

APPENDIX C

MITIGATION ACTION PLAN

MITIGATION ACTION PLAN

LAND-WATER INTERFACE
AND
SERVICE PIER EXTENSION
AT NAVAL BASE KITSAP BANGOR

NAVAL BASE KITSAP BANGOR
SILVERDALE, WA

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DEPARTMENT OF THE NAVY

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EXECUTIVE SUMMARY

This document presents a Mitigation Action Plan for the proposed construction and operation of two Proposed Actions on Naval Base Kitsap Bangor (NAVBASE Kitsap Bangor), Washington: the Land-Water Interface (LWI) and the Service Pier Extension (SPE).

Aspects of these two Proposed Actions have the potential to cause environmental impacts. Several measures, including current practices (CPs), best management practices (BMPs), and mitigation measures (MMs), will be applied to the project to avoid, reduce, and mitigate the effects from this action.

Project measures include the following:

- BMPs to ensure compliance with the United States Environmental Protection Agency's (USEPA) general permit for stormwater discharges from construction sites (operational stormwater management is considered part of project design);
- CPs to minimize the potential for impacts during construction and operational phases of the project;
- Noise attenuation measures during construction, including bubble curtains and soft start for impact pile drivers;
- Monitoring to minimize noise impacts;
- Mitigation measures for biological and other resources;
- Compensatory mitigation for impacts to aquatic resources; and
- Treaty mitigation.

These measures are in addition to project compliance with all applicable regulations or permit conditions. The Department of the Navy (Navy) ultimately will be responsible for ensuring agreed-upon measures are implemented.

Measures are described in Sections 2 through 5 of this Mitigation Action Plan. For each category of CPs, BMPs, and MMs, the Mitigation Action Plan provides (1) description of the measure; (2) parties responsible for implementation; (3) planned implementation schedule; (4) planned funding; (5) mitigation-specific performance criteria; (6) monitoring and tracking mechanisms; and (7) enforcement measures. Section 6 of this Mitigation Action Plan describes the Navy's proposed Compensatory Mitigation action, which would offset unavoidable adverse impacts on aquatic resources under the provisions of the Clean Water Act (CWA) Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (U.S. Army Corps of Engineers [USACE] and U.S. Environmental Protection Agency [USEPA] 2008). Section 9 of the Mitigation Action Plan describes mitigation projects proposed to address potential effects of the LWI and SPE Proposed Actions on reserved treaty rights and resources of federally recognized American Indian Tribes. Mitigation measures will be documented in the Records of Decision (ROD) for the two Proposed Actions.

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LIST OF ACRONYMS AND ABBREVIATIONS

BMP	best management practice
BSS	Beaufort Sea State
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COMNAVREGNWINST	Commander Navy Region Northwest Instruction
CP	current practice
CWA	Clean Water Act
dB	decibel
dba	A-weighted decibel
DoD	Department of Defense
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
ESA	Endangered Species Act
FLUPSY	Floating Upwelling System
GPS	Global Positioning System
HCCC	Hood Canal Coordinating Council
Hz	hertz
ILF	In-lieu fee
IMP	integrated management practices
kHz	kilohertz
LID	low impact development
LWI	Land-Water Interface
MBTA	Migratory Bird Treaty Act
MHHW	mean higher high water
MLLW	mean lower low water
MM	mitigation measure
MMO	marine mammal observer
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MSGP	Multi-Sector General Permit
NAVBASE	Naval Base
NAVFAC NW	Naval Facilities Engineering Command Northwest
Navy	Department of the Navy
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OPNAVINST	Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Administration
PSB	Port Security Barrier
PSNERP	Puget Sound Nearshore Ecosystem Restoration Project
RMS	root mean square
ROD	Record of Decision
SEL	sound exposure level
SHPO	State Historic Preservation Officer
SPE	Service Pier Extension
SPL	sound pressure level
SSBN	OHIO Class Ballistic Missile submarine
SSN	SEAWOLF, LOS ANGELES, or VIRGINIA Class attack submarine
SR	State Route

LIST OF ACRONYMS AND ABBREVIATIONS

SWPPP	storm water pollution prevention plan
TRIDENT	TRIDENT Fleet Ballistic Missile
TTS	temporary threshold shift
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDOE	Washington Department of Ecology
WRA	Waterfront Restricted Area

1.0 INTRODUCTION

This document presents the Department of the Navy's (Navy's) Mitigation Action Plan for two Proposed Actions on Naval Base (NAVBASE) Kitsap Bangor, Washington: the Land-Water Interface (LWI) and the Service Pier Extension (SPE). NAVBASE Kitsap Bangor, Washington, is located on Hood Canal approximately 20 miles due west of Seattle, Washington (Figure 1). The project sites for the LWI are located on the perimeter of the Waterfront Restricted Area (WRA) at the Bangor waterfront. Access to this portion of the Bangor waterfront is restricted by a fencing system on the land and a floating barrier system on the water. The Service Pier is not located within the WRA but is within the floating barrier system, which extends beyond the WRA (Figure 2). Both project sites are within the Hood Canal hydrologic unit code 17110018 and the Water Resource Inventory Area 15 (Kitsap County).

As recognized by the Council on Environmental Quality (CEQ) in their Memorandum about the appropriate use of mitigation and monitoring (CEQ 2011), mitigation is an important mechanism that federal agencies can use to minimize potential adverse environmental impacts associated with their actions. The term mitigation includes avoiding, minimizing, rectifying and reducing impacts, as well as compensating for impacts. Federal agencies rely upon the expertise of professional staff to assess mitigation needs, develop mitigation plans, and oversee mitigation implementation. Agencies may also rely on outside resources and experts to develop appropriate monitoring strategies and to ensure mitigation has the desired effects.

The mitigation measures detailed in this Mitigation Action Plan were developed through a multi-disciplinary approach. Input from environmental professionals from the Navy, agencies, tribes, and private industry influenced the project design; this will result in an action that would avoid and minimize environmental impacts to the maximum extent possible, while still meeting the Navy's mission requirements. Measures to minimize species impacts were developed through consultation with federal resource agency experts. The Navy's proposed compensatory mitigation is to use the Hood Canal Coordinating Council's In Lieu Fee program, which was developed through extensive discussion with federal agencies, tribes, state agencies, local governments, and non-governmental organizations; this is discussed in further detail in Section 6.0 of this Mitigation Action Plan.

CEQ guidance recommends that agencies not commit to mitigation unless they have sufficient legal authorities and expect there will be resources available to implement the mitigation. The Navy has determined that the mitigation measures within this Mitigation Action Plan are within the Navy's legal authority to implement, and anticipates that resources will be available to ensure mitigation performance. The CEQ also recommends that agencies take steps to ensure that mitigation commitments are actually implemented. The Navy's Environmental Readiness Program Manual (OPNAVINST 5090.1D CH-1) directs action proponents to identify and track mitigation and monitoring requirements committed to in environmental planning decision documents. This Mitigation Action Plan details specific mitigation measures, parties responsible for implementing each measure, schedule for implementation, funding, performance criteria, monitoring and tracking mechanisms, and enforcement measures.

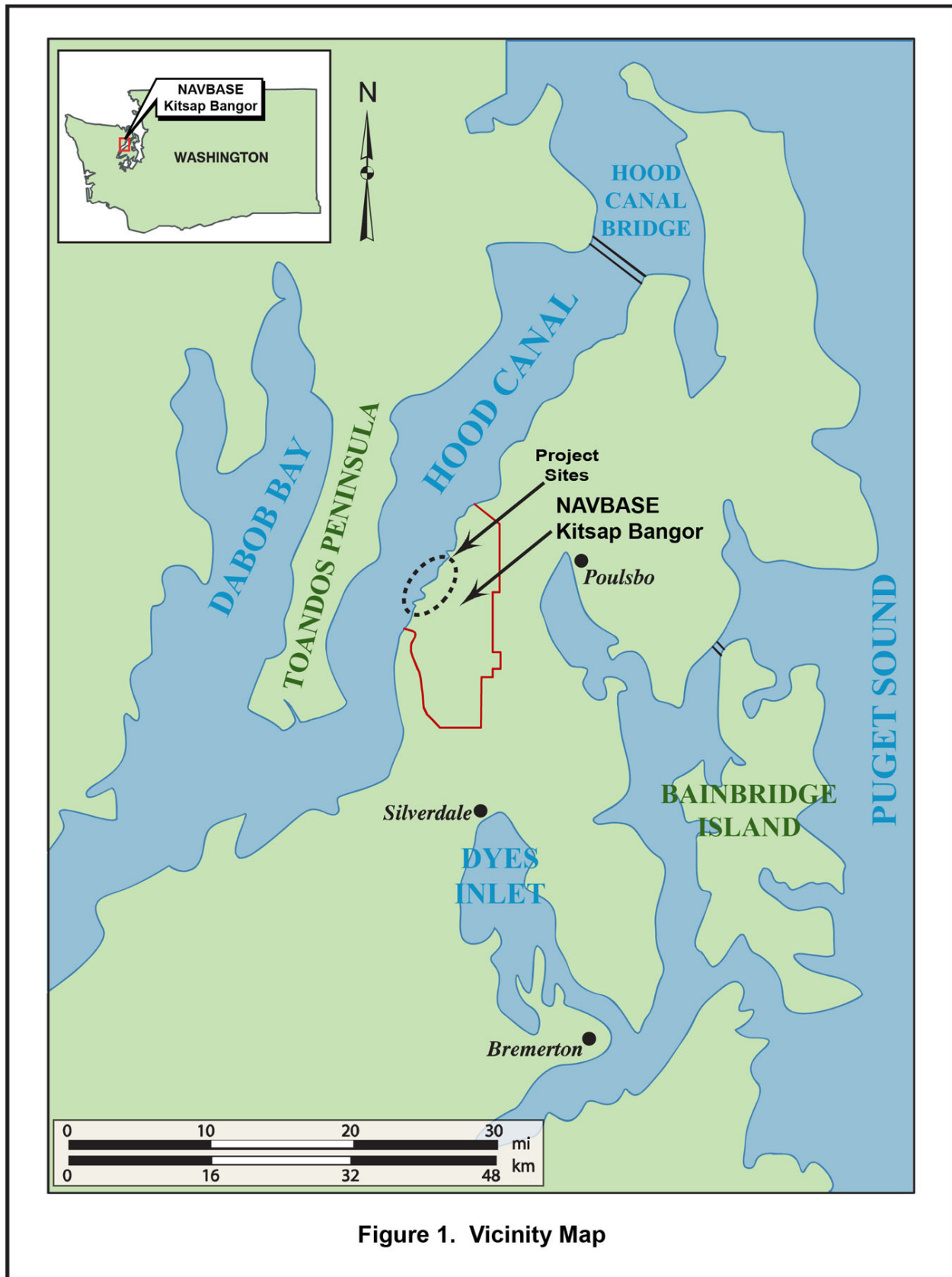


Figure 1. Vicinity Map

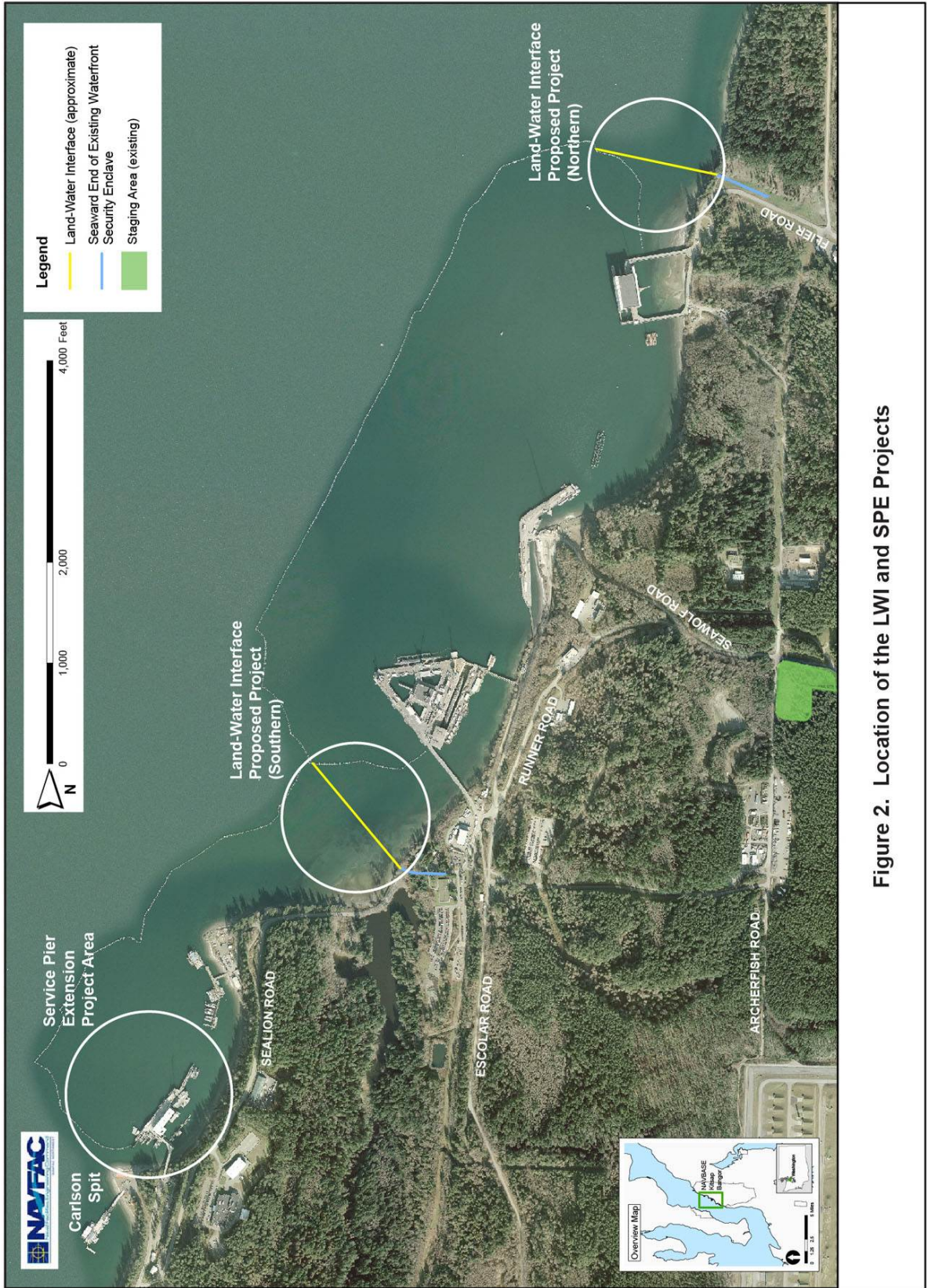


Figure 2. Location of the LWI and SPE Projects

The CEQ encourages agencies to include public involvement components in their mitigation monitoring programs and provide public access to mitigation monitoring information. This Mitigation Action Plan requires the Navy to submit monitoring reports to federal resource agencies at the conclusion of each year of in-water construction. The Navy will make these reports available to the public on a Navy website.

Aspects of the LWI and SPE projects have the potential to cause environmental impacts. Several measures, including current practices (CPs), best management practices (BMPs), and mitigation measures (MMs), will be applied to the project to avoid, reduce, and mitigate the effects from this action. These measures are in conjunction with project compliance to all applicable regulations or permit conditions. CPs are physical, structural, or managerial practices that decrease the potential for impacts, particularly related to water quality. BMPs are required to ensure compliance with the U.S. Environmental Protection Agency (USEPA) general permit for stormwater discharges from construction sites (operational stormwater management is considered part of project design; see Section 2.4.1). They can be used singly or in combination as appropriate in a particular situation. Mitigation measures are used most frequently to reduce or minimize impacts that are unavoidable. These measures are described in Sections 2 through 5 of this Mitigation Action Plan and summarized in Table 1. Section 6 of this Mitigation Action Plan describes the Navy's proposed Compensatory Mitigation action, which would offset unavoidable adverse impacts on aquatic resources under the provisions of the Clean Water Act (CWA) Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (U.S. Army Corps of Engineers [USACE] and USEPA 2008). Section 9 of the Mitigation Action Plan describes mitigation projects proposed to address potential effects of the LWI and SPE Proposed Actions on reserved treaty rights and resources of federally recognized American Indian Tribes. Mitigation measures will be documented in the Records of Decision (ROD) for the two Proposed Actions.

1.1. PROPOSED ACTION

The Navy proposes two projects, the LWI and SPE, on the Bangor waterfront. Under the LWI project, the Navy proposes to enhance security at the perimeter of the Waterfront Restricted Area (WRA) on NAVBASE Kitsap Bangor by constructing physical barriers through shallow waters and onto the immediate upland areas at the northern and southern extent of the WRA. These structures would tie into the existing Port Security Barrier (PSB) system and the on-land Waterfront Security Enclave (WSE) system. Under the SPE project, the Navy proposes to extend the existing Service Pier and construct associated support facilities. The SPE would provide additional berthing for maintenance of existing homeported and visiting submarines. The associated support facilities would provide logistical support for submarines at the Navy's SSN research, development, test, and evaluation hub, which is currently located on NAVBASE Kitsap Bangor. Detailed descriptions of the marine and land components of the two Proposed Actions, including the purpose and need, are provided in Chapters 1 and 2 of the Environmental Impact Statement (EIS).

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for the LWI and SPE Projects

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
1. Protection of Marine Water Quality and Seafloor During Construction			
<p>Impact: Contaminant loading via stormwater runoff from construction sites.</p> <p>BMP 1: Implement stormwater pollution prevention plan (SWPPP).</p>	<p>Implement SWPPP prior to the start of construction phase. Install and maintain all structural BMPs throughout construction phase in accordance with SWPPP and permit.</p>	<p>The Navy will be responsible for obtaining USEPA Construction General Permit and complying with permit conditions.</p> <p>The contractor will be responsible for implementing and maintaining BMPs specified in the SWPPP.</p>	<p>Conduct monitoring and inspections as required by SWPPP to document compliance with permit conditions.</p>
<p>Impact: Accidental spill of oil, fuels, or other related materials.</p> <p>CP 1a: Implement oil and hazardous spill contingency plan, and deploy containment boom during in-water construction as required.</p>	<p>Use existing NAVBASE Kitsap Bangor fuel spill prevention and response plans (the <i>Commander Navy Region Northwest Oil and Hazardous Substance Integrated Contingency Plan</i> and the <i>NAVBASE Kitsap Bangor Spill Prevention, Control, and Countermeasure Plan</i> [COMNAVREGNWINST 5090.1, Integrated Contingency Plan, Annex G]); Navy is responsible for providing plans, training, and spill response materials.</p>	<p>The contractor will be responsible for notifying the Navy of any fuel spills.</p> <p>The Navy will be responsible for implementing the plan, notifying appropriate agencies, and providing oversight for incident response.</p>	<p>Containment and cleanup of spilled materials as soon as possible; investigate cause of spill; identify and implement appropriate corrective actions to prevent recurrence.</p>
<p>Impact: Incidental release of construction debris and related contaminants.</p> <p>CP 1b: Develop and implement debris management procedures, deploy containment boom during in-water construction, and handle removed treated piles as required.</p>	<p>Develop and implement procedures prior to start of in-water construction activities.</p>	<p>The contractor will be responsible for developing and implementing the procedures.</p> <p>The Navy will be responsible for reviewing and approving the procedures and for monitoring implementation.</p>	<p>The contractor will be responsible for deploying and maintaining booms, as required, throughout construction period and ensuring that all debris and other materials are collected and properly disposed of. Following completion of in-water construction activities, the contractor will conduct an underwater survey to collect and remove any remaining construction materials.</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
<p>Impact: Prop wash from work vessels could resuspend bottom sediments.</p> <p>CP 1c: Instruct vessel operators to avoid excess engine thrust in water depths shallower than 30 feet (9 meters) to the extent possible.</p>	Conduct briefings with vessel operators prior to start of in-water construction activities.	<p>The contractor will be responsible for briefing vessel operators.</p> <p>The Navy will be responsible for monitoring in-water activities and developing and implementing corrective actions as needed.</p>	Visual inspection to ensure prop wash from vessel operations is not causing sediment resuspension and surface turbidity plumes.
<p>Impact: Grounding of work vessels could disturb bottom sediments.</p> <p>CP 1d: Instruct vessel operators to avoid bottoming out (running aground).</p>	Conduct briefings with vessel operators prior to start of in-water construction activities.	<p>The contractor will be responsible for briefing vessel operators.</p> <p>The Navy will be responsible for monitoring in-water activities and developing and implementing corrective actions as needed.</p>	Visual inspection to ensure work vessels are not grounding during low tides.
<p>Impact: Anchoring work vessels could disturb bottom sediments.</p> <p>CP 1e: Develop a mooring and anchoring plan and implement measures to avoid dragging anchors and lines in special status areas.</p>	Develop plan and obtain plan approval prior to start of in-water construction activities. Conduct briefings with vessel operators prior to start of in-water construction activities.	<p>The contractor will be responsible for developing the plan and briefing vessel operators.</p> <p>The Navy will be responsible for reviewing and approving the plan, monitoring in-water activities, and developing and implementing corrective actions as needed.</p>	Visual inspection to ensure anchor and line recovery operations are causing minimal sediment disturbance.
2. In-Water Work Windows			
<p>Impact: In-water construction activities could interfere with seasonal migrations or life stages of sensitive marine species.</p> <p>MM 2: In-water construction would observe an in-water juvenile salmonid work window.</p>	In-water work would be restricted to periods coinciding with the specified work window (July 15 through January 15). An exception is that, for the LWI project, in-water work other than pile driving and abutment work below MHHW could occur outside the in-water work window.	<p>The construction contractor would be responsible for ensuring that in-water work does not occur outside of the work window except as noted.</p> <p>The Navy would be responsible for monitoring in-water work activities.</p>	The Navy would take necessary corrective actions if the construction contractor does not comply with work window restrictions.

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
3. Protection of Upland Water Quality During Construction			
<p>Impact: Increased potential for erosion and sedimentation from stormwater runoff.</p> <p>BMP 3: Implement SWPPP.</p>	<p>Implement SWPPP prior to the start of construction phase. Install and maintain all structural BMPs throughout construction phase in accordance with SWPPP and permit.</p>	<p>The Navy will be responsible for obtaining permit and complying with permit conditions.</p> <p>The contractor will be responsible for implementing and maintaining BMPs specified in the SWPPP.</p>	<p>Conduct monitoring and inspections as required by SWPPP to document compliance with permit conditions.</p>
4. Protection of Water Quality During Operations			
<p>Impact: Contaminant loadings from stormwater runoff discharges from the project sites.</p> <p>BMP 4: Implement SWPPP.</p>	<p>Implement SWPPP prior to the start of operation phase. Install and maintain all structural BMPs throughout operation phase in accordance with SWPPP, Erosion and Sedimentation Control Plan, and permit.</p>	<p>The Navy will be responsible for obtaining National Pollutant Discharge Elimination System (NPDES) permit and implementing and maintaining BMPs specified in the SWPPP and Erosion and Sedimentation Control Plan.</p>	<p>Conduct monitoring and inspections as required by SWPPP to document compliance with permit conditions.</p>
<p>Impact: Contaminant loadings from stormwater runoff discharges from the project sites.</p> <p>CP 4a: Implement low impact development (LID) integrated management practices (IMP).</p>	<p>Implement practices prior to the start of operation phase. Install and maintain all structural IMPs throughout operation phase.</p>	<p>The Navy will be responsible for implementing and maintaining IMPs.</p>	<p>Conduct monitoring and inspections to document effectiveness of practices and compliance with permit conditions.</p>
<p>Impact: Accidental spills from vessels or wharf operations.</p> <p>CP 4b: Implement oil and hazardous spill contingency plan.</p>	<p>Use existing NAVBASE Kitsap Bangor fuel spill prevention and response plans (the <i>Commander Navy Region Northwest Oil and Hazardous Substance Integrated Contingency Plan</i> and the <i>NAVBASE Kitsap Bangor Spill Prevention, Control, and Countermeasure Plan</i> [COMNAVREGNWINST 5090.1, Integrated Contingency Plan, Annex G]); Navy will be responsible for providing plans, training, and spill response materials.</p>	<p>Navy will be responsible for implementing the plan, notifying appropriate agencies, and providing oversight for incident response.</p>	<p>Containment and cleanup of spilled materials as soon as possible; investigate cause of spill; identify and implement appropriate corrective actions to prevent recurrence.</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
5. Noise Attenuation During Construction			
<p>Impact: Noise from in-water construction activities could impact marine species.</p> <p>MM 5a: Use vibratory driver for pile driving, with the exception of use of impact hammer to drive concrete piles, to proof piles and in cases where vibratory methods are not able to drive the pile to tip elevation.</p> <p>MM 5b: Deploy air bubble curtain or other noise attenuating device during impact hammer operations for steel piles.</p> <p>MM 5c: Use soft start for impact pile driving operations.</p> <p>MM 5d: Observe timing restrictions on pile driving.</p>	<p>These measures would apply to all in-water pile driving operations throughout the construction phase for both projects.</p>	<p>The contractor would be responsible for implementing these measures. The Navy would be responsible for monitoring construction activities.</p>	<p>Performance objective is minimizing potential for noise-related impacts on sensitive species.</p> <p>The Navy would be responsible for monitoring and enforcing these measures (see #6). Documentation would be submitted by the Navy to National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS).</p>
6. Monitoring to Minimize Noise Impacts			
<p>Impact: Noise from construction activities could impact sensitive species.</p> <p>MM 6: Conduct marine mammal and marbled murrelet monitoring during pile driving operations. Suspend pile driving operations when sensitive species are present in shutdown zone.</p>	<p>Marine mammal and marbled murrelet monitoring would be conducted daily prior to and during pile driving operations to determine whether individuals of these species are present in the shutdown and behavioral disturbance zones and to ensure that pile driving is suspended as needed.</p>	<p>The Navy would be responsible for ensuring trained monitors conduct real-time monitoring for sensitive species.</p> <p>The Navy would be responsible for notifying the contractor when sensitive species are present in the shutdown and behavioral disturbance zones.</p> <p>The contractor would be responsible for suspending pile driving operations until notified by the trained monitors that the zones are clear of sensitive species.</p>	<p>The Navy would be responsible for monitoring and enforcing this measure. Documentation would be submitted by the Navy to NMFS and USFWS.</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
7–13. Mitigation Measures for Biological, Cultural, and Other Resources			
<p>Impact: Shading effects and/or physical disturbance of eelgrass.</p> <p>CP 7: Avoid spudding/anchoring in existing eelgrass habitat whenever possible. Vessel operators will be provided with maps of the construction area with eelgrass beds clearly marked.</p>	<p>This measure will be implemented for the duration of in-water construction work.</p>	<p>The construction contractor will be responsible for ensuring that all vessel operators observe this measure. The Navy will also be responsible for monitoring in-water construction activities.</p>	<p>The performance criterion for these requirements is minimizing project-related impacts on eelgrass beds. The Navy will be responsible for monitoring and enforcing these measures.</p>
<p>Impact: Physical disturbance of upland habitat.</p> <p>MM 8a: A revegetation plan would be developed with the objective of restoring native vegetation to the areas temporarily cleared for the construction laydown area and construction of new roads.</p> <p>MM 8b: Any seed mixtures used in the site would include native grass and herbaceous species, which would provide foraging habitat for wildlife.</p>	<p>These measures would be implemented at the completion of the construction phase in the areas temporarily cleared for the construction laydown area and for construction of new roads. Monitoring would continue for 3 years. Depending on the program developed, the mitigation measure(s) may be completed after construction begins.</p>	<p>The Navy would be responsible for developing and implementing the revegetation plan.</p>	<p>The performance criterion is recovery of the native plant and wildlife communities within areas disturbed by construction operations. Recovery would be monitored and enforced by the Navy.</p>
<p>MM 8c: Periodic monitoring for and removal of noxious weeds from all upland areas cleared for project operations or facilities, and immediately adjacent to the cleared area. Particular attention would be paid to the interface between disturbed and existing adjacent second-growth forest stand. Noxious weeds would be removed by hand, mechanical means, or herbicides as appropriate.</p>			

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
<p>MM 8d: Dense weed infestations that require more intensive treatments that result in ground disturbance would be reseeded or planted with native species. A more intensive monitoring and maintenance program (such as once a month) would be implemented until the native plants are sufficiently established to minimize invasion by noxious weeds.</p>			
<p>Impact: Tree removal has the potential to impact migratory birds and potential breeding marbled murrelets.</p> <p>MM9a: Tree removal would not occur during the marbled murrelet breeding season of April 1 through September 23.</p> <p>MM 9b: Tree removal would be conducted in a manner protective of all migratory birds.</p>	<p>This measure would be implemented throughout tree removal for the SPE project.</p>	<p>The construction contractor would be responsible for ensuring that these measures are implemented. The Navy would be responsible for implementing this measure.</p>	<p>The Navy would be responsible for enforcing these measures.</p>
<p>Impact: Inadvertent discovery of unknown archaeological resources</p> <p>MM 10: In compliance with Section 106 of NHPA, inadvertent discovery of unknown archaeological resources would require work stoppage and consultation with the SHPO and affected tribes.</p>	<p>This measure would be implemented throughout the duration of construction.</p>	<p>The Navy would be responsible for consulting with the SHPO and affected tribes.</p>	<p>The performance criterion for this measure is shut-down of the appropriate construction area if unknown archaeological resources are uncovered. The SHPO would be responsible for enforcing this measure.</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
<p>Impact: Airborne noise levels from pile driving and other construction activities would exceed allowable noise limits for the Occupational Safety and Health Administration (OSHA). Airborne noise would exceed nighttime maximum residential levels imposed by WAC (50 A-weighted decibel [dBA]) at Thorndyke Bay. Underwater noise from pile driving could affect divers.</p> <p>MM 11a: Construction activities would not be conducted during the hours of 10:00 p.m. to 7:00 a.m. Between July 15 and September 23, impact pile driving would occur between 2 hours after sunrise and 2 hours before sunset to protect foraging marbled murrelets during the breeding season. Between September 24 and January 15, in-water construction activities would occur during daylight hours (sunrise to sunset).</p> <p>MM 11b: The Navy would notify the public about upcoming construction activities and noise at the beginning of each construction season. The Notice to Mariners (MM 11a) would also serve to notify divers, including tribal divers, of potential underwater noise impacts.</p>	<p>These measures would be implemented throughout the duration of construction.</p> <p>The Navy would notify the public about upcoming construction activities and noise at the beginning of each construction season.</p>	<p>The construction contractor would be responsible for ensuring that all vessel operators observe this measure. The Navy would also be responsible for monitoring in-water construction activities.</p> <p>The Navy would be responsible for implementing this measure.</p>	<p>The Navy would be responsible for enforcing these measures.</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
<p>Impact: Temporary adverse noise impact to recreational areas. MM 11b (described above)</p>	<p>These measures would be implemented throughout the duration of construction.</p>	<p>The Navy would be responsible for implementing these measures.</p>	<p>The Navy would be responsible for enforcing these measures.</p>
<p>Impact: Increased marine vessel traffic. MM 12a: The Navy would develop a local Notice to Mariners to establish uniform procedures to facilitate the safe transit of vessels operating in the project vicinity. MM 12b: Barge trips and associated bridge openings would be scheduled to avoid peak commuting hours.</p>	<p>These measures would be implemented throughout the duration of construction.</p>	<p>The Navy would be responsible for implementing these measures.</p>	<p>The Navy would be responsible for enforcing these measures.</p>
<p>Impact: Disturbance and loss of marine/aquatic habitat, including eelgrass MM 13: Compensatory mitigation would be implemented to fully mitigate all impacts on waters of the U.S. The Navy would partner with the Hood Canal Coordinating Council (HCCC), an in-lieu-fee (ILF) sponsor, to implement the mitigation action in the Kitsap County/Hood Canal region.</p>	<p>This measure would be implemented as soon as feasible, would take several years to implement, and would require a minimum of 5 years of monitoring. Methods are described in Section 6.0.</p>	<p>Under the ILF program, the Navy would provide the funding while the ILF sponsor would be responsible for planning, implementing and managing the mitigation action.</p>	<p>Compensatory mitigation must comply with the Compensatory Mitigation for Losses of Aquatic resources, Final Rule (USACE and USEPA 2008).</p>

Table 1. Summary of Mitigation Measures, Current Practices, and Best Management Practices for LWI and SPE Projects (continued)

Mitigation Measures	Timing and Methods	Responsible Party(ies)	Performance and Enforcement
<p>Impact: Effects on access to and use of Treaty protected resources</p> <p>MM 14:</p> <p>For LWI:</p> <ul style="list-style-type: none"> a. Shellfish seeding and beach enhancement at locations off Navy property b. Development and implementation of a floating upweller system (FLUPSY) management plan c. Killisut Harbor Restoration Project <p>For SPE:</p> <ul style="list-style-type: none"> d. Shellfish seeding and beach enhancement at locations off Navy property e. Culvert replacement at Little Boston Road over Shipbuilders Creek 	<p>These measures would be implemented as soon as feasible and would take a varying number of years to implement. Methods are described in Section 9.0.</p>	<p>For items a, b, d, and e the Navy would provide funding through a Cooperative Agreement and the tribal sponsors would be responsible for planning, implementing and managing the mitigation actions. For item c, the Navy would provide funding and the tribal sponsor would be responsible for planning, implementing and managing the mitigation actions.</p>	<p>For items a, b, d, and e the tribal sponsors would be responsible for enforcing these measures.</p> <p>For item c, the project sponsor would be responsible for enforcing these measures.</p>

1.2. SCHEDULE

Construction of the LWI would occur from August 2016 to August 2018. Construction activities planned for August 2016 through January 2017 may involve pile driving. In-water construction, including pile driving and abutment work below mean higher high water (MHHW), for the proposed projects would occur during an in-water work window of July 15 to January 15 (described under Section 2.2). One exception is that, for the LWI project, in-water work other than pile driving and abutment work below MHHW, such as anchor installation, could occur outside the in-water work window. Pile driving and abutment work below MHHW would be accomplished in the dry, that is, when the tide is out. Once the pile driving and abutment work below MHHW is complete, other in-water construction activities may occur in the water up until January 2018. The design life of the LWI Proposed Action is 50 years.

The SPE project is currently unprogrammed, and the construction schedule has not been determined. Upland construction would take approximately 400 days. Construction of all proposed facilities is anticipated to take approximately 24 months. Pile driving would occur within the in-water work windows (July 15 to January 15). It is not expected that completion of pile driving would require two full 6 month in-water work seasons. Relocation of existing PSB units and anchors could occur outside the in-water work window. The design life of the SPE Proposed Action is 50 years.

Construction would typically occur 6 days per week. Upland construction would occur between 7:00 a.m. and 10:00 p.m. in accordance with the Washington Administrative Code (WAC) noise guidelines.

Timing restrictions on pile driving, to protect Endangered Species Act (ESA)-listed marbled murrelet during the breeding season, are described in Section 3.2.4.

1.3. COMPENSATORY MITIGATION

Section 6 of this Mitigation Action Plan describes the Navy's proposed Compensatory Mitigation action, which would offset unavoidable adverse impacts on aquatic resources. Compensatory mitigation is required by CWA Section 404 and Sections 9 and 10 of the Rivers and Harbors Act of 1899. Compensatory Mitigation must comply with the USACE and USEPA Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (USACE and USEPA 2008).

1.4. TREATY MITIGATION

Section 9 of this Mitigation Action Plan describes the Navy's proposed treaty mitigation actions for impacts from the Navy projects on Treaty protected resources. These mitigation actions are being developed in consultation with the affected Native American Tribes. Agreement on the treaty mitigation actions was reached with the Skokomish Indian Tribe. Agreement on the mitigation was not reached with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe. Per Department of Defense (DOD) Instruction 4710.02, Secretary of the Navy Instruction 11010-14A, and Commander Navy Region Northwest Instruction (COMNAVREGNWINST) 11010.14, agreement with Tribes on the mitigation is not required to proceed with the proposed Navy actions.

1.5. MONITORING AND REPORTING PROCEDURES

Mitigation measures would be implemented in accordance with this Mitigation Action Plan. Prior to release of bid specifications, construction plans would be provided to the Navy for review and approval. Operational mitigation measures would be monitored by the Navy and any specified responsible parties designated by the Navy.

This Mitigation Action Plan would be in place through all phases of the project, including design, construction, and operation, and would help ensure that project objectives are achieved. The Navy would be responsible for administering the plan and ensuring that all parties comply with its provisions. The Navy may delegate monitoring activities to staff, consultants, or contractors. All construction contractors would submit an Environmental Protection Plan for Construction Management and approval prior to beginning construction activities. This plan would document how the contractor intends to comply with all measures applicable to the contract including application of BMPs. The Navy also would ensure that monitoring is documented through periodic reports and that deficiencies are promptly corrected. The designated environmental monitor would track and document compliance with mitigation measures, note any problems that may result, and take appropriate action to rectify problems.

1.6. MITIGATION MONITORING AND REPORTING PROGRAM IMPLEMENTATION

This Mitigation Action Plan was prepared to verify compliance with individual mitigation measures. This plan identifies each mitigation measure by discipline, the entity (organization) responsible for its implementation, the report/permit/certification required for each measure, and an accompanying form used to certify completion. Certain inspections and reports must be prepared by qualified individuals, and these are specified as needed. The timing and method of verification for each measure is also specified.

1.7. ADAPTIVE MANAGEMENT

The Proposed Actions include adaptive management to minimize environmental impacts. The Navy would evaluate results from other pile-driving operations and research to ensure the most appropriate noise attenuation measures and procedures are applied during project construction, as discussed in Sections 3.2.1, 3.2.2, and 3.2.3 of this Mitigation Action Plan. Mitigation measures would include visual monitoring of marine mammals and marbled murrelets, and shut down of pile driving when these species approach or enter areas where injury may occur.

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2.0 CURRENT AND BEST MANAGEMENT PRACTICES

2.1 PROTECTION OF MARINE WATER QUALITY AND SEAFLOOR DURING CONSTRUCTION

2.1.1 Potential Impacts

Construction-related impacts on water quality would be limited to temporary (minutes to hours) and localized changes associated with resuspension of bottom sediments from pile installation and barge and tug operations, such as anchoring and propeller wash, as well as accidental losses or spills of construction debris into Hood Canal. These changes would be spatially limited to the construction corridor, including areas potentially impacted by anchor drag and areas immediately adjacent to the corridor (i.e., up to approximately 100 feet [30 meters] from the offshore edge of the construction corridor) that could be impacted by plumes of resuspended bottom sediments, and would not violate applicable state or federal water quality standards. Nevertheless, several CPs and BMPs will be implemented to protect marine water quality and the seafloor during construction of both projects. These measures are intended to prevent or minimize potential impacts associated with the following:

- Contaminant loadings from stormwater discharges containing runoff from the construction site;
- Accidental spills or releases of contaminants from work vessels;
- Accidental or incidental release of construction debris and related contaminants;
- Excessive sediment resuspension from prop wash;
- Seafloor disturbances from grounding of work vessels; and
- Seafloor disturbances from anchor dragging.

2.1.2 Environmental Protection Measures

The following measures will be implemented to address each of the above potential impacts.

2.1.2.1 STORMWATER POLLUTION PREVENTION PLAN (BMP 1)

2.1.2.1.1 DESCRIPTION

During project construction, stormwater discharges will be in accordance with a USEPA Construction General Permit. The Navy will also seek a Water Quality Certification from the Washington Department of Ecology (WDOE), under Section 401 of the CWA, certifying that the Proposed Actions will not violate state water quality standards. The contractor will submit a Storm Water Notice of Intent (NOI) (for coverage under the general permit for construction activities) and a SWPPP for the project to the Contracting Officer and obtain approval prior to the commencement of work. The SWPPP will be filed, through the Contracting Officer, to the appropriate federal or state agency for approval, a minimum of 14 calendar days prior to the start of construction. The contractor and the Navy will file Notices of Intent for permit coverage and Notices of Termination once construction is complete.

The SWPPP will meet the requirements of the USEPA general permit for stormwater discharges from construction sites, following guidance in WDOE's *Stormwater Management Manual for Western Washington* (WDOE 2014). The SWPPP will specify the BMPs that will be implemented during all phases of construction to limit contaminant discharges to Hood Canal and monitoring requirements to document compliance with permit conditions. In addition, the SWPPP will:

- Identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharge from the sites;
- Describe and ensure implementation of practices that will be used to reduce the pollutants in stormwater discharge from the sites;
- Ensure compliance with terms of the USEPA Construction General Permit for stormwater discharge;
- Select applicable BMPs from the USEPA guide to developing SWPPPs for construction sites (USEPA 2007, EPA 833-R-060-04); and
- Select applicable BMPs from the WDOE *Stormwater Management Manual for Western Washington* (WDOE 2014).

The contractor will be required to install, inspect, and maintain BMPs, and to conduct and document SWPPP site inspections. The contractor will ensure construction operations and management are in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

The contractor will create and maintain a three-ring binder of documents at the construction onsite office that demonstrates compliance with the Stormwater Construction Activity permit. The binder will include a copy of the permit Registration Statement, SWPPP and SWPPP update amendments, inspection reports, copies of correspondence with the agency that issued the permit, and a copy of the permit Notice of Termination. At the completion of the project, the folder will be provided to the Contracting Officer and will become the property of the Navy. An advance copy of the Registration Statement will be provided to the Contracting Officer immediately after the form is presented to the permitting agency.

2.1.2.1.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The contractor will be responsible for preparing and submitting an application for the Construction General Permit. The USEPA will review the application and issue the permit. The contractor will be responsible for implementing all required BMPs, including maintenance of structural BMPs, and performing all monitoring and reporting as required by the permit.

2.1.2.1.3. PLANNED IMPLEMENTATION SCHEDULE

Construction General Permit coverage will be obtained prior to the start of all construction work and maintained for the duration of the construction phase. The SWPPP will be implemented prior to the start of construction. Once construction is complete, the Navy will be responsible for updating the existing industrial SWPPP to reflect changes in the facility and operations associated with the LWI and SPE.

2.1.2.1.4. PLANNED FUNDING

Implementation of the Construction General Permit and SWPPP, including installation and maintenance of BMPs, will be part of the contractor's scope of work, and will be funded under the Navy's construction contract.

2.1.2.1.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criteria will be as specified in the Construction General Permit.

2.1.2.1.6. MONITORING AND TRACKING MECHANISMS

As the co-permittee, the contractor will be responsible for monitoring and reporting per the specifications in the permit.

2.1.2.1.7. ENFORCEMENT MEASURES

The Construction General Permit will be enforced by the USEPA. Non-compliance with the permit could be used as a basis for corrective actions and/or fines.

2.1.2.2. SPILL PREVENTION CONTROL MEASURE (CP 1A)

2.1.2.2.1. DESCRIPTION

The existing facility response plans for the Bangor waterfront provide guidance that will be used in a spill response, such as a response procedures, notification, and communication plan; roles and responsibilities; and response equipment inventories (COMNAVREGNWINST 5090.1, Integrated Contingency Plan, Annex G). In the event of an accidental spill, response measures will be implemented immediately to reduce potential impacts on the surrounding environment.

This measure will consist of the following elements:

- Spill kits will be maintained on site and readily available,
- The contractor and crew will be trained in spill prevention and containment techniques,
- Spill prevention will be implemented daily by maintaining awareness in the construction crew and monitoring the activities, and
- Clean and well-maintained equipment and tools will be used.

Additionally, during in-water construction activities, an absorbent oil containment boom will be placed around the construction area, as required by the CWA Section 401 Water Quality Certification for the projects, to contain accidental oil or hazardous materials spills and prevent or minimize impacts on marine mammals or other fish and wildlife species.

2.1.2.2.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The Navy will be responsible for providing copies of the spill response plans to the contractors and training the contractor and crew in spill prevention and containment techniques. The Navy also will be responsible for maintaining all equipment and supplies required for a spill response.

The contractor will be responsible for exercising due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. In the event of a spill, the contractor will take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; the contractor will immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. The Navy is responsible for verbal and written notifications as required by the federal 40 Code of Federal Regulations (CFR) 355, state, local regulations, and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable state and local regulations.

2.1.2.2.3. PLANNED IMPLEMENTATION SCHEDULE

The existing spill response plans will be implemented for the duration of the construction phase. An oil containment boom will be in place as required by the CWA Section 401 Water Quality Certification for the projects.

2.1.2.2.4. PLANNED FUNDING

If Government assistance is requested or required, the contractor will reimburse the Navy for such assistance. Funding for maintaining spill response activities will be part of the Navy's existing Operations and Maintenance budget.

2.1.2.2.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

Performance criteria will be in accordance with the existing plans.

2.1.2.2.6. MONITORING AND TRACKING MECHANISMS

Monitoring and tracking will be in accordance with the existing plans.

2.1.2.2.7. ENFORCEMENT MEASURES

Deficiencies in the spill response, notification, or cleanup will be cause for corrective actions. The contractor will reimburse the government for all costs incurred including sample analysis materials, equipment, and labor if the government must initiate its own spill cleanup procedures, for contractor responsible spills, when (a) the contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence or (b) if, in the Navy's judgment, the contractor's spill cleanup is not adequately abating a life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

2.1.2.3. CONSTRUCTION DEBRIS AND PILE REMOVAL CONTROL MEASURES (CP 1B)

2.1.2.3.1. DESCRIPTION

This measure will consist of the following elements:

The contractor will prepare and implement construction debris management procedures as required by the Clean Water Act Section 401 Water Quality Certification for the project. Debris

will be prevented from entering the water during all demolition or new construction work. During in-water construction activities, the contractor will deploy and maintain floating booms no further seaward than the 100-foot (30-meter) designated construction corridor to collect and contain floatable materials. Any accidental release of equipment or materials will be immediately retrieved and removed from the water. Uncured concrete or slurries will not be discharged. The contractor will provide a temporary platform or other suitable means of capturing debris from all demolition operations. Debris which could pollute storm water will be stored, covered and frequently removed from the site. Following completion of in-water construction activities, an underwater survey will be conducted to remove any remaining construction materials that may have been missed previously. Removed debris will be disposed of at an approved upland disposal site.

Old piles will be removed using a crane with a clamshell bucket or similar methods and will be cut at the mudline if splitting or breakage occurs. During removal of old piles, removed creosote-treated wood piles and associated sediments (if any) will be contained on a barge or, if a barge is not utilized, stored in a containment area near the construction site. All creosote-treated material and associated sediments will be disposed of in a landfill that meets the liner and leachate standards of the WAC.

2.1.2.3.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The Navy will require the construction contractor to retrieve and clean up any debris spilled into Hood Canal. The contractor will be responsible for preparing and implementing the procedures. The Navy will be responsible for reviewing and approving the procedures and for monitoring their implementation.

2.1.2.3.3. PLANNED IMPLEMENTATION SCHEDULE

The construction debris management procedures and controls will be in place and approved by the Navy Contracting Officer prior to the start of any in-water construction work. These procedures will be implemented throughout the in-water construction period including post-construction removal of any remaining debris.

2.1.2.3.4. PLANNED FUNDING

The construction debris management procedures will be part of the contractor's scope of work, and will be funded under the Navy's construction contract.

2.1.2.3.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criteria will be no loss of floatable debris outside of the flotation booms and no debris will be left on the seafloor during and after construction is complete. Following completion of in-water construction activities, an underwater survey will be conducted to remove any remaining construction materials that may have been missed during previous cleanups.

2.1.2.3.6. MONITORING AND TRACKING MECHANISMS

The Navy will be responsible for monitoring compliance with the construction debris management procedures. The Navy will monitor for compliance using a combination of visual inspections and written correspondence/documentation from the contractor.

2.1.2.3.7. ENFORCEMENT MEASURES

Non-compliance with the procedures could be used as a basis for corrective actions or non-payment of contractor invoices.

2.1.2.4. PROP WASH CONTROL MEASURE (CP 1C)

2.1.2.4.1. DESCRIPTION

To minimize disturbances of the seafloor from prop wash, vessel traffic will be excluded from shallow areas outside of the 100-foot (30-meter) construction zone, which will be marked using temporary buoys or other visual guides. Additionally, shallow draft, low horsepower tugboats will be used in the nearshore area and for extended operations in areas shallower than about 40 feet (12 meters) below mean lower low water (MLLW).

2.1.2.4.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The contractor will be responsible for implementing this measure.

2.1.2.4.3. PLANNED IMPLEMENTATION SCHEDULE

This measure will be implemented throughout the construction phase.

2.1.2.4.4. PLANNED FUNDING

No additional funding will be required for this measure.

2.1.2.4.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is complete avoidance of excessive prop wash, causing unnecessary resuspension of bottom sediments as manifested by the presence of surface turbidity plumes within the project sites.

2.1.2.4.6. MONITORING AND TRACKING MECHANISMS

The Navy will have overall responsibility for monitoring in-water construction activities. The construction contractor will be directly responsible for monitoring and for tracking compliance with this measure.

2.1.2.4.7. ENFORCEMENT MEASURES

Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

2.1.2.5. WORK VESSEL GROUNDING CONTROL MEASURE (CP 1D)

2.1.2.5.1. DESCRIPTION

To minimize seafloor disturbances, construction of the LWI and SPE will be conducted from barges in deep-water areas and/or from land to the extent possible. Construction barges will avoid grounding in eelgrass beds during low tides. Spudding/anchoring in existing eelgrass habitat will be avoided wherever possible. Vessel operators will be provided with maps of the

project site with eelgrass beds clearly marked. The abutments and observation posts will be built from land.

2.1.2.5.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor will be responsible for ensuring that all work vessel operations comply with this measure.

2.1.2.5.3. PLANNED IMPLEMENTATION SCHEDULE

This measure will be implemented throughout the construction phase.

2.1.2.5.4. PLANNED FUNDING

No additional funding will be required for this measure.

2.1.2.5.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is complete avoidance of vessel grounding at the project site.

2.1.2.5.6. MONITORING AND TRACKING MECHANISMS

The Navy will be responsible for monitoring in-water construction activities. The construction contractor will be responsible for monitoring and tracking compliance with this measure.

2.1.2.5.7. ENFORCEMENT MEASURES

Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

2.1.2.6. MOORING AND ANCHORING PLAN (CP 1E)

2.1.2.6.1. DESCRIPTION

To minimize the potential for seafloor disturbances, the contractor will submit a mooring and anchoring plan for approval by the Contracting Officer. The plan will identify measures to be taken to avoid or minimize significant impacts on bottom habitats in areas identified on the construction drawings from line or anchor drag. Measures will include:

1. Placement of anchors outside of special status areas, to the extent feasible;
2. Placement and retrieval of any anchors required within special status areas using a secondary work boat and/or vertical lift system to avoid/minimize dragging; and
3. Use of a buoy(s) (surface or subsurface) along the lower portion of mooring lines required within special status areas to avoid/minimize dragging.

2.1.2.6.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor will be responsible for preparing the plan and ensuring that all work vessel operations comply with the approved plan.

2.1.2.6.3. PLANNED IMPLEMENTATION SCHEDULE

This measure will be implemented throughout the construction phases of both projects.

2.1.2.6.4. PLANNED FUNDING

No additional funding will be required for this measure.

2.1.2.6.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is complete avoidance of dragging anchors or lines through sensitive bottom habitat at the project sites.

2.1.2.6.6. MONITORING AND TRACKING MECHANISMS

The Navy will be responsible for monitoring in-water construction activities. The construction contractor will be responsible for monitoring and tracking compliance with this measure.

2.1.2.6.7. ENFORCEMENT MEASURES

Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

2.2. IN-WATER WORK WINDOW (MM 2)**2.2.1. Potential Impacts**

In-water construction work could interfere with migrating salmonids and/or sensitive life stages of protected species during certain portions of the year.

2.2.2. Mitigation Measures (MM 2)

Construction activities with the greatest potential to harm fish, notably pile driving, would observe an in-water work window when ESA-listed salmonids are least likely to be present. The Tidal Reference Area 13 (northern Hood Canal) in-water juvenile salmonid work window is currently July 15 to January 15, as outlined in WAC-220-660-330. The work window reflects best available science considerations for minimizing in-water project impacts on migrating juvenile salmonids, primarily Hood Canal summer-run chum. All in-water work would occur only during the work window to minimize the number of ESA-listed salmonids exposed to underwater noise and other disturbance. The exception is that, for the LWI project, in-water work other than pile driving and abutment work below MHHW could occur outside the in-water work window.

2.2.3. Party(ies) Responsible for Implementation

The construction contractor would be responsible for ensuring that no in-water construction work occurs outside of the work window, except non-pile driving in-water work for the LWI project and that operations comply with this measure.

2.2.4. Planned Implementation Schedule

This measure would be implemented throughout the construction phase.

2.2.5. Planned Funding

No additional funding would be required for this measure.

2.2.6. Mitigation-Specific Performance Criteria

The performance criterion for this measure is complete avoidance of in-water construction work during non-work windows, as modified.

2.2.7. Monitoring and Tracking Mechanisms

The Navy would be responsible for monitoring in-water construction activities. The construction contractor would be responsible for monitoring and tracking compliance with this measure.

2.2.8. Enforcement Measures

Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices. ESA requirements would be enforced by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Section 10 and 404 permit conditions would be enforced by USACE.

2.3. PROTECTION OF UPLAND WATER QUALITY DURING CONSTRUCTION (BMP 3)**2.3.1. Potential Impacts**

During construction, there would be increased potential for erosion and sedimentation from stormwater runoff, which could entrain sediment that would cause temporary localized degradation of some water quality parameters.

2.3.2. Mitigation Measures**2.3.2.1. IMPLEMENT SWPPP (BMP 3)**

Construction activities will be in accordance with the USEPA Construction General Permit. For compliance with the Energy Independence and Security Act of 2007, the Navy will maintain site hydrology to the maximum extent feasible. Design of upland features (e.g., laydown area) will consider the USEPA guidance for compliance with the Energy Independence and Security Act (EISA) (USEPA 2009) as well as other relevant technical information regarding methods to improve stormwater retention and quality.

A number of measures will be implemented to protect water quality, including installation of a temporary runoff capture and discharge system, and installation of temporary siltation barriers below the excavation/construction zone, to control stormwater runoff into Hood Canal. Proper installation, routine maintenance, and periodic monitoring of BMPs, in accordance with the SWPPP, will ensure that the measures are effective and minimize the potential for impacts on marine water quality.

During shoreside mobilization of equipment, existing native vegetation will not be disturbed outside of the work area. BMPs for clearing, grading, and maintenance will be employed as needed to control erosion and sedimentation, including the possible use of benched surfaces, downdrain channels, diversion berms and ditches, erosion control blankets or turf reinforcement mats, plastic coverings, silt fences and check dams, and straw bales. Gravel pads will be installed at construction area access points to prevent tracking of soil onto paved roads. Water-spraying on soil will be used to control dust generation during earthmoving and hauling.

2.3.3. Party(ies) Responsible for Implementation

The contractor will be responsible for installing, maintaining, and monitoring BMPs, as specified in the SWPPP, and for ensuring compliance with the conditions of the Construction General Permit.

2.3.4. Planned Implementation Schedule

These measures will be completed prior to the start of construction and maintained for the duration of the construction phases of both projects.

2.3.5. Planned Funding

Implementation of the Construction General Permit and SWPPP, including installation and maintenance of BMPs, will be part of the contractor's scope of work, and would be funded under the Navy's construction contract.

2.3.6. Mitigation-Specific Performance Criteria

The performance criteria will be as specified in the Construction General Permit.

2.3.7. Monitoring and Tracking Mechanisms

As the co-permittee, the contractor will be responsible for monitoring and reporting per the specifications in the permit.

2.3.8. Enforcement Measures

The Construction General Permit will be enforced by USEPA. Non-compliance with the permit could be used as a basis for corrective actions and/or fines.

2.4. PROTECTION OF WATER QUALITY DURING OPERATIONS

2.4.1. Potential Impacts

Operation of the LWI and SPE would not require dredging or placement of fill or direct discharges of waste to the marine environment, other than stormwater discharges. Potential operational impacts on water quality would be limited to the following:

- Contaminant loadings from stormwater runoff discharges from the project sites, and
- Accidental spills or releases of contaminants from work vessels.

Stormwater discharges during operations will be in accordance with the Navy's Multi-Sector General Permit (MSGP) for Stormwater Discharges associated with Industrial Activity and the NAVBASE Kitsap Bangor SWPPP. Stormwater management is considered part of project design. Stormwater runoff from the LWI structures would not require treatment and could discharge directly into Hood Canal because the structure surfaces are expected to consist largely of inert materials and would not represent a source of substantial pollutant loadings to Hood Canal. Drainage water from the SPE project site would be collected in a trench drain on the pier, treated using an in-line canister system designed to meet the basic treatment requirements of the WDOE *Stormwater Management Manual for Western Washington*, and then discharged to Hood Canal in accordance with an NPDES permit. Thus, operations would not intentionally release materials that would have a potential to impact marine water quality, and WDOE stormwater standards would be maintained.

Operation of the LWI would not increase the risk of accidental spills because, other than minor, small boat operations, project operations would not require use of explosives, solvents, or other contaminants. The existing NAVBASE Kitsap Bangor fuel spill prevention and response plans (the *Commander Navy Region Northwest Oil and Hazardous Substance Integrated Contingency Plan* and the *NAVBASE Kitsap Bangor Spill Prevention, Control, and Countermeasure Plan* [COMNAVREGNWINST 5090.1, Integrated Contingency Plan, Annex G]) would minimize the risk of fuel spills from small boat operations. In the event of an accidental spill, emergency cleanup measures would be implemented immediately in accordance with state and federal regulations. Operation of the SPE would not increase the risk of accidental spills of fuel, explosives, cleaning solvents, and other contaminants that, if spilled, would impact water quality in Hood Canal. This is because BMPs and CPs (including the existing NAVBASE Kitsap Bangor spill prevention and response plans), would minimize the risk from fuel spills. In the event of an accidental spill, emergency cleanup measures would be implemented immediately in accordance with state and federal regulations. The cleanup would minimize impacts on the surrounding environment. Thus, the potential for impacts on water quality from LWI and SPE operations is expected to be minimal.

2.4.2. Mitigation Measures

2.4.2.1. INTEGRATED SWPPP (BMP 4)

Stormwater runoff discharges during operations will be regulated by the MSGP and the NAVBASE Kitsap Bangor industrial activity SWPPP. Drainage water from the SPE project site will be collected in a trench drain on the pier, treated using an in-line canister system designed to meet the basic treatment requirements of the WDOE *Stormwater Management Manual for Western Washington*, and then discharged to Hood Canal in accordance with the MSGP permit. Thus, operations will not intentionally release materials that would have a potential to impact marine water quality and WDOE water quality standards would be maintained.

2.4.2.2. LOW IMPACT DEVELOPMENT (CP 4A)

To comply with Section 438 of the EISA, the Navy will implement LID strategies in accordance with UFC 3-210-10N (*Low Impact Development*; Department of Defense [DoD] November 2010). LID is a stormwater management strategy designed to maintain site hydrology and mitigate the adverse impacts of stormwater runoff and non-point source pollution. LID provides decentralized hydrologic source control for stormwater using IMPs, which are distributed small-

scale controls that closely maintain or replicate hydrological behavior of the natural system for a defined design storm event. These strategies are intended to complement the federal, state, and local regulations pertaining to stormwater management. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product. Many practices have been used to adhere to these principles such as bio-retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed.

2.4.2.3. OIL AND HAZARDOUS SPILL CONTINGENCY (CP 4B)

Prevention, containment, and cleanup of spills associated with project operations are addressed by the existing facility response plans for the Bangor waterfront (COMNAVREGNWINST 5090.1, Integrated Contingency Plan, Annex G). The plan provides guidance that will be used in a spill response, such as a response procedures, notification, and communication plan; roles and responsibilities; and response equipment inventories. In the event of an accidental spill, response measures will be implemented immediately to reduce potential impacts on the surrounding environment. Containment practices will be consistent with the existing NAVBASE Kitsap Bangor waterfront structures, including the use of in-water containment booms and facility response plans, and will minimize the risk of spills during operations.

2.4.3. Party(ies) Responsible for Implementation

The Navy will be responsible for implementing the SWPPP and complying with the permit conditions. The Navy in conjunction with the project designer will be responsible for ensuring that the projects are designed with features needed to meet the EISA requirements.

2.4.4. Planned Implementation Schedule

The industrial discharge permit and spill response plan are already in place. The SWPPP will be modified to reflect the new waterfront facilities and any related changes in collection, treatment, and discharge of stormwater.

2.4.5. Planned Funding

No additional funding will be required.

2.4.6. Mitigation-Specific Performance Criteria

The performance criterion for stormwater discharges is compliance with the industrial discharge permit conditions. The performance criteria for spill response are included in the plan, and these include training, maintaining equipment and supplies of spill cleanup materials, and effectiveness as determined by regular spill response exercises.

2.4.7. Monitoring and Tracking Mechanisms

Monitoring and reporting requirements for the stormwater discharges are specified in the industrial discharge permit.

2.4.8. Enforcement Measures

The terms and conditions of the industrial discharge permit are enforced by USEPA, and non-compliance with the permit could result in regulatory actions.

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3.0 NOISE ATTENUATION DURING CONSTRUCTION

3.1. POTENTIAL IMPACTS

Pile driving noise would likely result in behavioral disturbance of ESA-listed fish (salmonids and rockfish), ESA-listed marbled murrelet, birds protected under the Migratory Bird Treaty Act (MBTA), and marine mammals protected under the MMPA. There is also a potential for noise-related injury to these species. This section addresses noise attenuation measures to minimize the potential for noise-related impacts on marine species during construction.

Marine mammal and marbled murrelet monitoring, which would be conducted during pile driving, is discussed in Section 4. The in-water work window restrictions, described in Section 2.2, would also reduce the potential for pile driving noise-related impacts on migrating salmonids.

3.2. MITIGATION MEASURES

The following noise attenuation measures will be implemented to minimize noise levels due to pile driving and other construction operations.

3.2.1. Use of Vibratory Driver in Lieu of Impact Hammer (MM 5a)

3.2.1.1. DESCRIPTION

The vibratory pile driver would be the primary method for driving steel piles; an impact hammer would be used primarily to drive concrete piles and to proof vibratory driven piles, but also to drive steel piles which cannot be driven to the required depth using a vibratory pile driver because of geotechnical conditions. Under the preferred Alternatives, the number of impact hammer strikes would not exceed 2,000 per day. No more than one impact hammer would be used concurrently for each project (LWI and SPE). Construction of the two projects would not overlap in time; therefore pile driving for the two projects would not occur at the same time.

3.2.1.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor would be responsible for ensuring that use of impact hammers does not exceed the parameters described above.

3.2.1.3. PLANNED IMPLEMENTATION SCHEDULE

This measure would be implemented throughout the construction phases of both projects.

3.2.1.4. PLANNED FUNDING

No additional funding would be required for this measure.

3.2.1.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is to reduce the use of impact hammers to the extent possible and, at a minimum, comply with the use restrictions described above.

3.2.1.6. MONITORING AND TRACKING MECHANISMS

The Navy would be responsible for monitoring in-water construction activities. The construction contractor would be responsible for monitoring and tracking compliance with this measure.

3.2.1.7. ENFORCEMENT MEASURES

Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

3.2.2. Deploy Air Bubble Curtains or Other Noise Attenuating Device(s) for Impact Hammer Operations (MM 5b)

3.2.2.1. DESCRIPTION

The contractor would deploy an air bubble curtain, or other noise attenuating device, around impact hammer operations for steel piles during in-water construction. The purpose of the bubble curtain noise attenuator is to reduce underwater pile driving noise levels. The bubble curtain would also reduce the radius of the area in which injurious or disturbing noise levels could occur, thus reducing the area in which fish, marine mammals, and birds would potentially be exposed to injury or disturbance.

3.2.2.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor would be responsible for ensuring that bubble curtains are deployed and operational around all impact hammer operations.

3.2.2.3. PLANNED IMPLEMENTATION SCHEDULE

This measure would be implemented during all impact hammer operations for steel piles for both projects.

3.2.2.4. PLANNED FUNDING

Funding for this measure would be included in the construction contract.

3.2.2.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is testing of proper bubble curtain deployment. Pile driving would not be allowed to start until a bubble curtain is shown to be deployed properly. Construction contractor would be responsible for not exceeding performance measures.

3.2.2.6. MONITORING AND TRACKING MECHANISMS

Monitoring in-water noise levels is discussed in Section 4 of this Mitigation Action Plan.

3.2.2.7. ENFORCEMENT MEASURES

ESA and MMPA requirements would be enforced by the Navy. Navy staff would ensure that the bubble curtain has been deployed properly. Assessments would be done by a monitoring contractor. Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

3.2.3. Soft Start for Pile Driver Operations (MM 5c)**3.2.3.1. DESCRIPTION**

The objective of a soft start is to provide a warning and/or give animals in close proximity to pile driving a chance to leave the area prior to an impact driver operating at full capacity, thereby exposing fewer animals to loud underwater and airborne sounds.

- A soft-start procedure would be used at the beginning of each day's in-water pile driving or any time pile driving has ceased for more than 30 minutes.
- For impact pile driving, the following soft-start procedures would be conducted as follows:
 - If a bubble curtain is used for steel impact pile driving, the contractor would start the bubble curtain prior to the initiation of impact pile driving in order to flush fish from the injury zone near the pile.
 - The contractor would provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer strike cannot be quantified because strikes vary by individual drivers. Also, the number of strikes would vary at reduced energy because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile, resulting in multiple "strikes.")

For vibratory pile driving, the contractor would initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure would be repeated two additional times. If marine mammal monitoring data indicate that there is no change in behavior of pinnipeds during vibratory pile driving or soft-start procedures and the NMFS concurs, then the soft-start procedure would no longer be required. Due to mechanical limitations, soft starts for vibratory driving would be conducted only with drivers equipped with variable moment features. Typically, this feature is not available on larger, high-power drivers. The Navy would use the driver model most appropriate for the geologic conditions at the project location, and would perform soft starts if the hammer is equipped to conduct them safely.

3.2.3.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor would be responsible for ensuring that soft-start procedures are employed for all pile driver operations.

3.2.3.3. PLANNED IMPLEMENTATION SCHEDULE

This measure would be implemented throughout the construction phases of both projects.

3.2.3.4. PLANNED FUNDING

No additional funding would be required for this measure.

3.2.3.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is consistent use of this method for pile driver operations.

3.2.3.6. MONITORING AND TRACKING MECHANISMS

The Navy would be responsible for monitoring in-water construction activities. The construction contractor would be responsible for monitoring and tracking compliance with this measure.

3.2.3.7. ENFORCEMENT MEASURES

ESA and MMPA requirements would be enforced by USFWS and NMFS. Navy staff would ensure that marine mammal and marbled murrelet monitoring is conducted in accordance with agency-approved monitoring plans. Assessments would be done by monitoring Navy reports/records. Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

3.2.4. Timing Restrictions (MM 5d)

3.2.4.1. DESCRIPTION

Construction activities would not be conducted between the hours of 10:00 p.m. and 7:00 a.m. Pile driving would be limited to daylight hours due to the requirement for visual monitoring of ESA-listed marbled murrelet presence in the construction area (described in Section 4.2.1). Impact pile driving during the first part of the in-water work window (July 15 to September 23) would only occur between 2 hours after sunrise and 2 hours before sunset to protect foraging marbled murrelets during the breeding season. Vibratory pile driving and other construction activities occurring in the water between July 15 and September 23 would occur during daylight hours (sunrise to sunset). Between September 24 and January 15, in-water construction activities would occur during daylight hours (sunrise to sunset).

3.2.4.2. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The construction contractor would be responsible for ensuring that pile driving work occurs during daylight hours only.

3.2.4.3. PLANNED IMPLEMENTATION SCHEDULE

This measure would be implemented throughout the construction phases of both projects.

3.2.4.4. PLANNED FUNDING

No additional funding would be required for this measure.

3.2.4.5. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance criterion for this measure is minimizing all construction-related noises during the night.

3.2.4.6. MONITORING AND TRACKING MECHANISMS

The Navy would be responsible for monitoring in-water construction activities. The construction contractor would be responsible for monitoring and tracking compliance with this measure.

3.2.4.7. ENFORCEMENT MEASURES

ESA and MMPA requirements would be enforced by USFWS and NMFS. Navy staff would ensure that marine mammal and marbled murrelet monitoring is conducted in accordance with agency-approved monitoring plans. Assessments would be done by monitoring Navy reports/records. Non-compliance with this measure could be used as a basis for corrective actions or non-payment of contractor invoices.

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4.0 MONITORING TO MINIMIZE NOISE IMPACTS

4.1. POTENTIAL IMPACTS

Pile driving noise could disturb ESA-listed fish (salmonids and rockfish), ESA-listed marbled murrelet, MBTA-protected birds, and MMPA-protected marine mammals. There would also be a potential for noise-related injury to these sensitive species. Marine mammal and marbled murrelet monitoring would be conducted during pile driving operations to reduce the potential for injury to ESA and non-ESA listed species. The movements of survey boats engaged in marbled murrelet monitoring during pile driving operations would tend to discourage seabirds from foraging or resting inside the injury zones while noise levels are elevated, as seabirds generally withdraw from moving boats. Thus, the marbled murrelet monitoring protocol would also protect MBTA-protected seabird species as well as the marbled murrelet from exposure to construction noise.

4.2. MITIGATION MEASURES

The monitoring program described below would be implemented during the construction phases of the LWI and SPE projects to reduce impacts on protected species. The monitoring program would include visual monitoring of marine mammals, visual monitoring of marbled murrelets, data collection, and reporting. The monitoring results would be used to assess the need to suspend pile driving operations when sensitive species are present in the work areas. These components are described below. The Navy is in consultation with the regulatory agencies about specific monitoring plans for regulated species. The monitoring plans discussed in this section may be modified as a result of these ongoing consultations.

4.2.1. Monitoring Plans

The Navy would develop protocol monitoring plans for marine mammal occurrence and marbled murrelet occurrence in coordination with NMFS and the USFWS. A draft marine mammal monitoring plan would be developed and submitted to the NMFS and would be approved prior to the start of construction. Similarly, a marbled murrelet monitoring plan consistent with the USFWS Marbled Murrelet Monitoring Protocol (USFWS 2012) would be developed and submitted to USFWS and would be finalized prior to construction. The basic element of the marine mammal monitoring plan is to designate a shutdown zone for pile driving that would be defined in consultation with NMFS to include all areas where underwater sound pressure levels (SPLs) have the potential to exceed physiological injury-related noise levels for marine mammals (Level A take as defined by the MMPA), based on sound attenuation modeling. The injury zones for marine mammals were determined by sound attenuation modeling based on in situ acoustic monitoring results from other pile driving projects (EHW-2 and Test Pile Project) at NAVBASE Kitsap Bangor, and results for similar pile sizes that were reported in the literature (Appendix H of the EIS). Modeled or calculated injury zones may be different from the shutdown zones.

The marbled murrelet monitoring plan would use a shutdown zone for impact pile driving defined as all areas where underwater SPLs have the potential to exceed auditory injury-related noise levels for marbled murrelets, based on sound attenuation modeling. There would be a shutdown zone including areas where airborne SPLs resulting from impact pile driving are

anticipated to equal or exceed the auditory masking zone. Conditions governing project shutdown for marbled murrelets could be modified subject to an adaptive management strategy. SPL criteria for various species groups are described in Section 4.2.1.2.

The individuals that implement the monitoring protocols would assess their effectiveness using an adaptive management approach. Monitoring biologists would use their best professional judgment throughout implementation and would seek improvements to these methods when deemed appropriate. Any modifications to the protocols would be coordinated between the Navy, USFWS, and NMFS. There would be multiple dedicated observers for the marine mammal and marbled murrelet survey efforts. Marbled murrelet observers would be certified by USFWS to perform the Marbled Murrelet Monitoring Protocol (USFWS 2012).

4.2.1.1. MARINE MAMMAL AND MARBLED MURRELET VISUAL MONITORING (MM 6)

4.2.1.1.1. SHUTDOWN AND BEHAVIORAL DISTURBANCE ZONES (IMPACT AND VIBRATORY PILE DRIVING/REMOVAL) FOR MARINE MAMMALS

- During impact and vibratory pile driving/removal, the shutdown zone would include all areas where the underwater SPLs are anticipated to equal the Level A (injury) harassment criteria for marine mammals (180 dB isopleths for cetaceans; 190 dB isopleths for pinnipeds). The shutdown zone distances would be specified in consultation with NMFS.
- All shutdown zones would initially be based on the distances from the source that were predicted for each threshold level.
- During impact pile driving, the behavioral disturbance zone would include all areas within the PSB where the underwater or airborne SPLs are anticipated to equal or exceed the Level B (disturbance) harassment criteria for marine mammals during impact pile driving (160 dB isopleth). The modeled distance to the 160 dB isopleth for impulsive sound caused by driving 36-inch steel pile is 1,775 feet (541 meters). Marine mammal observers cannot easily see animals on the other side of the PSB and it is not feasible for boats to move through the PSB structures during monitoring due to the intensive security checks required to enter the WRA. Therefore, visual monitoring to the furthest extent of the calculated disturbance zone may be largely obstructed by the PSB. Marine mammal monitors would monitor the area from the driven pile to the PSB at a minimum and would also attempt to record any additional observations of marine mammals beyond the fence.
- During vibratory pile driving, the Level B (disturbance) harassment criterion (120 dB isopleth) predicts an affected area up to 19.3 square miles (50.1 square kilometers) for 36-inch steel piles. The size of this area would make effective monitoring impractical. As a result, a behavioral disturbance zone equivalent to the size of the predicted 160 dB isopleth for impact pile driving, as described above, would be monitored for pinnipeds and cetaceans during all vibratory pile driving/removal activities. Marine mammal observers cannot easily see animals on the other side of the PSB and it is not feasible for boats to move through the PSB structures during monitoring due to the intensive security checks required to enter the WRA. Therefore, visual monitoring to the furthest extent of the calculated disturbance zone may be largely obstructed by the PSB. Marine mammal monitors would monitor the area from the driven pile to the PSB at a minimum and would also attempt to record any additional observations of marine mammals beyond the PSB fence.

- The shutdown and behavioral disturbance zones would be monitored throughout the time required to drive a pile. If a marine mammal enters the behavioral disturbance zone, an exposure would be recorded and behaviors documented. However, the pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would immediately be halted.
- Under certain construction circumstances, where initiating the shutdown and clearance procedures (which could include a delay of 15 minutes or more) would result in an imminent concern for human safety, the shutdown provision may be waived at the discretion of the construction foreman. The marine mammal monitoring plan would define the situations or criteria in which such a scenario may occur.

4.2.1.1.2. SHUTDOWN ZONE (IN-WATER CONSTRUCTION ACTIVITIES NOT INVOLVING A PILE DRIVING HAMMER) FOR MARINE MAMMALS

- During in-water construction activities not involving a pile driver, but having the potential to affect marine mammals, in order to prevent injury to these species from their physical interaction with construction equipment, a shutdown zone of 33 feet (10 meters) would be monitored to ensure that marine mammals are not present in this zone.
- These activities could include, but are not limited to: (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”), or (4) placement of sound attenuation devices around the piles.

4.2.1.1.3. SHUTDOWN ZONE (IMPACT PILE DRIVING) FOR MARBLED MURRELETS

- Shutdown zones for marbled murrelets include areas where underwater SPLs resulting from impact pile driving are anticipated to equal or exceed auditory injury. There would be a shutdown zone including areas where airborne SPLs resulting from impact pile driving are anticipated to equal or exceed the auditory masking zone. The auditory injury criterion is the 202 dB cumulative sound exposure level (SEL) isopleth for impact pile driving, depending on the number of pile strikes, as determined by sound attenuation modeling. The distance may be adjusted based on the number of pile strikes. The shutdown distances would be specified in consultation with the U.S. Fish and Wildlife Service (USFWS).
- The shutdown zones would be monitored throughout the time required to drive a pile with an impact hammer. If a marbled murrelet is observed in the monitored area, impact pile driving would be stopped until the marbled murrelet leaves the area under its own volition, but pile driving does not need to be stopped for longer than 1 hour per marbled murrelet encounter. Impact pile driving does not need to be curtailed for more than 2 hours total time per day, regardless of the number of marbled murrelets encountered.
- The Navy would document the duration and frequency of shutdowns of impact pile driving due to the presence of marbled murrelets. Should shutdowns occur at a frequency that is significantly affecting the project’s schedule for completion, the Navy may convene an adaptive management group consisting of representatives of the Navy and USFWS to address the issue. The adaptive management group would identify and agree to criteria and timelines for implementation of an adaptive strategy. Any changes or refinements of shutdown zones that are approved by USFWS would be incorporated into the marbled murrelet monitoring plan.

4.2.1.1.4. VISUAL MARINE MAMMAL MONITORING (MM 6)

A Marine Mammal Monitoring Plan would be finalized prior to commencement of pile driving activities. Based on NMFS requirements, the plan would include, at a minimum, the following procedures for impact pile driving.

QUALIFICATIONS

Monitoring would be conducted by qualified, trained marine mammal observers (MMOs). An observer is a biologist with prior training and experience in conducting at-sea marine mammal monitoring or surveys, and who has the ability to identify marine mammal species and describe relevant behaviors that may occur in proximity to in-water construction activities. NMFS requires that the observers have no other construction-related tasks while conducting monitoring. A trained observer would be placed at the best vantage point(s) practicable (e.g., from a small boat, the pile driving barge, on shore, or any other suitable location) to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator.

METHODS OF MONITORING

The Navy would monitor the vibratory and impact driver shutdown and behavioral disturbance zones before, during, and after pile driving.

- a. MMOs would be located at the best vantage point(s) in order to properly see the entire shutdown zone. This may require the use of a small boat to monitor certain areas while also monitoring from one or more land-based vantage points.
- b. During all observation periods, observers would use binoculars and the naked eye to search continuously for marine mammals.
- c. If the shutdown zones are obscured by fog, sea state, or poor lighting conditions, pile driving would not be initiated until all zones are visible.
- d. The shutdown and behavioral disturbance zones around the pile would be monitored for the presence of marine mammals before, during, and after any pile driving activity.
- e. Marine Mammal Observation Record forms (Attachment A-1) would be used to document observations.

PRE-ACTIVITY MONITORING:

The shutdown zones would be monitored for 15 minutes prior to initiating the soft start for impact pile driving. Soft start would be implemented at the beginning of each pile driving day and after breaks of more than 30 minutes (for impact pile driving only). If marine mammals are present within the shutdown zone prior to pile driving or during the soft start for impact pile driving, the start of pile driving would be delayed until the animals leave the shutdown zone. Pile driving would be initiated only after the MMO has determined, through sighting or by waiting approximately 15 minutes, that the animal(s) has moved outside the shutdown zone.

DURING ACTIVITY MONITORING:

The shutdown zones would be monitored throughout the time required to drive/remove a pile or complete other in-water construction activities. If a marine mammal is observed outside of this zone, an exposure would be recorded and behaviors documented, to the extent practicable. However, that pile segment or other in-water construction activity would be completed without cessation, unless the animal approaches/enters the shutdown zone, at which point all pile driving or other in-water construction activities would be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. Pile driving can only resume once the animal has left the shutdown zone of its own volition or has not been re-sighted for a period of 15 minutes. However, the shutdown provision may be waived in situations where shutdown would create an imminent concern for human safety.

POST-ACTIVITY MONITORING:

Monitoring of the shutdown and behavioral disturbance zones would continue for 30 minutes following the completion of pile driving. A post-monitoring period is not required for other in-water construction.

4.2.1.1.5. VISUAL MARBLED MURRELET MONITORING (MM 6)

The Navy would conduct marbled murrelet monitoring in compliance with USFWS Protocol for Marbled Murrelet Monitoring during Impact Pile Driving (USFWS 2012). This protocol applies only to impact pile driving. Monitoring would be conducted for marbled murrelets swimming in the water within the underwater auditory injury zone before, during, and after impact pile driving activities. Monitoring of the masking zone would occur before and during impact pile driving. The monitoring distances would be specified in consultation with USFWS. Monitoring would take place from 30 minutes prior to initiation through completion of impact pile driving activities.

QUALIFICATIONS

All observers would be experienced biologists certified through USFWS training to perform the Marbled Murrelet Monitoring Protocol (USFWS 2012).

METHODS OF MONITORING

The Navy would monitor the impact pile driving auditory injury zone before, during, and after pile driving. Based on USFWS protocols, the visual marbled murrelet monitoring would include the following procedures for impact hammer pile driving:

PRE-ACTIVITY MONITORING

The following survey methodology would be implemented prior to commencing impact pile driving activity:

- Transect lines would be established using Global Positioning System (GPS).

- Transect lines would be no more than 164 feet (50 meters) apart. The Navy is working with USFWS and NMFS to define sea states that would preclude the ability to monitor for marine mammals and marbled murrelets effectively and result in pile driving shutdown. As defined by the Beaufort Sea State (BSS) (Attachment B), if the sea state is greater than BSS 2, monitoring cannot be conducted effectively and pile driving activities would cease at BSS 3 or greater. The sea state conditions that would result in stopping pile driving activities may be further defined by wave height or wind conditions, depending on the outcome of ongoing discussions.
- A survey boat would monitor all marbled murrelets within the underwater injury zone radius from pile driving operations. These areas to be monitored would be specified in consultation with USFWS.
- Monitoring would commence at least 30 minutes before the initiation of impact pile driving (but not before daylight) and would continue until pile driving is completed each day (but not after nightfall). Monitoring would not start until 2 hours after sunrise and would cease 2 hours before sunset during the period from July 15 to September 23. Between September 24 and January 15, impact pile driving can occur during daylight hours.
- Impact pile driving would not commence until observers complete two full sweeps of the entire survey area and have determined that no marbled murrelets are within the underwater injury and non-injurious temporary threshold shift (TTS) zones.
- If marbled murrelets are not present within these monitored zones, the observers would communicate with the Lead Biologist, who would radio the Pile Driving Engineer Lead that impact pile driving can commence.
- If marbled murrelets are within these monitored zones, the survey would continue and pile driving would not commence until the murrelets have left the monitored zones. When a murrelet is detected within the monitored zones, it would be continuously observed until it leaves the monitored zones. If observers lose sight of the murrelet, searches for the murrelet would continue for at least 5 minutes. If the murrelet is still not found, then at least two full sweeps of the monitored zones would be conducted prior to resumption of impact pile driving.
- Boat speed would be from 5 to 10 knots per hour.
- Each boat would have a minimum of two observers using binoculars (not including the boat operator).
- In case of fog or reduced visibility, the observers must be able to see a minimum of 164 feet (50 meters) or pile driving would not commence.
- All bird observations would be recorded on the Seabird Monitoring Data Collection Form (Attachment A-2).

DURING-ACTIVITY MONITORING

The underwater auditory injury zones would be monitored throughout impact pile driving. The following monitoring protocol would be implemented:

- The survey protocol identified above would continue and be repeated during pile driving with the following additional conditions.

- If marbled murrelets are seen within the monitored zones during impact pile driving, the observers would communicate with the Lead Biologist, who would communicate to the Pile Driving Engineer Lead. This action would require an immediate shutdown of pile driving. The survey would continue and pile driving would not resume until the murrelets have left the monitored zones. If observers lose sight of the murrelet, searches for the murrelet would continue for at least 5 minutes. If the murrelet still is not found, then at least two full sweeps of the monitored zones would be conducted prior to resumption of impact pile driving.

VISUAL POST-PILE DRIVING OBSERVATIONAL SURVEY

These surveys would observe and record unusual or abnormal behavior of marbled murrelets. During these surveys, dead, injured, or sick seabirds may be discovered. In addition to surveys before and during pile driving, searches for seabird carcasses would be conducted following pile driving activities. Survey results would be noted in the Seabird Monitoring Data Collection Form (Attachment A-2).

Any dead diving seabird found within the survey area would be collected, placed in plastic bags, and kept cool (but not frozen). Carcasses would be submitted to USFWS (Washington Fish and Wildlife Office in Lacey) for necropsy using the Chain of Custody Record Form in Attachment C.

4.2.1.1.6. DATA COLLECTION FOR MARBLED MURRELETS AND MARINE MAMMALS

Each marbled murrelet observer would record information on each survey day using the USFWS-approved Seabird Monitoring Data Collection Form (Attachment A-2) and reference the completed Seabird Monitoring Site/Transects Identification Form (Attachment A-3) (USFWS 2012). The following information would be collected on the data collection form.

- a. Date and time that pile driving begins or ends;
- b. Construction activities occurring during each observation period;
- c. Weather parameters (e.g. wind, humidity, temperature);
- d. Tide state and water currents: the Beaufort Wind Scale (Attachment B) would be used to determine sea state;
- e. Visibility;
- f. Species, numbers, and if possible, sex and age class of marbled murrelets;
- g. Marbled murrelet behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs;
- h. Distance from pile driving activities to marbled murrelets and distance from the marbled murrelet to the observation point;
- i. Locations of all marbled murrelet observations; and
- j. Other human activity in the area.

MMOs would use NMFS-approved sighting forms. At a minimum, the following information would be collected on the sighting forms:

- a. Date and time that pile driving begins or ends;
- b. Construction activities occurring during each observation period;
- c. Weather conditions (e.g., percent cover, visibility);
- d. Water conditions (e.g., sea state, tidal state [incoming, outgoing, slack, low, and high]);
- e. Species, numbers, and if possible sex and age class of observed marine mammals;
- f. Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs;
- g. Distance from pile driving activities to marine mammals and distance from the observed species to the observation point;
- h. Locations of all marine mammal observations; and
- i. Other human activity in the area.

4.2.1.1.7. EQUIPMENT

The following equipment would be required to conduct marbled murrelet and marine mammal monitoring:

- a. Portable radio(s) to communicate with the Pile Driving Engineer Lead and with Port Ops and Security;
- b. Hearing protection for biologists;
- c. Cellular phones (one per boat) with contact information (other survey boats, Pile Driving Engineer Lead, USFWS point of contact);
- d. Three green flags (for boat, barges, or land-based observers) as back-up for radio communication;
- e. Three red flags (for boat, barges, or land-based observers) as back-up for radio communication;
- f. Nautical charts;
- g. Tide and current tables for Hood Canal;
- h. Steel-cased thermometer or an equivalent electronic instrument with underwater temperature probe;
- i. Chronometers;
- j. Binoculars with built-in rangefinder – quality 8 or 10 power (6);
- k. Monitoring protocols and equipment list in sealed clear plastic cover;
- l. Notebook with pre-standardized monitoring Seabird Monitoring Data Collection Form on non-bleeding paper;
- m. Seabird identification guides;

- n. Large zip-lock bags for samples;
- o. Clipboard; and
- p. Pen / Pencil.

The detailed marine mammal and marbled murrelet monitoring plans are in development. Most of the identified equipment cited in this section would also apply to both monitoring efforts; other equipment would be added based on agency discussions.

4.2.1.2. REPORTING

Draft annual reports on marine mammal and marbled murrelet monitoring would be submitted to NMFS and USFWS, respectively, within 60 days of the end of each in-water work period. Content and data requirements for the reports would be developed in consultation with NMFS and USFWS. The reports would include marine mammal and marbled murrelet observations prior to activity, during-activity, and post-activity during pile driving days. Final annual reports would be submitted to NMFS and USFWS within 30 days following receipt of comments on the draft reports from NMFS and USFWS. The Navy would make final reports available to the public by posting final reports on a Navy website. At a minimum, the reports would include:

- General data (all reports):
 - Date and time of activity;
 - Water conditions (e.g., sea state, tidal state); and
 - Weather conditions (e.g., percent cover, visibility).
- Description of the pile driving activity being conducted (size and type);
- Pre-, during-, and post-activity observational survey-specific data (Marine Mammal and Marbled Murrelet reports):
 - Dates and time survey is initiated and terminated;
 - Description of any observable marine birds, marine mammals, or fish behavior in the immediate area during monitoring;
 - Actions performed to minimize impacts on marine mammals and marbled murrelets;
 - Description of any “take” (as described in NMFS or USFWS Biological Opinions);
 - Copies of field data sheets or logs;
 - Birds salvaged for necropsy (if applicable);
 - Use Chain of Custody Record Form (Attachment C) for dead birds/threatened and endangered species (as required); and
 - Necropsy results, based on information provided by the Agencies (as required).

4.2.1.3. INTERAGENCY NOTIFICATION

Observers would immediately notify USFWS upon locating a dead, injured or sick marbled murrelet specimen. Notification must be made to the USFWS Law Enforcement Office at (425)

883-8122 or the Services' Western Washington Fish and Wildlife Office at (360) 753-9440, and include the date, time, precise location of the injured bird or carcass, and any other pertinent information. In addition, one of the following Washington Fish and Wildlife Office staff would be notified:

Nancy Brennan-Dubbs – phone: (360) 753-5835

Emily Teachout – phone: (360) 753-9583

Deanna Lynch – phone: (360) 753-9545

Care should be taken in handling sick or injured birds in order to preserve biological specimens in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of the sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

4.3. PARTY(IES) RESPONSIBLE FOR IMPLEMENTATION

The Navy would be responsible for conducting marine mammal and marbled murrelet monitoring during pile driving operations. The observers would be responsible for communicating with the construction contractor and providing information on when impact hammer operations can be initiated without disturbing sensitive species. The construction contractor would be responsible for ensuring that impact hammer operations comply with this measure.

4.4. PLANNED IMPLEMENTATION SCHEDULE

The monitoring plans would be approved by NMFS and USFWS prior to the start of in-water construction activities. Monitoring activities would be performed in accordance with the approved plan throughout the construction phase.

4.5. PLANNED FUNDING

Monitoring activities would be funded by the Navy.

4.6. MITIGATION-SPECIFIC PERFORMANCE CRITERIA

The performance objective would be to minimize the take of sensitive marine species, and this objective would be achieved by implementing the approved monitoring plan and limiting pile driving operations to periods when sensitive species are not present in the shutdown and behavioral disturbance zones.

4.7. MONITORING AND TRACKING MECHANISMS

Monitoring and reporting would be in accordance with the approved monitoring plan.

4.8. ENFORCEMENT MEASURES

Compliance with this measure would be enforced by NMFS and USFWS.

5.0 MITIGATION MEASURES FOR BIOLOGICAL, CULTURAL, AND OTHER RESOURCES

The LWI and SPE projects are expected to affect portions of the nearshore benthic and littoral habitats on NAVBASE Kitsap Bangor, particularly as related to potential effects on submerged macroalgae (eelgrass) beds, habitat and migration pathways for salmonids, and forage fish spawning habitat. Short-term and long-term impacts on eelgrass and eelgrass beds, and to the benthic community, could affect ESA-listed fish species directly, and all species indirectly through effects on prey resources such as forage fish. Both projects could affect migration of juvenile salmonids along the NAVBASE Kitsap Bangor shoreline. Otherwise, operation of the LWI and SPE are not expected to adversely affect ESA-listed species. Compensatory mitigation projects for impacts on marine habitats and prey populations would be undertaken on the shoreline that would restore some of the habitat and prey base functions of the project area (Section 6).

5.1. MITIGATION MEASURES FOR OTHER BIOLOGICAL IMPACTS

This section addresses mitigation measures for biological impacts other than underwater noise impacts (Sections 3.0 and 4.0), and impacts requiring compensatory mitigation (Section 6.0).

5.1.1. Potential Impacts

The LWI and SPE projects are expected to cause unavoidable impacts on marine resources, as well as impacts on terrestrial vegetation and wildlife communities. BMPs and mitigation measures to reduce these impacts are discussed below. The Navy's proposed mitigation plan to compensate for the unavoidable impacts of the Proposed Actions on aquatic habitats and species is described in Section 6.0.

In-water construction would result in water quality impacts and disruption of the seafloor that would affect marine organisms. Installation of piles and anchors would displace marine habitat, while installation of marine structures (piers) would result in shading of marine habitat. Construction of on-land facilities would result in clearing of vegetation, with potential impacts to wildlife species.

5.1.2. Mitigation Measures

Potential impacts on fish and benthic communities will be minimized by several of the environmental protection measures described previously for protecting water quality and the seafloor. These include:

- Deployment of oil containment booms during in-water construction to minimize potential impacts from an accidental oil spill, as required by the CWA Section 401 Water Quality Certifications for the projects (**CP 1a**);
- Retrieval of lost debris from the seafloor during and following in-water construction to prevent disturbance of benthic habitat (**CP 1b**);
- Prohibiting work vessels to ground in shallow waters, and excluding construction equipment and activities outside of the 100-foot (30-meter) construction corridor (**CP 1d**); and

- Restricting in-water work to specified work windows to minimize in-water project impacts on potentially occurring ESA-listed fish species that would otherwise be exposed to construction activities, including underwater noise produced during pile driving (**MM 2**). The exception is that in-water work other than pile driving and LWI abutment construction below MHHW could occur outside the in-water work window.

An additional measure to prevent or minimize impacts on eelgrass beds is:

- Spudding/anchoring in existing eelgrass habitat will be avoided during in-water construction (**CP 7**).

Efforts to restore the temporarily cleared upland areas to a natural vegetation community and comply with EO 13112 would include the following mitigation measures:

- A revegetation plan would be developed to establish a coniferous forest overstory and native shrub understory on the site, with the objective of restoring wildlife benefits to the site (**MM 8a**).
- Any seed mixtures used in the site would include native grass and herbaceous species, which would provide foraging habitat for wildlife (**MM 8b**).
- The Navy would conduct periodic monitoring for and removal of noxious weeds from within and immediately adjacent to the cleared area. Particular attention would be paid to the interface between disturbed and existing adjacent second-growth forest stand. Noxious weeds, such as Scotch broom and Himalayan blackberry, would be removed by hand, mechanical means, or herbicides per the NAVBASE Kitsap Bangor Pest Management Plan (Navy 2004) (**MM 8c**).
- Dense weed infestations that require more intensive treatments that result in ground disturbance would be reseeded or planted with native species. A more intensive monitoring and maintenance program (such as once a month) would be implemented until the native plants are sufficiently established to minimize invasion by noxious weeds (**MM 8d**).

To protect migratory birds and potential breeding marbled murrelets, the following mitigation measures would be implemented during upland construction of the SPE project:

- Tree removal would not be conducted during the marbled murrelet breeding season of April 1 through September 23 (**MM 9a**).
- Tree removal would be conducted in a manner that is protective of all migratory birds (**MM 9b**).

5.1.3. Party(ies) Responsible for Implementation

The Navy would be responsible for restoring and monitoring the terrestrial vegetation in areas affected by construction activities. The construction contractor would be responsible for conducting tree removal in accordance with mitigation measures **MM 9a** and **MM 9b**.

5.1.4. Planned Implementation Schedule

The revegetation plan would be prepared and approved prior to the completion of the project's construction phase. Once construction activities have stopped, the plan would be implemented. Monitoring would occur for 3 years following revegetation activities. Mitigation measures **MM 9a** and **MM 9b** would be implemented throughout tree removal activities.

5.1.5. Planned Funding

These revegetation activities would be funded by the Navy as part of the overall project. Any costs associated with mitigation measures **MM 9a** and **MM 9b** would be included in funding for the construction contract.

5.1.6. Mitigation-Specific Performance Criteria

The performance criterion for the revegetation measure is development of native plant and wildlife communities in upland areas affected by the project construction activities. An adaptive management plan would be included.

5.1.7. Monitoring and Tracking Mechanisms

The condition of the revegetated areas would be monitored by the Navy for 3 years following revegetation activities. The Navy would monitor tree removal to ensure that mitigation measures **MM 9a** and **MM 9b** are implemented.

5.1.8. Enforcement Measures

These measures would be enforced by the Navy.

5.2. MITIGATION MEASURES FOR CULTURAL RESOURCES IMPACTS

5.2.1. Potential Impacts

The Navy would comply with Section 106 of the National Historic Preservation Act (NHPA)¹. For both the LWI and SPE projects, the Navy concluded Section 106 consultations with the Washington State Historic Preservation Officer (SHPO), concurring with the Navy's findings of no adverse effects on historic properties. If, in the course of the construction, operation or maintenance of any component of the LWI or SPE, there is an unanticipated discovery of cultural resources, work would be stopped and the Navy cultural resources manager would be contacted to determine subsequent steps in compliance with Section 106 of NHPA and other relevant cultural resources legislation. The Navy would continue to comply with DoD policy and other laws and regulations, including the American Indian Religious Freedom Act of 1978 and Native American Graves Protection and Repatriation Act of 1990, if the need arises.

¹ The NHPA was recodified in December 2014 as part of a larger effort to better organize statutes related to the National Park Service. The code covering NHPA Section 106 is now located in Section 306108 of Title 54 USC.

5.2.2. Mitigation Measures (MM 10)

In compliance with Section 106 of NHPA, inadvertent discovery of unknown archaeological resources would require consultation with the SHPO and affected tribes.

5.2.3. Party(ies) Responsible for Implementation

The Navy would be responsible for completing this mitigation measure.

5.2.4. Planned Implementation Schedule

In the event of inadvertent discovery of unknown archaeological resources during construction, operation or maintenance, work would be stopped and the Navy would consult with the SHPO and affected tribes.

5.2.5. Planned Funding

This mitigation would be funded by the Navy.

5.2.6. Mitigation-Specific Performance Criteria

The specific performance criteria for this measure would be established as part of the agreement implementing the mitigation measures, as developed by the Navy in consultation with the SHPO.

5.2.7. Monitoring and Tracking Mechanisms

Reporting requirements would be specified in the agreement between the Navy and SHPO.

5.2.8. Enforcement Measures

The SHPO would enforce this mitigation measure.

5.3. OTHER RESOURCES

No mitigation measures are proposed for reducing impacts on air quality, aesthetics, socioeconomics, and public health and safety because any impacts on these resources from the LWI and SPE projects are expected to be minimal for reasons discussed below. Mitigation and environmental protection measures for geology and soils, noise, land use and recreation, and transportation are described below.

5.3.1. Geology and Soils

Mitigation measures are not necessary for geological resources because the projects would have only minor direct impacts on geologically hazardous areas and would not involve contaminated soils. However, the projects will include environmental protection measures such as design of the construction roadway and laydown area to minimize impacts by locating these features in areas away from steep slopes and streams, to the extent practicable. A geotechnical design evaluation will be performed to avoid steeper slopes and properly grade the soil, especially in areas where seepage has been observed. Measures to minimize soil erosion are described in Section 2.3.

5.3.2. Noise

Maximum noise levels for the LWI and SPE projects would occur during use of an impact pile driver, and the noise levels would exceed allowable noise limits for the OSHA (90 dBA) and Navy Occupational Safety and Health (84 dBA) for an 8-hour period. This could potentially cause injury to construction personnel working at the sites. In such conditions, personal protective equipment would be required for personnel working in these areas.

Pile driving for SPE would result in noise levels in the community of Olympic View approximately equal to the WAC daytime (7:00 a.m. to 10:00 p.m.) limit of 60 dBA. Temporary construction noise during the hours of 7:00 a.m. to 10:00 p.m. is exempt from WAC noise requirements. The WAC residential limit for nighttime (50 dBA) would not be exceeded because pile driving would occur only during daylight hours (**MM11a**).

For both LWI and SPE, due to intervening terrain and vegetation, residential areas on NAVBASE Kitsap Bangor and in the community of Vinland would not experience adverse noise impacts; noise levels would not exceed the WAC limits. Residential properties on the western shore of Hood Canal and in the community of Olympic View directly south of the base would be able to hear pile driving noise but levels would not experience noise levels above the WAC daytime or nighttime limits, in part because pile driving would not occur at night. The Navy would notify the public about upcoming construction activities and noise at the beginning of each construction season (**MM 11b**).

5.3.3. Air Quality

No mitigation measures are necessary, as the projects would not have an adverse impact on air quality. The project sites are in an attainment area for all six criteria pollutants. These projects would comply with the national and state ambient air quality standards, including being well below annual allowed emissions for criteria pollutants.

5.3.4. Land Use and Recreation

The LWI and SPE projects are consistent with land use plans and policies, and there would only be short-term, adverse noise impacts on land use and recreation on the western shore of Hood Canal during construction. Noise levels on the western shore of Hood Canal and in the community of Olympic View would not exceed environmental noise standards; in addition, the WAC provides an exemption for construction noise originating from temporary construction sites. These projects would be consistent with the NAVBASE Kitsap Bangor Master Plan and Integrated Natural Resources Management Plan. There are no other regulations pertaining to land use or recreation applicable to this alternative. The Navy would implement the following mitigation measures: Construction activities would not be conducted during the hours of 10:00 p.m. to 7:00 a.m.; pile driving would occur only during daylight hours (**MM 11a**); the Navy would notify the public about upcoming construction activities and noise at the beginning of each construction season (**MM 11b**); and the Navy would develop a local Notice to Mariners to establish uniform procedures to facilitate the safe transit of vessels operating in the project vicinity (**MM 12a**).

5.3.5. Aesthetics

While the project would result in changes in the viewshed, these changes would not be out of character with existing conditions. Therefore, no mitigation measures are necessary. There are no regulations pertaining to visual resources or aesthetics.

5.3.6. Socioeconomics

As there would be no adverse environmental impacts on the human population from construction or operation of the LWI or SPE, no mitigation measures are necessary.

Construction may impact adult salmon and steelhead that could be harvested by the tribes because pile driving (hammer and vibratory) would be conducted during adult salmon and steelhead return to Hood Canal, which may cause the salmon and steelhead to move to a different location within Hood Canal. This would not result in a net loss of tribal resources, but could increase the time allocated to observe the tribes' fishing rights. The LWI project would result in an economic loss for tribal shellfish harvest (Section 3.14.12 of the FEIS). This impact would be mitigated as part of the overall tribal mitigation discussed in Section 9.0 of this MAP.

5.3.7. Traffic

5.3.7.1. NOTICE TO MARINERS (MM 12A)

During construction, the projects would result in increased marine vessel traffic. The Navy would develop a local Notice to Mariners to establish uniform procedures to facilitate the safe transit of vessels operating in the project vicinity.

5.3.7.2. BARGE TRAFFIC (MM 12B)

Construction vessel traffic for the LWI and SPE projects would result in an average of 26 additional openings of the Hood Canal Bridge per month, resulting in total traffic delays of 13 hours per month. This would have an adverse impact on travelers crossing the Hood Canal Bridge on State Route (SR)-104. Impacts on motorists would be minimized by scheduling bridge openings during non-peak traffic hours (6:00 to 8:30 a.m. and 3:30 to 6:00 p.m., Monday through Friday) to the extent possible. The increase in weekly barge trips and associated bridge openings would not appreciably increase vessel traffic levels in the project area. This level of vessel traffic is not expected to adversely impact vessel transit routes in Hood Canal or Puget Sound. Potential impacts on vessel traffic would be minimized by the U.S. Coast Guard issuing, at the Navy's request, Notices to Mariners at the beginning of each construction season and for bridge openings. Operation of the LWI project would not result in additional vessel traffic on Hood Canal, so only the operational impacts of the SPE (two openings of the Hood Canal Bridge per month) would occur over the long term.

6.0 COMPENSATORY MITIGATION (MM 13)

6.1 INTRODUCTION

The Proposed Actions would result in the loss and shading of eelgrass habitat, impacts on sensitive species, including movement of salmonids, and other long-term impacts on marine habitats and species including forage fish. The Proposed Actions also would require Section 10 permits under the Rivers and Harbors Act (LWI and SPE projects), a 404 permit from USACE (LWI project only), and a CWA Section 401 water quality certification from WDOE (LWI and SPE projects). To receive permits the Proposed Actions must comply with *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* adopted on April 10, 2008 (USACE and USEPA 2008).

6.2 REGULATORY OVERVIEW

Compensatory Mitigation is the term given to projects or plans undertaken to offset “unavoidable adverse environmental impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.” Compensatory mitigation involves actions taken to offset unavoidable adverse impacts on wetlands, streams, and other aquatic resources. For impacts authorized under a Section 404 permit, compensatory mitigation is not considered until after all appropriate and practicable steps have been taken to first avoid and then minimize adverse impacts on the aquatic ecosystem pursuant to 40 CFR Part 230 (i.e., the CWA Section 404(b)(1) Guidelines). WDOE also considers compensatory mitigation when issuing a CWA Section 401 water quality certification.

Compensatory mitigation is required for permits authorized by the CWA Section 404 and other Department of the Army permits. The 1990 Section 404 Mitigation Memorandum of Agreement (MOA) signed by the USEPA and USACE established procedures for implementing existing Section 404 regulatory requirements. In particular, the MOA set forth the process by which USACE will comply with the Section 404(b)(1) Guidelines when considering impacts and mitigation within the context of Standard Permit (Individual Permit) applications. Only when USACE is satisfied that an applicant has taken all steps to first avoid the impact altogether and second to minimize impacts, will USACE consider mitigation. When determining the level of appropriate mitigation, USACE considers the type of aquatic resource impacted and its functions. Appropriate mitigation generally means in-kind mitigation and the goal is no net loss in aquatic resource functions.

Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (USACE and USEPA 2008) clarifies the use of mitigation banks and ILF programs and identifies the benefits of these mechanisms for providing compensatory mitigation. The rule allows for mitigation banks, approved ILF programs, and permittee responsible mitigation.

Compensatory Mitigation for Losses of Aquatic Resources, Final Rule emphasizes the use of a watershed approach to compensatory mitigation. The watershed approach involves consideration of several factors to assure proper implementation:

- Watershed needs and Compensatory Mitigation projects to address those needs,
- Landscape scale,

- Historic and potential aquatic resource conditions,
- Past and projected aquatic resource impacts, and
- Terrestrial connections between aquatic resources.

The changes to the regulations for compensatory mitigation are intended to increase the Compensatory Mitigation project success rate and improve the health of the aquatic resources in mitigated areas. The Compensatory Mitigation for Losses of Aquatic Resources, Final Rule was developed to provide better aquatic resource mitigation than the traditional focus on onsite/in-kind, which may not always be feasible or appropriate mitigation. Any proposed activity that impacts aquatic resources still needs to be addressed in the following order:

- Avoid. Proposed impacts must be avoided to the maximum extent possible.
- Minimize. Impacts that cannot be avoided should be minimized.
- Compensate for remaining impacts. Impacts that cannot be avoided must be compensated for through compensatory mitigation.

The Compensatory Mitigation for Losses of Aquatic Resources, Final Rule establishes a hierarchy or preference for Compensatory Mitigation:

- Mitigation Banks,
- ILF Programs, and
- Permittee-Responsible Mitigation.

The Navy has authority to participate in ILF programs and Mitigation Banks through the Sikes Act and DoD Natural Resource Policy Guidance.

The HCCC has established an ILF program for Hood Canal (HCCC 2014). Mitigation banks and ILF programs are forms of “third-party” compensation because a third party, such as a bank, or ILF sponsor assumes responsibility for the implementation and success of the compensatory mitigation. The emphasis on this rule is that the compensatory mitigation should be determined based on the specific details of the impacted aquatic resources, the watershed, and viability of various Compensatory Mitigation projects that could mitigate the impacts. The changes implemented by this rule should improve the efficiency, predictability, and success rate of Compensatory Mitigation projects. The rule provides for improved review of mitigation and anticipates enhanced mitigation success based on:

- The use of effective standards based on best available science that should increase the success rate of mitigation projects,
- Increased public participation that should lead to more input and ideas for proposed projects, and
- More uniform standards that should increase the viability of mitigation banks and ILF programs compared to the more traditional permittee-responsible mitigation.

6.3. SUMMARY OF IMPACTS REQUIRING COMPENSATORY MITIGATION

The proposed LWI project would be subject to permits under Section 404 of the CWA because construction of the shoreline abutments would require excavation (“in the dry” at low tide) of sediments below the MHHW water line; the affected area would include 24 square feet (2 square meters) of permanent fill in water of the U.S. represented by the LWI abutment stair landings. However, the Navy’s analysis indicates that the bents (rows of pilings) installed for both the LWI and SPE projects would not function as fill as defined by 33 CFR Part 323. Additionally, the proposed project designs include at least 20 feet between bents. As discussed in Section 3.1.2.1.2 of the EIS, the support piles installed for the LWI and SPE would slightly alter current speeds beneath the piers, which would cause minor erosion of fine-grained sediments near some piles impacted by turbulent flows, as well as settling and accumulation of fine-grained sediments at the base of other piles (Chiew and Melville 1987). Over the lifetime of the LWI and SPE, tidal currents would result in a gradual coarsening of surface sediments and thin scouring initially around the perimeter of each pile, and groups of piles (Sumer et al. 2001). However, shells and barnacles that accumulate on the piles would also slough off over time and contribute to the sediment content below the piles. The loss of fine-grained sediment would be offset by the accumulation of shell and barnacle particles. These two processes would result in no net impact on seafloor bathymetry below the piles, although there would be minor, localized coarsening of sediment particle size.

Construction and operation of the LWI and SPE pier structures, and relocation of PSBs and anchors, would not be expected to cause appreciable erosion or deposition of sediments within the project area or interfere with longshore sediment transport and delivery processes (cbec 2013). This conclusion is supported by the Golder Associates (2010) study, which concluded that the presence of other Navy structures along the Bangor shoreline has not caused appreciable changes in the morphology of the shoreline.

The proposed projects would impact aquatic resources, which would be mitigated in accordance with the Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (USACE and USEPA 2008). The impacts and mitigation are summarized in Tables 2 and 3.

Table 2. Compensatory Mitigation for LWI Preferred Alternative Impacts on Aquatic Habitat and Waters of the U.S.

LWI Impact	LWI Alternative 3 Area	LWI Anticipated Mitigation ¹
Habitat displaced by piles and/or anchors in shallow water (< 30 feet [10 meters])	118 square feet (11 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Over-water area (shading) in shallow water ²	5,070 square feet (471 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Eelgrass covered by buoy mooring anchors or degraded by PSB and buoy grounding	580 square feet (54 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Fill in waters of the U.S. (shoreline abutment stair landings and riprap)	4,124 square feet (383 square meters)	Mitigation for loss of aquatic resources ³ would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Excavation in waters of the U.S. (shoreline abutments)	15,600 square feet (1,449 square meters)	Mitigation for loss of aquatic resources ³ would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Total ⁴	20,670 square feet (1,920 square meters)	

N/A = not applicable; USACE = U.S. Army Corps of Engineers

- Final mitigation requirements for the selected alternative would be determined through the CWA permitting process.
- No full shading of eelgrass is expected.
- Impact is from excavation during construction of the abutments and concrete fill from the abutment stair landings.
- Total is the sum of the overwater area plus the excavation for the abutments; the abutment stair landing fill areas are included in the excavation areas; all other items are included in the overwater shading area.

Table 3. Compensatory Mitigation for SPE Preferred Alternative Impacts on Aquatic Habitat and Waters of the U.S.

SPE Impact	SPE Alternative 2 Area	SPE Anticipated Mitigation ¹
Habitat displaced by piles in deep water (>30 feet [10 meters])	0.045 acre (0.018 hectare)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Overwater area (full shading) in deep water (more than 30 feet below MLLW). There would be no shading shallower than 30 feet below MLLW.	1.0 acre (0.41 hectare)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.

- Final mitigation requirements for the selected alternative would be determined through the CWA permitting process. Habitat displaced by piles is included in the habitat in the overwater area. Project would not shade or displace shallow habitat.

6.4. HOOD CANAL IN-LIEU FEE PROGRAM

The use of an ILF Program remains the preferred compensatory mitigation approach for the unavoidable impacts on aquatic resources from the Proposed Actions.

6.4.1. ILF Program Goal and Objectives

The primary goal of the HCCC ILF Program for Hood Canal is to increase aquatic resource functions in the Hood Canal watershed. This can be accomplished by improving existing mitigation requirements with rigorous site assessment and selection processes that fully support priorities for conserving and restoring Hood Canal. While mitigation seeks to generally offset the impacts of development projects resulting in no net loss, this ILF Program adds value to mitigation processes by implementing projects in a coordinated manner, consistent with existing regulations and legal limitations relating to mitigation. To accomplish this goal, the HCCC incorporated the following objectives into the ILF Program (HCCC 2011):

- Provide a viable option to ensure the availability of high-quality mitigation for unavoidable, site-specific impacts to freshwater wetlands and marine/nearshore aquatic resources in the Hood Canal watershed.
- Promote “net resource gain” (defined as restoration of ecological processes) and improved ecological functions of the Hood Canal watershed.
- Meet the needs and goals of the Hood Canal Integrated Watershed Management Plan approach and the HCCC members.
- Develop, in cooperation with environmental regulatory partners, an ecologically based site selection process to identify the most appropriate mitigation options that result in greater ecological benefit to the Hood Canal watershed than could be achieved through permittee responsible mitigation.
- Combine the mitigation requirements from individual permitted projects within a service area into larger mitigation sites.
- More efficiently and cost-effectively meet federal, state, and local regulatory requirements by creating a mechanism for fulfilling compensatory mitigation requirements.
- Select the best mitigation sites for the watershed through a rigorous analysis by a group of professional resource managers and local experts, drawing from local knowledge and best available science and analyses.
- Develop a self-sustaining ILF Program that identifies, prioritizes, and completes mitigation projects that result in a “net resource gain” on a watershed scale over time.
- Provide an effective and transparent accounting structure for collecting ILFs, disbursing project funds, and conducting compliance reporting, as required under 33 CFR 332.8.
- Work in an efficient and transparent manner with the Interagency Review Team, co-chaired by the USACE and WDOE, to review, analyze, and implement mitigation projects and enact amendments to the ILF Program.

The HCCC has four strategies to accomplish its goal and objectives. These strategies are to: restore aquatic resource functions; enhance existing aquatic resources; establish new functions

where they no longer exist; and, under certain circumstances, preserve intact or fully functioning aquatic resource functions. Compensatory mitigation can take one of these four forms, in order of preference:

1. Restoration: returning a damaged aquatic resource to its original condition through restoration of habitat forming processes;
2. Creation: converting an area that has no significant aquatic resources into an aquatic resource area with all of the physical and biological characteristics to replace the area lost or damaged;
3. Enhancement: making changes or improvements to an aquatic resource to replace the functions or values performed by the resources lost or damaged; and
4. Preservation: protecting aquatic resources in an area that is equivalent to the area damaged, and that might otherwise be impacted or lost.

The mitigation strategy selected for each permitted impact would be based on an assessment of type and degree of disturbance at the landscape and/or drift cell scales. Restoration generally would be the first mitigation option considered because the likelihood of success is greater and the impacts on potential ecologically important uplands are reduced compared to enhancement or creation. Restoration also has potential to produce more substantial gains in aquatic resource functions compared to enhancement and preservation.

6.4.2. Hood Canal ILF Service Area

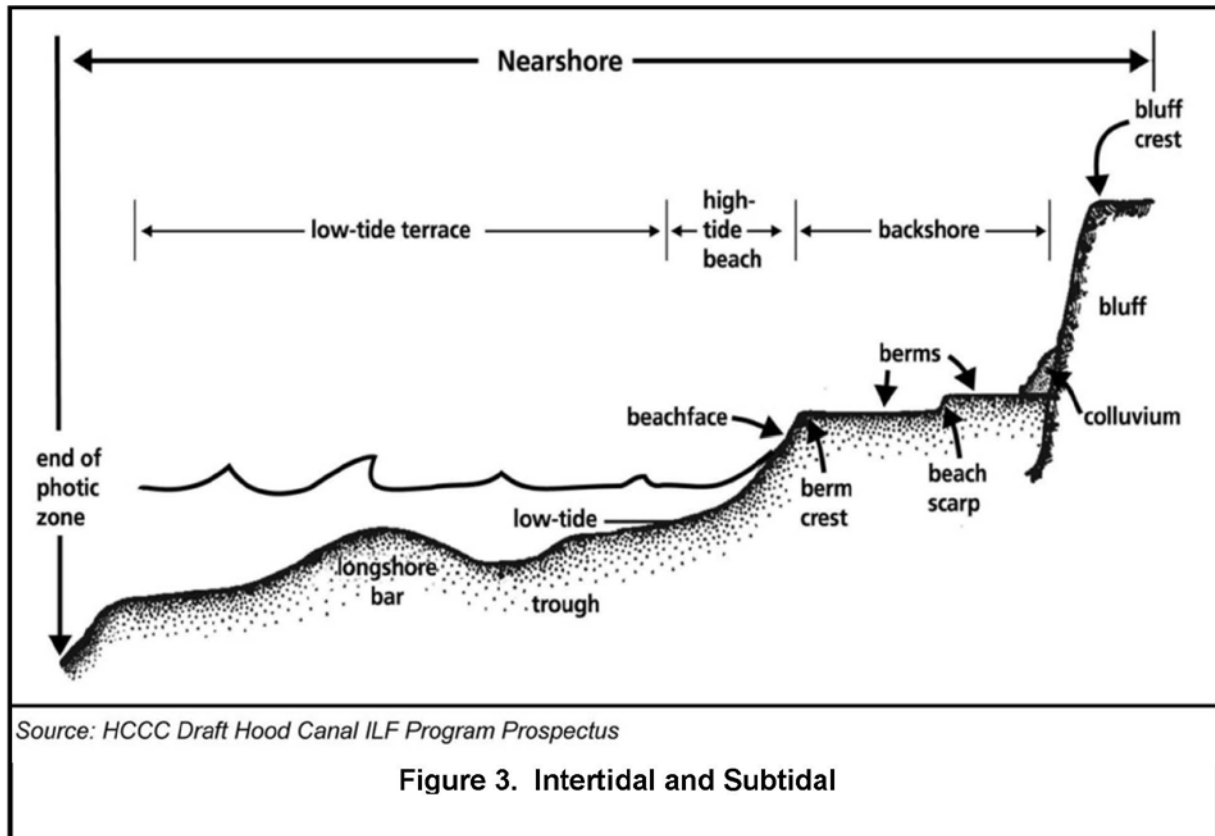
The service area for the Hood Canal ILF Program encompasses those portions of Water Resource Inventory Areas 14, 15, 16, and 17 draining to Hood Canal, defined by a line extending from Foulweather Bluff to Tala Point, south through the Great Bend to its terminus near the town of Belfair, Washington.

The service area is divided into two components for the purposes of this ILF Program:

1. Freshwater Environment, which generally includes areas landward of the marine riparian zone, including freshwater and estuarine wetlands and streams up to and excluding any National Park or National Forest Lands; and
2. Marine / Nearshore Environment, which extends from the marine riparian area at the top of the coastal bluffs to the adjacent aquatic intertidal and subtidal zones (Figure 3).

6.4.3. Navy's Use of the HCCC ILF Program

The Navy's use of the HCCC's ILF program would follow the requirements of the Final Instrument for the HCCC's ILF program, which was developed based on input from the IRT and prescribes the credit/debit methodology, fee calculation structure, and financial assurances for the program (HCCC 2012). Appendix C of the Final Instrument specifies the procedures for approval of an applicant's use of the program, including mitigation sequencing, and how the ILF program would implement the mitigation. In accordance with the Final Instrument and appendices, the Navy, regulatory agencies, and ILF Program will undertake the following actions:



- The Navy will complete data collection and a preliminary site and impacts assessment, and provide this information to the applicable regulatory agencies and permitting entities for review.
- The applicable regulatory agencies and permitting entities will review the proposed development project to ensure impacts are avoided and minimized to the maximum extent practicable and all onsite mitigation options are exhausted.
- The permitting agencies will determine if the HCCC ILF Program provides the best option for compensating for unavoidable impacts; if so then the Navy, in cooperation with the Program Sponsor (the HCCC), will complete the site and impacts assessment to determine the amount of credits needed to offset the impact (or debit). This will constitute the ILF Use Plan. The Program Sponsor will review and confirm the ILF Use Plan, and informally consult with the IRT if appropriate. The ILF Use Plan will then be provided to the applicable regulatory agencies and permitting entities.
- The agencies will approve or deny the permit conditioned on purchasing credits from the HCCC ILF Program for mitigation.
- The Navy will purchase mitigation credits from the HCCC ILF Program to offset the project's unavoidable impacts.
- The statement of sale will be sent to Corps, Ecology, and any other applicable regulatory or permitting entities which issued the permit conditioned upon purchasing credits from the HCCC ILF Program.

After mitigation sequencing steps have occurred and mitigation has been assigned to the HCCC ILF Program, the following steps (covered in detail in subsequent appendices of the Instrument) describe how mitigation will be implemented:

- The HCCC ILF Program will review impacts and ecological needs at the appropriate, nested scale.
- The HCCC ILF Program will propose mitigation sites and project concepts, along with the draft Spending Agreement, to the Corps and Ecology.
- In consultation with the IRT, the Corps and Ecology will review and approve the sites and conceptual plans, and sign the Spending Agreement. The HCCC ILF Program Credit and Debit calculations include a factor to account for risk and uncertainty associated with temporal loss.
- The HCCC ILF Program will develop draft and final mitigation plan(s) and site protection instrument(s).
- In consultation with the IRT, the Corps and Ecology will review and approve final mitigation plan(s) and final site protection instrument(s).
- The HCCC ILF Program will implement the mitigation project(s).
- All subsequent steps related to credit fulfillment, site maintenance, monitoring/reporting, adaptive management, and site protection are listed and discussed in Appendices K to P of the Final Instrument.
- Once fees are collected from the applicant, the ILF program will have three years to secure a site and begin implementation of the mitigation action.

More information on the HCCC ILF Program can be found on the HCCC website:
<http://hccc.wa.gov/>.

7.0 PERMITTING AND CONSULTATION TERMS AND CONDITIONS

Consultation with NMFS under the ESA and MSA is complete for the LWI project. NMFS did not have conservation recommendations for the LWI project, because they determined that BMPs and other measures included in the BA, and other information provided by the Navy, to avoid, reduce, or mitigate impacts would be sufficient to offset impacts to protected resources. ESA consultation with the USFWS for both the LWI and SPE projects is complete, with the USFWS finding that impacts to bull trout would be insignificant and impacts to the marbled murrelet would be discountable, with no additional conservation recommendations. ESA consultation with NMFS is ongoing for the SPE project, as is CWA permitting by the USACE and WDOE for both projects. Any additional measures to minimize impacts identified during those consultations and permitting processes will be included in this section once those processes are complete.

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8.0 SUMMARY OF PROPOSED MEASURES TO AVOID, MINIMIZE, AND COMPENSATE FOR ENVIRONMENTAL IMPACTS ON AQUATIC RESOURCES

This section summarizes measures that the Navy will implement to avoid, minimize and compensate for impacts on aquatic resources. Integrated into the projects are design features and measures to avoid environmental impacts. Where avoidance is not possible, the designs have been modified to minimize those impacts. Design features include the following:

- For both projects, the number of piles and anchors was minimized while still meeting structural, safety, and security requirements.
- For LWI Alternative 2, the piers were designed to minimize overwater coverage and maximize light transmittance. The pier was limited to pedestrian access, which allows it to be narrower and have a grated deck, as well as fewer, more widely spaced piles.
- For LWI Alternative 2, a mesh anchoring system was developed that did not require dredging.
- For LWI Alternative 2, the mesh size was maximized to facilitate fish passage while still meeting security requirements.
- For LWI Alternative 3, the PSB pontoons would be fitted with “feet” to minimize disturbance of the seafloor when the pontoons bottom out at low tide.
- For both LWI alternatives, the abutments would be built from shore, thereby eliminating the need for in-water pile driving.
- For LWI Alternative 3, the observation posts would be built from shore, thereby eliminating the need for in-water pile driving.
- For both SPE alternatives, the pier extension was placed in deep water to minimize impacts on marine vegetation and habitat, and interference with nearshore fish migration.
- For both SPE alternatives, as many facilities as possible were sited on land versus on the pier to minimize the size of the pier.

Additional measures to avoid, minimize, or compensate for impacts on aquatic resources are described below by resource. Sections of the Mitigation Action Plan providing more detailed descriptions of these measures are cited. Please refer also to Tables 2 and 3 for summaries of aquatic impacts and compensatory mitigation. Residual (i.e., following avoidance and minimization measures) impacts on habitat functions would be compensated for by implementation of the Navy’s compensatory habitat mitigation action, which employs a Hood Canal watershed approach, as described in Section 6.0. Residual impacts are described in Sections 3.1 through 3.17 of the EIS.

8.1. HYDROGRAPHY

Impacts on hydrography will be avoided by limiting construction vessels to a construction corridor of 100 feet (30 meters) around the new structure (Section 2.1.2.4) and implementing

work vessel grounding control measures (Section 2.1.2.5). Impacts on hydrography would be minimized by:

- Keeping the size of the proposed LWI piers and SPE to the minimum needed to provide the functions required;
- Establishing construction debris and pile removal control measures (Section 2.1.2.3);
- Instituting prop wash control measures (Section 2.1.2.4); and
- Preparing and implementing a mooring and anchoring plan to avoid underwater anchor and line drag (Section 2.1.2.6).

8.2. MARINE WATER QUALITY

Impacts on marine water and sediment quality will be avoided by preparing and implementing a SWPPP (Section 2.1.2.1) and limiting construction vessels to a construction corridor of 100 feet around the new structure (Section 2.1.2.4). Impacts on marine water quality would be minimized by:

- Implementing spill response control measures in the event of an accidental spill (Section 2.1.2.2);
- Establishing construction debris and pile removal control measures (Section 2.1.2.3);
- Instituting prop wash control measures (Section 2.1.2.4); and
- Preparing and implementing a mooring and anchoring plan (Section 2.1.2.6).

8.3. EELGRASS

Impacts on eelgrass will be avoided by:

- Keeping the size of the proposed LWIs and SPE to the minimum needed to provide the functions required;
- Limiting construction vessels to a construction corridor of 100 feet (30 meters) around the new structures (Section 2.1.2.4);
- Implementing work vessel grounding control measures (Section 2.1.2.5); and
- Avoiding spudding and anchoring in eelgrass beds (Section 5.1.2).

Impacts on eelgrass will be minimized by:

- Placing the SPE in deep waters;
- Limiting the width of the LWI piers that cross the eelgrass bed to the minimum needed to provide the functions required;
- Aligning the LWI piers perpendicular to the shoreline so that the piers cross the shortest length of eelgrass bed possible;
- Designing the PSB pontoons with feet to reduce the amount of eelgrass disturbed;
- Establishing construction debris and pile removal control measures (Section 2.1.2.3);
- Instituting prop wash control measures (Section 2.1.2.4); and

- Preparing and implementing a mooring and anchoring plan (Section 2.1.2.6).

Residual (i.e., following avoidance and minimization measures) impacts on eelgrass and its environmental functions would be compensated for by implementation of the Navy's compensatory mitigation action as described in Section 6.0.

8.4. BENTHIC COMMUNITY

Impacts on benthic communities will be avoided by:

- Preparing and implementing a SWPPP (Section 2.1.2.1);
- Limiting construction vessels to a construction corridor of 100 feet (30 meters) around the new structure (Section 2.1.2.4); and
- Implementing work vessel grounding control measures (Section 2.1.2.5).

Impacts on benthic communities will be minimized by:

- Placing the SPE in deep waters;
- Limiting the width of the LWI piers that cross nearshore benthic habitats such as oyster beds to the minimum needed to provide the functions required;
- Aligning the LWI piers perpendicular to the shoreline so that the piers cross the shortest length of nearshore benthic habitats possible;
- Designing the PSB pontoons with feet to reduce the amount of benthic habitat disturbed;
- Establishing construction debris and pile removal control measures (Section 2.1.2.3);
- Instituting prop wash control measures (Section 2.1.2.4); and
- Preparing and implementing a mooring and anchoring plan (Section 2.1.2.6).

Avoidance and minimization measures described above that are protective of eelgrass beds would also be protective of those benthic species which use eelgrass for habitat (e.g., Dungeness crabs). Residual (following avoidance and minimization measures) impacts on the benthic community and its environmental functions would be compensated for by implementation of the Navy's compensatory mitigation action as described in Section 6.0.

8.5. MARINE FISH

Impacts on marine fish, including ESA-listed species, will be avoided by adhering to the established work window, except as noted, for this portion of Hood Canal (Section 2.2). Impacts on marine fish would be further minimized by:

- Limiting the width of the LWI piers that cross the migratory path of juvenile salmonids to the minimum needed to provide the functions required; and
- Deploying air bubble curtains or other noise attenuating device(s) during impact hammer operations for steel piles (Section 3.2.2).

Other avoidance and minimization measures described above for hydrography, water quality, and eelgrass would also be protective of marine fish habitats (Section 5.1.2).

8.6. MARINE MAMMALS AND BIRDS

Impacts on ESA-listed marine birds and MMPA-protected marine mammals will be avoided by the use of visual monitoring for marine mammals and marbled murrelets during construction and shut-down of pile driving when these species approach or enter areas where injury could occur (Section 4.0). Impacts on marine mammals and birds will be minimized by deploying air bubble curtains or other noise attenuating device(s) during impact hammer operations (Section 3.2.2) and employing a soft-start approach during pile driving operations (Section 3.2.3). Other avoidance and minimization measures described above for hydrography, water quality, eelgrass, and marine fish would also be protective of marine mammal and bird aquatic habitats and food resources.

9.0 TREATY MITIGATION (MM 14)

As discussed in FEIS Section 3.14, the LWI and SPE Proposed Actions would affect American Indian traditional resources subject to tribal treaty rights. The Navy invited and has engaged in government-to-government consultation with the affected tribes to evaluate potentially significant impacts to Treaty-protected resources, and identify appropriate mitigation for the impacts. The following subsections describe measures the Navy would undertake to mitigate potential adverse impacts of the LWI and SPE Proposed Actions on Treaty protected resources.

9.1. SKOKOMISH INDIAN TRIBE

The Navy and the Skokomish Indian Tribe have conducted government-to-government consultations to discuss the nature, scope, and schedule of the Navy's Proposed Actions. These consultations began in May 2008 for the LWI project and July 2012 for the SPE project, and focused on measures to address the potential effects of the projects on reserved tribal treaty rights and resources. On March 3, 2016 the Navy and the Skokomish Indian Tribe completed a Memorandum of Agreement (MOA) to undertake treaty mitigations for LWI and SPE by contributing funding to support Skokomish River Basin restoration, with the terms and conditions of the MOA to apply only after the Navy begins in-water construction.

9.1.1. Skokomish River Basin Ecosystem Restoration

The Skokomish River Basin, located on the Great Bend of Hood Canal, is the largest source of freshwater to Hood Canal and includes the Skokomish Indian Reservation. The mitigation measures identified in the MOA are part of an ecosystem restoration plan for the Skokomish Basin being undertaken by USACE in partnership with the Skokomish Indian Tribe and Mason County, Washington. The plan is described and its alternatives analyzed in the *Skokomish River Basin Mason County, Washington Ecosystem Restoration Integrated Feasibility Report and Environmental Impact Statement* (Skokomish River Basin EIS; USACE 2015), incorporated here by reference. The preferred alternative (Section 3.11, p. 54-56) consists of the following actions:

- Removal of a levee;
- Placement of large woody debris;
- Reconnection of a side channel; and
- Wetland restoration at two sites.

The Skokomish River Basin EIS (Section 5.9.1, p. 126) summarizes the anticipated unavoidable adverse impacts of the actions itemized above as follows:

- Temporary, minor, and localized degradation of water quality from increases in turbidity during in-water work;
- Temporary, minor disturbance to fish and aquatic insects through increased turbidity and construction activity in the water;
- Temporary clearing of upland and riparian vegetation for access and staging areas;

- Fill of up to 5 acres (2 hectares) of wetland where wetland embankments are constructed, which is offset by a net gain of 51 acres (21 hectares) of wetlands by these increments; plus another 1 acre (0.4 hectare) of disturbance to wetlands for the Side Channel Reconnection inlet; and
- Temporary and localized disruptions to traffic caused by construction vehicle access to worksites.

These impacts would be mitigated as summarized in Section 5.10, p. 127, of the Skokomish River Basin EIS: “Implementation of the recommended plan would involve three ecosystem restoration sites with only minor construction activities in the aquatic environment, primarily for temporary culvert installation for access. Each of the proposed sites would have negligible, short-term construction related effects. All of these minor and temporary effects can be avoided and minimized through construction designs and standard best management practices (BMPs). Specific measurable and enforceable measures would be developed for each site based on the specific effects of the project. The Corps would require construction contractors to adhere to BMPs to protect water quality. Standard construction stormwater BMPs can be incorporated into site designs, operational procedures, and physical measures on site. There are no legal requirements to mitigate for greenhouse gas emissions; however, BMPs are available for fuel and material conservation during construction.”

A NEPA Record of Decision is expected to be executed in 2016 for the Ecosystem Restoration Project. The project design and construction would be implemented on a cost sharing basis between the federal government (65 percent) and the Skokomish Indian Tribe and Mason County (35 percent). The Navy would contribute funding toward the Skokomish Indian Tribe’s cost share.

9.2. PORT GAMBLE S’KLALLAM TRIBE, JAMESTOWN S’KLALLAM TRIBE, AND LOWER ELWHA KLALLAM TRIBE

The Navy began government-to-government consultation with the Port Gamble S’Klallam Tribe, Jamestown S’Klallam Tribe, and Lower Elwha Klallam Tribe for the LWI project in 2008 and for the SPE project in 2012. Although the Navy and Tribes were not able to reach formal agreement on the treaty mitigation measures at the time of publication of this FEIS, the Navy would fund one or more of the following treaty mitigation projects.

For LWI:

- Shellfish seeding and beach enhancement at locations off Navy property;
- Development and implementation of a floating upweller system (FLUPSY) management plan; and
- Kilisut Harbor Restoration Project.

For SPE:

- Shellfish seeding and beach enhancement at locations off Navy property; and
- Culvert replacement at Little Boston Road over Shipbuilders Creek.

9.2.1. Shellfish Seeding and Beach Enhancement

As mitigation for the LWI and SPE Proposed Actions, the Navy would fund shellfish seeding and beach enhancement at locations off Navy properties. This mitigation measure would be consistent with the goals of the Port Gamble S'Klallam Tribe's Sustainable Shellfish Program to improve the health of the Hood Canal nearshore areas and shellfish populations.

The procedures and expected environmental impacts of shellfish seeding are described in the *TRIDENT Support Facilities Explosives Handling Wharf (EHW-2) Final Environmental Impact Statement (EHW-2 FEIS)* (Navy 2012; Appendix F, Mitigation Action Plan, p. F-166-169), incorporated here by reference. Beach seeding with juvenile clams or oysters is done by hand during a low tide when the intertidal area is exposed as much as possible. The seeding requires an aquaculture permit from USACE. The process does not result in adverse impacts to fish and wildlife or physical features of the environment, and socioeconomic effects are beneficial. Shellfish seeding would not be conducted in locations where eelgrass is present.

The procedures and expected environmental impacts of beach enhancement are described in the EHW-2 FEIS, Appendix F, p. F-157-161, and incorporated here by reference. Beach enhancement involves placing gravel and sand on tidelands (beach nourishment) to enhance shellfish seed habitat. The gravel and sand are placed through the use of barges and dispersal equipment during appropriate tidal windows. The fill placement is regulated by a USACE permit under the authority of CWA Section 404 and also requires a Section 401 Water Quality Certification from WDOE. The work would be conducted during a NMFS-approved in-water work window to minimize potential impacts on ESA-listed fish species and juvenile populations. The impact on ESA-listed species would likely be “may affect, not likely to adversely affect” because adults of these species could be present during the in-water work window. Beach enhancement would not be conducted in locations where eelgrass is present. The fill placement would produce temporary water quality impacts through local turbidity, but no long-term adverse effects on water quality would be expected. Short-term air quality impacts would occur from haul truck and construction equipment exhaust and from brief fugitive dust emissions. Equipment operating during the fill placement would generate noise temporarily, but there would be no sensitive receptors near the proposed mitigation action. Long-term socioeconomic impacts would be beneficial.

9.2.2. Floating Upweller System (FLUPSY) Management Plan

As mitigation for the LWI project, the Navy would fund the development and implementation of a management plan for a shellfish nursery floating upweller system (FLUPSY) to be operated by the Port Gamble S'Klallam Tribe. In coordination with the Jamestown S'Klallam Tribe and Lower Elwha Klallam Tribe, the Port Gamble S'Klallam Tribe would hire a consultant with expertise in shellfish nursery operation to develop a plan that would specify procedures for achieving a self-sustaining FLUPSY operation within 6 years after startup. The management plan would describe the setup, procedures, required equipment, schedules, and other information necessary to operate and maintain the FLUPSY, including a shellfish seeding/capacity plan for the FLUPSY during build-out and implementation. FLUPSY operations in the Pacific Northwest are typically initiated in the spring and run through at least late October on an annual basis. Supervision and oversight by a shellfish nursery consultant would be needed for the first 6 years of operation as oyster seed grow out. The consultant would assist with setting up pumps

or paddlewheels, stocking bins with shellfish seed, maintaining seed on a daily and weekly basis, and ensuring that gantry operations are conducted efficiently and safely. Minor equipment and supplies may also be purchased.

The procedures and expected environmental impacts of FLUPSY operations are described in the EHW-2 FEIS, Appendix F, p. F-171-176, and incorporated here by reference. The proposed FLUPSY would be located in the marine environment beyond depths in which eelgrass and other marine vegetation typically grow, and the structure would be sited to avoid impacts from underwater utility cables on nearshore marine vegetation, shoreline riparian vegetation, and fish and wildlife resources and habitats. The FLUPSY would be sited to minimize impacts on ESA-listed fish species and their habitats during operation, and the short-term construction impact on listed species would likely be “may affect, not likely to adversely affect” because adults of these species could be present during the in-water work window. All applicable stormwater control measures would be in effect during construction, and a Spill Prevention, Control and Countermeasure Plan for fuels and lubricants would be maintained and followed during facility operation. With these controls in place, no appreciable adverse effect on water quality would be expected during construction and operation of the FLUPSY. Power tools used to build the facility would be audible nearby during construction; during operation, pumps used to produce upwellings, and occasional boat traffic to and from the facility, would not appreciably raise ambient noise levels above existing conditions. Vehicle and boat engine emissions would occur during construction, but no new stationary emission source would be involved, and no long-term air quality impacts would be anticipated to result from operation of the facility.

9.2.3. Kilisut Harbor Restoration Project

As mitigation for LWI, the Navy would fund a portion of the Kilisut Harbor Restoration Project. Kilisut Harbor is located at the southern tips of Indian and Marrowstone Islands in northern Puget Sound. As described by the project website (North Olympic Salmon Coalition 2016), the harbor was once connected to Oak Bay through two tidal channels. A causeway and two bridges were constructed across the channels and intertidal area in the early 1900s to support Washington State Route 116. Since that time the former tidal channels have become closed by sediment deposition due to reduced tidal exchange, and in recent decades saltwater flow from Oak Bay to the marsh system has been limited to waves overtopping the beach during storm events. In the early 1970s extensive fish kills were reported in Kilisut Harbor due to low dissolved oxygen levels caused by the reduced tidal flushing. The proposed project would partially restore former conditions by reopening the tidal channels and replacing the existing undersized culverts with a bridge spanning the channels.

The Kilisut Harbor Restoration Project, known also as the Kilisut Harbor/Oak Bay Reconnection Project, is one of 36 candidate restoration projects under consideration by the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP), a partnership organization of federal state, local, and tribal governments along with academic institutions, nongovernmental organizations, and private sector representatives led by USACE and the Washington Department of Fish and Wildlife (PSNERP 2012).

The Kilisut Harbor Restoration Project was not among the 11 projects selected for analysis in the *Puget Sound Nearshore Ecosystem Restoration Study Draft Integrated Feasibility Report and Environmental Impact Statement* (Puget Sound Ecosystem Restoration DEIS) (USACE 2014).

However, planning for the project continues under the sponsorship of the North Olympic Salmon Coalition and cooperating organizations within the Regional Fisheries Enhancement Group Program. The project goal is to “Re-create the historic and self-maintaining tidal channel connection between southern Kilisut Harbor and Oak Bay to restore ecosystem processes to a regionally significant water body and shoreline” (North Olympic Salmon Coalition 2016). To accomplish this, the project would replace 450 linear feet of road fill and existing twin 5-foot-diameter culverts on State Route 116 with a bridge spanning excavated tidal channels that would reconnect the salt marsh and southern Kilisut Harbor to Oak Bay, thereby increasing flushing, improving water quality, and restoring connectivity during high tide periods (PSNERP 2012).

Environmental impacts of the Kilisut Harbor Restoration Project would be comparable to most of those described for the restoration projects analyzed in the Puget Sound Ecosystem Restoration DEIS and are incorporated here by reference (USACE 2014, Sections 5.1-5.5, p. 159-204 and summarized in Table 5-10, p. 199-204. The projects evaluated in the Puget Sound Ecosystem Restoration DEIS are approximately similar in scale, scope, and regional setting to the Kilisut Harbor Restoration Project and were analyzed collectively in the DEIS. Adverse effects of the restoration projects were documented to be associated primarily with short-term construction activities, including but not limited to:

- Localized and temporary impacts to nearshore currents due to location of temporary work structures;
- Risk of fuel spill and encountering undocumented sources of contaminants;
- Short-term release of sediment from excavation and blockage removal;
- Greenhouse gas emissions from construction equipment;
- Potential for noise-producing activities that could cause behavior disruption or harm to aquatic species;
- Potential for harm to birds or marine mammals, or loss of a few fish in close proximity to pile driving;
- Temporary turbidity disturbance to vegetation and wetlands;
- Minor loss of freshwater marsh plants from restoring tidal inundation;
- Disturbance to benthic and epibenthic communities from dredging and related temporary increases in turbidity;
- Turbidity from excavation and dredging, and noise and vibration from pile driving, could cause fish and wildlife to flee, delay migration, or cause physical harm;
- Wildlife disturbance from noise from pile driving and operation of heavy equipment;
- Pile driving noise may disturb marine mammals in locating prey, or cause flee response or temporary hearing loss;
- Potential to affect or encounter known or unknown archaeological resources during construction, and long-term risk of damage to or loss of artifacts from erosion or inundation;
- Access and recreational opportunities temporarily limited or closed during construction; and
- Temporary lane closures on State Route 116 during construction.

Mitigation measures for construction of the Kilisut Harbor Restoration Project would be similar to those described in the Puget Sound Ecosystem Restoration DEIS and are incorporated here by reference (USACE 2014, Section 5.7, p. 217-220). In summary, the mitigation measures proposed to alleviate impacts of the ecosystem restoration projects include:

- Standard practices to mitigate negative effects of construction;
- Best management practices to protect water quality;
- Measures to limit greenhouse gas emissions;
- Mitigation measures for underwater noise effects; and
- Best management practices and mitigation measures for cultural resources.

9.2.4. Culvert Replacement at Little Boston Road over Shipbuilders Creek

As mitigation for SPE, the Navy would provide funding to support the replacement of a culvert at Shipbuilders Creek on the Port Gamble S'Klallam Tribe Reservation. The present culvert is undersized, perched, and is a barrier to fish passage. To restore fish migration, the project would install a properly-sized culvert, designed per Washington State Department of Fish and Wildlife stream simulation modeling criteria. The adjacent riparian corridor disturbed by the construction would be restored with native vegetation and appropriate streambed substrate.

The replacement culvert at the Little Boston Road crossing of Shipbuilders Creek would be properly designed, sized, aligned, and sloped for optimal fish passage and appropriate hydraulic parameters in compliance with the Hydraulic Project Approval (Washington Department of Fish and Wildlife 2013; Washington State Department of Transportation 2016). Adverse environmental effects would be confined to the construction and immediate post-construction periods and could include, but would not be limited to, the following types of impacts, which would be mitigated through standard Best Management Practices in compliance with applicable permits and approvals:

- Temporary roadway or lane closures
- Removal of existing paving, exposing soil to runoff;
- Removal of existing vegetation, including bank-stabilizing roots;
- Construction stormwater runoff;
- Bank erosion and downstream sedimentation;
- Siltation-related effects on downstream fish and wildlife;
- Inadvertent exposure of, or damage to, archaeological artifacts;
- Potential contaminant release from accidental spills or leaks;
- Construction noise;
- Greenhouse gas emissions from equipment and vehicle exhaust; and
- Fugitive dust emissions.

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ATTACHMENT A-1

MARINE MAMMAL OBSERVATION RECORD FORM (Sample)

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Project Name: _____

Monitoring Location _____
(Pier Location, Vessel based, Land Location, other)

Page _____ of _____

Date: _____

Vessel Name: _____

Time Effort Initiated: _____

Time Effort Completed: _____

Sighting Data

Event Code	Sighting Number (1 or 1.1 if resight)	Time/Duration watching sighting (Start/End time if continuous)	WP # (every time a sighting is made)	Observer	Sighting cue	Species	Dist/ Dir to Animal (from Observer)	Dist to Pile (btwn animal & pile)	# of Animals Group Size (min/max/best) # of Calves	Relative Motion/and Behavior Code (see code sheet)	Const Type During Sighting	Mitigation used during sighting?	Mitigation Type?	Visibility	% Glare	Weath Cond	Sea State and Wave Ht	Swell Dir	Behavior Change/ Response to Activity/Comments
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	
		: : : :					m or km °	m or km	/ / ___ calves	opening closing parallel none Behavior Code: _____	PRE POST SSV SSI V I PC DP ST NONE	Y N	DE SD	B P M G E			Light Mod Heavy	N or S W or E	

Sighting#=chronological number of sightings, if resight of same animal, then 1.1, 1.2, etc. WP (Waypoint)=GPS recording of lat/long, time/date stamp. Critical for vessel observers.

Sighting Form last revised October 10, 2012. POC-DoN, NAVFAC NW, Balla-Holden

Sighting Codes (Sighting Cue & Behavior 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
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

Sighting Form last revised October 10, 2012. POC-DoN, NAVFAC NW, Balla-Holden

Marine Mammal Species

Code	Marine Mammal Species
CASL	California Sea Lion
HSEA	Harbor Seal
STSL	Steller Sea Lion
HPOR	Harbor Porpoise
DPOR	Dall's Porpoise
ORCA	Killer Whale
HUMP	Humpback Whale
UNLW	Unknown Large Whale
OTHR	Other
UNKW	Unknown

Construction Type

Code	Activity Type
SSV	Soft Start (Vibratory)
SSI	Soft Start (Impact)
V	Vibratory Pile Driving (installation and extraction)
I	Impact Pile Driving
PC	Pneumatic Chipping
DP	Dead pull
ST	Stabbing
NONE	No Pile Driving
OTH	Other

Event

Code	Activity Type
E ON	Effort On
E OFF	Effort Off
PRE	Pre Watch
POST	Post Watch
SSV	Soft start-vibratory
SSI	Soft start-impact
WC	Weather Condition/Change
S	Sighting
M-DE	Mitigation Delay
M-SD	Mitigation Shutdown

Mitigation Codes

Code	Activity Type
DE	Delay onset of Pile Driving
SD	Shut down Pile Driving

Sighting Form last revised October 10, 2012. POC-DoN, NAVFAC NW, Balla-Holden

Visibility

Code	Distance Visible
B	Bad (<0.5km)
P	Poor (0.5 – 1.5km)
M	Moderate (1.5 – 10km)
G	Good (10 - 15km)
E	Excellent (>15km)

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.

Weather Conditions

Code	Weather Condition
S	Sunny
PC	Partly Cloudy
L	Light Rain
R	Steady Rain
F	Fog
OC	Overcast

Sea State and Wave Height

Use Beaufort Sea State Scale for Sea State Code. This refers to the surface layer and whether it is glassy in appearance or full of white caps. In the open ocean, it also takes into account 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.

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

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.

Sighting Form last revised October 10, 2012. POC-DoN, NAVFAC NW, Balla-Holden

ATTACHMENT A-2

SEABIRD MONITORING DATA COLLECTION FORM (Sample)

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Seabird Monitoring Data Collection Form
 Project Name _____ Date _____
 Monitoring Site/Transect ID _____
 Observers _____
 Activity _____ Time and Duration _____

Time	Species	# of birds	Wind speed (Beaufort Marine Scale)	Land Observer	Boat Observer		Observed Behavior*	Comments
				Grid Location	Distance	Land/Sea Ward		

*R=resting, F=feeding/diving, P=preening, Y=flushing, T=transiting, N=nesting, O=other


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ATTACHMENT A-3

SEABIRD MONITORING SITE/TRANSECTS IDENTIFICATION FORM (Sample)

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Seabird Monitoring Site/Transect Identification Form (Sample)

<p>Seabird Monitoring Site/Transect Identification Form</p> <p>Project Name <u>Dolphin repair</u></p> <p>Monitoring Dates <u>November 8, 9, 10, 2012</u></p> <p>Number of Monitoring Sites/Transects <u>4</u></p> <p>Insert aerial photo of entire monitoring project area. Identify each monitoring site/station reflecting 50 meter zones for each observer. For example, if there are two observers on a boat transect, the box will be 100 meters wide. Some monitoring stations will overlap and should be indicated here.</p>	
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ATTACHMENT B
BEAUFORT WIND SCALE

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**Table 1 – Beaufort Wind Scale develop in 1805 by Sir Francis Beaufort of England
(0 = calm to 12 = hurricane)**

Force	Wind (knots)	Classification	Appearance of wind effects on the water	Appearance of wind effects on land	Notes specific to on-water seabird observations
0	<1	Calm	Sea surface smooth and mirror like	Calm, smoke rises vertically	Excellent conditions, no wind, small or very smooth swell. You have the impression you could see anything.
1	1-3	Light air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes	Very good conditions, surface could be glassy (Beaufort 0), but with some lumpy swell or reflection from forests, glare, etc.
2	4-6	Light breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move	Good conditions, no whitecaps, texture/lighting contrast of water make murrelets hard to see. Surface could also be glassy or have small ripples, but with a short, lumpy swell, thick fog, etc.
3	7-10	Gentle breeze	Large wavelets, crests beginning to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended	Surveys cease, scattered whitecaps present, detection of murrelets definitely compromised, a hit-or-miss chance of seeing them owing to water choppiness and high contrast. This could also occur at lesser wind with a very short wavelength, choppy swell.
4	11-16	Moderate breeze	Small waves 0.3 to 1.1m becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move	
5	17-21	Fresh breeze	Moderate waves 1.1 to 2.0 m taking longer form, many whitecaps, some spray	Small trees begin to sway	

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ATTACHMENT C
CHAIN OF CUSTODY RECORD FORM

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Chain of Custody Record				
Date and Time of Collection:	Duty Station:	Collection By:		
Source of Specimen (Person and/or Location) Found At:		Project Name:		
Item No:	Description of Specimen (include Species and Tag Number):			
Item No:	From: (Print Name, Agency)	Release Signature:	Release Date:	Delivered via: FEDEX U.S. Mail In Person Other:
	To: (Print Name, Agency)	Receipt Signature:	Receipt Date:	
	To: (Print Name, Agency)	Receipt Signature:	Receipt Date:	
Item No:	From: (Print Name, Agency)	Release Signature:	Release Date:	Delivered via: FEDEX U.S. Mail In Person Other:
	To: (Print Name, Agency)	Receipt Signature:	Receipt Date:	

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