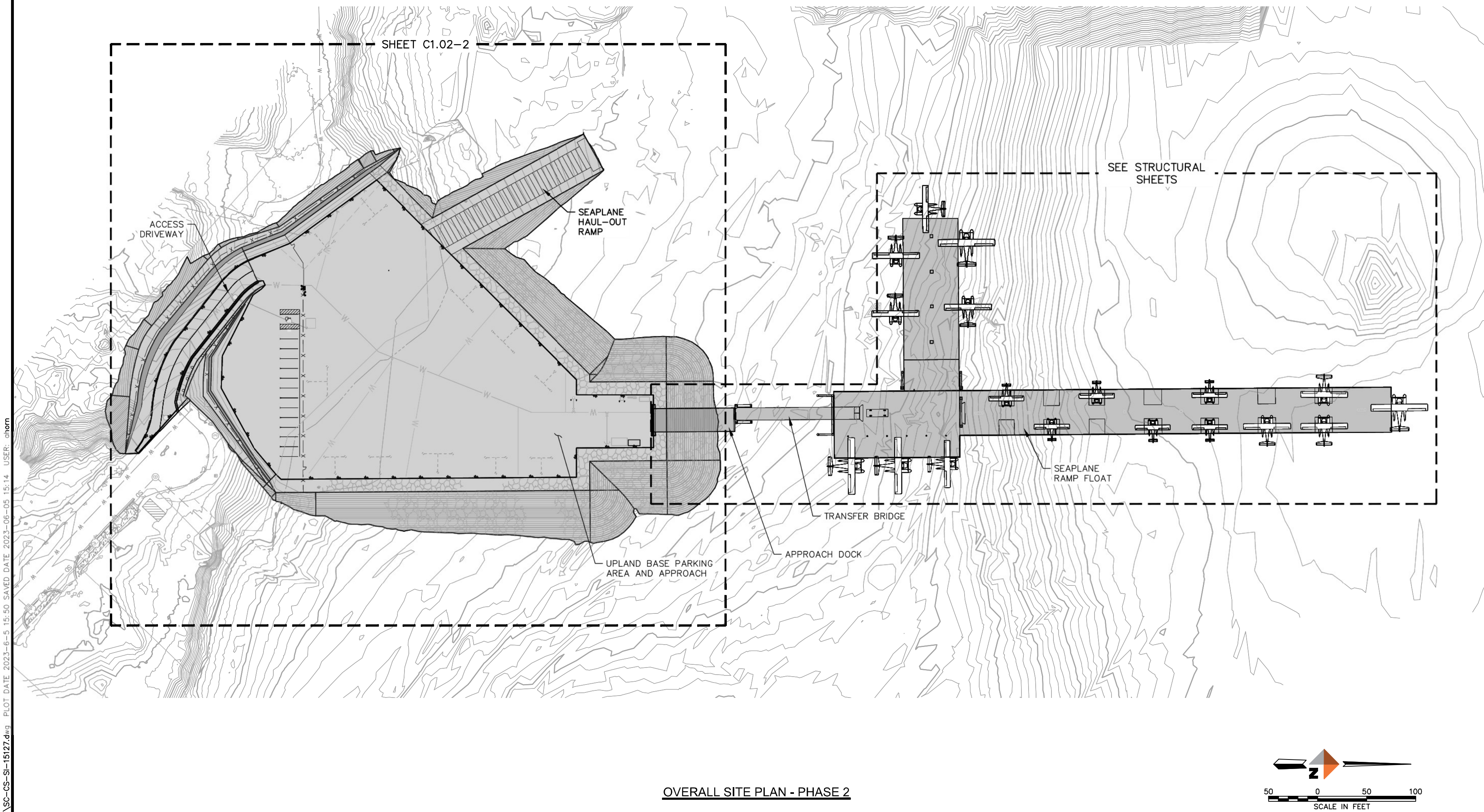

OVERALL SITE PLAN - PHASE 2

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NEW SITKA SEAPLANE BASE
SEWARD AVENUE, JAPONSKI ISLAND

OVERALL SITE PLAN - PHASE 2

1190 SEWARD AVENUE
CITY AND BOROUGH OF SITKA, ALASKA

PROJECT 2023.15127.01
DATE 6/5/2023

SHEET
C1.01-2

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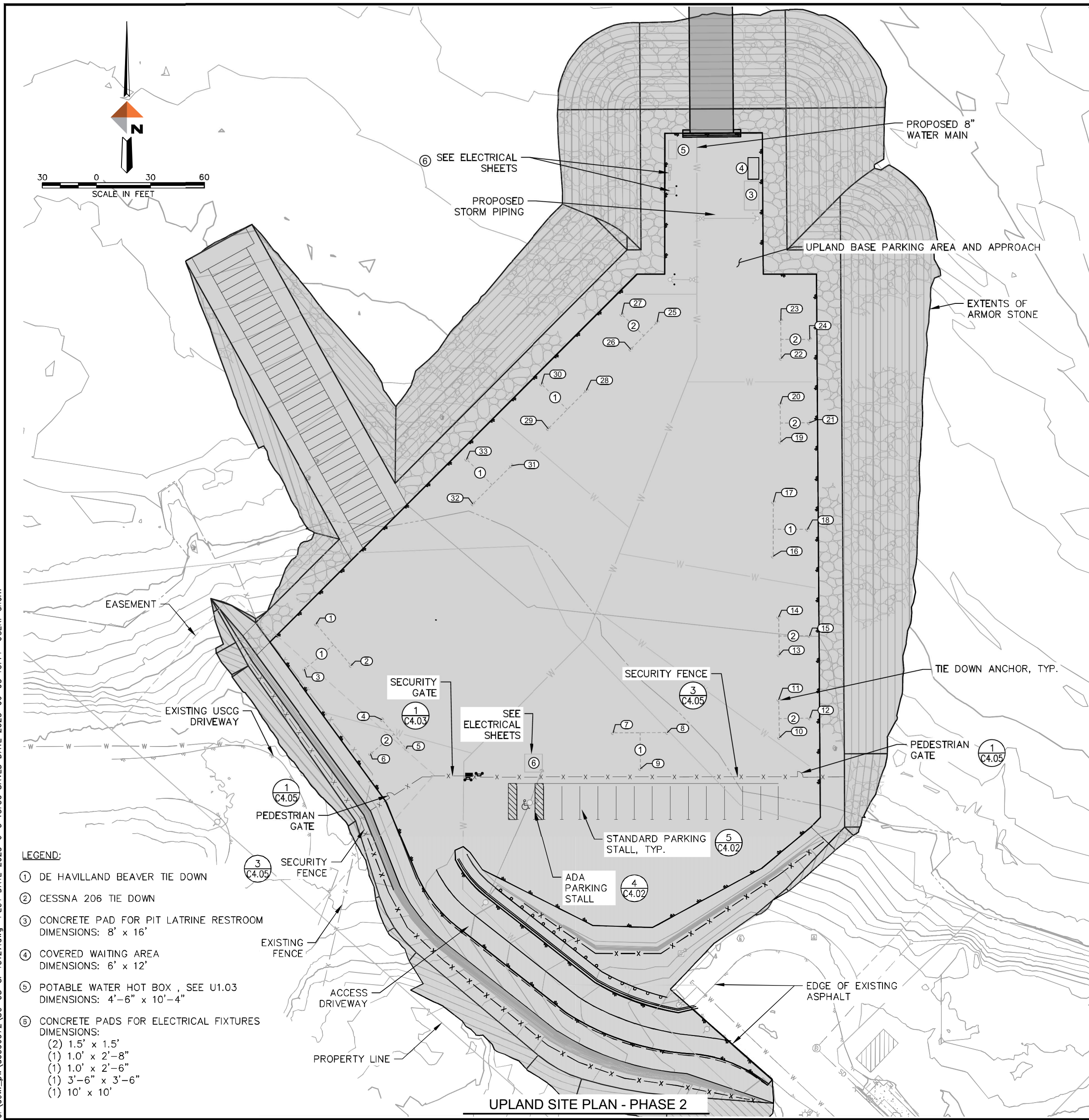

UPLAND SITE PLAN - PHASE 2

LEGEND:

1. DE HAVILLAND BEAVER TIE DOWN
2. CESSNA 206 TIE DOWN
3. CONCRETE PAD FOR PIT LATRINE RESTROOM DIMENSIONS: 8' x 16'
4. COVERED WAITING AREA DIMENSIONS: 6' x 12'
5. POTABLE WATER HOT BOX , SEE U1.03 DIMENSIONS: 4'-6" x 10'-4"
6. CONCRETE PADS FOR ELECTRICAL FIXTURES DIMENSIONS:
   - (2) 1.5' x 1.5'
   - (1) 1.0' x 2'-8"
   - (1) 1.0' x 2'-6"
   - (1) 3'-6" x 3'-6"
   - (1) 10' x 10'

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1911418.19	2347862.86	19.00	TIE DOWN 1: BEAVER – LEFT WING
2	1911395.20	2347882.14	19.00	TIE DOWN 1: BEAVER – RIGHT WING
3	1911393.21	2347856.41	19.00	TIE DOWN 1: BEAVER – TAIL
4	1911365.24	2347899.22	19.00	TIE DOWN 2: 206 – LEFT WING
5	1911349.15	2347912.71	19.00	TIE DOWN 2: 206 – RIGHT WING
6	1911346.28	2347892.93	19.00	TIE DOWN 2: 206 – TAIL
7	1911357.95	2348027.32	19.00	TIE DOWN 3: BEAVER – LEFT WING
8	1911358.10	2348057.32	19.00	TIE DOWN 3: BEAVER – RIGHT WING
9	1911338.02	2348042.42	19.00	TIE DOWN 3: BEAVER – TAIL
10	1911355.31	2348119.56	19.00	TIE DOWN 4: 206 – LEFT WING
11	1911376.31	2348119.18	19.00	TIE DOWN 4: 206 – RIGHT WING
12	1911366.11	2348136.37	19.00	TIE DOWN 4: 206 – TAIL
13	1911401.08	2348119.30	19.00	TIE DOWN 5: 206 – LEFT WING
14	1911422.08	2348119.14	19.00	TIE DOWN 5: 206 – RIGHT WING
15	1911411.73	2348136.22	19.00	TIE DOWN 5: 206 – TAIL
16	1911455.78	2348116.05	19.00	TIE DOWN 6: BEAVER – LEFT WING
17	1911485.78	2348116.21	19.00	TIE DOWN 6: BEAVER – RIGHT WING
18	1911470.67	2348135.13	19.00	TIE DOWN 6: BEAVER – TAIL
19	1911519.08	2348120.15	19.00	TIE DOWN 7: 206 – LEFT WING
20	1911540.08	2348119.99	19.00	TIE DOWN 7: 206 – RIGHT WING
21	1911529.71	2348136.07	19.00	TIE DOWN 7: 206 – TAIL
22	1911565.40	2348120.47	19.00	TIE DOWN 8: 206 – LEFT WING
23	1911586.40	2348120.31	19.00	TIE DOWN 8: 206 – RIGHT WING
24	1911576.02	2348136.39	19.00	TIE DOWN 8: 206 – TAIL
25	1911585.55	2348051.66	19.00	TIE DOWN 9: 206 – LEFT WING
26	1911570.44	2348037.08	19.00	TIE DOWN 9: 206 – RIGHT WING
27	1911589.80	2348032.13	19.00	TIE DOWN 9: 206 – TAIL
28	1911547.74	2348012.52	19.00	TIE DOWN 10: BEAVER – LEFT WING
29	1911526.43	2347991.41	19.00	TIE DOWN 10: BEAVER – RIGHT WING
30	1911551.16	2347987.75	19.00	TIE DOWN 10: BEAVER – TAIL
31	1911505.87	2347970.83	19.00	TIE DOWN 11: BEAVER – LEFT WING
32	1911484.75	2347949.53	19.00	TIE DOWN 11: BEAVER – RIGHT WING
33	1911509.51	2347946.10	19.00	TIE DOWN 11: BEAVER – TAIL

NOTES:

1. SECURITY GATE SHALL EXTEND TO THE EDGE OF SLOPE OF ARMOR ROCK. SEE DETAIL X, SHEET C5.04 FOR FENCE POST INSTALLMENT.

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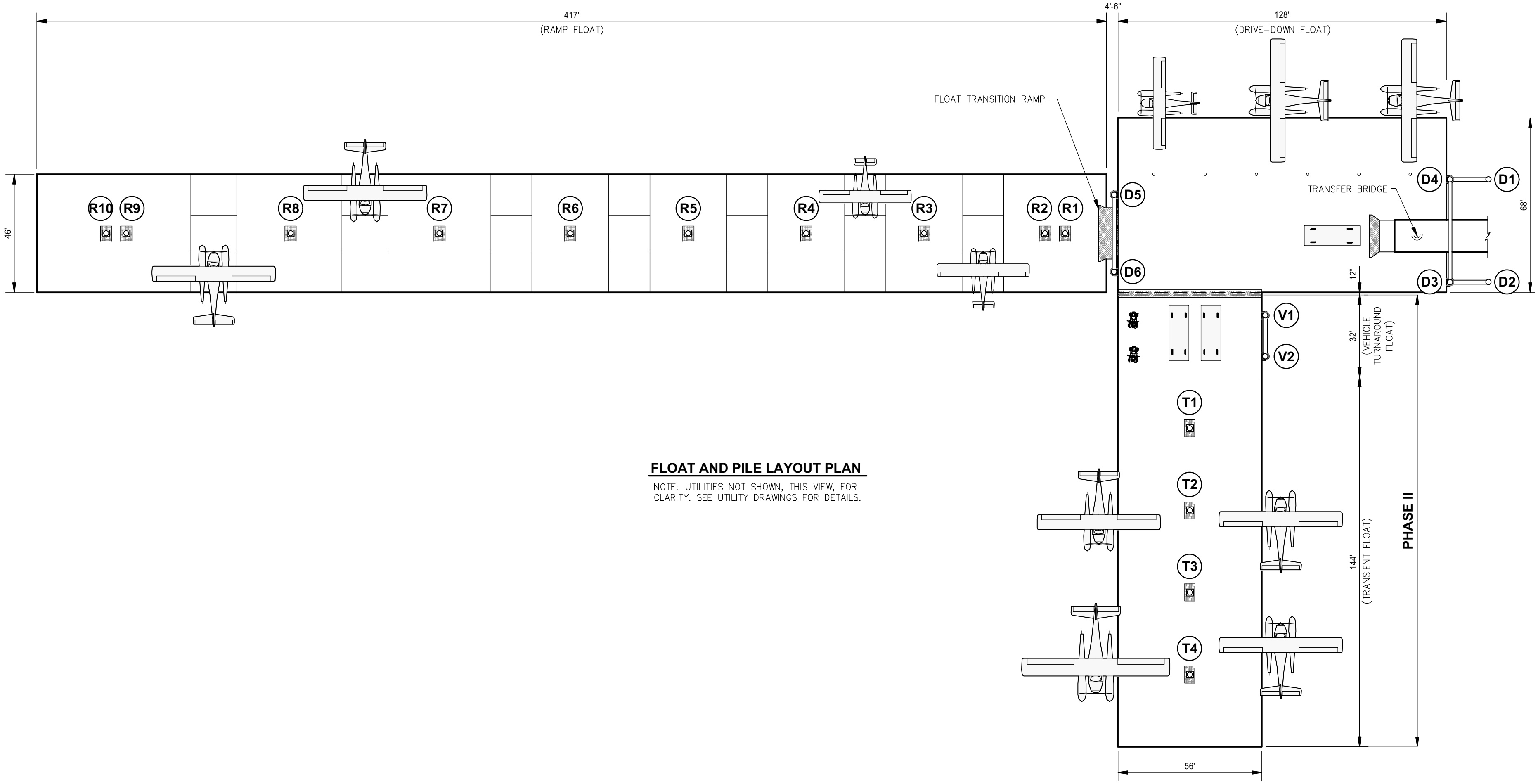
NEW SITKA SEAPLANE BASE
SEWARD AVENUE, JAPONSKI ISLAND

UPLANDS SITE PLAN - PHASE 2

1190 SEWARD AVENUE
CITY AND BOROUGH OF SITKA, ALASKA

PROJECT 2023.15127.01
DATE 6/5/2023

SHEET
C1.02-2



FLOAT AND PILE LAYOUT PLAN

NOTE: UTILITIES NOT SHOWN, THIS VIEW, FOR CLARITY. SEE UTILITY DRAWINGS FOR DETAILS.

REV	DATE	REVISIONS DESCRIPTION	BY

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PND ENGINEERS, INC.
9360 Glacier Highway
Ste 100
Juneau, Alaska 99801
Phone: 907-586-2093
Fax: 907-586-2099
www.pndengineers.com
PND Project # 212050

NEW SITKA SEAPLANE BASE
SEWARD AVENUE, JAPONSKI ISLAND

OVERALL FLOAT PLAN AND PILE LAYOUT

PROJECT 2023.15127.01
DATE 5/05/2023

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F3.01

Appendix B: Sitka Seaplane Base Project Threshold Calculation Spreadsheets

Sitka Seaplane Base Project
Proxy Summary

Project Pile Size	Installation method	Proxy Pile Size	RMS/SPL	SEL	PK	Weighting Factor	# of piles in 24-hour	Duration (mins)	Strikes	TLC	Distance of Measurement	Reference
16, 24	Vibratory (perm, and temp - install and removal)	24	161	-	-	2.5	6	10		15	10	For installation of 16" and 24" permanent piles and installation and removal of 16" temporary piles, the vibratory source level is proxy 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).
16 (Phs I)	DTH	24	166 (173 Northern sea otters)	159	184	2	2	60	36,000 per pile	15	10	For 16" piles, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021).
24 (Phs I& II)	DTH	24	167 (173 Northern sea otters)	159	184	2	2	90	54,000 per pile	15	10	For 24" pile, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021).
16	Impact	16	185	175	200	2	4	5	175 per pile	15	10	For 16"piles, impacting source levels are proxy from agreed upon values within NMFS Alaska Region (NMFS 2023).
24	Impact	24	190	177	203	2	4	5	175 per pile	15	10	For 24"piles, impacting source levels are proxy from agreed upon values within NMFS Alaska Region (NMFS 2023).
All Piles	In-air Vibratory	30	103.2 @15m				10	15		15	10	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). Maximum levels were used to extrapolate distances for the projects.
All Piles	In-air Impact	48	106 @15m				10	15		15	10	In-air impacting sound source level is 106 dB rms at 15 m, the median value during impact installation of 24 to 48-inch-diameter steel piles at Naval Base Kitsap Bangor (Illingworth and Rodkin, Inc. 2012).

USER SPREADSHEET INTRODUCTION

VERSION: 2.2 (2020)

Companion* User Spreadsheet to:

National Marine Fisheries Service (NMFS): 2018 Revision to: Technical Guidance For Assessing the Effects of Anthropogenic Noise on Marine Mammal Hearing: Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts (Version 2.0)

2018 Revised Technical Guidance web page

***For more information on the optional methodology provided within this User Spreadsheet, see Appendix D of Technical Guidance (2018)**

DISCLAIMER: NMFS has provided this spreadsheet as an optional tool to provide estimated effect distances (i.e., isopleths) where PTS onset thresholds may be exceeded. Results provided by this spreadsheet do not represent the entirety of the comprehensive effects analysis, but rather serve as one tool to help evaluate the effects of a proposed action on marine mammal hearing and make findings required by NOAA's various statutes. Input values are the responsibility of the individual user.

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.

INSTRUCTIONS

STEP 1: Determine what spreadsheet is appropriate for activity

HOW TO DETERMINE WHICH TAB TO USE

1) Is the sound source NON-IMPULSIVE or IMPULSIVE? (If it is unclear which category describes your source, consult NOAA)
- a) NON-IMPULSIVE (e.g., drilling, vibratory pile driving, tactical sonar): Go to Question 2
- b) IMPULSIVE (e.g., explosives, impact pile driving, DTH pile driving, seismic): Go to Question 5

2) Is the NON-IMPULSIVE sound source STATIONARY or MOBILE?
- a) STATIONARY: Go to Question 3
- b) MOBILE: Go to Question 4

3) Is the NON-IMPULSIVE, STATIONARY source CONTINUOUS or INTERMITTENT†?
- a) CONTINUOUS: Use Tab A* — RED
- *If source is vibratory pile driving: Use Tab A.1 — BRICK
- b) INTERMITTENT: Use Tab B — YELLOW

† A key distinction between continuous and intermittent sound sources is that intermittent sounds have a more regular (predictable) pattern of bursts of sounds and silent periods (i.e., duty cycle), which continuous sounds do not.

4) Is the NON-IMPULSIVE, MOBILE source CONTINUOUS or INTERMITTENT?
- a) CONTINUOUS: Use Tab C ("safe distance" methodology from Sivle et al. 2014) — BLUE
- b) INTERMITTENT: Use Tab D ("safe distance" methodology from Sivle et al. 2014) — ORANGE

5) Is the IMPULSIVE sound source STATIONARY or MOBILE?
- a) STATIONARY: Use Tab E* — GREEN
- *If source is impact pile driving: Use Tab E.1 — EVRGRN
- *If source is DTH pile driving/installation: Use Tab E.2 — TEAL
- b) MOBILE: Use Tab F ("safe distance" methodology from Sivle et al. 2014) — PURPLE

STEP 2: Within the appropriate tab, fill-in: **SAGE CELLS** specific to the activity
- a) Please provide information used to support values in provided in sage boxes (e.g., surrogate data, direct measurements, etc.)
- b) If information is unavailable to fill-out one or more of the sage boxes, please consult NMFS

STEP 3: Estimated PTS isopleths (meter) will be provided in: **SKY BLUE CELLS** by marine mammal hearing group

STEP 4: When using this spreadsheet to estimate marine mammal takes, please provide a copy of completed tab used to estimate isopleths

ASSUMPTIONS & ADDITIONAL INFORMATION

1) Marine mammals remain stationary during activity
2) Currently, recovery between intermittent sounds is not considered regardless of time between sounds (i.e., all sounds within the accumulation period are counted)

Suggested (Default*) Weighting Factor Adjustments (WFA) for Broadband Sources:

Source	WFA	Example Supporting Sources
Seismic airguns	1 kHz	Breitzke et al. 2008; Tashmukhambetov et al. 2008; Tolstoy et al. 2009
Impact pile driving hammers	2 kHz	Blackwell 2005; Reinhall and Dahl 2011
Vibratory pile driving hammers	2.5 kHz	Blackwell 2005; Dahl et al. 2015
DTH pile driving/installation	2 kHz	Denes et al. 2016; Denes et al. 2019; Reyff and Heyvaert 2019
Drill vessels/platforms	2 kHz	Greene 1987; Blackwell et al. 2004; Blackwell and Greene 2006

* NMFS acknowledges default WFAs are likely conservative

Marine Mammal Hearing Group
Low-frequency (LF) cetaceans: baleen whales
Mid-frequency (MF) cetaceans: dolphins, toothed whales, beaked whales, bottlenose whales
High-frequency (HF) cetaceans: true porpoises, Kogia, river dolphins, cephalorhynchid, Lagenorhynchus cruciger & L. australis
Phocid pinnipeds (PW): true seals
Otariid pinnipeds (OW): sea lions and fur seals

Based on NMFS 2018 Revised Technical Guidance

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Technical questions or suggestion on User Spreadsheet: Please contact Amy Scholik-Schlomer (amy.scholik@noaa.gov)

UPDATES (will be posted when change results in the need to recalculate an isopleth; other non-substantive changes may be made periodically but will not result in a version number change)

Original Version	Updated Version	Change	Date posted
1.0	1.1	Sheet A, error with formula for phocid pinniped	Aug. 22, 2016
1.1	2.0	Corresponds to 2.0 version of Revised Technical Guidance (2018). Added sheet specific to vibratory pile driving and explosives and added capabilities to calculate peak sound pressure level isopleths for impulsive sources	July 2018
2.0	2.1	Updated version based on comments from 2018 public comment period. Added Tab for DTH	July 2020
2.0	2.2	Updated version based on comments from 2018 public comment period (late) on seismic surveys from IAGC	December 2020
	2.2	Additional clarification on 1/repetition rate term No changes to tool functionality	November 2021

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

VERSION 2.2: 2020

KEY

(green)	**Action Proponent Provided Information**
(pink)	**NMFS Provided Information (Technical Guidance)**
(blue)	**Resultant Isopleth**

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATION	For installation and removal of 16" pile and installation of 24" permanent pile, vibratory source level is proxy 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
Please include any assumptions	
PROJECT CONTACT	Natalie Kiley-Bergen, natalie@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	

[¥] 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)	10
Duration of Sound Production within 24-h period (seconds)	3600
10 Log (duration of sound production)	35.56
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)	**6.8**	**0.6**	**10.1**	**4.2**	**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.

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

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

VERSION 2.2: 2020

KEY

(green)	**Action Proponent Provided Information**
(pink)	**NMFS Provided Information (Technical Guidance)**
(blue)	**Resultant Isopleth**

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATION	For 16" pile, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021).

Please include any assumptions

PROJECT CONTACT	Natalie Kiley-Bergen, natalie@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	

¥ 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)	**194.6**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,\text{single strike}}$) specified at "x" meters (Cell B30)	146
Strike rate (average strikes per second)	10
Duration to drive pile (minutes)	60
Number of piles per day	2
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,\text{single strike}}$) measurement (meters)	10
Total number of strikes in a 24-h period	72000

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G26)	172
Distance of $L_{p,0\text{-}pk}$ measurement (meters)+	10
$L_{p,0\text{-}pk}$ Source level	187.0

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)	**59.0**	**2.1**	**70.3**	**31.6**	**2.3**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**NA**	**NA**	**NA**	**NA**	**NA**

"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

(green)	**Action Proponent Provided Information**
(pink)	**NMFS Provided Information (Technical Guidance)**
(blue)	**Resultant Isopleth**

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATION	For 24" pile, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021).

Please include any assumptions

PROJECT CONTACT	Natalie Kiley-Bergen, natalie@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	

¥ 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)	**209.3**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,\ single\ strike}$) specified at "x" meters (Cell B30)	159
Strike rate (average strikes per second)	10
Duration to drive pile (minutes)	90
Number of piles per day	2
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)	184
Distance of $L_{p,0\text{-}pk}$ measurement (meters)⁺	10
$L_{p,0\text{-}pk}$ Source level	199.0

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)	**568.9**	**20.2**	**677.6**	**304.4**	**22.2**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**NA**	**NA**	**NA**	**NA**	**NA**

"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.1: IMPACT PILE DRIVING (STATIONARY SOURCE: Impulsive, Intermittent)

VERSION 2.2: 2020

KEY

(green)	**Action Proponent Provided Information**
(pink)	**NMFS Provided Information (Technical Guidance)**
(blue)	**Resultant Isopleth**

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATION	For 16"piles, impacting source levels are proxy from agreed upon values within NMFS Alaska Region (NMFS 2023).

Please include any assumptions

PROJECT CONTACT	Natalie Kiley-Bergen, natalie@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	

[¥] 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 73), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

NOTE: METHOD E.1-1 is PREFERRED method when SEL-based source levels are available (because pulse duration is not required). Only use method E.1-2 if SEL-based source levels are not available.

E.1-1: METHOD TO CALCULATE PK AND SEL_{cum} (SINGLE STRIKE EQUIVALENT) **PREFERRED METHOD (pulse duration not needed)**

Unweighted $SEL_{cum\ (at\ measured\ distance)}$ = SEL_{ss} + 10 Log (# strikes)	**203.5**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,\ single\ strike}$) specified at "x" meters (Cell B32)	175
Number of strikes per pile	175
Number of piles per day	4
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,\ single\ strike}$) measurement (meters)	10

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G29)	200
Distance of $L_{p,0\text{-}pk}$ measurement (meters)[+]	10
$L_{p,0\text{-}pk}$ Source level	215.0

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)	**230.6**	**8.2**	**274.6**	**123.4**	**9.0**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**NA**	**NA**	**7.4**	**NA**	**NA**

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

E.1: IMPACT PILE DRIVING (STATIONARY SOURCE: Impulsive, Intermittent)

VERSION 2.2: 2020

KEY

(green)	**Action Proponent Provided Information**
(pink)	**NMFS Provided Information (Technical Guidance)**
(blue)	**Resultant Isopleth**

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATION	For 24"piles, impacting source levels are proxy from agreed upon values within NMFS Alaska Region (NMFS 2023).

Please include any assumptions

PROJECT CONTACT	Natalie Kiley-Bergen, natalie@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	

[¥] 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 73), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

STEP 3: SOURCE-SPECIFIC INFORMATION

NOTE: METHOD E.1-1 is PREFERRED method when SEL-based source levels are available (because pulse duration is not required). Only use method E.1-2 if SEL-based source levels are not available.

E.1-1: METHOD TO CALCULATE PK AND SEL_{cum} (SINGLE STRIKE EQUIVALENT) **PREFERRED METHOD (pulse duration not needed)**

Unweighted $SEL_{cum\ (at\ measured\ distance)}$ = SEL_{ss} + 10 Log (# strikes)	**205.5**

SEL_{cum}

Single Strike SEL_{ss} ($L_{E,p,\ single\ strike}$) specified at "x" meters (Cell B32)	177
Number of strikes per pile	175
Number of piles per day	4
Transmission loss coefficient	15
Distance of single strike SEL_{ss} ($L_{E,p,\ single\ strike}$) measurement (meters)	10

PK

$L_{p,0\text{-}pk}$ specified at "x" meters (Cell G29)	203
Distance of $L_{p,0\text{-}pk}$ measurement (meters)†	10
$L_{p,0\text{-}pk}$ Source level	218.0

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)	**313.4**	**11.1**	**373.3**	**167.7**	**12.2**
PK Threshold	219	230	202	218	232
PTS PK Isopleth to threshold (meters)	**NA**	**NA**	**11.7**	**NA**	**NA**

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

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For installation of 24" permanent piles and installation and removal of 16" temporary piles, the vibratory source level is proxy 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	Natalie Kiley-Bergen (natalie@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	5411.7

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 16" and 24" piles, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021).
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =		167
Distance =		10

	Fish		Spreading	MarMam		
	Meters to Threshold		Model	Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	71	dB = 20*log(R1/R2)	2	22	2239
Cylindrical spreading	0	501	dB = 10*log(R1/R2)	1	50	501187
Practical spreading	0	136	dB = 15*log(R1/R2)	1	29	13594

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 16" and 24" piles, DTH source level is proxy from the sound source verification of 24" piles DTH drilled during the Tenakee Ferry Terminal Improvements Project (Heyvaert and Reyff 2021). A different RMS is used for Northern sea otters per USFWS request.
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =		173
Distance =		10

	Fish		Spreading	MarMam		
	Meters to Threshold		Model	Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	0	141	dB = 20*log(R1/R2)	4	45	4467
Cylindrical spreading	0	1995	dB = 10*log(R1/R2)	2	200	1995262
Practical spreading	0	341	dB = 15*log(R1/R2)	3	74	34145

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 16" piles, impacting source level is proxy from median measured source levels from NMFS guidance (NMFS 2023).
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =	200	185
Distance =	10	10

	Fish		Spreading	MarMam		
	Meters to Threshold		Model	Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	100	562	dB = 20*log(R1/R2)	18	178	17783
Cylindrical spreading	1000	31623	dB = 10*log(R1/R2)	32	3162	31622777
Practical spreading	215	2154	dB = 15*log(R1/R2)	22	464.2	215443

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	For 24" piles, impacting source level is proxy from median measured source levels from NMFS guidance (NMFS 2023).
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =	203	190
Distance =	10	10

	Fish		Spreading	MarMam		
	Meters to Threshold		Model	Meters to Threshold		
Spreading Model	Peak(180 dB)	RMS (150 dB)		RMS 180 dB	RMS 160 dB	RMS 120 dB
Spherical spreading	141	1000	dB = 20*log(R1/R2)	32	316	31623
Cylindrical spreading	1995	100000	dB = 10*log(R1/R2)	100	10000	100000000
Practical spreading	341	4642	dB = 15*log(R1/R2)	46	1000.0	464159

GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base 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). Maximum levels were used to extrapolate distances for the projects.
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =		103.2
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	2	68.56323	21.6816
Cylindrical spreading	0	0	dB = 10*log(R1/R2)	0	0	0		
Practical spreading	0	0	dB = 15*log(R1/R2)	0	0	1		

Fill in SPL and distance at which SPL was measured

Conversion	meters	feet	miles
	1	3.733157477	7E-04

GENERAL PROJECT INFORMATION

PROJECT TITLE	Sitka Seaplane Base Project
PROJECT/SOURCE INFORMATIONPlease include any assumptions	In-air impacting sound source level is 106 dB rms at 15 m, the median value during impact installation of 24 to 48-inch-diameter steel piles at Naval Base Kitsap Bangor (Illingworth and Rodkin, Inc. 2012).
PROJECT CONTACT	Natalie Kiley-Bergen (natalie@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 =		106
Distance =		15

	Fish		Spreading	MarMam				
	Meters to Threshold		Model	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	3	94.6436	29.92893
Cylindrical spreading	0	0	dB = 10*log(R1/R2)	0	0	1		
Practical spreading	0	0	dB = 15*log(R1/R2)	0	0.0038	2		

Fill in SPL and distance at which SPL was measured

Conversion	meters	feet	miles
	2	5.737767906	0.001

Appendix C: Sitka Seaplane Base Project Marine Mammal Monitoring and Mitigation Plan

Marine Mammal Monitoring and Mitigation Plan

City and Borough of Sitka

Sitka Seaplane Base

Sitka Channel, Sitka, Alaska

August 2023

Revised October 2023

Prepared for:
City and Borough of Sitka

6100 Lincoln St.

Sitka, AK 99835

Prepared by:

SOLSTICE alaska consulting inc

2607 Fairbanks Street Suite B
Anchorage, Alaska 99503

Submitted to:

National Marine Fisheries Service and U.S. Fish and Wildlife Service

CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

3M	Marine Mammal Management
4MP	Marine Mammal Monitoring and Mitigation Plan
DPS	distinct population segment
DTH	down the hole
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HF	high-frequency
HTL	high tide line
IHA	Incidental Harassment Authorization
LF	low-frequency
MF	mid-frequency
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
OW	otariid
PSO	protected species observer
PW	phocid
rms	root mean square
SPB	seaplane base
SPL	sound pressure level
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WDPS	Western Distinct Population Segment

1 INTRODUCTION

The City and Borough of Sitka (CBS) proposes the following Marine Mammal Monitoring and Mitigation Plan (4MP) for use during in-water work for the Sitka Seaplane Base (SPB) Project in Sitka, Alaska (Figure 1 and Figure 2). 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 the Biological Assessment, in accordance with the ESA, and the Incidental Harassment Authorization (IHA) applications, in accordance with the MMPA (Section 101(a)(5)(D) permitting).[1] Monitoring and shutdown zones will be implemented to minimize Level A and 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 Corps of Engineers (USACE), Sitka Channel, for activities in Waters of the U.S. (forthcoming)
- NMFS Alaska Region, ESA Section 7(a)(2) Biological Opinion (requested)
- NMFS Office of Protected Resources Permits and Conservation Division IHA (requested)
- USFWS Alaska Region Marine Mammal Management (3M) IHA (requested)

[1] This draft 4MP reflects the draft Biological Assessment submitted to NMFS and will be revised as needed for submission with the NMFS IHA application and USFWS IHA application.

Figure 1. Sitka SPB Project Location and Vicinity

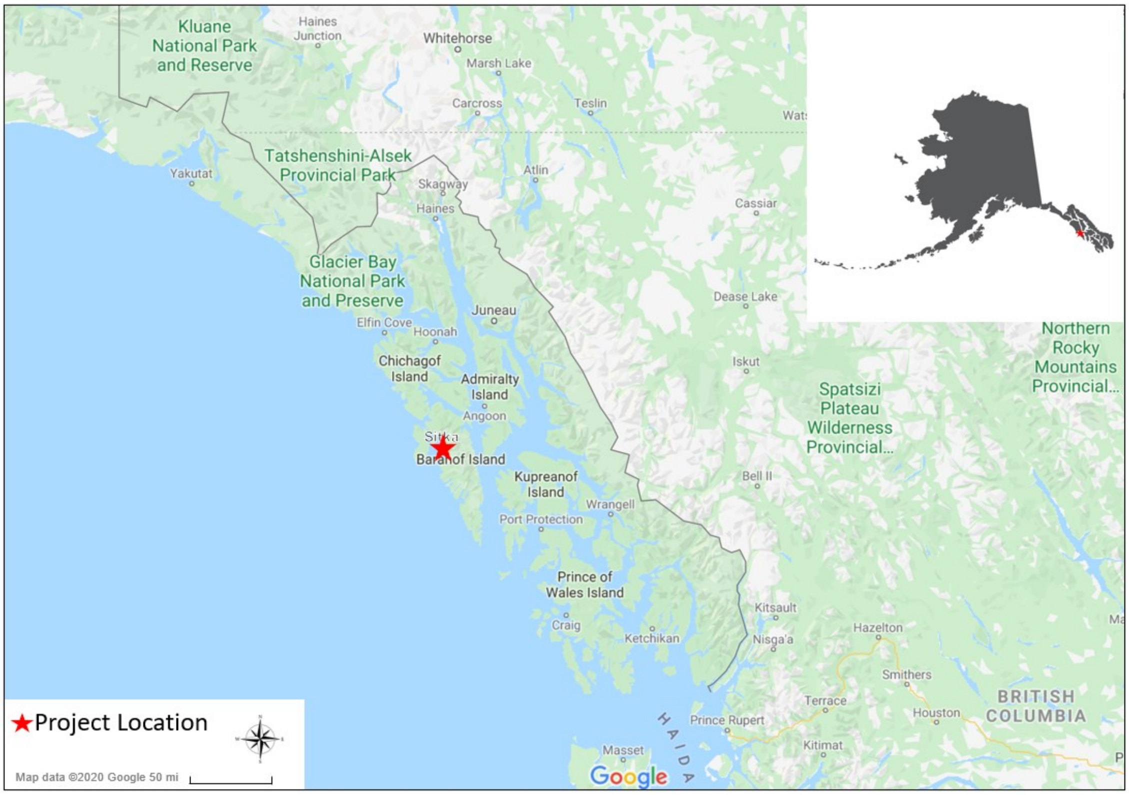


Figure 2. Sitka SPB Project Location

2 PROJECT DESCRIPTION

CBS is proposing to construct a new SPB in Sitka Channel on the northern shore of Japonski Island in Sitka, Alaska. The new SPB would replace the existing SPB (Federal Aviation Administration [FAA] identifier A29) currently located on the eastern shore of Sitka Channel, near Eliason Harbor and downtown Sitka. The new SPB would address existing capacity, safety, and condition deficiencies for critical seaplane operations, and allow seaplanes to transit Sitka Channel more safely.

The project would consist of several components, completed over two phases:

The following components are proposed for Phase I (construction from May 2024 to May 2025):

- Seaplane ramp float
- Drive-down float
- Pedestrian and vehicle transfer bridge
- Approach dock
- Uplands approach, storage area, and parking

The following components are proposed for Phase II (construction from May 2025 to May 2026):

- Transient seaplane float
- Turnaround float
- Expanded uplands approach, storage area, and parking
- Drive-down launch ramp

Sound would extend approximately 6.0 kilometers (3.7 miles) from the western opening in the Channel Rock Breakwaters, 7.0 kilometers (4.3 miles) from the eastern opening in the Channel Rock Breakwaters, and 13.6 kilometers (8.5 miles) from the south end of Sitka Channel. Construction for Phase I would begin in May 2024 and be completed in March 2025 and construction for Phase II would begin in May 2025 and be completed in March 2026. During Phase I, pile removal and installation activities is expected to occur for a total of approximately 46 hours over 31 days (not necessarily consecutive days). Most of the in-water pile driving time would be spent down-the-hole (DTH) drilling (34 hours). Construction of Phase II would follow a similar sequence with in-water work (pile driving) occurring for approximately 13 hours over 9 days (not necessarily consecutive). Most of the in-water work time would be spent DTH drilling (12 hours). Table 1 and Table 2 provide a more detailed overview of the project components.

Table 1. Sitka SPB Project Groundwork Summary – Phase I and II

Phase	Total Area (acre)	Volume (cubic yards)	Time (hours)	Days
Phase I	**Blasting**			
	1.3	9,500	564	47.0
	Excavating			
	1.4	5,925	178	14.8
	Entire Footprint (includes areas above HTL)			
	2.6	34,650	1,041	86.7
	Fill in intertidal waters (area between mean high water [MHW] and HTL)			
	0.03	21,340	641	53.4
	Fill in marine waters (area below MHW)			
	1.3	360	11	0.9
Phase II	**Entire Footprint (includes areas above HTL)**			
	1.3	22,000	661	55.1
	Fill in intertidal waters (area between MHW and HTL)			
	0.5	1,690	51	4.2
	Fill in marine waters (area below MHW)			
	0.8	7,810	235	19.5

Table 2. Sitka SPB Project Pile Size, Quantity, and Installation Method -Phase I and II

Project Component	Temp Install	Temp Remove	Perm Install	Perm Install	Total	Temp Install	Temp Remove	Perm Install	Total	Total
	Phase I					Phase II				I & II
Diameter of Steel Pipe Piles (inches)	16	16	16	24	--	16	16	24	--	--
Total # of Piles	12	12	10	16	--	6	6	6	--	--
Vibratory Pile Driving										
Total Quantity	12	12	10	16	--	6	6	6	--	--
Max # Piles Vibrated Per Day	6	6	6	6	--	6	6	6	--	--
Vibratory Time Per Pile (minutes)	10	10	10	10	--	10	10	10	--	--
Vibratory Time Per Day (minutes)	60	60	60	60	--	60	60	60	--	--
Number of Days	2.0	2.0	1.7	2.7	**8.4**	1.0	1.0	1.0	**3.0**	**11.4**
Vibratory Time Total (hours)	2.0	2.0	1.7	2.7	**8.4**	1.0	1.0	1.0	**3.0**	**11.4**
DTH Pile Drilling										
Total Quantity	--	--	10	16	--	--	--	6	--	--
Max # of Piles Installed per Day	--	--	2	2	--	--	--	2	--	--
# of Strikes Per Pile	--	--	36,000	54,000	--	--	--	54,000	--	--
# of Strikes Per Second	--	--	10	10	--	--	--	10	--	--
Actual Drilling Time Per Pile (minutes)	--	--	60	90	--	--	--	90	--	--
Time per Day (minutes)	--	--	120	180	--	--	--	180	--	--
Number of Days	--	--	5.0	8.0	**13.0**	--	--	3.0	**3.0**	**16.0**
DTH Drilling Time Total (hours)	--	--	10.0	24.0	**34.0**	--	--	9.0	**9.0**	**43.0**

Project Component	Temp Install	Temp Remove	Perm Install	Perm Install	Total	Temp Install	Temp Remove	Perm Install	Total	Total
	Phase I					Phase II				I & II
Impact Pile Driving										
Total Quantity	12	--	10	16	--	6	--	6	--	--
Max # Piles Impacted Per Day	4	--	4	4	--	4	--	4	--	--
# of Strikes Per Pile	175	--	175	175	--	175	--	175	--	--
Impact Time Per Pile (minutes)	5	--	5	5	--	5	--	5	--	--
Impact Time Per Day (minutes)	20	--	20	20	--	20	--	20	--	--
Number of Days	3.0	--	2.5	4.0	**9.5**	1.5	--	1.5	**3.0**	**12.5**
Impact Time Total (hours)	1.0	--	0.8	1.3	**3.1**	0.5	--	0.5	**1.0**	**4.1**

3 SPECIES COVERED UNDER THE IHA

There are five ESA-listed species under NMFS jurisdiction that have ranges that extend into the project area (humpback, fin, North Pacific right, and sperm whales and Steller sea lions). However, take has only been requested for the Mexico distinct population segment (DPS) humpback whale and Western DPS (WDPS) Steller sea lions that are known to frequent the area (Table 3). Take has also been requested for gray whales, minke whales, killer whales, harbor porpoise, harbor seals, and northern sea otters which are not listed under the ESA. Additionally, take by Level B harassment is also requested for Northern sea otters which are under USFWS jurisdiction. For additional information about species with ranges in the project action area, see Appendix A.

There are various ESA-listed and MMPA-listed species with habitat ranges that overlap with the ensonified area of the project; however, these species have not been observed in the project area. No Level A or B take is requested for the following species: fin whale (ESA-listed, *Balaenoptera physalus*), North Pacific right whale (ESA-listed, *Eubalaena japonica*), sperm whale (*Physeter macrocephalus*), northern fur seals (*Callorhinus ursinus*), pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and Dall's porpoise (*Phocoenoides dalli*). In-water project construction activities will be shut down if any individuals of these species or any other species not listed in Table 3 are observed approaching the Level B shutdown zone to ensure there is no Level A or B take of these species.

Table 3. Species Known to Occur in Project Area and Requested Take Types and Numbers (may be updated following issuance of IHAs)

Species	Hearing Group	Phase I		Phase II	
		Level A	Level B	Level A	Level B
Gray Whale (*Eschrichtius robustus*)	Low-Frequency (LF) Cetacean	0	6	0	4
Minke Whale (*Balaenoptera acutorostrata*)	LF Cetacean	0	6	0	4
Humpback Whale (*Megaptera novaeangliae*)	LF Cetacean	0	11	0	4
Killer Whale (*Orcinus orca*)	Mid-Frequency (MF) Cetacean	0	30	0	9
Harbor Porpoise (*Phocoenoides dalli*)	High-Frequency (HF) Cetacean	5	8	5	5
Harbor Seal (*Phoca vitulina*)	Phocid Pinniped (PW)	48	130	13	38
Northern Sea Otter (*Enhydra lutris kenyoni*)	Otariid Pinniped (OW)	0	36	0	14
Steller Sea Lion (WDPS; *Eumetopias jubatus*)	OW	16	124	6	36

4 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 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 the shutdown zone.
- If a marine mammal approaches or appears in a Level A shutdown zone without permitted take, all permitted construction activities will immediately halt until the marine mammal has left the shutdown zone 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 approaches or appears in a Level B zone, all permitted construction activities will immediately halt until the marine mammal has left the Level B zone or has not been sighted for 15 minutes (pinnipeds, small cetaceans, and sea otters) or 30 minutes (large cetaceans).

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 this project. These monitoring and shutdown zones are summarized in Table 4 and Figure 3 through Figure 8.

4.1 Level A Harassment Zones

Level A harassment zones are defined as areas where sound pressure levels (SPLs) meet or exceed the level that would cause auditory injury to marine mammals. Level A shutdown zones are intended to protect marine mammals from auditory injury. In-water activities would be halted upon the sighting of a marine mammal that is in (or anticipated to enter) the shutdown zone. For select species where Level A take has been requested, the Level A zone will function as a monitoring zone to observe and record if Level A take occurs.

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 or construction personnel when a PSO is not present. Radial distances to Level A shutdown zone boundaries are defined in Table 4 for Phase I and Table 5 for Phase II and shown by hearing group in Figures 3 through Figure 7 below.

Table 4. Sitka SPB Level A and Level B Harassment Zones – Phase I

Source	Distance (meters)							
	Level A						Level B	
	NMFS					USFWS	NMFS	USFWS
	LF	MF	HF	PW (shutdown)	Steller Sea Lion	Northern Sea Otter	All Marine Mammals	Northern Sea Otter
In-water Activities								
Barge movements, pile positioning, etc.[a]	10	10	10	10	10	20	10	10
Vibratory Pile Driving/Removal								
16-inch steel temporary installation (12 piles, 60 minutes/day, 2.0 days)	10	10	20	10	10	20	5,415	20
16-inch steel temporary removal (12 piles, 60 minutes/day, 2.0 days)	10	10	20	10	10	20	5,415	20
16-inch steel permanent installation (10 piles, 60 minutes/day, 1.7 days)	10	10	20	10	10	20	5,415	20
24-inch steel permanent installation (16 piles, 60 minutes/day, 2.7 days)	10	10	20	10	10	20	5,415	20
DTH Drilling								
16-inch steel permanent installation (10 piles, 2.0 hours/day, 5.0 days)	60	10	75	35	10	30	13,600[b] (Stopped at 8,500)	30
24-inch steel permanent installation (16 piles, 3.0 hours/day, 8.0 days)	570	30	680	305 (125)	30	30	13,600[b] (Stopped at 8,500)	75
Impact Pile Driving								
16-inch steel temporary installation (12 piles, 20 minutes/day, 3.0 days)	235	10	275	125	10	20	465	465
16-inch steel permanent installation (10 piles, 20 minutes/day, 2.5 days)	235	10	275	125	10	20	465	465
24-inch steel permanent installation (16 piles, 20 minutes/day, 4.0 days)	315	20	375	170	20	20	1,000	1,000

Harassment zone distances refer to the maximum radius of the zone and are rounded.
[a] Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.
[b] These sound zones are blocked by landforms at 8,500 meters.

Table 5. Sitka SPB Level A and Level B Harassment Zones – Phase II

Source	Distance (meters)							
	Level A						Level B	
	NMFS					USFWS	NMFS	USFWS
	LF	MF	HF	PW (shutdown)	Steller Sea Lion	Northern Sea Otter	All Marine Mammals	Northern Sea Otter
In-water Activities								
Barge movements, pile positioning, etc.[a]	10	10	10	10	10	20	10	10
Vibratory Pile Driving/Removal								
16-inch steel temporary installation (6 piles, 60 minutes/day, 1.0 days)	10	10	20	10	10	20	5,415	20
16-inch steel temporary removal (6 piles, 60 minutes/day, 1.0 days)	10	10	20	10	10	20	5,415	20
24-inch steel permanent installation (6 piles, 60 minutes/day, 1.0 days)	10	10	20	10	10	20	5,415	20
DTH Drilling								
24-inch steel permanent installation (6 piles, 4.0 hours/day, 3.0 days)	570	30	680	305 (125)	30	30	13,600[b] (Stopped at 8,500)	75
Impact Pile Driving								
16-inch steel temporary installation (6 piles, 20 minutes/day, 1.5 days)	235	10	275	125	10	20	465	465
24-inch steel permanent installation (6 piles, 20 minutes/day, 1.5 days)	315	20	375	170 (125)	20	20	1,000	1,000

Harassment zone distances refer to the maximum radius of the zone and are rounded.
[a] Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.
[b] These sound zones are blocked by landforms at 8,500 meters.
[c] CBS is requesting a 125-meter minimum shutdown zone for large Level A distances for PW pinnipeds.

Figure 3. Sitka SPB Project Distances to LF Cetaceans Level A Harassment Zones – Phase I and II

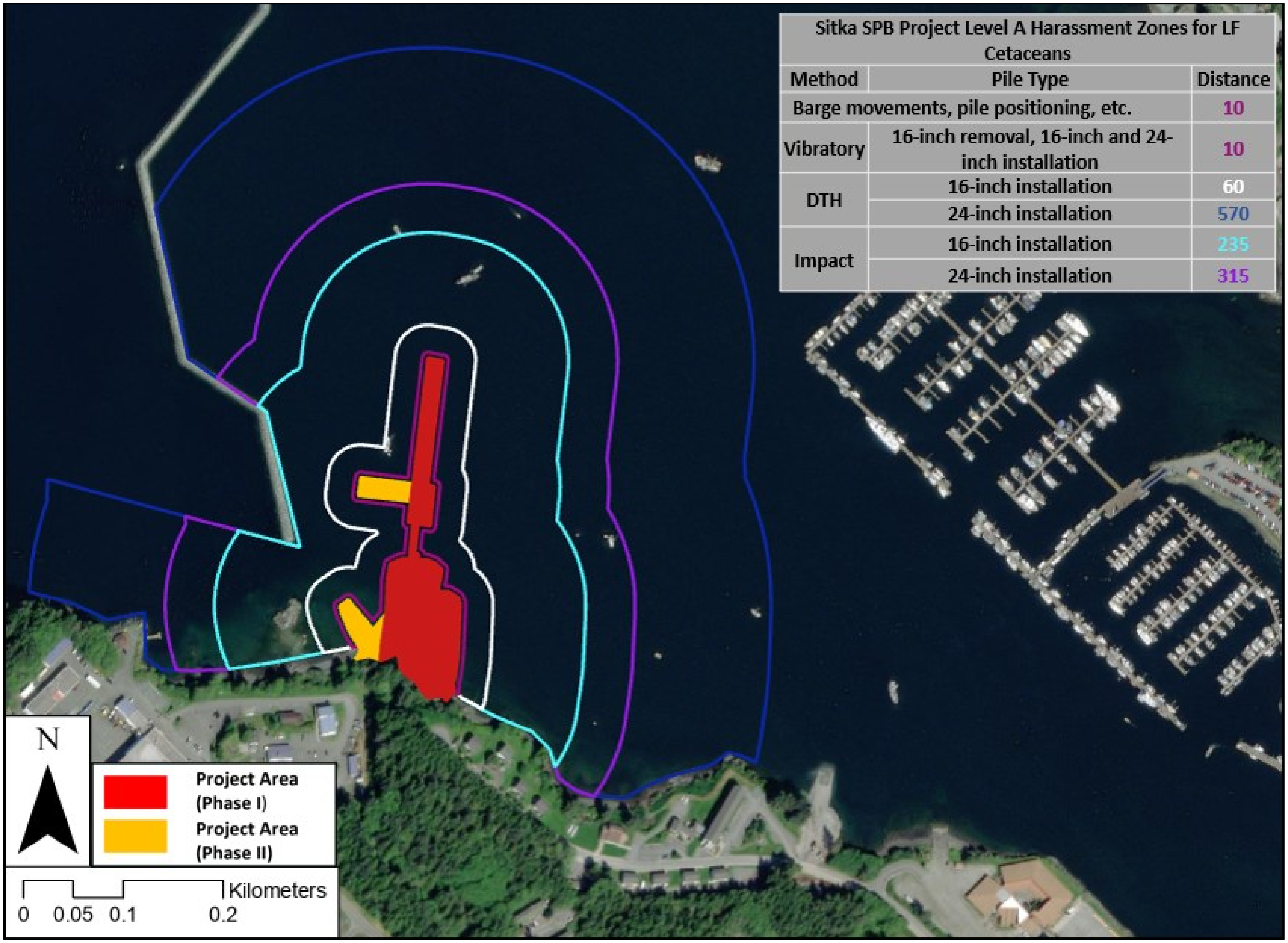
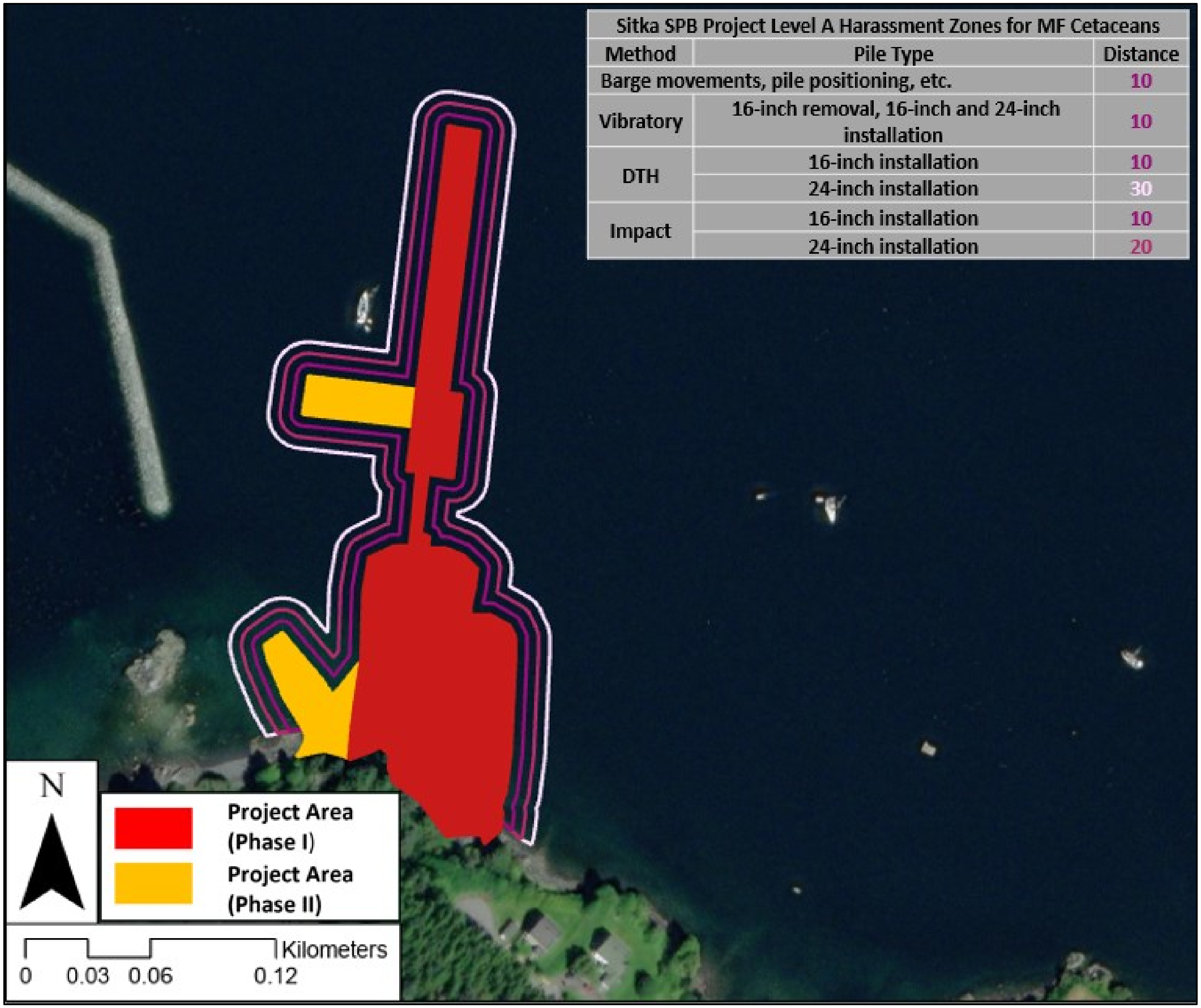
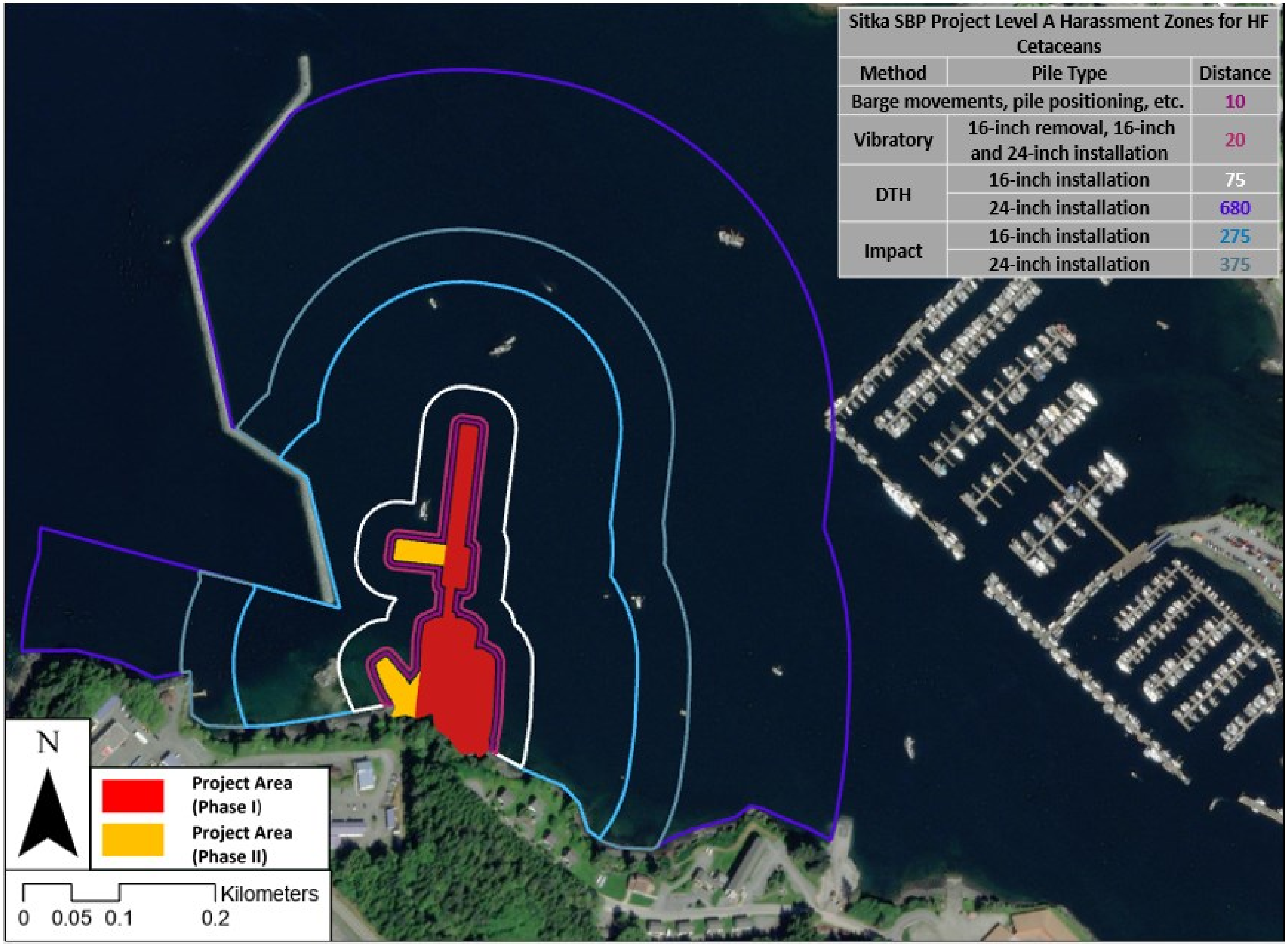


Figure 4. Sitka SPB Project Distances to MF Cetaceans Level A Harassment Zones – Phase I and II



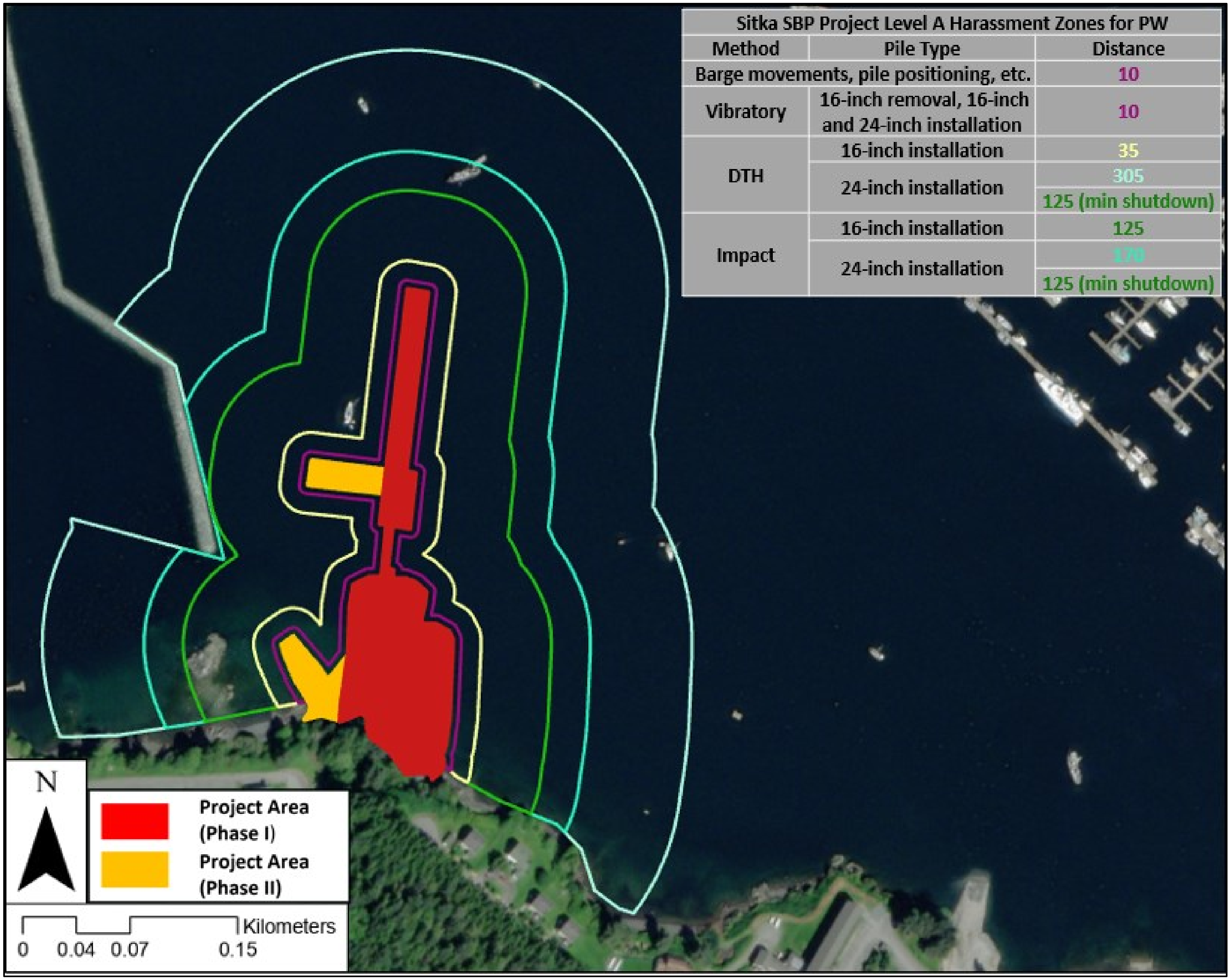
Sitka SPB Project Level A Harassment Zones for MF Cetaceans		
Method	Pile Type	Distance
Barge movements, pile positioning, etc.		10
Vibratory	16-inch removal, 16-inch and 24-inch installation	10
DTH	16-inch installation	10
	24-inch installation	30
Impact	16-inch installation	10
	24-inch installation	20

Figure 5. Sitka SPB Project Distances to HF Cetaceans Level A Harassment Zones – Phase I and II



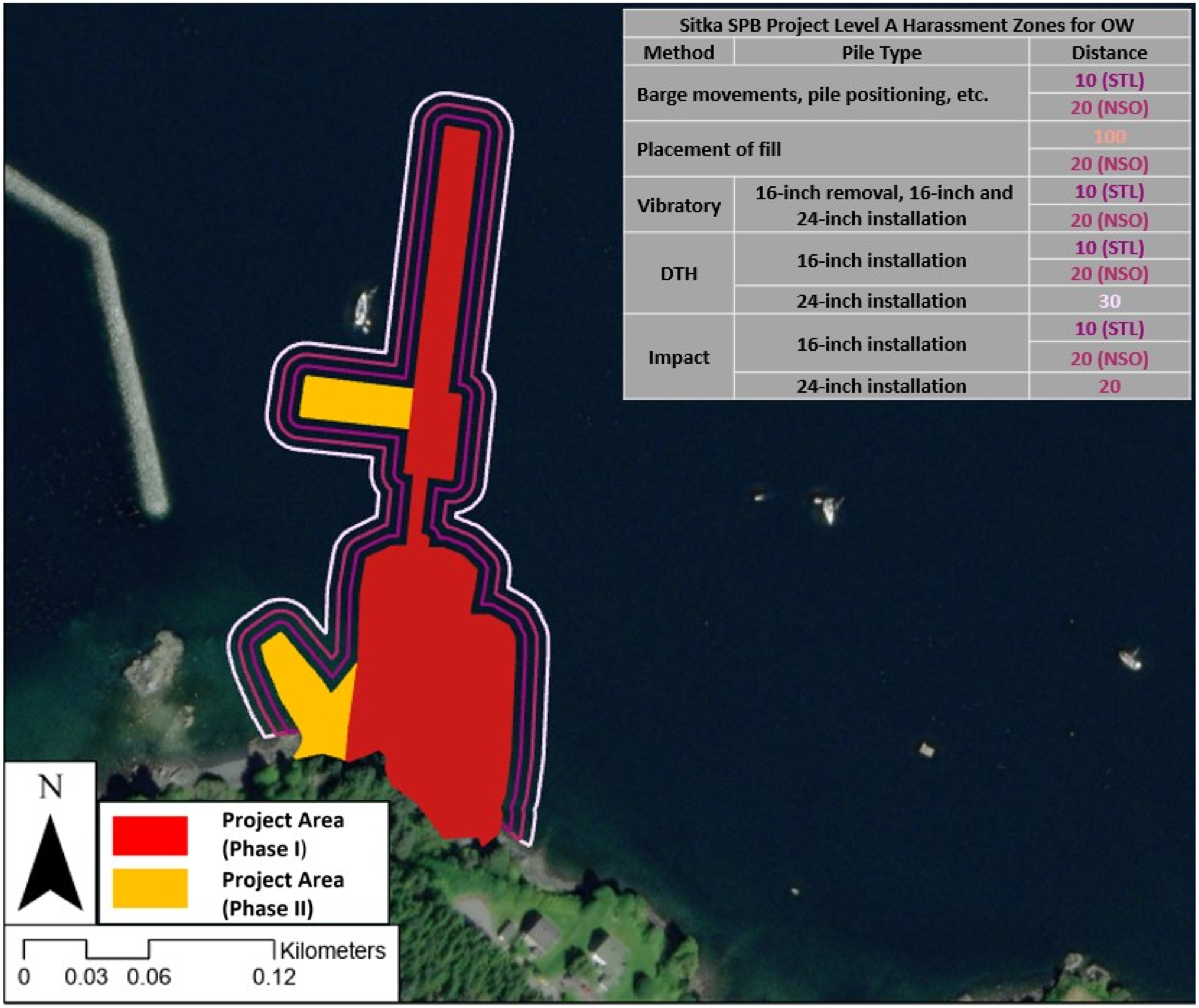
Sitka SBP Project Level A Harassment Zones for HF Cetaceans		
Method	Pile Type	Distance
Barge movements, pile positioning, etc.		10
Vibratory	16-inch removal, 16-inch and 24-inch installation	20
DTH	16-inch installation	75
	24-inch installation	680
Impact	16-inch installation	275
	24-inch installation	375

Figure 6. Sitka SPB Project Distances to PW Level A Harassment Zones – Phase I and II



Sitka SBP Project Level A Harassment Zones for PW		
Method	Pile Type	Distance
Barge movements, pile positioning, etc.		10
Vibratory	16-inch removal, 16-inch and 24-inch installation	10
DTH	16-inch installation	35
	24-inch installation	305
		125 (min shutdown)
Impact	16-inch installation	125
	24-inch installation	170
		125 (min shutdown)

Figure 7. Sitka SPB Project Distances to OW Level A Harassment Zones – Phase I and II



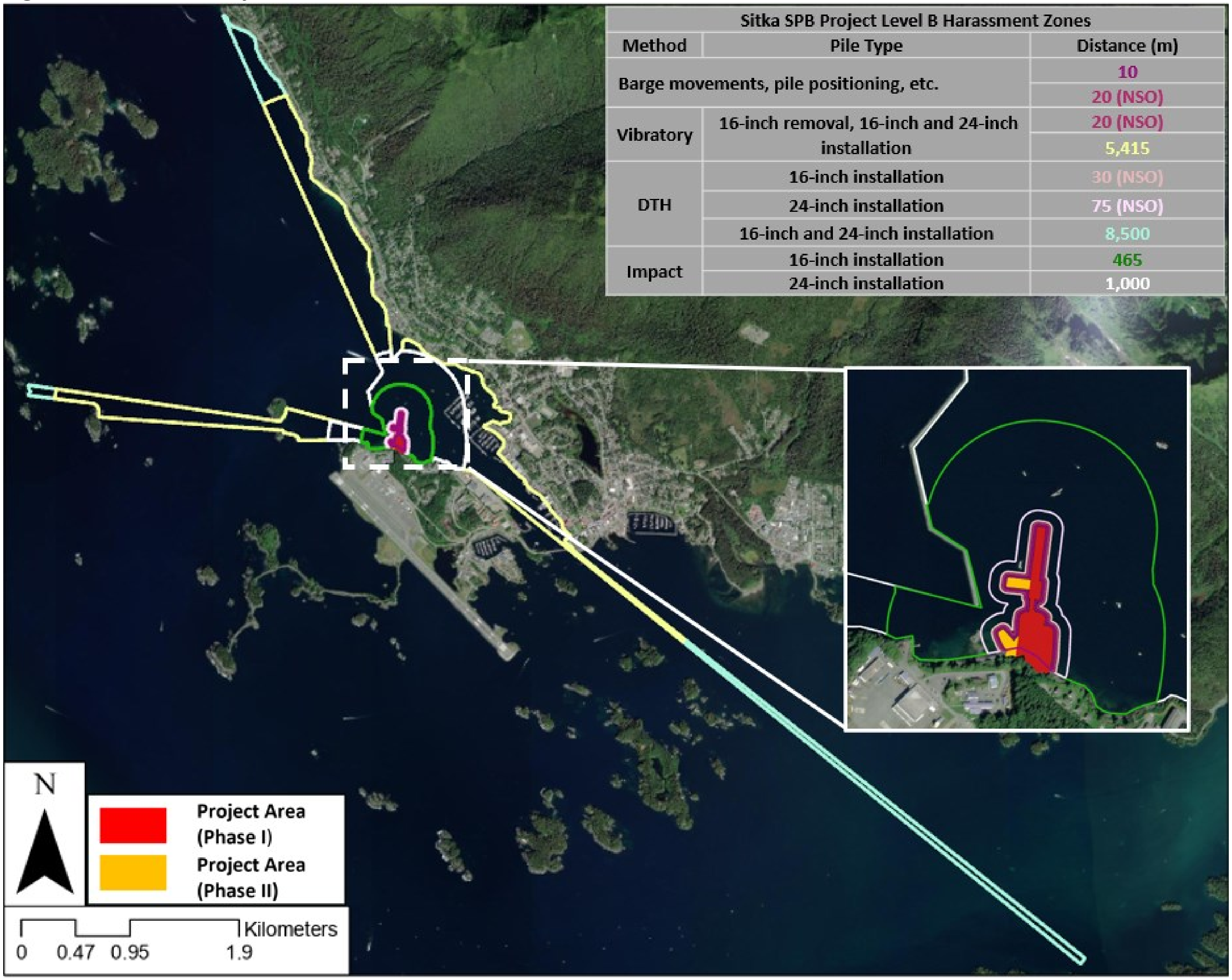
Sitka SPB Project Level A Harassment Zones for OW		
Method	Pile Type	Distance
Barge movements, pile positioning, etc.		10 (STL)
		20 (NSO)
Placement of fill		100
		20 (NSO)
Vibratory	16-inch removal, 16-inch and 24-inch installation	10 (STL)
		20 (NSO)
DTH	16-inch installation	10 (STL)
		20 (NSO)
	24-inch installation	30
Impact	16-inch installation	10 (STL)
		20 (NSO)
	24-inch installation	20

4.2 Level B Harassment Zones

Level B harassment zones have been determined based on in-water activity type and represent areas where the SPLs generated from pile driving activities meet or exceed 120 decibels (dB) root mean square (rms) during vibratory pile driving and DTH drilling and 160 dB rms during impact pile driving for NMFS-jurisdiction species (all applicable marine mammals except northern sea otters). Level B harassment zones represent areas where the SPLs generated from pile driving activities meet or exceed 160 dB rms for USFWS-jurisdiction species (northern sea otters).

For permitted marine mammals, these harassment zones serve as monitoring areas 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, it acts as a shutdown area in which in-water work should cease if they approach or appear likely to enter. 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. Level B monitoring/shutdown zones are presented in in Table 4 for Phase I and Table 5 for Phase II and Figure 8 below.

Figure 8. Sitka SPB Project Level B Harassment Zones – Phase I and II



Sitka SPB Project Level B Harassment Zones		
Method	Pile Type	Distance (m)
Barge movements, pile positioning, etc.		10
		20 (NSO)
Vibratory	16-inch removal, 16-inch and 24-inch installation	20 (NSO)
		5,415
DTH	16-inch installation	30 (NSO)
	24-inch installation	75 (NSO)
	16-inch and 24-inch installation	8,500
Impact	16-inch installation	465
	24-inch installation	1,000

5 MITIGATION MEASURES

The purpose of a marine mammal monitoring plan is to observe for marine mammals in the area where potential sound effects may occur. Work will be stopped or delayed if a non-permitted marine mammal is sighted in the Level B monitoring area or Level A shutdown area. Work will not begin or resume until the marine mammal 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, including ESA-listed species.

5.1 General Conditions and Requirements

- A sediment curtain will be employed during all DTH-drilling activities to contain drill spoils as much as possible to allow them to settle to the sea floor in the immediate area rather than increasing turbidity over a wider area.
- The contractor is required to conduct briefings for construction supervisors and crews and the monitoring team prior to the initiation of 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. In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone (Table 4 and Table 5), 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 is observed entering or within an established shutdown zone (Table 4 and Table 5). 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 or sea otters.
- The contractor must use soft start techniques when impact pile driving.
- 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 4 and Table 5). 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.
- 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 within the shutdown zone could be detected.

- Monitoring for in-water work, including pre-watch and post-watch can only occur between civil twilight and dusk.
- 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).

5.2 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.
- A lead observer or monitoring coordinator must be designated if a team of three or more PSOs are required. The lead observer must have prior experience working as a marine mammal observer during construction.
- The contractor must submit PSO resumes for approval by NMFS and USFWS at least 2 weeks prior to the onset of pile driving.

5.3 Data Collection

5.3.1 Environmental Conditions and Construction Activities

PSOs will use the construction activities and communications 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 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 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.

5.3.2 Sightings

Observers will use an approved Marine Mammal Sighting Form and Grid Maps (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.

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

5.4 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 points of contact
- Daily tide tables for the project area
- Binoculars (quality 7 x 50 or better) and a rangefinder
- Hand-held GPS unit, map and compass, 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 Maps (Appendices C and D)

5.5 Number and Location of PSOs

The number of locations of observers 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 four PSOs will be onsite during in-water activities for the Sitka SPB Project, stationed in the following locations (Figure 9):

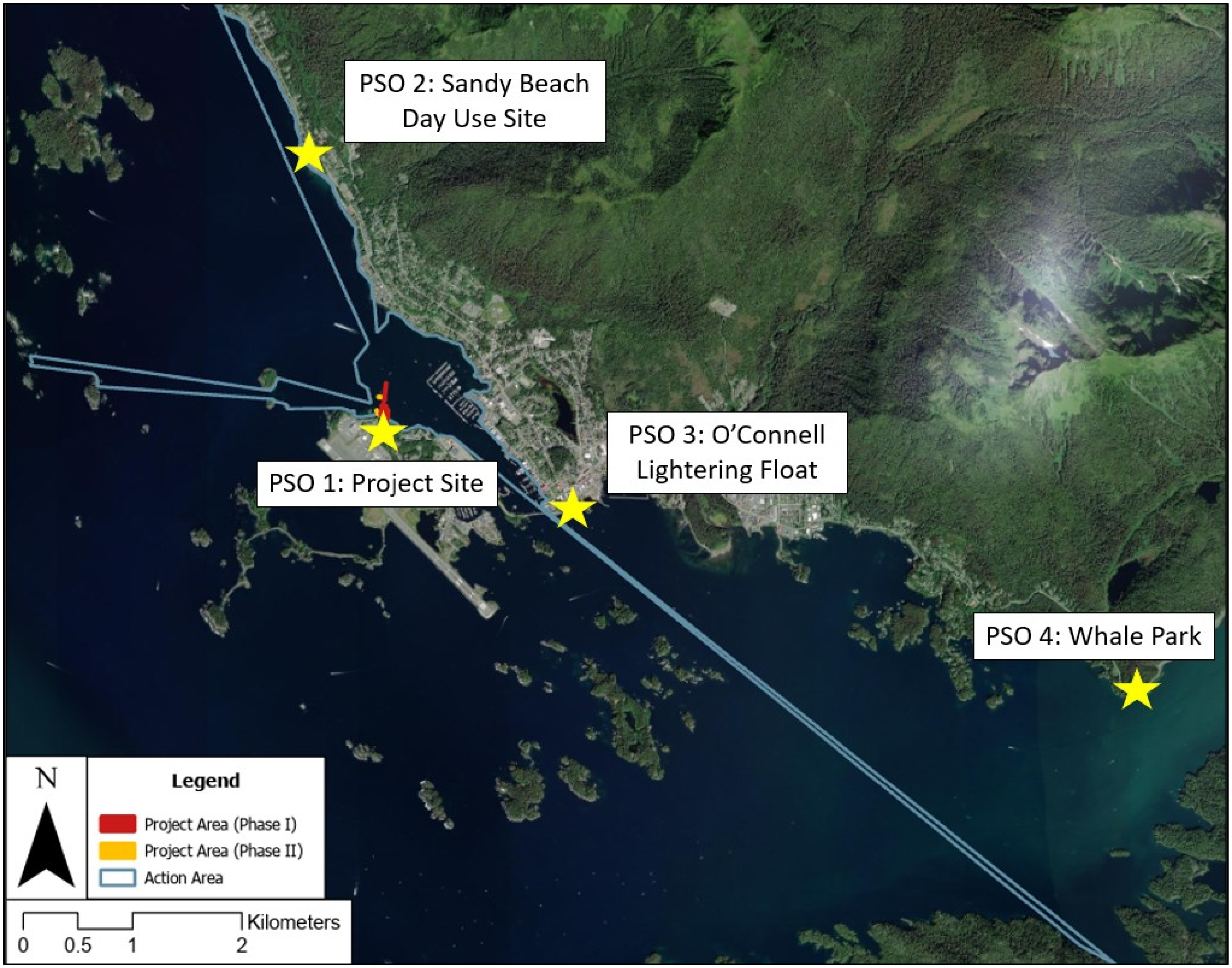
- PSO 1: stationed along the project site
- PSO 2: stationed at Sandy Beach Day Use Site
- PSO 3: stationed on the O’Connell Lightering Float
- PSO 4: stationed at Whale Park

The number and locations of monitors will be based on the following in-water work scenarios presented in Table 6.

Table 6. Sitka SPB Project PSO Scenarios

Construction	Piles	PSO Locations
Vibratory	16-inch pile removal, and 16-inch and 24-inch pile installation	PSO 1, PSO 2, PSO 3
DTH	16-inch and 24-inch pile installation	PSO 1, PSO 2, PSO 3, PSO 4
Impact	16-inch and 24-inch pile installation	PSO 1

Figure 9. Sitka SPB Project PSO Locations



5.6 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.

Vessels will also adhere to the following USFWS guidance developed to avoid the risk of skiff operators disturbing or striking sea otters:

- While operating skiffs in near shore areas, operators will scan the water surface ahead of the boat vigilantly for otters and limit cruising speed to 10 knots. In choppy water conditions when sea otters may be difficult to spot and if boating with another person, the second person will be located at the boat's bow to help search. Otters as individuals, a mother and a pup, or rafts of 10 or more have been encountered.
- Vessel operators shall use established navigation channels or commonly recognized vessel traffic corridors during transit, and they shall avoid alongshore travel in shallow water (<20 meters or 66 feet depth) when safe and practicable.
- If an otter(s) is seen, the boat's course will be altered and the speed will be slowed to avoid disturbance and collision. Once an otter(s) is sighted, it will not be assumed that the otter(s) will dive and get out of the way. Even if sea otters are alert, capable, and do dive, your action of knowingly staying the course would be considered harassment.
- A skiff will not be operated at any rate of speed heading directly at the otter(s). A buffer will be maintained that allows ample room for the otter(s) to swim away without startling them. The boat operator will understand that it is their responsibility to minimize the stimulus and threat of a loud boat approaching quickly.
- If vessel operators observe sea otters consistently flushing in response to the vessel transiting at the minimum distance, then the vessel operator shall increase the minimum distance until sea otters are no longer flushing in response to the vessel.
- Vessels shall maintain maximum distance practicable from areas of surface kelp.
- The more otters that are seen, the wider the berth will be given. The boat operator will not pass between otters, but rather go around the outside perimeter, plus add a buffer.

- To further reduce the risk of impacts to sea otters, we request the skiff always maintain a minimum distance of 20 meters (not 10) from any sea otters, and a greater distance whenever safe and practicable: 100 meters (328 feet) from single

5.7 Monitoring Techniques

5.7.1 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 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 exclusion 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.

5.7.2 Soft Start Procedures

Soft start procedures will be used prior to periods of vibratory and impact driving to allow marine mammals to leave the area prior to exposure to maximum noise levels.

- For vibratory hammers, the contractor shall run the vibratory hammer for no more than 30 seconds followed by a quiet period of at least 60 seconds without vibratory removal of piles. This process shall be repeated twice more within 10 minutes before beginning vibratory removal operations that last longer than 30 seconds.
- For impact hammers, 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.

5.7.3 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.

5.7.4 Inclement Weather

Sitka Channel and Sitka Sound occasionally experience 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. 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.

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

5.7.5 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.

5.7.6 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 there are no concurrent permitted construction activities.

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.

5.7.7 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.

6 REPORTING

6.1 Notification of Intent to Commence Construction

The contractor will inform NMFS Alaska Region Permits Division and USFWS Alaska Region 3M one week prior to commencing construction activities.

6.2 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

6.3 Interim Monthly Reports

The contractor will submit brief, monthly reports to the NMFS Alaska Region Permits Division and USFWS Alaska Region 3M summarizing PSO observations and recorded takes during construction. Monthly reporting will allow NMFS to track takes (including extrapolated takes) and reinitiate consultation in a timely manner, if necessary. Monthly reports will be submitted by email to NMFS at akr.section7@noaa.gov and to USFWS at 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 May 1–31, 2024, would be submitted to the NMFS and USFWS by close of business on June 10, 2024).

6.4 Final Report

The contractor will submit a draft final report by email to NMFS at akr.section7@noaa.gov and to USFWS at 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 ’s 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 any deviation from the initially proposed pile numbers, 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.

6.5 Reporting Injured or Dead Marine Mammals

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 the NMFS Alaska Region Permits 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 NMFS Permits Division or USFWS Alaska Region 3M, 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 Permits Division 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.

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

Table A-1. Species that May Occur in the Project Vicinity

Species	Status Listing	Jurisdiction	Occurrence	Link to Species Profile
North Pacific Right Whale (*Eubalaena japonica*)	ESA Endangered	NMFS	Rare	https://www.fisheries.noaa.gov/species/north-pacific-right-whale
Gray Whale (*Eschrichtius robustus*)	MMPA	NMFS	Infrequent	https://www.fisheries.noaa.gov/species/gray-whale
Minke Whale (*Balaenoptera acutorostrata*)	MMPA	NMFS	Infrequent	https://www.fisheries.noaa.gov/species/minke-whale
Fin Whale (*Balaenoptera physalus*)	ESA Endangered	NMFS	Rare	https://www.fisheries.noaa.gov/species/fin-whale
Humpback Whale (*Megaptera novaeangliae*)	ESA Threatened Mexico DPS/ North Pacific DPS	NMFS	Infrequent	https://www.fisheries.noaa.gov/species/humpback-whale
Sperm Whale (*Physeter macrocephalusa*)	ESA Endangered	NMFS	Rare	https://www.fisheries.noaa.gov/species/sperm-whale
Cuvier's Beaked Whale (*Ziphius cavirostris*)	MMPA	NMFS	Rare	https://www.fisheries.noaa.gov/species/cuviers-beaked-whale
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	MMPA	NMFS	Rare	https://www.fisheries.noaa.gov/species/pacific-white-sided-dolphin
Killer Whale (*Orcinus orca*)	MMPA	NMFS	Frequent	https://www.fisheries.noaa.gov/species/killer-whale
Harbor Porpoise (Phocoena phocoena)	MMPA	NMFS	Infrequent	https://www.fisheries.noaa.gov/species/harbor-porpoise

Species	Status Listing	Jurisdiction	Occurrence	Link to Species Profile
Dall's Porpoise (*Phocoenoides dalli*)	MMPA	NMFS	Rare	https://www.fisheries.noaa.gov/species/dalls-porpoise
Harbor Seal (*Phoca vitulina*)	MMPA	NMFS	Common	https://www.fisheries.noaa.gov/species/harbor-seal
Northern Sea Otter (*Enhydra lutris kenyoni*)	MMPA	USFWS	Common	https://www.fws.gov/species/northern-sea-otter-enhydra-lutris-kenyoni
Northern Fur Seal (*Callorhinus ursinus*)	MMPA	NMFS	Rare	https://www.fisheries.noaa.gov/species/northern-fur-seal
Steller Sea Lion (*Eumatopia jubatus*)	ESA Endangered (WDPS)	NMFS	Common	https://www.fisheries.noaa.gov/species/steller-sea-lion

Appendix B: Construction Activity and Communication Log

Construction Activity and Communication Log

Project:_________________________ **Location:** _______________ **Observer(s):** __________________________ **Date:**_____________

Time	Pile Size	Pile Type	Pile ID	Construction/Equipment 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	Sitka Seaplane Base Project
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:		V I DR FL 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:		V I DR FL 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:		V I DR FL 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:		V I DR FL 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:		V I DR FL 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:		V I DR FL 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:		V I DR FL 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:		V I DR FL OWC NOWC NONE	DE SD None		

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
HPBK	Humpback Whale
GR	Gray Whale
MK	Minke Whale
ORCA	Killer Whale
HAPO	Harbor Porpoise
HSEA	Harbor Seal
NFS	Northern Fur Seal
SO	Sea Otter
STSL	Steller Sea Lion

Construction Type

Code	Activity Type
OWC	Over-Water Construction
NOWC	No Over-Water Construction
V	Vibratory Hammer
I	Impact Hammer
DR	DTH Drilling
FL	Placement of Fill (below HTL)
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

Filling Out Sighting Forms	
Data Columns	**Definition and How to Record Data**
General Information *(Top of Form)*	
Project Name	Sitka Seaplane Base Project
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)
Waypoint (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 N** this should be denoted by **N-2B**).
Distance from Pile	Distance from pile driving site to the sighted marine mammal.

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)

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 Maps

Figure D-1. Sitka Seaplane Base Grid Map North (N)

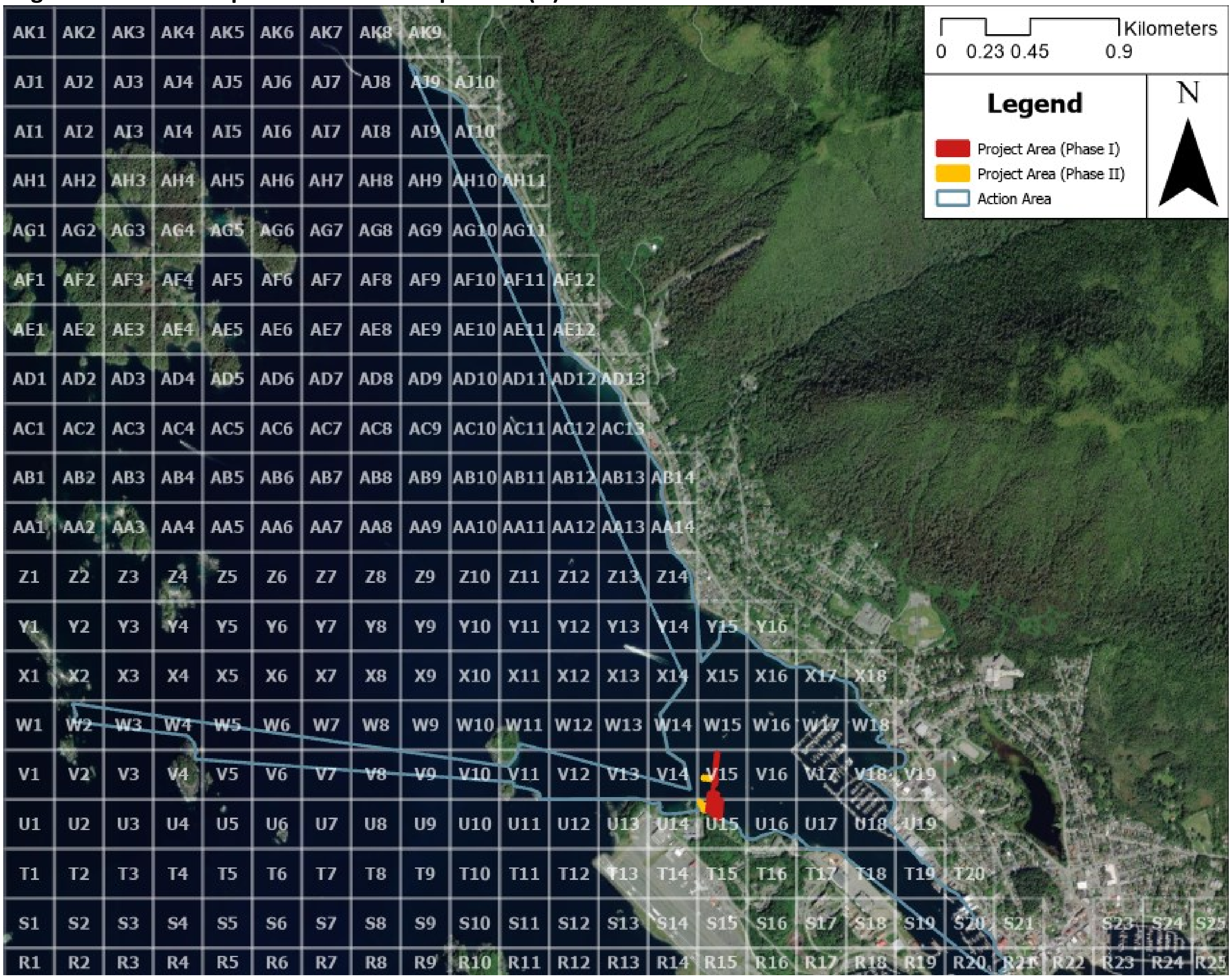


Figure D-1. Sitka Seaplane Base Grid Map South (S)