

Marine Mammal Monitoring and Mitigation Plan

Halibut Point Marine Services, LLC

Old Sitka Dock North Dolphins Expansion Project

Sitka Sound, Sitka, Alaska

July 2019

Revision #1 September 2019

Revision #2 October 2019

Revision #3 November 2019

Revision #4 February 2020

Revision #5 March 2020

Prepared for and by:

Halibut Point Marine Services, LLC

PO Box 718

4513 Halibut Point Road

Sitka, Alaska 9983

Table of Contents

1 INTRODUCTION.....	1
2 PERMITS AND AUTHORIZATIONS	2
3 EXPECTED SPECIES AND TAKE REQUESTED	2
4 METHODS SUMMARY.....	2
5 MITIGATION MEASURES.....	3
5.1 GENERAL CONSTRUCTION MITIGATION MEASURES	3
5.2 PILE DRIVING AND REMOVAL MITIGATION MEASURES.....	4
5.3 PROTECTED SPECIES OBSERVERS.....	4
5.4 PSO QUALIFICATIONS.....	4
5.5 MARINE MAMMAL MONITORING PROTOCOLS	5
5.6 NUMBER AND LOCATION OF PSOs.....	6
6 MONITORING AND SHUTDOWN ZONES	7
6.1 LEVEL B MONITORING ZONES	7
6.2 LEVEL A SHUTDOWN ZONES	9
6.3 MONITORING AND SHUTDOWN SUMMARY	10
7 REPORTING.....	11
7.1 USACE	11
7.2 USFWS	11
7.3 NMFS AK	11
7.4 NMFS OPR	12
7.5 REPORTING OF INJURED OR DEAD MARINE MAMMALS.....	12
7.6 REPORTING OF TAKE OF ESA-LISTED SPECIES.....	13

List of Figures

FIGURE 1 - PROJECT LOCATION.....	1
FIGURE 2- LEVEL B MONITORING ZONES.....	8
FIGURE 3 - LEVEL A SHUTDOWN ZONES	10

List of Tables

TABLE 1 – SPECIES MOST LIKELY TO OCCUR..... 2

TABLE 2 - LEVEL B MONITORING ZONES..... 7

TABLE 3 - LEVEL A SHUTDOWN ZONES..... 9

Appendices

Appendix A. Marine Mammal Sighting Forms

1 INTRODUCTION

Halibut Point Marine Services LLC (HPMS) proposes the following Marine Mammal Monitoring and Mitigation Plan (4MP) for use during in-water construction to Old Sitka Dock North Dolphins Expansion Project in Sitka Sound.

The project is in Waters of the U.S, within the range of Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) listed marine mammals 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). The purpose of this plan is to minimize impacts to marine mammals by prescribing how mitigation measures and construction techniques will be employed, outlining the duties of the Protected Species Observers (PSOs), and summarizing reporting requirements. The plan uses of a combination of marine mammal monitoring, soft-starts, shutdowns (if needed), and species data collection and reporting to comply with the permits and authorizations required to construct this project.

Figure 1 - Project Location



2 PERMITS AND AUTHORIZATIONS

A number of permits and authorizations are required for this project. The project shall comply with the terms and conditions outlined in the following requested permits and authorizations:

- U.S Army of Engineers (USACE) Permit (requested);
- NMFS Office of Protected Resources (OPR) Incidental Harassment Authorization (IHA) (requested);
- USFWS Marine Mammal Management (MMM) IHA (request to be submitted);
- NMFS Alaska Region Protect Resources Division Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Incidental Take Statement (ITS);

3 EXPECTED SPECIES AND TAKE REQUESTED

The species that are most common in the project area are listed in Table 1. A NMFS IHA has been requested for this project and the species for which Level B take has been requested, and the number and type of take are shown in Table 1. In addition, a small number of Level A take has been requested which are also shown in Table 1.

Table 1 – Species Most Likely to Occur

Species Most Likely to Occur	Level B Take	Level A Take
Humpback Whale (<i>Megaptera novaeangliae</i>)	152	
Killer Whale (<i>Orcinus orca</i>)	32	
Harbor Porpoise (<i>Phocoena phocoena</i>)	95	7
Harbor Seal (<i>Phoca vitulina</i>)	532	7
Steller Sea Lion (<i>Eumatopia jubatus</i>)	304	
Minke whale (<i>Balaenoptera acutorostrata</i>)	4	
Gray whale (<i>Eschrichtius robustus</i>),	3	

4 METHODS SUMMARY

HPMS, the contractor, and qualified PSOs will work together to carry out construction methods that minimize impacts to marine mammals, marine mammal monitoring, and reporting.

The contractor will employ construction mitigation measures including the vibratory hammer at reduced energy settings, driving all piles with a vibratory hammer to the maximum extent possible prior to using an impact hammer, operating the impact hammer at reduced energy settings, and using soft-starts and pile caps for pile driving.

PSOs will be employed for marine mammal monitoring and will be present during all in-water work. PSOs will be onsite before, during, and after all in-water construction activities. The PSO(s) will perform monitoring and data collection and will relay data to the contractor and HPMS for reporting.

PSO(s) will be located at sites that allow them to view the Level A and B harassment zones. PSOs will continuously scan the Level A and B monitoring zones and ensure shutdown zones are clear of marine mammals prior to in-water construction. PSOs will collect data including environmental conditions, marine mammal sightings and behavior, construction activity at the time of sightings, and take. If a marine mammal is observed approaching a shutdown zone the PSOs will contact the contractor to shutdown construction activity.

Because of the large size of some of the Level B monitoring zones, Level B take may be extrapolated. PSOs may observe a smaller area than the entire Level B zone and extrapolate project take from that area. For example, if the PSOs could confidently monitor 50 percent of the Level B zone, and 10 seals were observed during pile driving, then the total extrapolated number of takes would be 20.

PSOs will maintain verbal communication with construction personnel to implement appropriate mitigation measures (detailed in Section 5). If the number of species observed within the B zones during noise-producing project activities approaches the number of takes authorized in the ITS, HPMS will notify NMFS and USFWS and reinitiate consultation.

HPMS will be responsible for preparing and submitting marine mammal monitoring reports. The following sections of this plan describe mitigation, monitoring protocols, monitoring and shutdown zones, and reporting in detail.

5 MITIGATION MEASURES

A number of proposed mitigation measures and construction techniques will be employed to minimize effects to marine mammal species. Mitigation measures for the project include general construction mitigation measures, mitigation measures during pile removal and installation, and marine mammal shutdown zones. These measures are detailed below.

5.1 General Construction Mitigation Measures

- The project uses the most compact design possible, while meeting the demands of the vessels that would use the facility.
- Wood that has been surface or pressure-treated with creosote or treated with pentachlorophenol will not be used. If treated wood must be used, any wood that comes in contact with water will be treated with waterborne preservatives in accordance with Best Management Practices developed by the Western Wood

Preservers Institute. Treated wood will be inspected before installation to ensure that no superficial deposits of preservative material remain on the wood.

- The project uses a design that does not require dredging, blasting, or fill.
- Plans for avoiding, minimizing, and responding to releases of sediments, contaminants, fuels, oil, and other pollutants will be developed and implemented.
- Spill response equipment will be kept on-site during construction and operation.
- Floats or barges will not be grounded at any tidal stage.

5.2 Pile Driving and Removal Mitigation Measures

- 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 (HDPE) or ultra-high-molecular-weight polyethylene (UHMW) softening material on all templates to eliminate steel on steel noise generation.
- Soft start procedures will be used prior to pile removal and installation, to allow marine mammals to leave the area prior to exposure to maximum noise levels. For vibratory hammers and down hole drills, the soft-start technique will initiate noise from the hammer for 15 seconds at a reduced energy level, followed by a 1-minute waiting period and will repeat the procedure 2 additional times. For impact hammers, the soft-start technique will initiate 3 strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would also be repeated two additional times.

5.3 Protected Species Observers

Qualified PSOs will be employed for marine mammal monitoring and will be present during all in-water work. PSOs will maintain verbal communication with the construction personnel to implement the appropriate mitigation measures listed below.

5.4 PSO Qualifications

As prescribed by NMFS, PSOs must meet the following criteria:

- Independent PSOs will be used (i.e., not construction personnel).
- HPMS must submit to NMFS OPR Greg Balogh – greg.balogh@noaa.gov the curriculum vitae (CV) of all observers prior to monitoring.
- At least one PSO must have prior experience working as a marine mammal observer during construction activities.
- Other PSOs may substitute education (degree in biological science or related field) or training for experience.
- When using a team of three or more observers, one observer will be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.
- HPMS will ensure that, and observers must have, the following additional qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times and reasons for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior;
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary; and
- Sufficient training, orientation, or experience with the construction operations to provide for personal safety during observations.

5.5 Marine Mammal Monitoring Protocols

The following marine mammal monitoring protocols will be implemented during pile driving and removal activities to help prevent and document acoustic effects on marine mammals.

1. The PSO will have no other primary duties than watching for and reporting on events related to marine mammals.
2. The PSO will have the tools necessary to aid in determining the location of observed listed species, to take action if listed species are likely to enter a shutdown zone, and to record these events. These tools may include:
 - a. Binoculars
 - b. spotting scope
 - c. range finder
 - d. GPS
 - e. Compass
 - f. two-way radio communication with construction foreman/superintendent
 - g. log book of all activities, which will be made available to U.S. Army Corps of Engineers and NMFS upon request
3. Prior to in-water pile driving and removal, monitoring and shutdown zones will be field verified.
4. Pile driving and removal will not be conducted when weather conditions or darkness restrict clear, visible observation of all waters within and surrounding the shutdown zone.
5. Each day prior to commencing in-water work the PSO will conduct a radio check with the construction foreman or superintendent. The PSO will brief the foreman or

supervisor as to the shutdown procedures if any of the listed species are observed likely to enter or within a shutdown zone, and will have the foreman brief the crew, requesting that the crew notify the PSO when a listed species is spotted.

6. The PSO will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform duties as an PSO for more than 12 hours in a 24-hr period (to reduce PSO fatigue).
7. The PSO will remain onsite during in-water pile driving/removal.
8. The PSO will scan the monitoring zone for the presence of listed species for 30 minutes before any pile driving or removal activities take place, or if pile driving has not occurred for over one hour, specifically to ensure the monitoring zone are clear before construction begins.
9. Throughout all pile-driving activity, the PSO will continuously scan the shutdown and monitoring zone that apply to the construction methods being used to ensure that listed species do not enter them.
 - a. If any listed species enter, or appear likely to enter, the shutdown zone during pile-driving activities, all driving activity will cease immediately. Pile -driving may resume when the animal(s) has been observed leaving the area on its own accord. If the animal(s) is not observed leaving the area, pile-driving activity may begin 15 min (for pinnipeds and sea otters) or 30 min (for cetaceans) after the animal is last observed in the area.
10. Once the shutdown zone has been cleared, ramp-up 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 min:
 - a. 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-sec waiting period. This procedure will be repeated two additional times.
11. A data sheet will be used to record the species, behavior, date, and time of any marine mammal sightings. This data will be used to prepare a PSO report.

5.6 Number and Location of PSOs

Three PSO's will be utilized at various monitoring locations. These locations will be selected to provide an unobstructed view of all water within the shutdown zone and as much of the Level A and B harassment zone as possible for pile driving activities.

- Three PSOs will monitor during all vibratory pile driving activities at the project site, with locations as follows:
 - PSO #1: stationed at or near the site of pile driving;
 - PSO #2: stationed on the north end of Big Gavanski Island and positioned to be able to view north into Olga Strait and south east towards the project area;
 - PSO #3: stationed on the north end of Middle Island and positioned to be able to view west towards Kruzoff Island and east towards the project area;
- Three PSOs will monitor during all impact pile driving activities at the project site, with locations as follows:
 - PSO #1: stationed at or near the site of pile driving;

- PSO #2: stationed on the east side of Big Gavanski Island and positioned to be able to view north towards Olga Strait and south towards the project area;
- PSO #3: stationed on the east side of Middle Island and positioned to be able to view south towards Sitka Channel and east towards the project area;

6 MONITORING AND SHUTDOWN ZONES

Because species are impacted by noise in different ways, species-specific monitoring and shutdown zone have been calculated for this project. These monitoring and shutdown zones are listed in Tables 2, 3, and summarized in Table 4. The zones are shown in Figures 2, and 3.

Further, there will be a nominal 10-meter shutdown zone for all species during construction-related activity where acoustic injury is not the primary concern. 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). For these activities, monitoring would take place from 15 minutes prior to initiation until the action is complete.

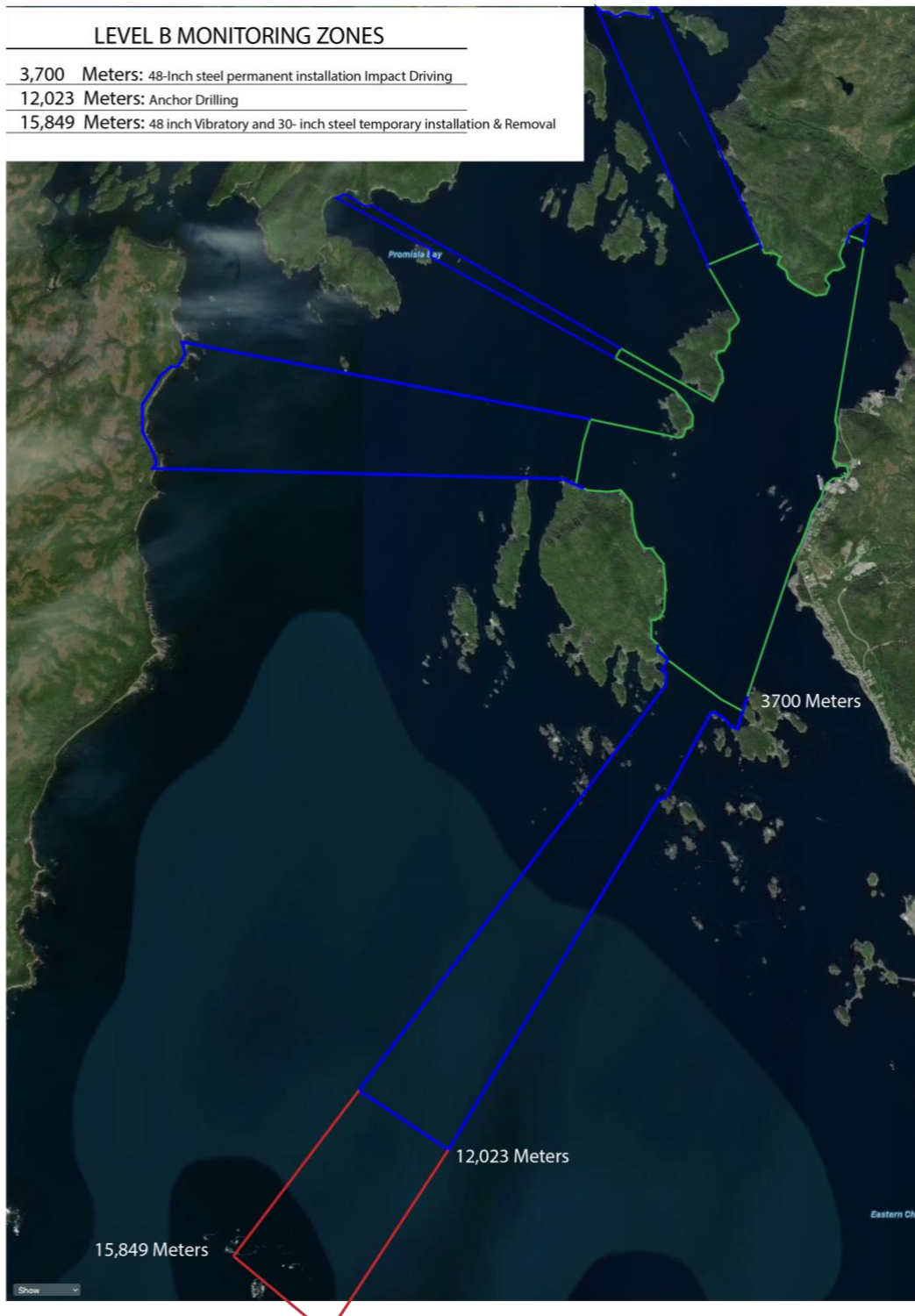
6.1 Level B Monitoring Zones

If a marine mammal species for which Level B take is authorized (humpback whale, killer whale, harbor porpoise, harbor seal, Steller sea lion) is observed within the Level B monitoring zones outlined in Table 2 during the activity specified, presence in that zone would be considered a Level B take. If a marine mammal species for which take has not been requested were to approach the action area, in-water construction would be shutdown.

Table 2 - Level B Monitoring Zones

Source	Monitoring Zone (m)*
30-inch steel temporary installation (8 piles; 1 hour per day on 4 days)	15,849
30-inch steel removal (8 piles; 40 min on 2 days)	15,849
48-inch steel permanent installation (10 piles; ~2 hours per day on 5 days)	15,849
Impact Pile Driving	
48-inch steel permanent installation (10 piles; ~6 minutes per day on 5 days)	3,700
Anchor Drilling	
33-inch Anchor Shaft Drilling (8 piles; ~2.5 hours per day on 8 days)	12,023

Figure 2- Level B Monitoring Zones



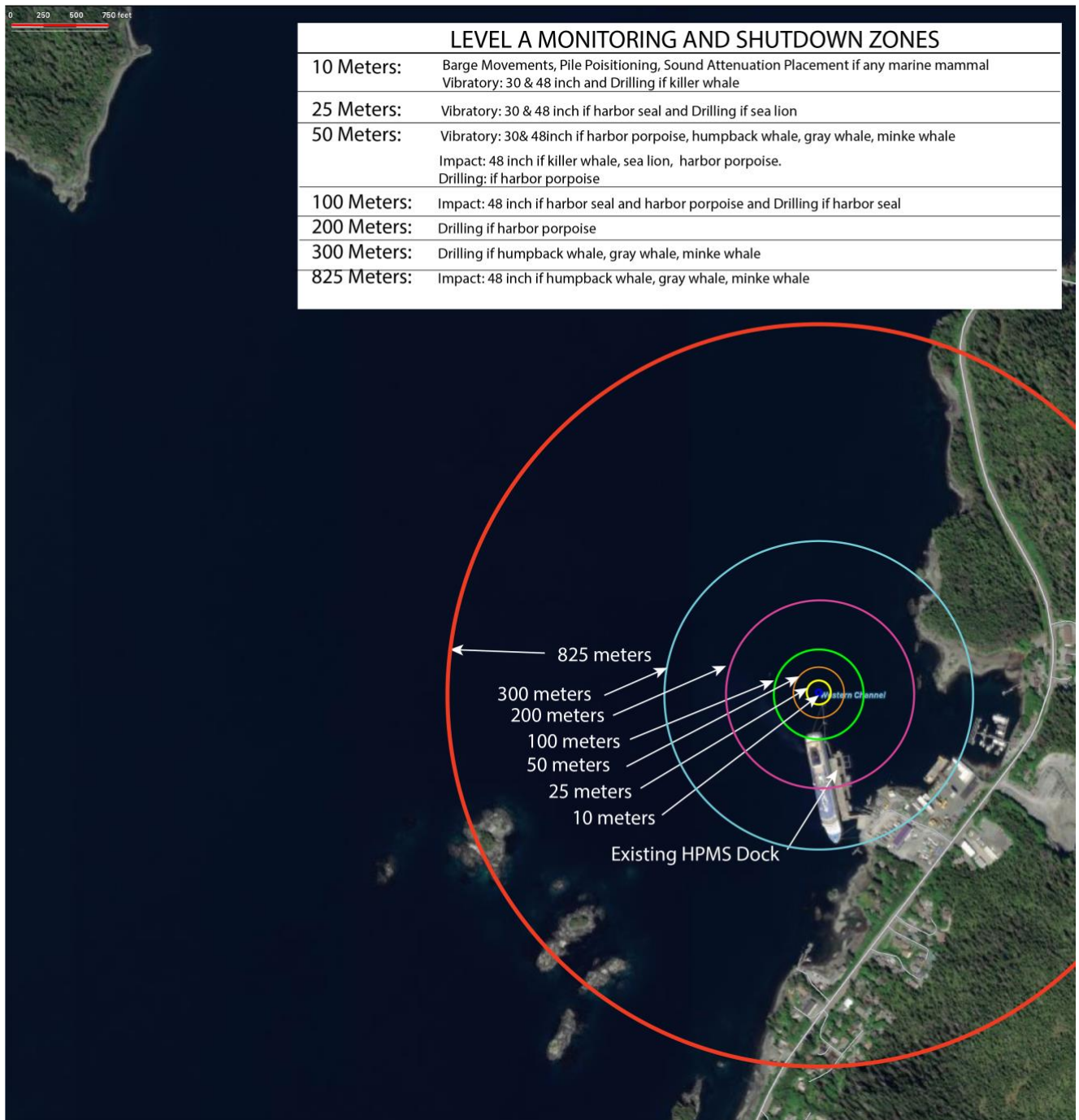
6.2 Level A Shutdown Zones

If a specified marine mammal is observed within the shutdown zones outlined in Table 3 during the activity specified, presence in that zone would be considered a Level A take. To prevent Level A take, shutdowns will be employed if a species approaches or is present within the following shutdown zones.

Table 3 - Level A Shutdown Zones

Source	Shutdown Zones in Meters				
	Low-Frequency Cetaceans (humpback whale)	Mid-Frequency Cetaceans (killer whale)	High-Frequency Cetaceans (harbor porpoise)	Phocid (harbor seal)	Otariid (sea lion)
In Water Construction Activities*					
Barge movements, pile positioning, sound attenuation placement*	10	10	10	10	10
Vibratory Pile Driving/Removal					
30-inch steel temporary installation (8 piles; 1 hour per day on 4 days)	50	10	50	25	10
30-inch steel removal (8 piles; 40 min on 2 day)	50	10	50	25	10
48-inch steel permanent installation (10 piles; ~2 hours per day on 5 days)	50	10	50	25	10
Impact Pile Driving					
48-inch steel permanent installation (10 piles; ~6 minutes per day on 5 days)	825	50	100	100	50
Anchor Drilling					
33-inch drilled Anchor Shaft (8 Piles – 2.5 hour per pile)	300	10	200	100	25

Figure 3 - Level A Shutdown Zones



7 REPORTING

A compliance certification form is due to the USACE after project completion, and comprehensive marine mammal reports are due to USFWS MMM regarding sea otters and to NMFS AK and NMFS OPR regarding all marine mammals. The sections below provide an overview of reporting requirements for this project. Refer to the requested DA Permit, the requested NMFS and USFWS IHAs and NMFS BO for detailed terms and conditions.

7.1 USACE

Within 60 days of completion of the work authorized by this permit, the HPMS shall complete the "Self-Certification Statement of Compliance" form (attached to the DA Permit) and submit it to the USACE.

7.2 USFWS

All observation records will be made available to the USFWS at the end of each calendar month and a summary report will be provided to the USFWS by December 1 each year. The contact for these reports is to be determined.

7.3 NMFS AK

A final monitoring report will be provided to NMFS Alaska Region - Greg Balogh within 90 days of completion of pile driving. In general, reporting may include:

- Numbers of days of observations.
- Lengths of observation periods.
- Locations of observation stations and dates used.
- Numbers, species, dates, group sizes, and locations of marine mammals observed.
- Descriptions of work activities, categorized by type of work taking place while marine mammals were being observed.
- Distances to marine mammal sightings, including closest approach to construction activities.
- Descriptions of any observable marine mammal behavior in the Level A and Level B harassment zones.
- Actions performed to minimize impacts to marine mammals.
- Times of shutdown events including when work was stopped and resumed due to the presence of marine mammals or other reasons.
- Refined take estimates based on the numbers of humpback whales, killer whales, Pacific white-sided dolphin, harbor porpoises, harbor seals, and Steller sea lions observed during the course of pile installation and removal activities.
- Descriptions of the type and duration of any noise-generating work occurring and ramp-up procedures used while marine mammals were being observed.
- Details of all shutdown events, and whether they were due to presence of marine mammals, inability to clear the hazard area due to low visibility, or other reasons.
- Tables, text, and maps to clarify observations.

- Full documentation of monitoring methods, an electronic copy of the data spreadsheets, and a summary of results will also be included in the report.
- Final reports and reports of unauthorized take will be submitted to: NMFS Alaska Protected Resources Division and NMFS Office of Protected Resources.

7.4 NMFS OPR

Submit a draft report to NMFS – Greg Balogh – greg.balogh@noaa.gov on all monitoring conducted under the requested IHA within ninety calendar days of the completion of marine mammal monitoring. A final report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements below:

- Detailed information about any implementation of shutdowns, including the distance of animals to pile driving and removal and description of specific actions that ensued and resulting behavior of the animal, if any.
- Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take (i.e., multiple exposures of the same animal).

7.5 Reporting of 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, HPMS must immediately cease the specified activities and report the incident to the NMFS Office of Protected Resources (301-427-8401) and Alaska Region Stranding Coordinator (907-586-7209). The report must include the following information:

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

In the event HPMS discovers an injured or dead marine mammal, and the lead observer 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), HPMS must immediately report the incident to the Office of Protected Resources, NMFS, and the Alaska Region Stranding Coordinator, NMFS. The report must include the same information identified in 6(c)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with HPMS to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that HPMS discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the specified activities (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), HPMS must report the incident to the Office of Protected Resources, NMFS, and the Alaska Region Stranding Coordinator, NMFS, within 24 hours of the discovery.

7.6 Reporting of Take of ESA-Listed Species

If take of humpback whales or Steller sea lions approaches the number of takes authorized in the ITS, the HPMS will notify NMFS AK representative – Greg Balogh – greg.balogh@noaa.gov

Appendix A.

Marine Mammal Sighting Forms

Marine Mammal Sighting Form

Project: _____ **Location:** _____ **Sighting #:** _____

(1st sighting of the day is Sighting#: 1)

Date: _____ **Observer(s):** _____

Time (military)		Species (circle)	Distance (animal to activity)		Number of Animals		Number of Animals in Each Class			
Initial Sighting Time		Steller Sea Lion	Initial Distance		Min Count		Adults		Calves/ Pups	
Final Sighting Time			Harbor Seal	Closest Distance		Max Count		Juveniles		Unkn. Age
Time Entered H-Zone B		Harbor Porpoise		Final Distance		Best Count				
Time Exited H-Zone B		Killer Whale					Male		Female	
Time Entered H-Zone A		Sea Otter								
Time Exited H-Zone A		other: _____					Unknown Sex			

Behavior of Marine Mammal check all observed behaviors; place a **1** next to primary, 2 next to secondary activity):

Indicate any changes in behavior in the Additional Information section

☐ Travel ☐ Fight ☐ Mill Other: _____
☐ Disoriented ☐ Play ☐ Dive
☐ Slap ☐ Spyhop ☐ Unknown
☐ Feeding Observed ☐ Swimming Toward Site ☐ Swimming Away from Site

Group Cohesion (Orientation of animals within the group and the approx. distance between animals) :

Project Activities and Harassment Zone

Entered Harassment Zone A? **Y or N**

Entered Harassment Zone B? **Y or N**

In-Water Work was occurring at initial sighting? **Y or N**

List In-water Activities: _____

SHUT DOWN or DELAYED from _____ to _____ (time)

NO SHUT DOWN, EXPLANATION REQUIRED:

Describe Commerical Activities (# and type of vessels offloading at sea food processing dock, traveling by, refueling at dock):

Additional Information (include more detailed information on behavior):

Draw locations on hardcopy map

Page ____ of ____

[illegible]

Marine Mammal Sighting Form Version 2

Marine Mammal Sightings During Pile Driving

Date: _____ Observer: _____

General Weather AM _____

Daily Start Time: _____

PM _____

Daily End Time: _____

Was the Entire Exclusion Zone Visible During
Pile Driving Operations (Y/N)? _____

If No, Please Explain _____

Time of initial observation	Species Code	No. of Indiv.		Age Class	Sex	Within Exclusion Zone (Y/N)	Resight (Y/N/UNK)	Beh. 1*	Beh. 2*	Pile Number	Activity Type	Notes/Abnormal Behaviors/Other
1		HO	Water									
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

Sheet _____ of _____

Data Codes

Species Code

Steller Sea Lion = **SSL**
 Ringed Seal = **RS**
 Bearded Seal = **BS**
 Spotted Seal = **SS**
 Harbor Seal = **HS**
 Fur Seal = **FS**
 Bowhead Whale = **BW**
 Beluga Whale = **BE**
 Humpback Whale = **HW**
 Fin Whale = **FW**
 Killer Whale = **KW**
 Gray Whale = **GW**
 Unidentified Phocid = **PH**
 Unidentified Pinniped = **UP**
 Unidentified Whale = **UW**

Age Classifications

Unknown Age = **UA**
 Adults
 Juveniles
 Calves/Pups

Sex

Female = **F**
 Male = **M**
 Mixed
 Unknown = **U**

Primary Behavior Codes

Dive = **DV**
 Travelling = **TR**
 Mating Suspected = **MS**
 Milling = **MI**
 Resting = **RE**
 Feeding = **FE**
 Tail Slap = **TS**
 Enter Water = **EN**
 Exit Water = **EX**
 Hauled Out = **HO**
 Look = **LO**

Secondary Behavior Codes

Directional Change = **DC**
 Increased Breathing Rate = **IB**
 Increased Swimming Rate = **IS**
 Surface Active = **SA**
 Flush = **FL**

Activity Type

No Activity = **0**
 Soft start = **1**
 Impact Pile Driving = **2**
 Vibratory Pile Driving = **3**
 Shutdown = **4**