PORT of ANCHORAGE

2000 Anchorage Port Road
Anchorage, Alaska 99501
907-343-6200
PortOfAnchorage@Muni.org
**PortOfAnc.com**

March 6, 2017

Ms. Amanda Whittier
U.S. Army Corps of Engineers
Regulatory Division
CEPOA-RD-S
Post Office Box 6898
JBER, Alaska 99506-0898

RE: Anchorage Port Modernization Program
Petroleum and Cement Terminal Project
Application for Department of the Army Permit

Dear Ms. Whittier:

The Port of Anchorage (Port) is submitting the attached application for a Department of the Army (DA) permit requesting authorization under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act to discharge fill material into Knik Arm for construction of the Petroleum and Cement Terminal (PCT) Project, in support of its Anchorage Port Modernization Program (APMP).

The PCT will replace the existing Petroleum, Oil, and Lubricant (POL 1) terminal with a new structure designed and constructed to exceed current seismic standards at a new location. POL 1 is the only bulk cement-handling facility in Alaska and is the primary terminal for receipt of refined petroleum products. The construction of PCT is necessary because POL 1 is structurally deficient and in need of replacement. The PCT will replace the functions of POL 1 and be designed and constructed to withstand a major seismic event and rapidly return to service in the event of trestle damage.

The Port requests the DA authorization allow for construction of the PCT to occur within a 10-year period. As the project is dependent upon public funding and may be subject to unforeseeable funding and construction constraints, the additional construction time will allow for possible schedule changes without needing to request permit modifications.

The Port is also requesting the DA permit authorize, in perpetuity, the installation and removal of a temporary bridge and associated pipelines on the emergency trestle piles. This will avoid the need to apply for and obtain permit modifications when the structures could be placed and removed to test the system or in response to an emergency when access to and use of the PCT in the most expedited manner possible is of utmost importance. The Port believes it is in the public's interest for the DA to authorize this approach so that emergency response and rebuilding efforts are not impeded.

DA approval for the PCT is being sought separate from the other APMP projects due to its independent utility. A full description of the project and associated figures are included with this application. In addition, technical reports are attached addressing Section 106 of the National Historic Preservation Act, the Endangered Species Act, and Essential Fish Habitat (under the Magnuson-Stevens Fishery Conservation and Management Act). These technical reports examine the effects of the PCT on their respective resources to support USACE's effect determinations for each. The Port is available to serve as USACE's non-federal representative for any consultations you may undertake pursuant to these laws.

as USACE's non-federal representative for any consultations you may undertake pursuant to these laws.

In this regard, attached please find:

- A completed application for a DA permit
- Appendix A: PCT Project Description
- Appendix B: Avoidance, Minimization, and Compensation Statement
- Appendix C: Design Drawings
- Appendix D: Section 106 Technical Report
- Appendix E: Endangered Species Act Technical Report
- Appendix F: Essential Fish Habitat Technical Report
- A Draft Public Notice for your review and use

We will also be providing a copy of this application package to the Alaska Department of Environmental Conservation Division's Water 401 Certification Program for their information and use.

Additionally, we are requesting to modify DA permit number POA-2003-502, Knik Arm, issued on March 9, 2016, which authorized our Test Pile Program. To facilitate construction of the PCT, we request authorization to remove test piles 8, 9, and 10 to a depth of -55 feet mean lower low water. Removal will be performed by cutting the piles from the inside and then lifting the cut portion of each pile out of the substrate.

We look forward to working with you and responding to any questions or feedback you may have on this permit application. Should you have any questions, need further information, or care to discuss this application, please contact Todd Cowles, Port Engineer, at 907-343-6209 or our designated agent, Dave Casey, at 907-644-2191.

Sincerely,

Stephen Ribuffo
Director
Port of Anchorage

Attachments:
USACE Application for Department of the Army Permit, with Appendices A through F
Draft Public Notice

Cc: Todd Cowles, P.E., Port Engineer, APMP PM
Jeff Bool, P.E., APMP PMC PM
Dave Casey, APMP Permitting Lead

U.S. ARMY CORPS OF ENGINEERS
**APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**
33 CFR 325. The proponent agency is CECW-CO-R.

***Form Approved - OMB No. 0710-0003 Expires: 31-AUGUST-2013***

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

**(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)**

| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED | 4. DATE APPLICATION COMPLETE |
|---|---|---|---|
| | | | |

***(ITEMS BELOW TO BE FILLED BY APPLICANT)***

| 5. APPLICANT'S NAME | 8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) |
|---|---|
| First - Steve Middle - Last - Ribuffo | First - Dave Middle - Last - Casey |
| Company - Municipality of Anchorage, Port of Anchorage | Company - HDR, Inc. |
| E-mail Address - ribuffos@muni.org | E-mail Address - dave.casey@hdrinc.com |
| 6. APPLICANT'S ADDRESS: | 9. AGENT'S ADDRESS: |
| Address- | Address- 2525 C Street, Suite 500 |
| City - Anchorage State - AK Zip - 9950 Country - USA | City - Anchorage State - AK Zip - 9950 Country - USA |
| 7. APPLICANT'S PHONE NOs. w/AREA CODE | 10. AGENTS PHONE NOs. w/AREA CODE |
| a. Residence b. Business 907-762-1340 c. Fax | a. Residence b. Business 907-644-2191 c. Fax 907-644-2022 |

**STATEMENT OF AUTHORIZATION**

11. I hereby authorize, Dave Casey to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Stephen Ribuffo 3/6/17
SIGNATURE OF APPLICANT DATE

**NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY**

12. PROJECT NAME OR TITLE (see instructions)

Anchorage Port Modernization Program - Petroleum and Cement Terminal

| 13. NAME OF WATERBODY, IF KNOWN (if applicable) | 14. PROJECT STREET ADDRESS (if applicable) |
|---|---|
| Knik Arm | Address 2000 Anchorage Port Rd |
| 15. LOCATION OF PROJECT Latitude: °N 61.233499 Longitude: °W 149.985068 | City - Anchorage State- AK Zip- 99501 |

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality Municipality of Anchorage

Section - 7 Township - 13 N Range - 3 W; Seward Meridian

17. DIRECTIONS TO THE SITE

From 5th Avenue and A Street, head north on A Street. Take the exit towards the Port and continue onto West Loop Rd. West Loop Rd. turns slightly right and becomes Ocean Dock Rd. (partial restricted usage road). Make slight right onto Anchorage Port Rd. (restricted use road). Destination will be on the left in 0.3 miles.

18. Nature of Activity (Description of project, include all features)

Please see attached Project Description.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the PCT is to replace the existing POL 1 with a new structure that exceeds current seismic standards. A newly constructed and operational PCT would be designed to withstand a major seismic event and rapidly return to service.

**USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED**

20. Reason(s) for Discharge

Discharge due to PCT construction will be in the form of pile placement and material displaced from auguring out the steel piles. The piles provide the structural foundation for the PCT. Auguring out the substrate within the piles is necessary in order to fill them with concrete which will extend the lifespan of the PCT, preventing the need to reconstruct the structure in the near future. A total of 247 piles (203 permanent and 44 temporary) will be driven for the PCT.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

| Type<br>Amount in Cubic Yards | Type<br>Amount in Cubic Yards | Type<br>Amount in Cubic Yards |
|---|---|---|
| Augured substrate: Approx. 1,500 cy | | |

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres Approx. 0.06 acres

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See attached Avoidance, Minimization, and Compensation Statement (Appendix B).

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

a. Address- Alaska Railroad, Pouch 7-2111

City - Anchorage State - AK Zip - 99501

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

| AGENCY | TYPE APPROVAL* | IDENTIFICATION NUMBER | DATE APPLIED | DATE APPROVED | DATE DENIED |
|---|---|---|---|---|---|
| NMFS | IHA | | | | |
| MOA | Flood Hazard Permit | | | | |
| USACE Civil Works | Section 408 Auth. | | 2016-12-15 | | |
| | | | | | |

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

| SIGNATURE OF APPLICANT | DATE | SIGNATURE OF AGENT | DATE |
|---|---|---|---|
| | | [signature] | 2 March 2017 |

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

# Appendix A

Project Description

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# PCT Project Description

## Project Purpose and Need

The Petroleum and Cement Terminal (PCT) is part of the first phase of a suite of construction projects proposed as part of the Anchorage Port Modernization Program (APMP), which is intended to address the deteriorating conditions of the Port of Anchorage's (Port's) marine facilities and enable safe, reliable, and cost-effective port operations. The Port has identified the PCT as a priority for the APMP, due to the need to have a reliable terminal for moving goods into Alaska.

The PCT project is a new construction project intended to replace the existing petroleum oil and lubricants terminal (POL 1). The purpose of PCT is to replace the existing POL 1 with a new structure designed and constructed to exceed current seismic standards. With all Port facilities in critical condition and limited secured funding, there is a significant need to construct the PCT with minimal delays, rather than waiting for funding or permitting of additional APMP components. The existing POL 1 is the only bulk cement-handling facility in Alaska and is the primary terminal for the receipt of refined petroleum products. The PCT will be designed to withstand a major seismic event and rapidly return to service in the event of trestle damage, providing Anchorage and other areas of Alaska with refined fuels and bulk cement, both of which are necessary for reconstruction activities. Construction of the PCT will include installation of the following project components:

- 175 48-inch-diameter steel, concrete reinforced piles
- 28 36-inch-diameter steel fender piles
- PCT main trestle and platform with associated utility and product lines
- Six (6) mooring dolphins each consisting of 8 battered piles
- Five (5) breasting dolphins each consisting of 8 battered piles
- Above-water access catwalks to connect the dolphins and the platform
- 44 temporary H-piles to facilitate installation of battered dolphin piles
- Emergency trestle, bridge and temporary utility lines (water, electric, communication, and product)

## PCT Features

The PCT will be a pile-supported platform and trestle structure located above and below the high tide line and mean high water mark (34.4 feet and 28.3 feet, respectively from 0.00 feet mean lower low water (MLLW)) of Knik Arm sited at the southernmost shoreline of the Port, and will include both breasting and mooring dolphins to receive and secure ships while in port. The platform will have a finished elevation of +40 feet MLLW. It will be designed for a 75-year lifespan, minimizing the need for future maintenance and replacement projects. The platform structure will be designed to meet or exceed seismic stability standards for resiliency in the event of a large earthquake. The platform structure will be accessed by the main trestle, which will attach to shore at an elevation of +35 feet

MLLW. The platform and main trestle will be supported by 72, 48-inch diameter piles ranging in length between approximately 130 feet and 150 feet. Additionally, a second set of piles will be constructed immediately south of the main trestle to support the installation of an emergency trestle. If the main trestle is damaged in an earthquake or other event, the emergency trestle will be placed on these 15, 48-inch diameter piles, allowing for access to and use of the PCT platform until the main trestle can be repaired.

Another innovation incorporated into the PCT design is the use of concrete and steel composite piles to support the main trestle and platform structure. Installation of these hybrid piles will consist of driving a hollow, 48-inch-diameter steel pile and subsequently filling it with reinforced concrete to a level below the mudline. Above the mudline, the steel pile will be cut off at an elevation between +23 feet MLLW and +33 feet MLLW, which will allow the composite pile to absorb forces that would be impeded by the presence of the steel sheath. The steel pile will be structurally sacrificial, and the full strength of the pile will be provided by the reinforced concrete core. Each composite pile will be topped with a reinforced concrete cap, on which the main trestle or platform will sit. A design detail showing a cross-section of the hybrid pile is provided in Figure 5 of Appendix C.

Five breasting dolphins will be constructed parallel to the PCT platform face (three dolphins north of the main platform, and two to the south) and at an elevation of +40’ MLLW, as shown in Figure 7, Appendix C. Each of these dolphins will be supported by eight 261-foot long, 48-inch-diameter battered hollow steel piles driven to a depth of approximately –225 feet MLLW. Additionally, 28 fender piles approximately 70-feet long and 36-inch diameter, will be installed on the docking faces of the breasting dolphins, driven to an approximate depth of -65 feet MLLW.

Six mooring dolphins will be constructed parallel to and landward of the platform face and breasting dolphins and at an elevation of +40’ MLLW, as shown in Figure 3, Appendix C. These will provide additional secure mooring points for ships docking at the PCT. Each mooring dolphin will be supported by eight 206-foot long, 48-inch-diameter battered hollow steel piles driven to a depth of approximately -170 feet MLLW (shown in Figure 6, Appendix C).

The breasting and mooring dolphins will be connected to each other and the PCT platform by a series of open-steel grate catwalks, also shown in Figure 3, Appendix C. These catwalks will be approximately 3 feet wide and supported by high strength steel beams (no additional piles will be installed between dolphins). The bottom elevation of the catwalk’s structure will be +40 feet MLLW. A total of 910 feet of catwalk will connect the dolphins to the platform.

The PCT will also include construction of a set of secondary piles located parallel to and immediately south of the main trestle, which will allow for a temporary emergency trestle to be installed if the main trestle is damaged in a major earthquake. Much of the PCT’s earthquake resiliency is provided by the ability of the above-mudline segments of the piles to flex and absorb shaking. Since the piles of the main trestle are in shallow water relative to those of the platform, more of their length is below the mudline, which limits their ability to flex and absorb the energy of a strong earthquake. To meet the need of providing an earthquake resilient port, the secondary piles and emergency trestle will provide redundant access to the PCT platform in the case of main trestle failure. Fifteen (15) round, 48-inch diameter steel pipe piles will be placed in sets of three for the emergency trestle, with a steel cap on top of each set. This will allow for the temporary emergency trestle, which will be stored on-site, to be quickly installed on the piles in an emergency. Temporary utility lines, including water, electric, communication and product pipelines, will be installed with the emergency trestle.

A total of 247 piles (203 permanent and 44 temporary) will be installed for the PCT. The number of piles for each component of the PCT is provided in **Table 1**. Note that these quantities are representative of the current conceptual design. Final design and construction will be performed by an as-yet unidentified design-build contractor, and while the general design elements presented here are expected to remain, pile numbers may change in the future. The POA will communicate any relevant design changes to USACE, and will apply for permit modifications if necessary.

Table 1. PCT Pile Specifications

| Pile Type | Quantity | Outside Diameter (inches) | Approximate Area of Impact (square feet) |
|---|---|---|---|
| Main Trestle/Platform Piles | 72 | 48 | 907 |
| Emergency Trestle Piles | 15 | 48 | 189 |
| Mooring Dolphin Piles | 48 | 48 | 605 |
| Breasting Dolphin Piles | 40 | 48 | 504 |
| Fender Piles | 28 | 36 | 199 |
| Temporary Piles | 44 | H-Piles (12” x 16”) | 704 |

## Utility Lines

Utility lines will extend from the PCT to connection points with existing landside infrastructure, as shown in Figure 9, Appendix C. These will include water, electric, and communication lines; as well as a petroleum pipeline and a cement-carrying pipeline. Of these, only the water line will involve trenching below mean high water (MHW; 28.3 feet MLLW), the extent of USACE jurisdiction. The water line will be approximately 1,100 feet long and will connect the PCT with an existing water line on Anchorage Port Road.

Installation of the water line will involve the excavation of approximately 2,200 cubic yards of material from below MHW. Excavated material will be sidecast and, to the extent possible, used as backfill after the placement of the utilities. After the placement of the water line, approximately 2,160 cubic yards of material will be placed as backfill below MHW. It will be the responsibility of the contractor to dispose any excess overburden material left over after backfilling the utility trenches at a site permitted by the

DA or at a site outside of the DA's authority. A detail of the water line trench is included in Figure 10, Appendix C.

## Construction Methods

Hollow steel piles will be installed using impact-driving methods, likely from an anchored barge. Vibratory pile installation methods will not be used for permanent pile installation, once the main trestle piles are driven into place, an auger will be used to remove substrate from inside the piles to a depth of approximately 15 to 30 feet below the mudline. The removed substrate material, totaling approximately 1,500 cubic yards, will be immediately discharged and allowed to fall around the pile and be distributed by currents. Once the substrate material is removed, the piles will be backfilled and capped with concrete.

## Temporary Piles

During construction of the PCT, temporary piles will be used to anchor the template that will guide the installation of battered piles at each of the 11 dolphin locations. It is anticipated that temporary piles will be 12" x 16" x 130' H-piles and will be installed 20 to 40 feet into the substrate. Four temporary piles will be needed per mooring and breasting dolphin, for a total of 44 temporary piles. Temporary piles will be installed and removed using vibratory methods.

## Anticipated Construction Schedule

Construction on the landside portion of the PCT is expected to begin in fall 2017, followed by marine construction of the PCT structures in 2018. Marine construction is anticipated to take approximately 12 months.

## Project-related Dredging

The PCT will extend approximately 75 feet into the current USACE Anchorage Harbor Project dredging limits, as shown in Appendix C, Figure 2. USACE Civil Works will perform excavation and grading work landward of the PCT in order to provide a stable transition zone between the upland edge and the Anchorage Harbor Project dredging area. The POA has submitted a request for authorization for this work under Section 408 of the Rivers and Harbors Act of 1899.

## PCT Figures

Appendix C provides concept-level drawings and details of PCT project components. Included in the drawings is the vicinity map showing the location of the PCT, overviews of the PCT components, and project component details.

# Appendix B

Avoidance, Minimization, and Compensation Statement

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# PCT Avoidance, Minimization, and Compensation Statement

The number of piles for the PCT was minimized to the quantity necessary to construct a seismically resilient PCT, while maximizing the life of the structure in order to reduce the need for future in-water work. The number of piles for the main trestle has also been reduced to shorten its length. The PCT design includes breasting and mooring dolphins instead of a solid-deck platform, again minimizing the number of required piles. The use of a 75 year design standard is also a method to minimize impacts to the aquatic environment in that reconstruct will be avoided for a substantial period of time. Additionally, catwalks will be constructed of prefabricated high-strength-steel segments, rendering additional piles unnecessary. Encapsulated bubble curtains will be used when seasonally appropriate and technically feasible to reduce auditory impact to marine mammals and the use of a vibratory hammer to install permanent piles has been removed from the project in order to minimize adverse effects on marine mammals (please see Appendix E, Endangered Species Act Technical Memorandum, for additional information regarding marine mammal impact minimization). Because the project does not result in the loss of waters of the United States, compensatory mitigation is not proposed.

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# **Appendix** C

Preliminary Design Drawings

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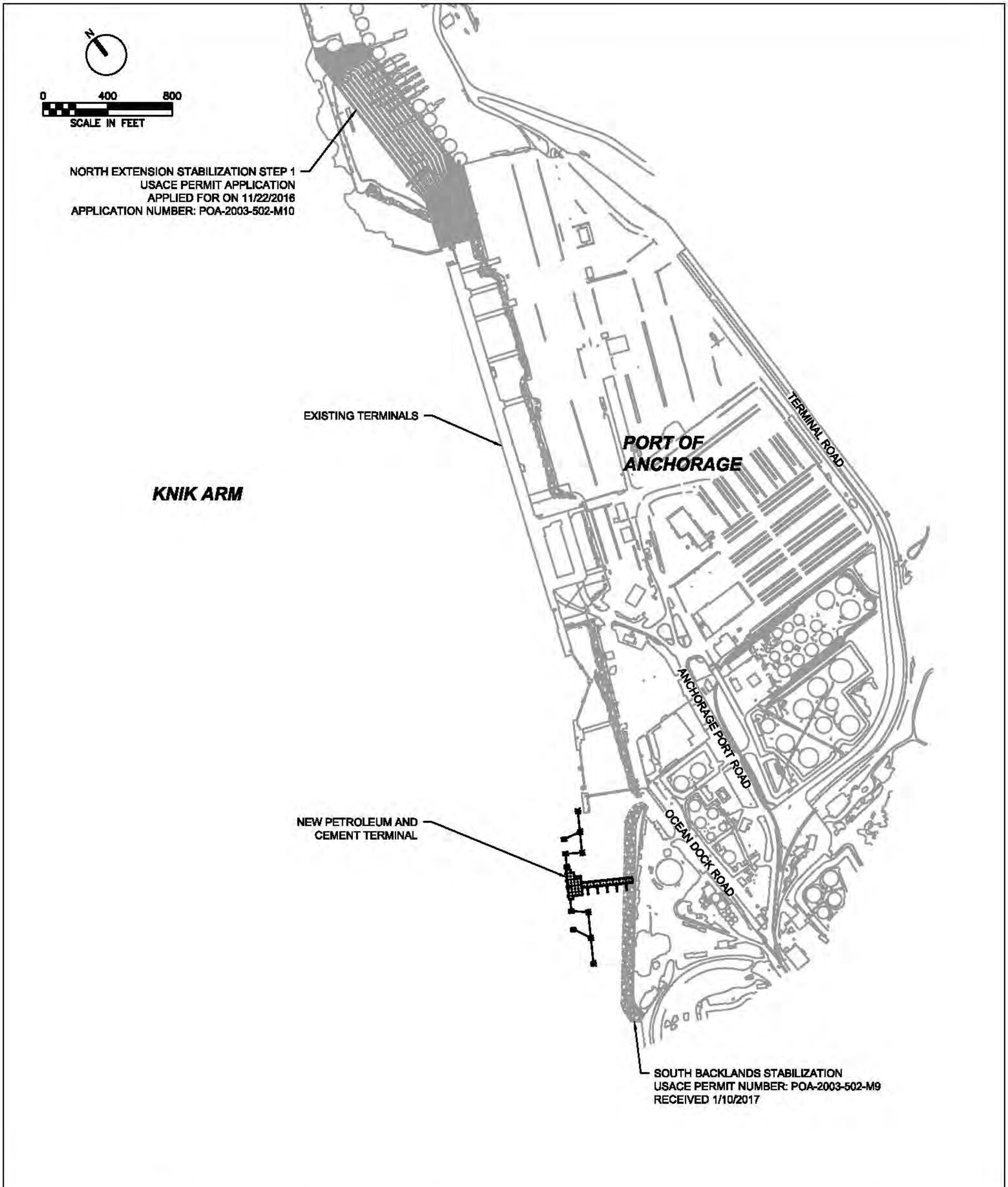
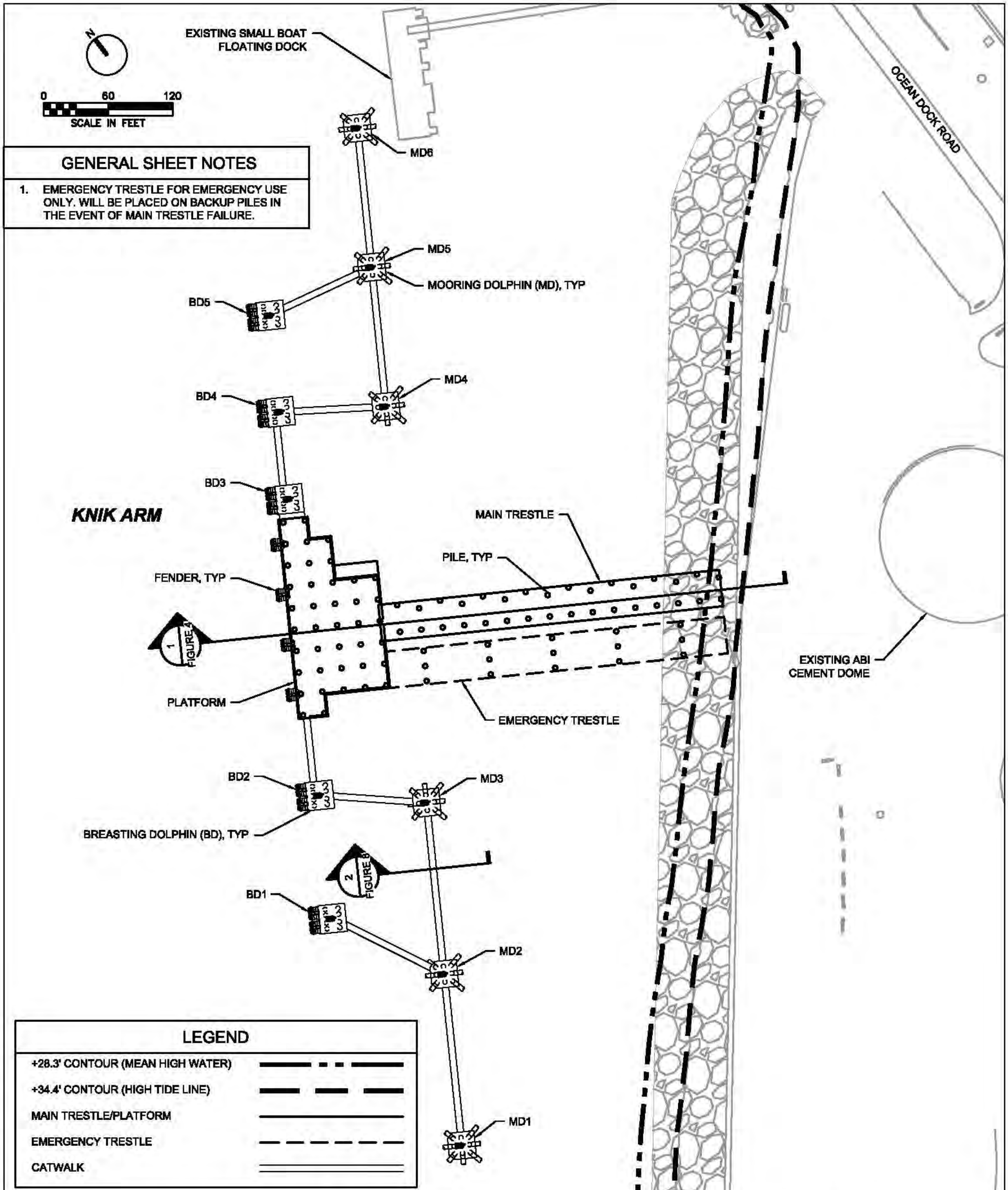



APPLICANT: Municipality of Anchorage,
Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N,
Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 2, Overall Site Plan

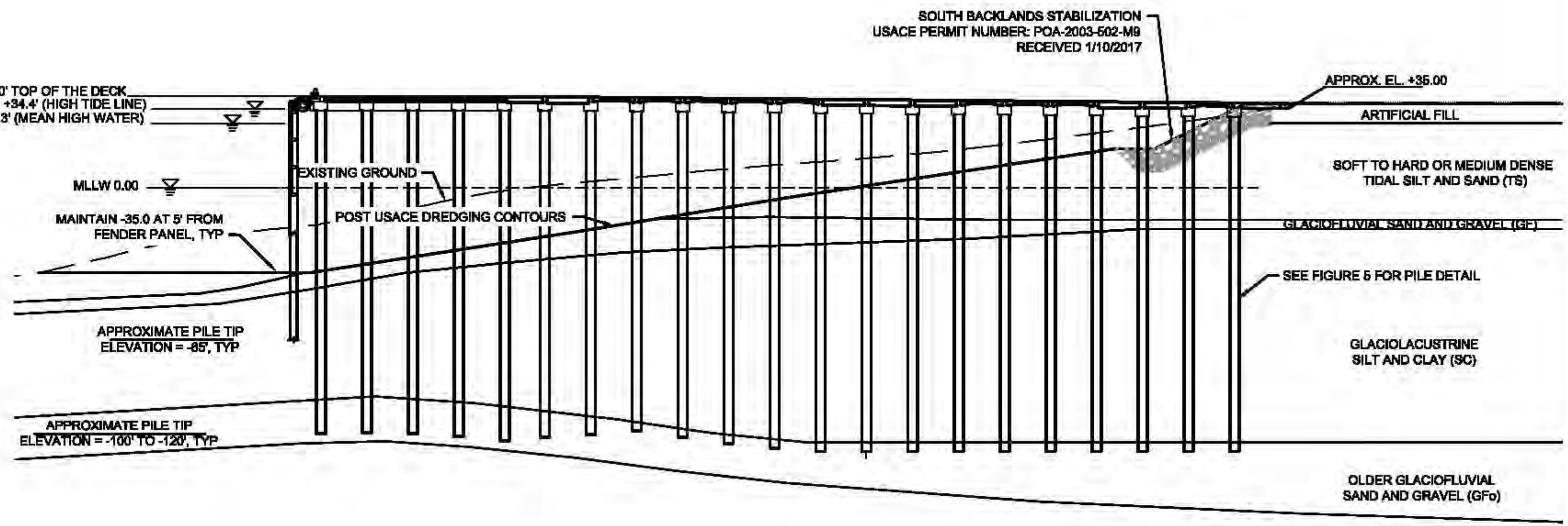



APPLICANT: Municipality of Anchorage, Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N, Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 3, New PCT Plan

APPLICANT: Municipality of Anchorage,
Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

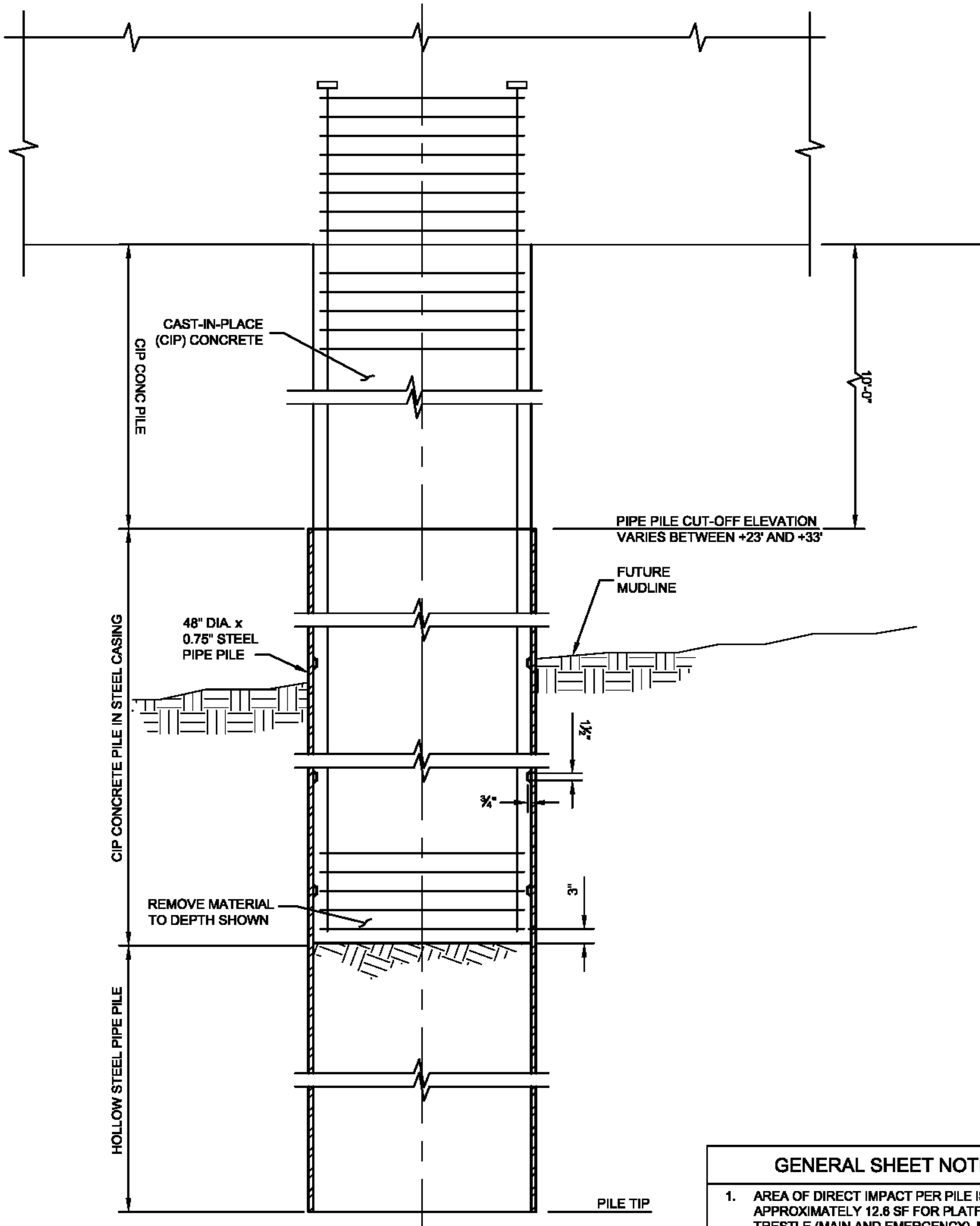
WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N,
Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 4, Typical Section




## 1 TYPICAL SECTION

1" = 80'-0"

FIGURE 3



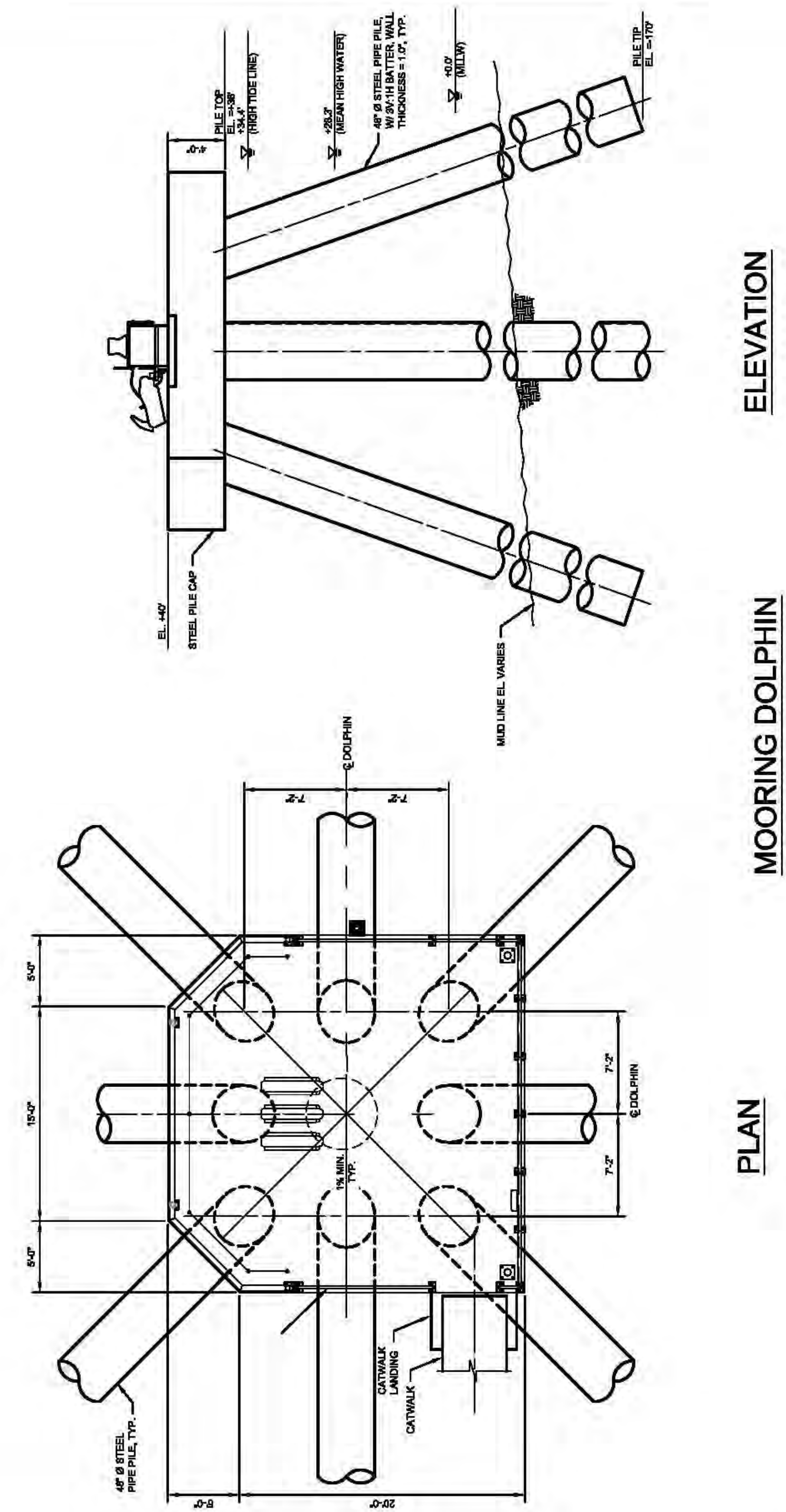

## COMPOSITE PILE ELEVATION

### GENERAL SHEET NOTES

1. AREA OF DIRECT IMPACT PER PILE IS APPROXIMATELY 12.6 SF FOR PLATFORM, TRESTLE (MAIN AND EMERGENCY), MOORING AND BREASTING PILES. AREA OF DIRECT IMPACT PER PILE IS APPROXIMATELY 7.1 SF FOR FENDER PILES. TOTAL AREA OF DIRECT IMPACT IS APPROXIMATELY 2,400 SF.

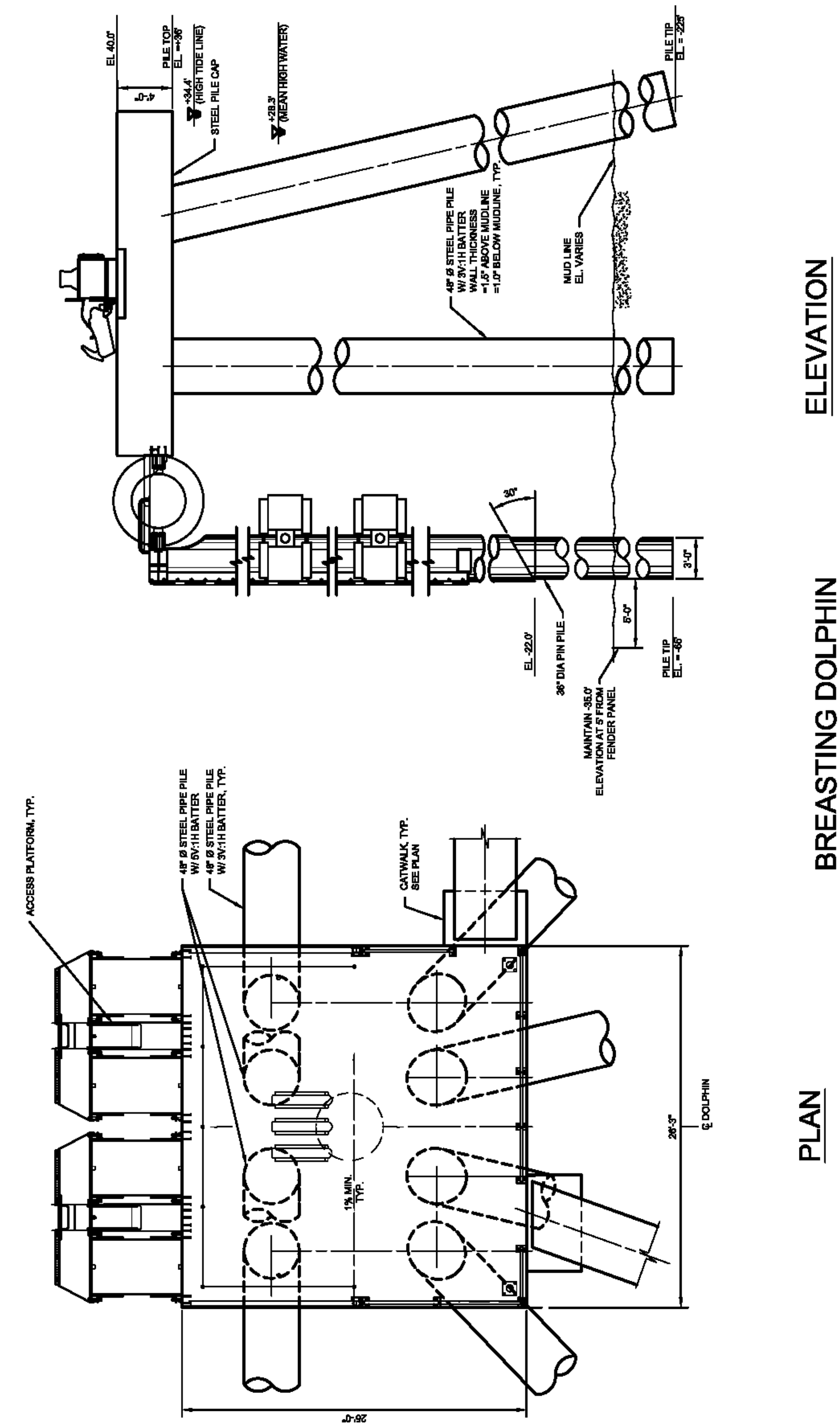
APPLICANT: Municipality of Anchorage, Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N, Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 5, Pile Detail



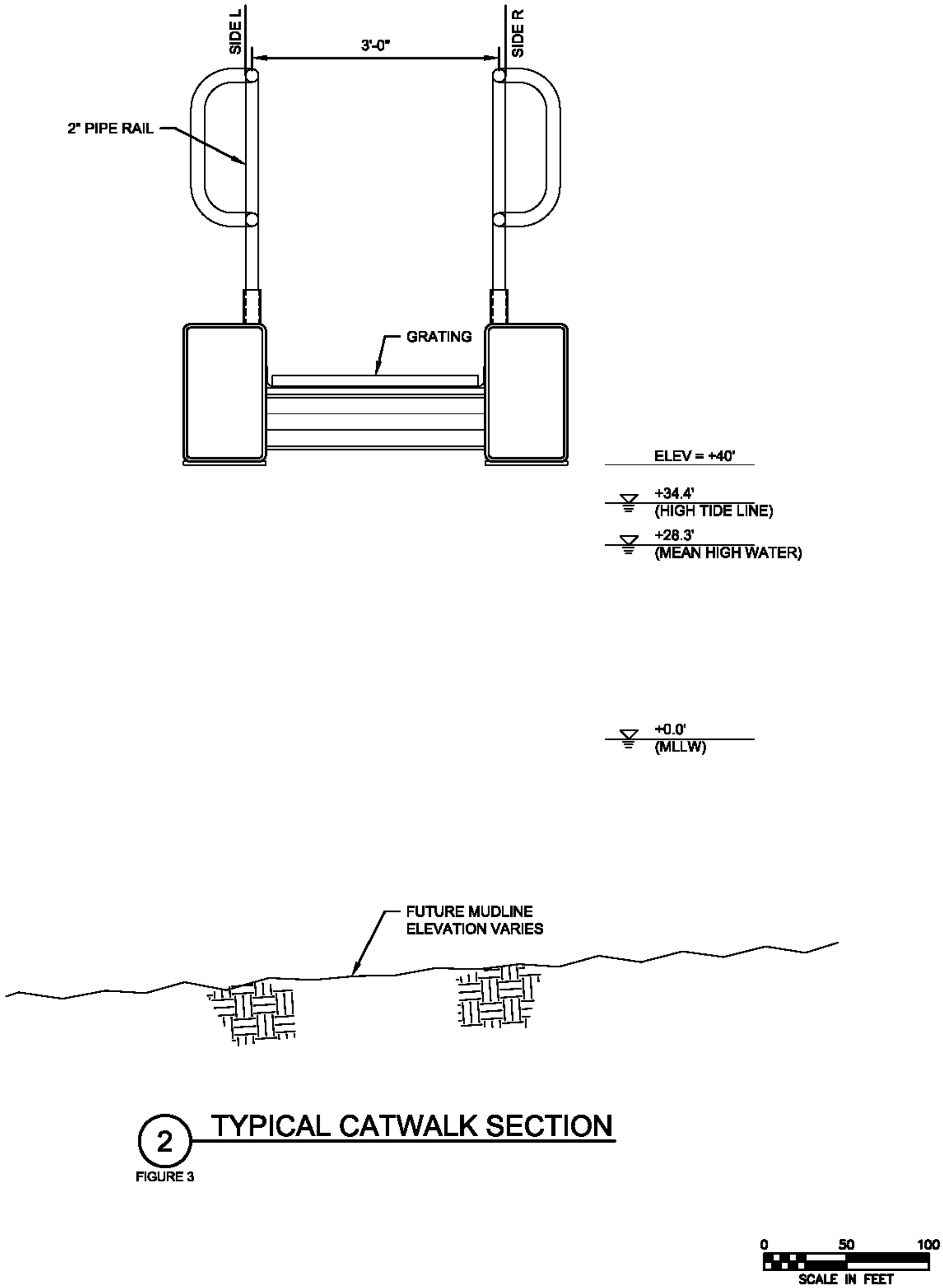

APPLICANT: Municipality of Anchorage, Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N, Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 6, Mooring Dolphin Details




APPLICANT: Municipality of Anchorage,
Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N,
Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 7, Breasting Dolphin Details




2 TYPICAL CATWALK SECTION

FIGURE 3

APPLICANT: Municipality of Anchorage,
Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

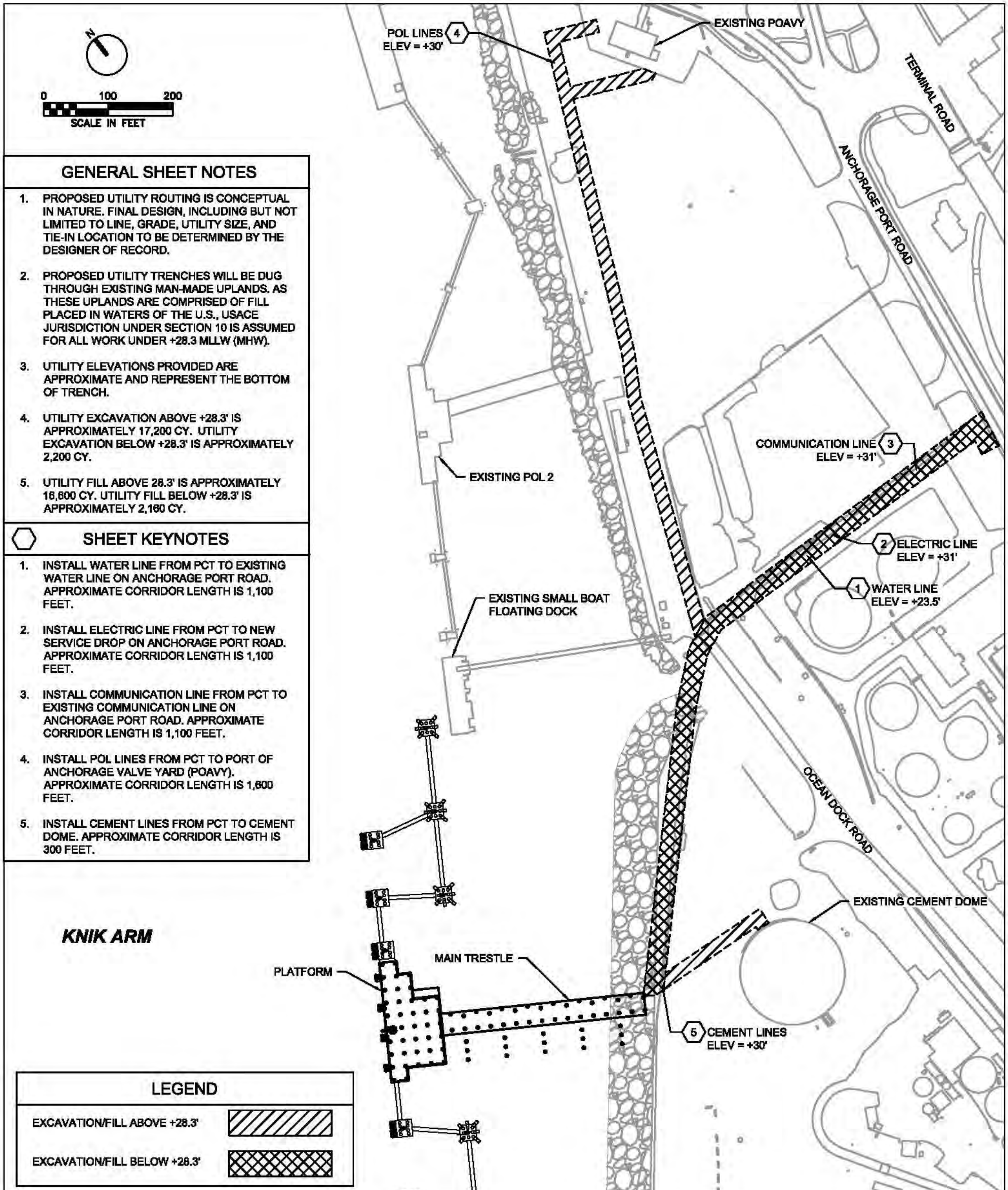
WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N,
Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 8, Catwalk Detail

## GENERAL SHEET NOTES

1. PROPOSED UTILITY ROUTING IS CONCEPTUAL IN NATURE. FINAL DESIGN, INCLUDING BUT NOT LIMITED TO LINE, GRADE, UTILITY SIZE, AND TIE-IN LOCATION TO BE DETERMINED BY THE DESIGNER OF RECORD.
2. PROPOSED UTILITY TRENCHES WILL BE DUG THROUGH EXISTING MAN-MADE UPLANDS. AS THESE UPLANDS ARE COMPRISED OF FILL PLACED IN WATERS OF THE U.S., USACE JURISDICTION UNDER SECTION 10 IS ASSUMED FOR ALL WORK UNDER +28.3 MLLW (MHW).
3. UTILITY ELEVATIONS PROVIDED ARE APPROXIMATE AND REPRESENT THE BOTTOM OF TRENCH.
4. UTILITY EXCAVATION ABOVE +28.3' IS APPROXIMATELY 17,200 CY. UTILITY EXCAVATION BELOW +28.3' IS APPROXIMATELY 2,200 CY.
5. UTILITY FILL ABOVE 28.3' IS APPROXIMATELY 16,600 CY. UTILITY FILL BELOW +28.3' IS APPROXIMATELY 2,160 CY.

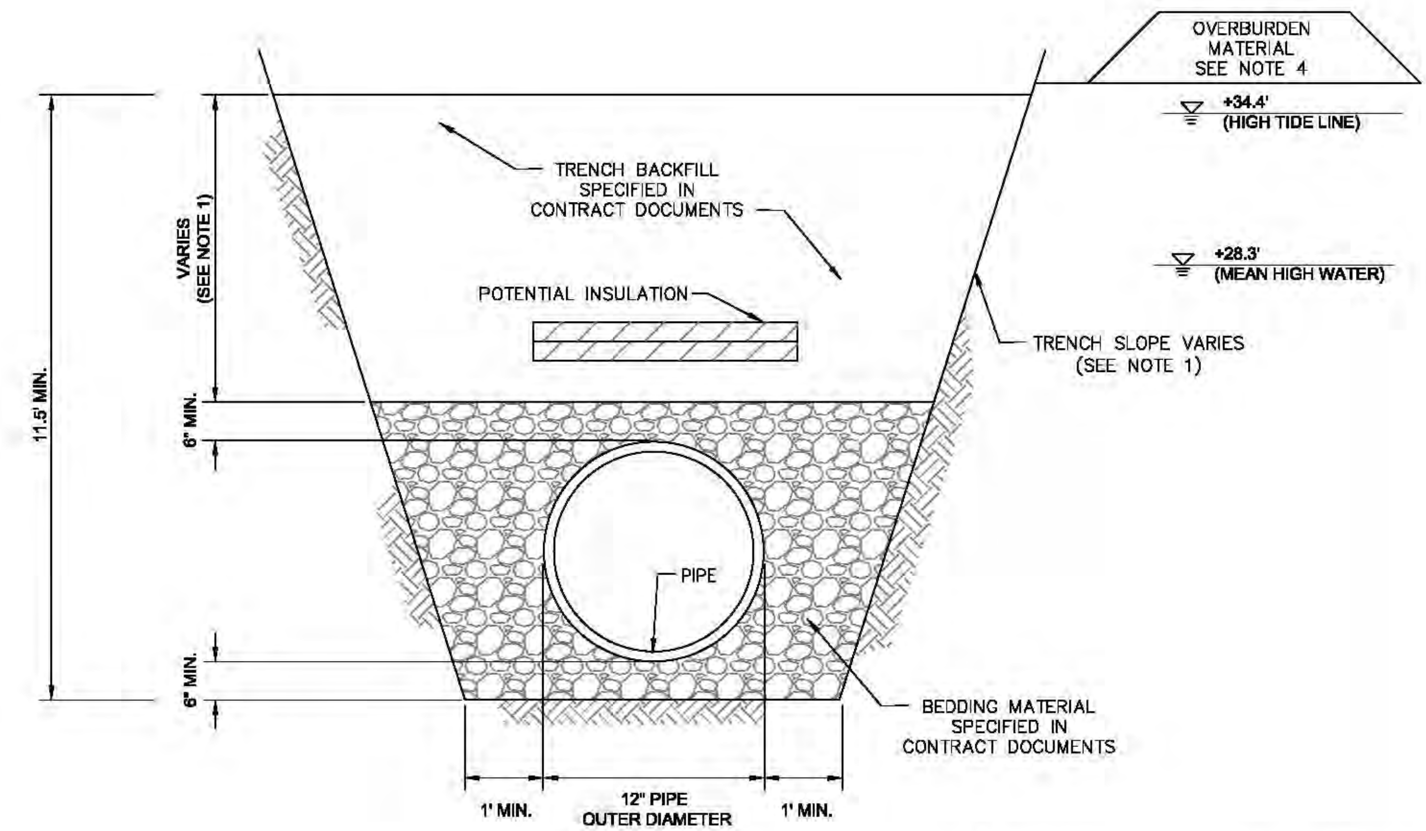
## SHEET KEYNOTES

1. INSTALL WATER LINE FROM PCT TO EXISTING WATER LINE ON ANCHORAGE PORT ROAD. APPROXIMATE CORRIDOR LENGTH IS 1,100 FEET.
2. INSTALL ELECTRIC LINE FROM PCT TO NEW SERVICE DROP ON ANCHORAGE PORT ROAD. APPROXIMATE CORRIDOR LENGTH IS 1,100 FEET.
3. INSTALL COMMUNICATION LINE FROM PCT TO EXISTING COMMUNICATION LINE ON ANCHORAGE PORT ROAD. APPROXIMATE CORRIDOR LENGTH IS 1,100 FEET.
4. INSTALL POL LINES FROM PCT TO PORT OF ANCHORAGE VALVE YARD (POAVY). APPROXIMATE CORRIDOR LENGTH IS 1,600 FEET.
5. INSTALL CEMENT LINES FROM PCT TO CEMENT DOME. APPROXIMATE CORRIDOR LENGTH IS 300 FEET.




APPLICANT: Municipality of Anchorage, Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N, Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 9, New Utility Plan




## WATER LINE SECTION

### GENERAL SHEET NOTES

1. TRENCH BACKFILL MATERIAL PLACED AND COMPACTED TO DEPTHS SHOWN IN THE DRAWINGS OR AS DETERMINED BY ENGINEER. COMPACT TRENCH BACKFILL TO A MINIMUM OF 95% MAXIMUM DENSITY.
2. TRENCH WALL SLOPES WILL VARY WITH SOIL STRENGTH AND CHARACTER. SLOPES SHALL CONFORM TO OSHA SAFETY STANDARDS.
3. BACKFILL SHALL BE FREE OF CLAYS AND ORGANIC MATERIALS.
4. EXCAVATED MATERIAL WILL BE SIDECAST AND, TO THE EXTENT POSSIBLE, USED AS BACKFILL AFTER THE PLACEMENT OF THE UTILITIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE ANY EXCESS OVERBURDEN MATERIAL LEFT OVER AFTER BACKFILLING THE UTILITY TRENCHES AT A SITE PERMITTED BY THE DA OR AT A SITE OUTSIDE THE DA'S AUTHORITY. THE TOTAL VOLUME OF OVERBURDEN OF ALL UTILITY INSTALLATION IS APPROXIMATELY 4,200 CY.

APPLICANT: Municipality of Anchorage, Port of Anchorage
Petroleum and Cement Terminal
FILE NO:

WATERWAY: Knik Arm
LOCATION: Section 7, Township 13N, Range 3W, Seward Meridian
DATE: March 3, 2017
FIGURE 10, Trench Backfill and Bedding Layout

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# Appendix D

National Historic Preservation Act Section 106

Technical Report

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REPORT

# Anchorage Port Modernization Program

## Recommended Effect Determination for Cultural Resources – Petroleum Cement Terminal

*Prepared for*

Port of Anchorage


1980 Anchorage Port Road
Anchorage, Alaska 99501


March 3, 2017


CH2M HILL, Inc.
Anchorage, Alaska

# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| AHRS | Alaska Heritage Resources Survey |
| APE | Area of Potential Effect |
| APMP | Anchorage Port Modernization Program |
| DA | Department of Army |
| HDR | HDR, Inc. |
| ICRC | Integrated Concepts and Research Corporation |
| MARAD | Maritime Administration |
| MOA | Municipality of Anchorage |
| NHPA | National Historic Preservation Act |
| NOAA | National Oceanic and Atmospheric Administration |
| NRHP | National Register of Historic Places |
| PCT | Petroleum, Cement Terminal |
| POA | Port of Anchorage |
| SHPO | State Historic Preservation Office |
| USACE | U.S. Army Corps of Engineers |

# 1 Introduction

The Petroleum and Cement Terminal (PCT) project is the first phase of a suite of construction projects proposed as part of the Anchorage Port Modernization Program (APMP), which is intended to address the deteriorating conditions of the Port of Anchorage's (Port's) marine facilities to enable safe, reliable, and cost-effective Port operations. The PCT Project would involve new construction of the pile-supported terminal, trestles, and dolphins to replace the existing POL 1 (Petroleum Oil Lubricants) terminal. The existing POL 1 is the only bulk cement-handling facility in Alaska and is the primary terminal for receipt of refined petroleum products. The PCT will be designed to withstand a major seismic event and rapidly return to service, which would provide Anchorage and other areas of Alaska with refined fuels and bulk cement. The new PCT would be located at the southern extent of the Port and would include breasting and mooring dolphins to receive and secure ships.

The purpose of this report is to support the U.S. Army Corps of Engineers (USACE) with regard to their effort toward regulatory compliance with Section 106 (36 CFR 800) of the National Historic Preservation Act of 1966 (as amended) (NHPA). Section 106 mandates that effects on historic properties, including archaeological sites, historic buildings and structures, historic districts, and traditional cultural properties that are listed or have been determined eligible for listing on the National Register of Historic Places (NRHP), must be accounted for by federal agencies as part of their undertakings. In addition, USACE has developed its own implementing regulations for Section 106 of the NHPA (33 CFR 325 Appendix C). These regulations outline procedures for the identification and treatment of historic properties as part of Department of the Army (DA) permit application review and issuance.

# 2 Undertaking

The undertaking described by the PCT project description includes the construction of a pile-supported platform and trestle structure located at the southernmost shoreline of the Port, which is located within the Municipality of Anchorage on the Knik Arm in upper Cook Inlet (see Figure 1 in the attached DA application). The PCT will include both mooring and breasting dolphins to receive and secure ships while in port, as well as utility pipelines (i.e., water, cement, petroleum) to serve the terminal. The Port proposes to install up to 203 permanent pipe piles and an estimated 44 temporary H piles in Knik Arm to support construction and operation of a new PCT. The permanent pipe piles would be installed using an impact hammer. The location of the undertaking is south of the existing Port wharf and terminal facilities, and will not require any alteration to the Port wharf and/or associated buildings. Project activities and schedule are described in Appendix A of the DA application.

# 3 Area of Potential Effects

The Area of Potential Effects (APE) as defined by 36 CFR 800.16(d) includes areas directly and indirectly affected by the proposed undertaking. Areas directly affected by project activities include all areas of ground-disturbing activities. For this project, the Direct APE includes 203 seaward and landward pile locations, utility line (i.e., water) and pipeline (i.e., petroleum, oil, and lubricant pipeline and a cement-carrying pipeline) locations, and project construction staging areas (Figure 1). The utility pipelines are within the intertidal zone and areas of previously disturbed gravels. The construction staging area has not yet been identified;


*Figure 1. The Petroleum Cement Terminal Project APE*

however, the staging area will likely be within areas of fill gravels within the POA facility, such as the reclaimed tideland near the proposed PCT or on the reclaimed tideland north of the POA dock. The Indirect APE for the PCT project is an area adjacent to the Direct APE, within a 0.25 mile radius where visual or audible effects have potential to occur (Figure 1).

# 4 Cultural Resources within the APE

In effort to identify cultural resources that may be affected by the Project, HDR, Inc. (HDR), reviewed several sources of available information pertaining to known cultural resources in the vicinity of the project area. These sources of information include prior archaeological investigations, documented cultural resources listed in the Alaska Heritage Resources Survey (AHRS) database, and documented shipwrecks and obstructions listed on the National Oceanic and Atmospheric Administration (NOAA) shipwreck database.

Prior cultural resources investigations in the vicinity of the of APE include an investigation of the Port wharf and associated buildings (Integrated Concepts and Research Corporation [ICRC] 2012), a 1987 archaeological survey in the vicinity of the Port for the relocation of a mobile office trailer (the exact survey location is not described in the report; Steele 1987), a 2004 archaeological survey for the road and rail extension at the eastern boundary of the Port (Rudolph 2004), a 2006 archaeological survey for the Port Haul Road, Cherry Hill Borrow Pit, and North End Borrow Pit (USACE, n.d.), and a 2009 archaeological survey adjacent to the eastern boundary of the Port (Braund 2009).

An examination of the AHRS database identified no historic properties or known cultural resources within the Direct APE and five previously recorded cultural resources within the Indirect APE (Table 1; Figure 1).[1]

Table 1. AHRS Sites and NRHP Eligibility

| AHRS Site | Name | NRHP Eligibility |
|---|---|---|
| ANC-00396 | Crawford Park Cabin 1 | Unevaluated |
| ANC-02883 | POA Dock | Recommended Not Eligible by ICRC 2012 |
| ANC-02884 | POA Transit Shed | Recommended Not Eligible by ICRC 2012 |
| ANC-02885 | Sea-Land Stevedore Building | Recommended Not Eligible by ICRC 2012 |
| ANC-04073 | Port of Alaska Breakwater Site | Unevaluated |

Previously known cultural resources include four AHRS sites that comprise the existing Port wharf and associated buildings (ANC-02883, ANC-02884, ANC-02885, and ANC-02886). In 2012, ICRC evaluated the Port terminal wharf (ANC-02883), the Port Transit Shed (ANC-02884), and the Sea-Land Stevedore Building (ANC-02885) for their eligibility for inclusion on the NRHP. ICRC (2012) determined that all four Port resources were not eligible for listing on the NRHP. The 2012 ICRC report was provided to the Maritime Administration (MARAD), the former federal agency involved with the Port. However, the 2012 ICRC report has not yet been provided to the State Historic Preservation Officer (SHPO) for review and concurrence; therefore, these three Port properties remain formally unevaluated for NRHP eligibility.

[1] The location of ANC-04073 reflects the location of the site as verified through Google Earth imagery and is different from the location provided on the AHRS card, which shows the site situated approximately 84 meters west northwest of the actual position. The site was originally documented by NOAA and was not investigated at that time because it was outside their area of hydrography.

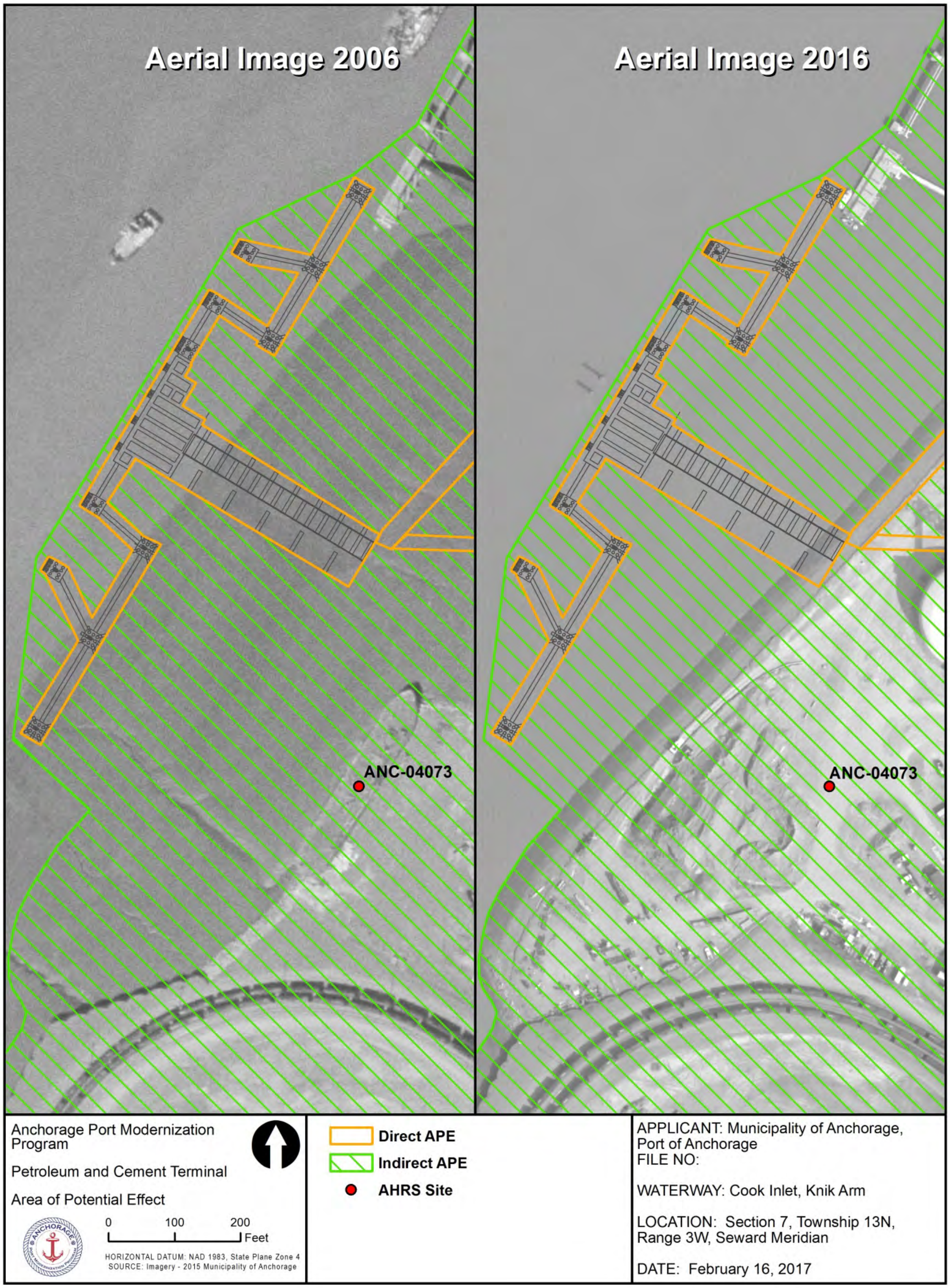


*Figure 2. Aerial Imagery from 2006 and 2016 Showing the Presence and Absence of ANC-04073 and its Position in Relation to the PCT Project*

The other two sites within 0.25 mile of the APE include the Crawford Park Cabin 1 (ANC-00396) and the Port of Alaska Breakwater Site (ANC-04073). Neither of these sites has been evaluated for eligibility for inclusion in the NRHP. However, both sites are unlikely to be considered eligible. The Crawford Park Cabin 1 (ANC-00396) is an early twentieth century log cabin that was moved in the 1970s from its original location to its present location (AHRS 2017). Structures removed from their original location are not ordinarily considered NRHP-eligible. Similarly, the Port of Alaska Breakwater Site (ANC-04073) is a wrecked hull that was scuttled in 1966 to be used as a breakwater and a dock. The ship is possibly one of two World War II liberty ships, either Edward A. Feline or diesel screw Howell Cobb. The hull is visible in 2006 aerial imagery (see Figure 2) but was partially dismantled and covered with fill during Port expansion activities prior to 2010 (AHRS 2017). The extent of the dismantling of the hull is uncertain; however, the dismantling and subsequent burial by fill gravels make the ship unlikely to have retained the integrity required for NRHP eligibility.

# 5 Effects of the Action and Recommended Effect Determination

No previously identified cultural resources or historic properties are located within the Direct APE for this project. The Direct APE encompasses an area of fill gravels and reclaimed tidelands and holds low potential for the discovery of cultural resources due to both the destructive nature of the intertidal zone (e.g., wave action, ice scouring), and prior ground disturbing activity associated with the reclamation of lands within the intertidal zone.

Five previously identified cultural resources exist within the Indirect APE; however, though all remain unevaluated, three of the resources have been recommended not eligible for listing in the NRHP. Audible effects will be temporary as part of construction activities and do not have enough vibratory impact to adversely effect cultural resources. Construction will also have a temporary visual effect, but not adverse. Because it is a functioning port that must remain operational, the addition of the new platform and trestle structure would not adversely impact the port setting if it were formally evaluated as an NRHP-eligible historic district, as numerous buildings and structures have been added and removed from the port over its lifespan of operation. Therefore, the indirect effects are negligible for the Project because the PCT construction activities will be temporary in duration and the placement of the new structure is within the context of the operations and maintenance of a working, industrialized port setting.

For the purpose of this Project with regard to determining effects to historic properties, the five resources are being treated as eligible for the NRHP as none have been formally evaluated. As there are no previously recorded resources in the Direct APE and that construction of the new platform and trestle structure is in keeping with the operations and maintenance activities of the port, and construction activities will have a temporary and minimal effect to resources, HDR recommends a finding of no adverse effect to historic properties for the APMP PCT project.

# 6 References

AHRS (Alaska Heritage Resource Survey) 2016. Alaska Heritage Resources Survey online database, maintained by Alaska Office of History and Archaeology, Alaska Department of Natural Resources, Anchorage.

Braund (Stephan R. Braund and Associates). 2009. Survey of Knik Arm Crossing Project on Elmendorf Air Force Base and Army Property at the Port of Anchorage Northern Access-Erickson Street Alternative Elmendorf Air Force Base, Alaska. On file with the Office of History and Archaeology, Anchorage.

ICRC (Integrated Concepts and Research Corporation) 2012. Port of Anchorage Terminal Wharf and Associated Buildings: Determination of Eligibility for the National Register of Historic Places Prepared for U.S. Department of Transportation, Maritime Administration, Washington, DC; Port of Anchorage, Anchorage, AK, by ICRC, Anchorage, AK. On file with CH2MHILL, Anchorage.

Rudolph, T. 2004. Archaeological Reconnaissance Road and Rail Extension Corridor, Port of Anchorage. On file with the Office of History and Archaeology, Anchorage.

Steele, J. 1987. BLM Report of Examination for Cultural Resources, AA-5345, Permit Extension AKDOT&PF at Port of Anchorage. On file with the Office of History and Archaeology, Anchorage.

USACE (U.S. Army Corps of Engineers). n.d. Department of the Army Permit Evaluation and Decision Document, Port of Anchorage, POA-2003-052-N. On file with the Office of History and Archaeology, Anchorage.

# Appendix E

Endangered Species Act (ESA)

Technical Report

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REPORT

# Anchorage Port Modernization Program

## Recommended ESA Effect Determination for Listed Species – Petroleum and Cement Terminal Project

*Prepared for*

Port of Anchorage

1980 Anchorage Port Road
Anchorage, Alaska 99501

March 3, 2017

CH2M Engineers, Inc.
Anchorage, Alaska

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# Executive Summary

The Port of Anchorage (Port) is proposing to construct the Petroleum and Cement Terminal (PCT) Project as part of the Anchorage Port Modernization Program (APMP), which is intended to address the deteriorating conditions of the Port's marine facilities to enable safe, reliable, and cost-effective operations. The PCT Project will replace the existing POL 1 (Petroleum Oil Lubricants) Terminal with a new structure designed and constructed to exceed current seismic standards at a new location. The PCT project will involve new construction of the pile-supported terminal, trestles, and dolphins; and installation of utility (electricity, water, and communication), petroleum, and cement lines linking the terminal and shore.

The action area for this project is defined as the geographic extent at which underwater noise produced from pile installation may directly or indirectly affect species listed under the Endangered Species Act (ESA). The analysis focuses solely on impacts to the marine portion of the action area during installation of the platform, trestles, dolphins, and temporary piles required for PCT construction. The Cook Inlet beluga whale (*Delphinapterus leucas*) is the most common ESA-listed marine mammal likely to occur in the action area. The Port is excluded from the Cook Inlet beluga whale critical habitat designation for national security reasons (76 Federal Register 20180), but designated critical habitat is located both north and south of the Port. In addition to the Cook Inlet beluga whale, members of the western distinct population segment (DPS) of Steller sea lion (*Eumetopias jubatus*) have been observed near the Port on two occasions; however, they are considered extremely rare in upper Cook Inlet.

Proposed PCT construction activities may affect up to 33 individual beluga whales that swim through the action area. Disturbance is anticipated to be temporary in nature, short term in duration, and localized. Individual Cook Inlet beluga whales may be disturbed by underwater noise during pile installation. Therefore, PCT construction **may affect,** and is **likely to adversely affect**, Cook Inlet beluga whales. The Port has prepared an Incidental Harassment Authorization application for submittal to the National Marine Fisheries Service for incidental take of Cook Inlet beluga whales under the Marine Mammal Protection Act.

Pile installation may cause a minor, temporary elevation in underwater acoustic levels within a small portion of designated critical habitat for Cook Inlet beluga whales. Therefore, proposed PCT construction may affect designated Cook Inlet beluga whale critical habitat. However, any disturbance would be limited, temporary in nature, and short term in duration. Therefore, PCT construction **may affect,** but is **not likely to adversely affect** Cook Inlet beluga whale critical habitat.

Steller sea lions of the western DPS may occur in the action area. Impacts to the species are unlikely, but would be minor and temporary if they were to occur. Construction of the PCT would result in both insignificant and discountable effects to Steller sea lions. Therefore, PCT construction **may affect,** but is **not likely to adversely affect** the western DPS of Steller sea lions. There is no designated critical habitat for the western DPS of Steller sea lions within or near the action area. Therefore, PCT construction would have **no effect** on critical habitat for this species.

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# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| APMP | Anchorage Port Modernization Program |
| CFR | Code of Federal Regulations |
| DA | Department of the Army |
| dB | Decibels |
| DPS | Distinct Population Segment |
| ESA | Endangered Species Act |
| FR | Federal Register |
| $km^2$ | Square Kilometer |
| ICRC | Integrated Concepts and Research Corporation |
| $mi^2$ | Square Mile |
| MMPA | Marine Mammal Protection Act |
| MTRP | Marine Terminal Redevelopment Project |
| NMFS | National Marine Fisheries Service |
| PCT | Petroleum and Cement Terminal |
| POL 1 | Petroleum Oil Lubricants |
| Port | Port of Anchorage |
| rms | Root Mean Square |
| TL | Transmission Loss |
| TPP | Test Pile Program |
| USACE | U.S. Army Corps of Engineers |

# 1 Introduction

The Port of Anchorage (Port) is proposing to construct the Petroleum and Cement Terminal (PCT) Project as part of the Anchorage Port Modernization Program (APMP), which is intended to address the deteriorating conditions of the Port's marine facilities to enable safe, reliable, and cost-effective operations. The Port is located on Knik Arm in upper Cook Inlet (Figure 1 in the attached Department of the Army [DA] permit application). The existing infrastructure and support facilities are substantially past their design life, have degraded to levels of marginal safety, and are in many cases functionally obsolete, especially in regard to seismic design criteria and condition.

As part of the overall APMP, the Petroleum and Cement Terminal (PCT) is a construction project intended to replace the existing POL 1 (Petroleum Oil Lubricants) Terminal with a new structure that exceeds current seismic standards. The existing POL 1 is the only bulk cement-handling facility in Alaska and is the primary terminal for receipt of refined petroleum products. The proposed PCT would be designed to withstand a major seismic event and rapidly return to service, which would allow for continued shipment of refined fuels and bulk cement to Anchorage and other areas of Alaska.

The PCT will be a pile-supported structure located along the southernmost shoreline of the Port. The PCT Project will involve new construction of the terminal, trestles, and dolphins; and installation of utility (electricity, water, and communication), petroleum, and cement lines linking the terminal and shore. The new PCT would include breasting and mooring dolphins to receive and secure ships.

The purpose of this report is to inform the U.S. Army Corps of Engineers (USACE) of potential effects on Endangered Species Act (ESA)-listed species and their critical habitat, assist in the determination of effects, and facilitate processing of applicable authorizations administered by the USACE for the PCT Project.

# 2 Proposed Action

Project activities and schedule are described in Appendix A of the DA permit application.

# 3 Action Area

The action area is defined as the area potentially affected directly or indirectly by a federal action (50 Code of Federal Regulations [CFR] §402.02). For this project, defining the action area involves taking into consideration airborne and underwater construction noise and the potential for increased turbidity from construction activities. The aquatic portion of the action area for this project is defined as the geographic extent at which underwater noise produced from pile installation could adversely affect marine mammals, their prey, habitat, or constituent elements of their critical habitat. The National Marine Fisheries Service (NMFS) defines harassment of marine mammals from continuous noise as any underwater noise level in excess of the ambient sound level (generally accepted as 120 dB). For impulsive noise, harassment is defined as any noise level in excess of 160 dB. Although noise from impact installation of piles would be perceptible at levels below 160 dB, this is not known to affect marine mammals. During construction of the PCT the largest area of harassment as defined by NMFS would be created by impact installation of unattenuated 48-inch piles. Noise from this activity would extend 1,529 meters from the source and ensonify up to 3.75 square kilometers ($km^2$) of marine waters. Source levels, propagation rates, and calculated harassment zones for all pile types and pile installation methods are discussed in detail in Section 5.

Construction activities will also produce in-air noise that could harass or harm ESA-listed species. Noise from the loudest pile installation method, impact installation of unattenuated 48-inch piles, would be perceptible up to 1,143 meters from the source. Therefore, the in-air action area during PCT construction would extend 1,143 meters in all directions from the PCT construction site; however, there is no habitat for ESA-listed terrestrial species in the area. The closest known haulout for an ESA-listed pinniped, the Steller sea lion (*Eumetopias jubatus*), occurs approximately 150 miles away, near Homer, Alaska (Fritz et al. 2016). This haulout is well beyond the distance that in-air construction noise from the PCT Project could travel, and therefore potential impacts from in-air noise are not considered further. The analysis below focuses solely on impacts to the marine portion of the action area during installation of the platform, trestles, dolphins, and temporary piles required for PCT construction.

# 4 Listed Species and Critical Habitat

## 4.1 Beluga Whales

### 4.1.1 Status and Distribution

The Cook Inlet beluga whale (*Delphinapterus leucas*) is the most common ESA-listed marine mammal to occur in the action area. Five beluga whale stocks are recognized in Alaska: Beaufort Sea, eastern Chukchi Sea, eastern Bering Sea, Bristol Bay, and Cook Inlet (Muto et al. 2016). Only the Cook Inlet stock inhabits the action area.

NMFS aerial surveys documented a 50 percent decline in Cook Inlet beluga whale abundance between 1994 and 1998, from an estimate of 653 to 347 whales (Rugh et al. 2000). In response to this decline, NMFS initiated a status review of the Cook Inlet beluga whale pursuant to the Marine Mammal Protection Act (MMPA) and the ESA in 1998 (63 Federal Register [FR] 64228). The Cook Inlet beluga whale stock was designated as depleted under the MMPA in 2000 (65 FR 34590). Annual abundance surveys conducted each June from 2002 to 2012 indicated that the population continued to decline at an annual rate of 0.6 percent (Muto et al. 2016). On 17 October 2008, NMFS listed the Cook Inlet beluga whale distinct population segment (DPS) as endangered under the ESA (73 FR 62919).

### 4.1.2 Presence in the Action Area

The Port conducted NMFS-approved monitoring programs for beluga whales and other marine mammals, focused at the Port, from 2005 to 2011, and again in 2016. Data on beluga whale sighting rates, groupings, behavior, and movements indicate that the Port is a relatively low-use area, occasionally visited by lone whales or small groups of whales (**Error! Reference source not found.**). They are observed most often in fall, with numbers peaking in late August to early October (Funk et al. 2005). Although groups with calves have been observed entering the Port area, data do not suggest that the area is an important nursery (Markowitz and McGuire 2007).

*Table 1. Beluga Whales Observed in the Port Area during Monitoring Programs*

| Year | Dates of Monitoring Effort | # of Hours of Monitoring Effort | Total Number of Groups[a] Sighted | Total Number of Beluga Whales | Monitoring Type |
|---|---|---|---|---|---|
| 2005 | August 2 – Nov. 28 | 374 | 21 | 157 | MTRP - Scientific Monitoring |
| 2006 | April 26 – Nov. 3 | 564 | 25 | 82 | MTRP - Scientific Monitoring |
| 2007 | Oct. 9 – Nov. 20 | 139 | 20 | 86 | MTRP - Scientific Monitoring |
| 2008 | June 24 – Nov. 14 | 612 | 54 | 283 | MTRP - Scientific Monitoring |
| | July 24 – Dec. 2 | 607[b] | 59 | 431 | MTRP - Construction Monitoring |
| 2009 | May 4 – Nov. 18 | 783 | 54 | 166 | MTRP - Scientific Monitoring |
| | March 28 – Dec. 14 | 3,322[b] | NA | 1,221 | MTRP - Construction Monitoring |
| 2010 | June 29 – Nov. 19 | 600 | 42 | 115 | MTRP - Scientific Monitoring |
| | July 21 – Nov. 20 | 862[b] | 103 | 731 | MTRP - Construction Monitoring |
| 2011 | June 28 – Nov. 15 | 1202 | 62 | 290 | MTRP - Scientific Monitoring |
| | July 17 – Sept. 27 | NA | 5 | 48 | MTRP - Construction Monitoring |
| 2016 | May 3 – June 21 | 85.3 | 9 | 10 | TPP - Construction Monitoring |

[a] A group consists of one or more individuals.
[b] In-water pile-driving hours.
Source: Cornick and Seagars 2016; Cornick et al. 2010, 2011; Cornick and Pinney 2011; Cornick and Saxon-Kendall 2008, 2009; ICRC 2009, 2010, 2011, 2012; Markowitz and McGuire 2007; Prevel-Ramos et al. 2006
Notes: MTRP = Marine Terminal Redevelopment Project; NA = not available; TPP = Test Pile Program

### 4.1.3 Critical Habitat

On 11 April 2011, NMFS designated two types of beluga whale critical habitat in Cook Inlet that represent specific areas containing essential biological and physical features (76 FR 20180). The designation includes 7,800 $km^2$ (3,013 square miles [$mi^2$]) of marine and estuarine habitat within Cook Inlet, encompassing approximately 1,909 $km^2$ (738 $mi^2$) in Area 1 and 5,891 $km^2$ (2,275 $mi^2$) in Area 2. Area 2 critical habitat is located south of Area 1 and the project area (Figure 1). In Area 1, the Port, the adjacent navigation channel, and the turning basin (the wider area offshore of the Port in which larger ships such as cargo ships can turn around) were excluded from critical habitat designation for national security reasons (76 FR 20180). Although much of the action area for the PCT Project is within the exclusion zone, a small portion of the project-related impulse Harassment B isopleth (160 decibels [dB] root mean square [rms]) overlaps with beluga whale critical habitat in the action area (Figure 1).

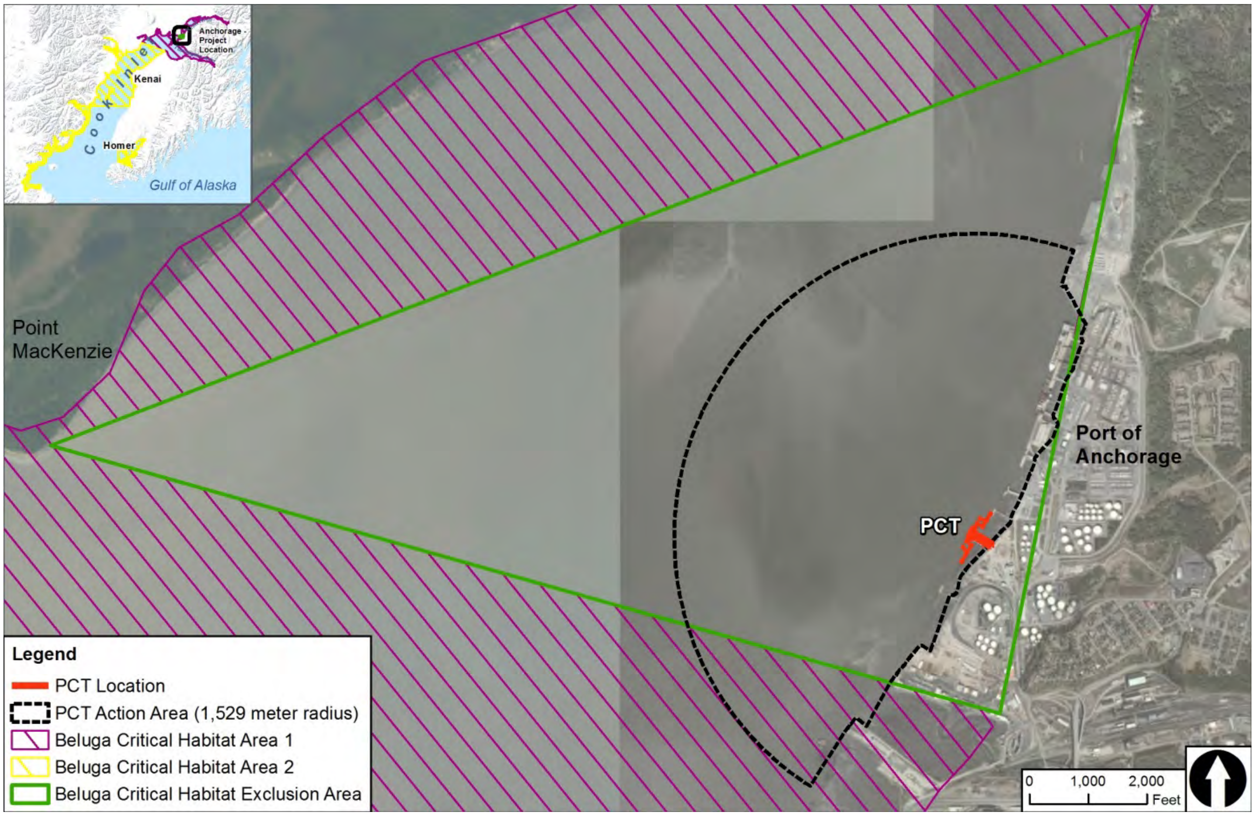


*Figure 1. APMP PCT Action Area and Cook Inlet Beluga Whale Critical Habitat*

# 4.2 Steller Sea Lion

## 4.2.1 Status and Distribution

Two DPSs of Steller sea lion occur in Alaska: the western DPS and eastern DPS. The western DPS includes animals that occur west of Cape Suckling, Alaska, and therefore includes individuals within the project area. The western DPS was listed under the ESA as threatened in 1990, and its continued population decline resulted in a change in listing status to endangered in 1997. Since 2000, studies have documented a continued decline in the population in the central and western Aleutian Islands; however, the population east of Samalga Pass (including the population that inhabits Cook Inlet) has increased and is potentially stable (Allen and Angliss 2014). The most recent abundance estimate for the western DPS, completed in 2014, was 49,497 individuals (Muto et al. 2016).

## 4.2.2 Presence in the Action Area

Steller sea lions have been observed on two different occasions near the POA, in June 2009 (ICRC 2009) and in June 2016 (Cornick and Seagars 2016). Both occasions were during summer, when the sea lions were likely attracted to ongoing salmon runs. However, the occurrence of Steller sea lions in the project area is rare, despite the many hours of observations that have taken place in the area.

## 4.2.3 Critical Habitat

Critical habitat for the western DPS of Steller sea lion is defined as all land and air within 3,000 feet, and all marine waters within 20 nautical miles, of a designated major haulout (58 FR 45269). As mentioned above, the nearest haulout to the Port is approximately 150 miles away near Homer, Alaska. Therefore, designated western DPS Steller sea lion critical habitat would not be affected by PCT construction activities.

# 5 Effects of the Action

Under the ESA, direct effects are defined as the direct or immediate effects of the project on a listed species or its habitat. Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur.

## 5.1 Direct Effects

Direct effects to ESA-listed marine mammals during the PCT Project include exposure to underwater anthropogenic sound, turbidity, and the use of tugs and barges during construction activities.

### 5.1.1 Underwater Noise

The proposed action will introduce additional elevated anthropogenic underwater noise levels within the action area. Such noise could harass marine mammals and affect communication, foraging, migration, and predator detection. NMFS defines harassment of marine mammals as any act of pursuit, torment, or annoyance. NMFS categorizes harassment as Level A or Level B, where Level A harassment has the potential to injure a marine mammal or marine mammal stock in the wild and Level B harassment has the potential to disturb, but not injure, a marine mammal stock in the wild by causing disruption of behavioral patterns. The Port has committed to a comprehensive marine mammal monitoring program during the PCT Project that will include implementation of a 100-meter shutdown zone. This zone would be greater than the largest Level A harassment zones for mid-frequency cetaceans (beluga whales) and otariid pinnipeds (sea lions), which extend no more than 86 and 53 meters from the source, respectively (see Incidental Harassment Authorization [IHA] application; HDR 2017a). As such, Level A harassment (injury) of beluga whales and Steller sea lions is very unlikely during PCT construction activities.

Noise from pile installation will propagate to the surrounding waters from each pile location. The distances to Level B harassment thresholds for beluga whales differ depending on the installation method, the type and size of pile being installed, the location of the pile, and whether an attenuation system is used. The sound source levels and propagation rates recorded during the Test Pile Program (Austin et al. 2016) were used to estimate harassment zone isopleth distances during the PCT (Table 2; Reyff 2017).

*Table 2. Average Underwater Sound Levels at 12 Meters and Average Transmission Loss Coefficient Used to Calculate Isopleth Distances as Recorded During the Test Pile Program at the Port in 2016*

| Activity | dB rms at 12 m | TL |
|---|---|---|
| 48-inch Impact Pile Installation | 200 | 19 |
| 36-inch Impact Pile Installation | 197 | 19 |
| H-pile Vibratory Pile Installation & Removal | 164 | 23 |

Note: dB rms = decibels root mean square; m = meters; TL = transmission loss.

Sound propagation was estimated by using the Practical Spreading Loss model. The model is written as transmission loss (TL) = Xlog10 (R/D), where X is the TL coefficient, R is the distance from the source, and

D is the distance at which the source levels were measured. The estimated distance to the Level B harassment isopleths and calculated zone sizes for each activity are presented in Table 3. Although a bubble curtain attenuation system will be used when feasible, it is conservatively anticipated that a bubble curtain could be used only during installation of the fender, trestle, and platform piles (bold values in Table 3). Additional details on construction activities are provided in Appendix A of the DA permit application and in the PCT Project IHA application.

Aerial surveys for beluga whales conducted each summer between 1994 and 2008 were used to develop a predicted density model for Cook Inlet beluga whales. The model predicted beluga whale densities between 0 and 1.12 beluga whales/km$^2$ that were then mapped throughout Cook Inlet at the scale of 1 km$^2$. The highest predicted beluga whale density in the action area is 0.062 beluga whale/km$^2$ (Goetz et al. 2012). This estimate was used to predict beluga whale exposure to noise levels that could cause Level B harassment during each PCT Project activity shown in bold in Table 3 (i.e., predicted density * isopleth area * duration in days = exposure estimate). The exposure estimates for each activity were then summed to estimate total beluga whale exposure, which resulted in an estimate of 19.75, rounded up to 20 whales, during construction of the PCT.

*Table 3. Pile Installation/Removal Activities, Calculated Distances to Level B Harassment Isopleths, and Size of Level B Harassment Isopleths*

| Activity | | Estimated Duration (days) | Distance to Level B Harassment Isopleth (m) | Size of Level B Harassment Isopleth (km$^2$) | Beluga Whale Exposure Estimate (number of whales) |
|---|---|---|---|---|---|
| 48" Mooring Dolphin Impact Installation | Bubble Curtain | 32 | 834 | 1.20 | 2.36 |
| | Unattenuated | | **1,529** | **3.63** | **7.18** |
| 48”Breasting Dolphin Impact Installation | Bubble Curtain | 27 | 834 | 1.25 | 2.08 |
| | Unattenuated | | **1,529** | **3.74** | **6.23** |
| 48” Main /Backup Trestle & Platform Impact Installation | Bubble Curtain | 58 | **834** | **1.25** | **4.47** |
| | Unattenuated | | 1,529 | 3.75 | 13.44 |
| 36” Fender Piles Impact Installation | Bubble Curtain | 7 | **580** | **0.65** | **0.28** |
| | Unattenuated | | 1,063 | 1.95 | 0.84 |
| H-Piles Vibratory Installation/ Removal | Bubble Curtain | 22 | 496 | 0.46 | 0.62 |
| | Unattenuated | | **819** | **1.16** | **1.57** |

Notes: km$^2$ = square kilometers; m = meters; bold numbers denote distances and areas used to calculate exposure estimates based on the reasonably likely construction scenario.

A drawback to using the predicted density model is that it lessens the influence of group size on abundance. Beluga whales are most often observed near the Port as single individuals or small groups, but it is not uncommon to observe large groups. On several occasions during previous construction projects at the Port, groups of beluga whales were potentially exposed to noise levels that could be considered Level B harassment. Scientific monitoring programs at the Port recorded group sizes ranging from 1 to 33 individuals. Given the possibility that a group of beluga whales could be taken together, we predicted the largest group size likely to be observed during the PCT Project. Using the scientific monitoring data collected between 2007 and 2011 at the Port, we determined that the largest group likely to be observed would be 13 individuals; this is based on the 95th percentile group size determined from the distribution of beluga whale observations during scientific monitoring. In order to balance reduced risk to the Port and protection of beluga whales, the Port has requested a total of 33 Level B harassment takes (20 by the density method + 13 from a large group) of Cook Inlet beluga whales in their IHA application. Exposure of Cook Inlet beluga whales to Level A harassment is not expected, and no Level A take was requested in the IHA application.

To reduce the chance of the Port reaching or exceeding authorized take, and to minimize harassment to beluga whales, in-water pile installation will be shut down if a group of five or more beluga whales is sighted approaching the Level B harassment zone. In addition, in-water pile installation will be shut down if any number of juvenile (dark gray in color) beluga whales are observed approaching the Level B harassment zone. Impacts to beluga whales from underwater noise would be temporary in duration and minor in intensity; most beluga whales that occur in the action area are transiting between upper Knik Arm and other portions of Cook Inlet. Beluga whales, like other marine mammals in Cook Inlet, have likely become habituated to increased noise levels. Beluga whales are able to adjust vocalization amplitude and frequency in response to increased noise levels. Because the nature of pile installation is intermittent and the use of the action area by beluga whales is relatively low, the likelihood of in-water pile-installation noise masking beluga whale communication is low, and displacement, if any, would be temporary in duration.

Tugboats and barges, which are used regularly as part of standard Port operations, will also be used in support of the PCT. NMFS (2008) reports that Alaska Native beluga whale hunters believe that Cook Inlet beluga whales are sensitive to boat noise, and that they will leave areas subjected to high boat use. However, in more heavily trafficked areas, beluga whales may habituate to vessel noise. This appears to be the case at the Port, where beluga whales appear to be relatively tolerant of intense vessel traffic, as they are commonly seen during summer and early fall. Indeed, Blackwell and Greene (2002) report that beluga whales were observed “within a few meters” of a large cargo ship, suggesting that they were not strongly affected by the sounds produced by the ship. Observations of beluga whales off the Port suggest that they are not harassed by vessel noise to the point of abandonment, although the whales may tolerate noise that would otherwise disturb them in order to feed or to conduct other biologically significant behaviors (NMFS 2008). In areas where they are subjected to heavy boat traffic, beluga whales are thought to habituate and become tolerant of the vessels, and to exhibit plasticity in their choice of call types, rates, and frequencies in response to changes in the acoustic environment (Blackwell and Greene 2002).

Port activities, including vessel traffic, contribute to existing high ambient noise levels in the action area, and have not resulted in abandonment from the area by beluga whales. It is unlikely that beluga whales would exhibit significant behavioral modification due to underwater noise and vessel activity associated with barges and tugboats during the PCT Project.

### 5.1.2 Turbidity

During PCT construction, a minor increase in turbidity is expected to occur within close proximity to each driven pile. Due to the implementation of the 100-meter shutdown zone, the high silt loads in the action area, and the unlikely drift of suspended sediments beyond the shutdown zone, such turbidity is unlikely to measurably affect beluga whales during passage through or while foraging in the action area.

## 5.2 Indirect Effects

An increase in turbidity from construction activities could affect phytoplankton primary productivity and the subsequent food web, including beluga whale prey species, resulting in an indirect effect on beluga whales. Fish may change their behavior by moving away from highly sediment-laden waters. However, any increase in sediment in the water column is likely to be quickly and fully dispersed due to the high tidal currents in Knik Arm. Therefore, any effects from increased turbidity are anticipated to be temporary and localized, and will not affect beluga whales.

Strong and/or intermittent sounds during pile installation may also elicit changes in fish behavior and local distribution and could potentially harm fish. High underwater sound pressure levels (such as those occurring during impact pile installation) are documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper 2005). Impacts to most species would be short-term and local; the PCT Project is not anticipated to substantially impede migration of adult or juvenile salmon or adversely affect the health and survival of the affected species at the population level. Affected fish would represent only a portion of the food available to marine mammals in the area. Once impact hammering has ceased and construction of the PCT is complete, habitat quality would be expected to return to current conditions. The only exception would be habitat lost due to the presence of piles; however, this amount of habitat is minimal compared to the available habitat in adjacent Knik Arm waters. Fish would be expected to move into and use adjacent available areas. Potential affects to fish are discussed in more detail in the APMP Essential Fish Habitat Technical Memorandum – APMP PCT Project (HDR 2017b).

## 5.3 Interrelated or Interdependent Actions

An interdependent activity is one that has no independent utility apart from the proposed action (50 CFR §402.02). An interrelated activity is one that is part of a larger action and depends on the larger action for its justification (50 CFR §402.02). Although the PCT Project is part of the larger APMP, the PCT Project is completely independent of all other actions associated with the APMP, and future development of the APMP would occur regardless of the status of the PCT.

## 5.4 Effects on Critical Habitat

PCT construction activity would be located entirely within the Cook Inlet beluga whale critical habitat exclusion zone. However, up to 0.41 $km^2$ of designated critical habitat would be subject to elevated noise equivalent to the Level B impulse harassment threshold for beluga whales (Figure 1). Noise produced during impact installation of 36- and 48-inch unattenuated piles could extend into this area. The amount of critical habitat affected by noise equivalent to the Level B impulse harassment zone would depend on numerous hydrologic factors and the exact location of the pile(s) being installed. However, the Port has committed to using a bubble curtain attenuation system, when feasible, that would substantially reduce the noise levels produced during pile installation. The Level B harassment zone would not overlap with designated critical habitat if a bubble curtain attenuation system were used during installation. Reasonable expectations are that a bubble curtain would be used during installation of all fender, trestle, and platform piles, but not during installation of temporary and dolphin piles (which are battered), unless feasible. Therefore, we reasonably expect that during the 146 days of construction, temporary acoustical changes to designated critical habitat from exceedance of the Level B impulse harassment threshold would occur on no more than 88 days.

As mentioned in Section 4.2.3, there is no designated critical habitat for western DPS Steller sea lions within or near the action area. Therefore, PCT construction would not affect critical habitat for this species.

# 6 Recommended Effect Determination

Cook Inlet beluga whales occur occasionally in the action area. Therefore, proposed PCT construction activities **may affect** individuals that swim through the action area near construction activities. Disturbance is anticipated to be temporary in nature, short term in duration, and localized. As many as 33 individual Cook Inlet beluga whales may be subject to underwater noise exceeding the Level B impulse disturbance thresholds during impact pile installation of 48- and 36-inch piles and vibratory installation and removal of H-piles. Therefore, PCT construction **may affect, and is likely to adversely affect** Cook Inlet beluga whales.

Underwater noise during pile installation may cause minor, temporary elevation in underwater acoustic levels within a small portion of designated critical habitat. Therefore, proposed PCT construction **may affect** designated Cook Inlet beluga whale critical habitat. However, disturbance at levels exceeding acoustic harassment thresholds would be limited to no more than 0.41 $km^2$ of critical habitat, temporary in nature, and short term in duration. Therefore, PCT construction **may affect, but is not likely to adversely affect** Cook Inlet beluga whale critical habitat. Adverse modification of critical habitat would not occur.

Steller sea lions of the western DPS have been observed in low numbers near the Port. Therefore, the PCT Project **may affect** Steller sea lions. The Port is considered extralimital for this species, and it is very unlikely that Steller sea lions would be affected by PCT construction activities. Impacts to Steller sea lions would be minor and temporary if they were to occur. The PCT Project IHA application conservatively requested Level B take of up to eight western DPS Steller sea lions during PCT construction under the MMPA. However, it is our conclusion that effects to Steller sea lions would be discountable and insignificant under the ESA and therefore the PCT Project **may affect, but is not likely to adversely affect** western DPS Steller sea lions.

There is no designated critical habitat for the western DPS of Steller sea lions within or near the action area. Therefore, PCT construction would have **no effect** on critical habitat for this species.

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# Appendix F

Essential Fish Habitat (EFH)

Technical Report

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REPORT

# Anchorage Port Modernization Program

## Essential Fish Habitat Technical Memorandum – APMP Petroleum and Cement Terminal Project

*Prepared for*

Port of Anchorage

1980 Anchorage Port Road
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March 3, 2017

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# Executive Summary

The Port of Anchorage (Port) is proposing to construct the Petroleum and Cement Terminal (PCT) Project as part of the Anchorage Port Modernization Program, which is intended to address the deteriorating conditions of the Port's marine facilities to enable safe, reliable, and cost-effective operations. The PCT Project would involve new construction of the pile-supported terminal, trestles, and dolphins in Knik Arm to replace the existing Petroleum Oil Lubricants terminal. The need to have a reliable terminal for moving goods into Alaska in the event of a major earthquake makes the PCT Project a high priority for the Port.

Knik Arm is considered essential fish habitat (EFH) for five Pacific salmon species, which are managed under a federal fishery management plan. The Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the National Marine Fisheries Service (NMFS) when an activity may adversely affect EFH. The intent of this document is to inform the U.S. Army Corps of Engineers of the PCT Project's potential effects and facilitate required EFH consultation.

The PCT Project would install up to 247 support piles in Knik Arm and construct overwater structures below the mean high water elevation; such activities have the potential to affect EFH. An impact hammer would be used to install 203 large-diameter piles from April 1 through November 20, 2018. Impact hammers can produce underwater sound pressure levels (SPLs) that have the potential to disturb, injure, or kill fish exposed to harmful levels. Impact hammers can also produce sound waves that may alter the migration path of adult salmon exposed to such levels.

Site-specific underwater acoustic data previously collected at the Port were input into NMFS' underwater acoustic calculator to estimate distances to interim noise thresholds for fish injury and behavioral disturbance. To minimize noise potential impacts, the Port proposes to deploy an encapsulated bubble curtain during impact hammer pile installation from August through October, the time during which beluga whales are likely to occur in the area. With the bubble curtain in place, fish within 11 to 15 meters (36 to 49 feet) of impact hammer installation of large-diameter piles would be exposed to the peak SPL threshold for fish injury. Estimates indicate that fish within 512 meters (1,680 feet) of repeated impact hammer strikes may be exposed to cumulative injury thresholds. Without the bubble curtain, potential injury zones increase.

Juvenile salmon may be the most vulnerable when exposed to peak SPLs for a single impact strike, based on their small body mass and entrainment within Knik Arm's fast-moving currents. These strong currents, however, may decrease the chance that a juvenile salmon would occupy habitat within harmful levels for extended periods. While some fish within the estimated potential injury zones may be harmed, the impacts to EFH would otherwise be short-term and local. The PCT Project is not anticipated to substantially impede adult or juvenile salmon migration or adversely affect the health and survival of the affected species at the population level.

The vibratory hammer installation and removal of 44 temporary piles is not anticipated to produce harmful sound waves; removing piles may result in a temporary but relatively minor increase in turbidity in surrounding waters. Potential impacts from the addition of overwater structures, including cement panels for the platform and trestles and open steel grating for the catwalk that would extend into relatively deep subtidal waters, are anticipated to be relatively minor.

Once impact hammering has ceased and construction of the PCT is complete, habitat quality would be expected to return to pre-PCT conditions. The only exception would be a small amount of habitat lost due to the presence of piles; however, the amount of habitat that would be eliminated is minimal compared to the available habitat in adjacent Knik Arm waters. Fish would be expected to move into and use adjacent available areas. Potential changes in hydrologic patterns from the pile-supported PCT are not anticipated to substantially affect EFH or federally managed fish species.

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# Contents



**Tables**

## Figures

# Acronyms and Abbreviations

| | |
|---|---|
| ADF&G | Alaska Department of Fish and Game |
| APMP | Anchorage Port Modernization Program |
| CFR | Code of Federal Regulations |
| DA | Department of Army |
| dB | Decibels |
| EFH | Essential Fish Habitat |
| FHWA | Federal Highway Administration |
| FHWG | Fisheries Hydroacoustic Working Group |
| FMP | Fishery Management Plan |
| GOA | Gulf of Alaska |
| Hz | Hertz |
| JBER | Joint Base Elmendorf-Richardson |
| KIWC | Kiewit Infrastructure West Co. |
| µPa | MicroPascal |
| MSFCMA | Magnuson-Stevens Fishery Conservation and Management Act |
| NES | North Extension Stabilization |
| NMFS | National Marine Fisheries Service |
| NPFMC | North Pacific Fishery Management Council |
| NTU | Nephelometric Turbidity Unit |
| PCT | Petroleum and Cement Terminal |
| POL 1 | Petroleum Oil Lubricants |
| Port | Port of Anchorage |
| RMS | Root Mean Square |
| SBS | South Backlands Stabilization Project |
| SPL | Sound Pressure Level |
| TL | Transmission Loss |
| TPP | Test Pile Program |
| USACE | U.S. Army Corps of Engineers |

# 1 Introduction

The Petroleum and Cement Terminal (PCT) project is the first phase of a suite of construction projects proposed as part of the Anchorage Port Modernization Program (APMP), which is intended to address the deteriorating conditions of the Port of Anchorage's (Port's) marine facilities to enable safe, reliable, and cost-effective Port operations. The PCT Project would involve new construction of the pile-supported terminal, trestles, and dolphins to replace the existing POL 1 (Petroleum Oil Lubricants) terminal. The existing POL 1 is the only bulk cement-handling facility in Alaska and is the primary terminal for receipt of refined petroleum products. The PCT will be designed to withstand a major seismic event and rapidly return to service, which would provide Anchorage and other areas of Alaska with refined fuels and bulk cement. The new PCT would be located at the southern extent of the Port and would include breasting and mooring dolphins to receive and secure ships.

The Port is located within the Municipality of Anchorage on Knik Arm in upper Cook Inlet (see Figure 1 in the attached Department of the Army [DA] application). The estuarine and marine waters in Cook Inlet provide habitat for fish species managed under federal fishery management plans (FMPs) and are considered Essential Fish Habitat (EFH) for some of these species. The PCT would involve installing up to 247 piles, constructing overwater structures, and placing fill below the mean high water elevation, and therefore has the potential to affect federally managed fish species and EFH.

The purpose of this report is to inform the U.S. Army Corps of Engineers (USACE) of potential effects to EFH and facilitate processing of applicable authorizations administered by the USACE for the PCT Project. In accordance with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)[1], this report summarizes components of the proposed PCT Project that may affect EFH and/or FMP species, identifies proposed conservation measures to minimize potential effects, and presents an analysis of potential impacts to EFH and managed species.

The MSFCMA defines EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The MSFCMA notes that:

> *…for the purpose of interpreting the definition of EFH, 'waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes sediment, hard bottom, structures underlying the waters, and associated biological communities, 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and 'spawning, breeding, feeding, or growth to maturity' covers a species full life cycle.*

# 2 Proposed Action

Project activities and schedule are described in Appendix A of the DA application.

[1] A provision of the MSFCMA requires that Fisheries Management Councils (FMCs) identify and protect EFH for fish species managed by a federal FMP (U.S. Code 1853 (a)(7)).

# 3 Essential Fish Habitat and Species

The North Pacific Fishery Management Council (NPFMC) identifies habitat in Cook Inlet as essential for Pacific salmon[2] and groundfish species (NPFMC 2012, 2016). Estuarine and marine waters in the vicinity of the Port provide EFH for Chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*), coho (*O. kisutch*), sockeye (*O. nerka*), and pink salmon (*O. gorbuscha*) (NPFMC 2012). Freshwater streams, lakes, ponds, wetlands, and other water bodies that support Pacific salmon, as identified by the Alaska Department of Fish and Game (ADF&G) *Anadromous Waters Catalog* (AWC), are also considered EFH. The subsections that follow present a summary of freshwater, estuarine, and marine habitat conditions within approximately 1.6 kilometers (1 mile) of the Port (**Figure 1**), and ecological notes on FMP-managed fish species. In some cases, the discussion of habitat and fish species extends beyond these limits to provide additional context.

Eulachon (*Thaleichthys pacificus*); low numbers of Pacific cod (*Gadus macrocephalus*), walleye pollock (*Theragra chalcogramma*), and Pacific herring (*Clupea pallasii*)[3]; longfin smelt (*Spirinchus thaleichthys*); and Pacific staghorn sculpin (*Leptocottus armatus*) have also been captured in upper Cook Inlet (NOAA 2016; Houghton et al. 2005). While these species are managed by the FMP for groundfish of the Gulf of Alaska (GOA), waters in the vicinity of the Port are not identified as EFH for these species (NPFMC 2016; Eagleton 2016). Available data are insufficient for the National Marine Fisheries Service (NMFS) to identify EFH for eulachon[4], longfin smelt, Pacific herring, and other species in the forage fish complex (NPFMC 2016; Eagleton 2016). Since eulachon occur near the Port and are a common prey species for the Cook Inlet beluga whale[5] (*Delphinapterus leucas*) (Moore et al. 2000), the eulachon is discussed below. Ecological notes are also provided for Pacific cod, walleye pollock, and the Pacific staghorn sculpin.

## 3.1 Habitat Description

### 3.1.1 Marine EFH

Cook Inlet is a large, semi-enclosed tidal estuary in Southcentral Alaska that ultimately opens into the GOA. Cook Inlet is divided into upper and lower regions by the East and West Forelands. Upper Cook Inlet is generally shallow, with most waters less than 73 meters (240 feet) deep (NMFS 2008). Near its northern extent, upper Cook Inlet branches into two shallower extensions: Knik Arm to the north and Turnagain Arm to the southeast. The Port is located in Knik Arm in upper Cook Inlet.

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[2] Marine EFH for salmon in Alaska includes all estuarine and marine areas utilized by salmon of Alaska origin, extending from the influence of tidewater and tidally submerged habitats to the limits of the U.S. Exclusive Economic Zone; marine habitat extends from the mean high line to the to the 200-nautical-mile limit offshore; the estuarine component includes the area within the mean high tide line and the salinity transition zone within nearshore waters (NOAA 2005).

[3] The NMFS determined that Chinook, sockeye, chum, and coho salmon; Pacific eulachon; Pacific cod; walleye pollock; saffron cod; and yellowfin sole are primary prey species that are essential to the conservation of the Cook Inlet beluga whale (NMFS 2016).

[4] Eulachon are also locally referred to as “hooligan” and “candlefish.” A personal use and small commercial fishery for eulachon is located nearby in Knik Arm.

[5] The Cook Inlet beluga whale is federally listed as “endangered” under the Endangered Species Act.


*Figure 1. Vicinity map showing the Port of Anchorage and the proposed PCT Project*

Freshwater input to Knik Arm comes from snowmelt and rivers, many of which are glacially fed and carry high sediment loads. The Matanuska and Knik rivers, located north of the Port, contribute the majority of fresh water and suspended sediment load into the Knik Arm during summer. Mud and sand flats dominate intertidal habitat in Knik Arm (KABATA 2006). As of 2006, approximately 60 percent of Knik Arm is exposed at mean lower low water. Tidally influenced areas of Knik Arm consist primarily of vegetated and unvegetated mudflats with fine, silt-size glacial flour.

Knik Arm is considered a harsh, extreme marine environment in terms of the powerful interacting effects of large tidal changes; strong currents; massive glacial and coastal sediment inputs from rivers and coastal erosion; and extreme winter ice scour (Houghton at al. 2005). These harsh conditions limit primary productivity and thus populations of marine flora and benthic invertebrates to relatively low densities, including on the beaches and throughout the water column (Houghton at al. 2005).

Average natural turbidity levels in Upper Cook Inlet and Knik Arm typically range from 400 to 600 nephelometric turbidity units (NTUs) (USACE 2008); monthly averages peak during spring breakup and increase again in late summer (to more than 650 NTUs; Houghton et al 2005). Water quality data indicate that despite high turbidity levels, relatively high levels of dissolved oxygen are maintained throughout the water column due to the turbulent nature of Knik Arm (USACE 2008). Pacific salmon and several other species have adapted to the naturally high levels of turbidity found in Knik Arm. Data suggest that small lenses of clearer water within the turbid waters of Knik Arm may be especially important feeding areas for juvenile salmon, as they are typically visual feeders (Houghton et al. 2005). These clear water pockets occur throughout Knik Arm and do not seem to be limited to specific areas.

The Port boundary currently encompasses an area of approximately 129 acres. Other commercial and industrial activities related to secure maritime operations are located south of the Port; Joint Base Elmendorf-Richardson (JBER) is to the east. The perpendicular distance to the west bank directly across Knik Arm is approximately 4.2 kilometers (2.6 miles) from the Port.  The distance from the Port (east side) to nearby Port MacKenzie (west side) is approximately 4.9 kilometers (3.0 miles).

The quantity and quality of nearshore habitat within the Port's vicinity has been reduced through numerous shoreline modifications, fill placement, dredging, and other development activities. Most of the intertidal habitat along the Port's shoreline has been modified, and annual dredging occurs in subtidal waters adjacent to the Port, including a portion of the PCT area, to maintain the operational depths.

The new PCT would be located near the Port's southern extent and adjacent to the South Backlands area, which was created in 2008 by placing fill under DA permit POA-2003-N. The Port received a second authorization in January 2017 to discharge additional fill for construction modifications of the South Backlands Stabilization (SBS) Project through a DA permit[6].  The SBS Project will place armor rock and gravel fill across approximately 3.7 acres of intertidal fill along about 525 linear meters (1,722 feet) of shoreline in 2017 to protect the shoreline from continued erosion. The new PCT would extend water-ward from the newly stabilized shoreline. Therefore, the majority of affected habitat within and adjacent to the PCT area would be subtidal, post-SBS Project construction. **Photographs** that show the extent of intertidal fill in the vicinity of the PCT and SBS projects over time are provided below. **Figures** of the proposed PCT Project are provided in the DA application.

[6] Work proposed under the SBS Project was permitted in August 2011 (DA permit POA-2003-502-M7, Cook Inlet) as part of the Port Intermodal Expansion Project. (The SBS Project was then named "South Backlands Slope Hardening" and described in Narrative B of the June 2011 permit application). The work was not completed within the timeframe allowed by that permit; therefore, the Port requested reauthorization for construction of the project. Reauthorization was granted in January 2017.

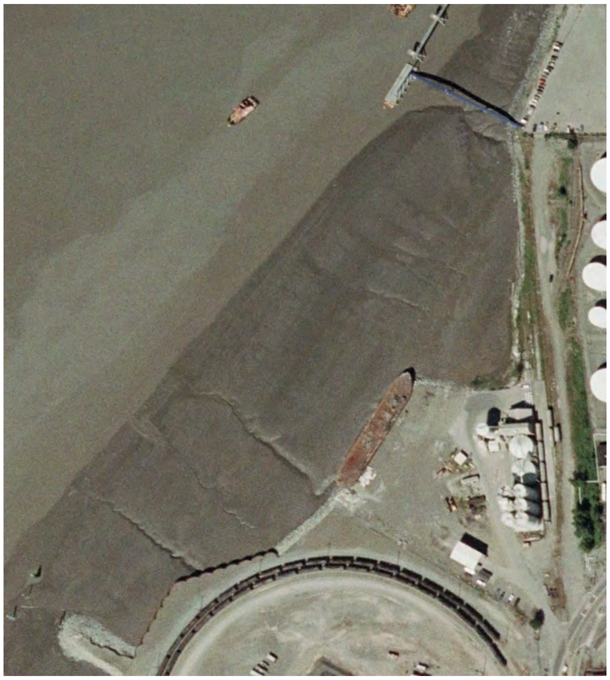

*Photo 1. Intertidal habitat visible before construction of South Backlands area, 2006.*

*Photo 2. South Backlands area, 2010.*

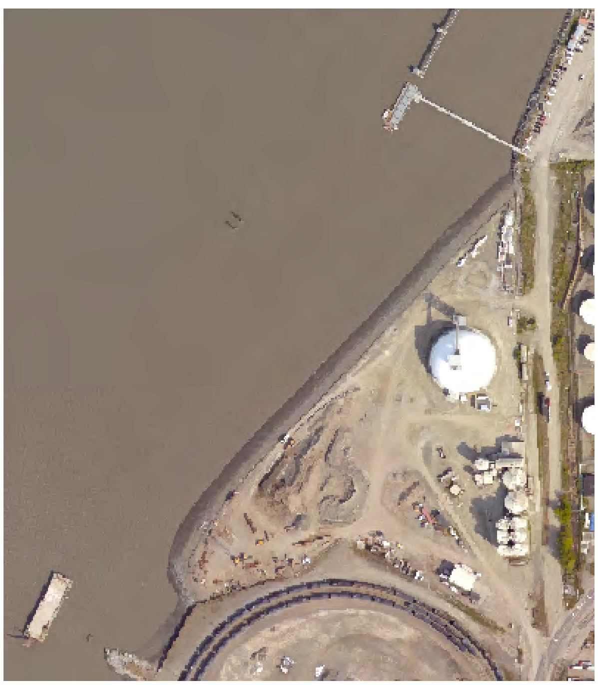

*Photo 3. Existing South Backlands area, 2016.*

*Photo 4. Fill footprint of future SBS Project superimposed on 2016 imagery.*

### 3.1.2 Freshwater EFH

Freshwater habitat near the Port is limited. Ship Creek (247-50-10060) and Sixmile Creek (247-50-10090) are the two nearest streams identified as anadromous by the AWC. Several other anadromous streams that empty into Knik Arm outside the assessment area provide essential spawning and/or rearing habitat for Pacific salmon. Fish migrating to and/or from these freshwater systems[7] contribute to the numbers and species that occur in Knik Arm; some of these fish likely use habitat in waters adjacent to the Port as they migrate to and from streams throughout Knik Arm.

#### 3.1.2.1 Ship Creek

Ship Creek, located along the southern edge of the Port and about 2.2 kilometers (1.4 miles) south of the Port, supports Pacific salmon (Johnson and Litchfield 2016). Ship Creek is a clear water stream that flows for nearly 48 kilometers (30 miles) from its headwaters (Chugach Mountains) to Knik Arm and drains approximately 319 square kilometers (123 square miles; KABATA 2007). The upper watershed, which flows through Chugach State Park for most of its length, is in a natural state and accounts for more than 80 percent of Ship Creek's watershed. In the lower watershed, Ship Creek has been modified as it flows through portions of JBER, urban Anchorage, and associated industrial areas.

Ship Creek provides EFH for coho, Chinook, chum, and pink salmon (Johnson and Litchfield 2016) and serves as an important recreational fishing resource[8]. Ship Creek Chinook and coho salmon runs, and to a lesser degree the pink and chum salmon runs, are enhanced by hatchery operations (KABATA 2007). Juvenile salmonids are reared at the William Jack Hernandez Sport Fish Hatchery for up to 2 years prior to release as smolts. Many of the smolts released from the hatchery reside in the Ship Creek area for a limited period of time before out-migrating to other parts of Knik Arm and Cook Inlet. Juvenile Chinook salmon captured from between Cairn Point and Point Woronzof were primarily of Ship Creek hatchery origin (Houghton et al. 2005).

The Ship Creek substrate consists primarily of gravel and cobble with some fines and is characterized as primarily riffle-run habitat in its lower reaches (KABATA 2007). The quality of habitat in the lower reaches has been negatively affected by fish passage barriers, impaired water quality, and industrial and commercial development. Although habitat quality has been compromised, lower Ship Creek still provides good quality habitat for fish and invertebrates (GeoNorth 2009). Roughly 80 percent of the habitat for which data are available in lower Ship Creek is considered good for fish and moderate for invertebrates (GeoNorth 2009).

#### 3.1.2.2 Sixmile Creek

Sixmile Creek is the nearest anadromous stream north of the Port. Sixmile Creek provides EFH for coho, sockeye, and pink salmon (Johnson and Litchfield 2016). During low tides, its intertidal channel extends south to Cairn Point, just north of the Port, while the mouth is located farther north. Between tidal phases, Sixmile Creek flows south across the tide flats within a confined, shallow (less than 15 centimeters [6 inches]), intertidal channel approximately 46–91 meters (150–300 feet) seaward of the toe of the bluff. This channel traverses approximately 4 kilometers (2.5 miles) before reaching subtidal waters offshore from Cairn Point (KABATA 2007).

[7] Other freshwater EFH streams include Goose, Fish, Willow and Cottonwood creeks; the Matanuska, Knik, and Eklutna rivers; Peters and Fire creeks; and Eagle River (Johnson and Litchfield 2016).

[8] Dolly Varden char (*Salvelinus malma*) and rainbow trout (*O. mykiss*) also use Ship Creek, but are not FMP-managed species.

## 3.2 FMP-Managed Fish Species

Life history summaries for fish species that are managed under a federal FMP and have been documented within 1.6 kilometers (1 mile) of the Port are provided below.

### 3.2.1 Pacific salmon

Marine and estuarine habitats in Knik Arm support five species of Pacific salmon during juvenile and adult life stages, including in waters adjacent to the Port. Nearby Ship Creek supports Chinook, coho, chum, and pink salmon, and Sixmile Creek provides habitat for sockeye, coho, and pink salmon (Johnson and Litchfield 2016). Adult salmon use the nearshore environments of Knik Arm as a migratory corridor to access spawning streams[9] in Knik Arm between May and September (KABATA 2006). Pacific salmon are important species for the sport and commercial fishery[10] within Cook Inlet and its tributaries, and are prey species for beluga whales.

Biologists sampled shoreline habitats in Knik Arm from July through November 2004, and both shoreline and mid-channel habitats from April through July 2005. Results indicate that juvenile salmon numbers throughout Knik Arm peak from May into August, depending on species. Biologists captured juvenile salmon in nearshore areas as well as in mid-channel surface waters of Knik Arm (Moulton 1997; KABATA 2006). Analysis of length, frequency, and timing patterns suggests that juvenile pink and chum salmon move through Knik Arm relatively quickly and do not grow much in this environment. Knik Arm appears to be important rearing habitat for the juvenile coho, Chinook, and sockeye salmon that emerged from streams that discharge into Knik Arm. Juveniles of these species appear to feed and actively grow in Knik Arm through August (FHWA and DOT&PF 1983; Houghton et al. 2005; KABATA 2006; Moulton 1997).

Juvenile salmon use of the Knik Arm shoreline and mid-channel habitats differs from juvenile salmon use of clearwater estuaries (Houghton et al. 2005), where early out-migrants are found residing primarily in nearshore habitats (see reviews by Healey 1991; Salo 1991; and Sandercock 1991). Physical conditions within Knik Arm are less like those of a clearwater estuary (e.g., moderate turbidity, high marine primary productivity) and more like those of a glacial river system (e.g., very high turbidity, low primary productivity, substantial allochthonous carbon inputs from decaying organic matter), especially in the spring and summer, when freshwater inputs (and coincidentally juvenile salmon use) are at their highest. This disparity between classic estuarine conditions and Knik Arm conditions substantially influences the ecological functions of Knik Arm and resulting behavior of juvenile salmon.

Researchers have indicated that many of the generalizations common to juvenile Pacific salmon use of nearshore environments of clear-water estuarine habitat may be partially or totally inapplicable in Knik Arm (Houghton et al. 2005)[11]. Extremely turbid waters of Knik Arm reduce the necessity of using shallow waters to escape predation (e.g., Cyrus and Blaber 1987a and 1987b; Gregory and Levings 1998 as cited in Houghton et al. 2005) and appear to obviate schooling behavior. The absence of natural intertidal structures limits nearshore physical refugia and the distribution of food sources (e.g., crustaceans, amphipods, insects [Hemiptera and Diptera]); organic detritus and vegetative mats within both mid-channel and shoreline waters likely reduce dependence on littoral habitat for feeding; and reduced

[9] Other freshwater EFH streams that empty into Knik Arm include Goose, Fish, Willow, and Cottonwood creeks; the Matanuska, Knik, and Eklutna rivers; Peters and Fire creeks; and Eagle River ((Johnson and Litchfield 2016).

[10] The nearest principal fishery is the salmon fishery in the Northern District of the Upper Cook Inlet Management Area.

[11] These include use of shallow water as refuge from predators (e.g., Heiser and Finn 1970); use of intertidal structures such as large woody debris, eelgrass, and kelp beds as refuge from predators (e.g., Brennan and Culverwell 2001); use of intertidal habitats due to abundance of epibenthic prey (e.g., Simenstad et al. 1982); and use of stream mouths and smaller estuaries for relief of osmoregulatory stresses (e.g., Myers et al. 1998); references cited in Houghton et al. 2005 Most of these functions are not provided for or are not necessarily exclusive to Knik Arm shorelines.

salinity within Knik Arm waters (averaging below 10 parts per thousand between June and August [KABATA 2006], coincident with peak juvenile use) provides favorable conditions for smoltification.

#### 3.2.1.1 Coho salmon

Coho salmon typically enter Knik Arm spawning streams from July through September, with a peak runtime in August (KABATA 2006). Eggs hatch in early spring, after which embryos remain in the gravel, relying on egg yolk until emerging in May or June. Juvenile coho spend one to three winters in streams before migrating to the sea as smolt (ADF&G 1994). Juvenile coho may also use estuarine areas in summer and return to fresh water to overwinter. Coastal streams, lakes, estuaries, and tributaries to large rivers generally provide rearing habitat for coho. Coho spend about 16 months at sea before returning to coastal areas to spawn in natal streams (NPFMC 1998b; KABATA 2006).

Sixmile and Ship creeks provide spawning and rearing habitat for coho salmon; juvenile coho may linger in intertidal channels during out-migration. Hatchery-released coho salmon likely constitute the majority of coho in Ship Creek.

Biologists sampled shoreline habitats in Knik Arm from July through November 2004, and both shoreline and mid-channel habitats from April through July 2005. Coho salmon were the most abundant juvenile salmonid captured in nearshore beach seines in 2005 and the second most abundant in 2004 (Houghton et al. 2005). Coho were the most abundant juvenile salmon captured in April and their numbers in Knik Arm peaked in July and were still present into late November (Houghton et al. 2005).

Adult coho were commonly caught in beach seines during July and August, but were not captured in after August (KABATA 2006). These results are consistent with reported Anchorage and Matanuska-Susitna freshwater runtimes. Coho salmon likely use waters adjacent to the Port while migrating to spawning habitat.

#### 3.2.1.2 Chinook salmon

Adult Chinook salmon occur over a broad geographic range that encompasses different ecotypes and diverse habitats throughout Alaska. Chinook salmon generally spawn from mid-June to mid-August. The freshwater runtime for Chinook salmon in Knik Arm typically peaks in June and July; adult Chinook are present during May through August (KABATA 2006). Eggs hatch in the late winter or early spring, and juveniles may immediately migrate to the ocean or remain in streams for up to a few years (ADF&G 1994). Chinook salmon spend between 1 to 6 years at sea before returning to natal streams to spawn (KABATA 2006).

Ship Creek supports spawning and rearing Chinook salmon. Hatchery-raised juveniles are released into Ship Creek and likely comprise the majority of Chinook salmon returning to Ship Creek. Both hatchery and natural stocks of Chinook salmon may linger in lower Ship Creek during out-migration and may use the upper intertidal mudflats during high stages of the tidal cycle during both out-migration and return (KABATA 2006).

Juvenile Chinook salmon abundance peaked in Knik Arm in May and June, and declined into mid- and late summer during the 2004–2005 sampling efforts (Houghton et al. 2005). Juvenile Chinook salmon captured in May were considerably longer than those captured in June, likely due to the May smolt releases from the hatchery on Ship Creek. A single adult Chinook salmon was captured during a beach seine survey in May 2005, prior to peak spawning (Houghton et al. 2005).

#### 3.2.1.3 Sockeye salmon

Sockeye salmon exhibit a greater variety of life history strategies than other Pacific salmon (NPFMC 2012). Sockeye salmon generally spawn in late summer and autumn. They use a wide variety of spawning habitats, such as rivers, streams, and upwelling areas along lake beaches. Eggs hatch during winter and the young salmon move into the rearing areas. In systems with lakes, juveniles usually spend

1 to 3 years in fresh water before migrating to the ocean as smolt, usually in spring. However, in systems without lakes, many juveniles migrate to the ocean soon after emerging from the gravel (ADF&G 1994). Anadromous sockeye salmon typically spend 1 to 4 years in the ocean before returning to spawn (NPFMC 2012).

Sockeye salmon were the most abundant juvenile salmonids captured from Knik Arm during beach seine sampling from July to November 2004 (Houghton et al. 2005). During the April through July 2005 sampling period, juvenile sockeye were third in abundance among salmonids, behind coho and Chinook in beach seine samples. Overall, juvenile sockeye catches were variable from May through August, highest in August, and lowest in April and in September through October. No juvenile sockeye were captured in November. Adult sockeye were caught in beach seine samples during July. No adult sockeye salmon were captured during August to November beach seine sampling. This is consistent with the local freshwater adult sockeye salmon runtime peak of July through August (KABATA 2006).

Sixmile Creek provides spawning and rearing habitat for sockeye salmon (Johnson and Litchfield 2016). Migrating juveniles and adults likely use habitat adjacent to the Port during migration. Additionally, juveniles likely use the intertidal channel of Sixmile Creek and nearshore intertidal habitat within and adjacent to the Port while their osmoregulatory systems adjust to the brackish waters (relatively low salinity) of Knik Arm.

#### 3.2.1.4 Pink salmon

Pink salmon are distinguished from other Pacific salmon by having a fixed 2-year life span. Because of their life span, pink salmon spawning in natal streams in odd and even years are reproductively isolated from each other and have developed into genetically different lines (NPFMC 2012). Adult pink salmon enter spawning streams between late June and mid-October. Pink salmon spawn within a few miles of the coast; spawning within the intertidal zone or the mouth of streams is quite common. Shallow riffles, where flowing water breaks over coarse gravel or cobble-size rock, and the downstream ends of pools are favored spawning areas. Eggs hatch in early to mid-winter and the fry swim up out of the gravel and migrate downstream into salt water by late winter or spring (ADF&G 1994; KABATA 2006).

No juvenile pink salmon were observed in July through November 2004 during shoreline sampling in Knik Arm (KABATA 2006). Few were expected because the larger even-year pink runs in this region of Alaska produce odd-year out-migrants. In 2005, only 33 pink salmon juveniles were captured in beach seines (1.9 percent of all juvenile salmonids), and most of those were captured in May (Houghton et al. 2005). A few pink salmon juveniles were captured in April, June, and July. Adult pink salmon were caught in beach seine samples in July but not captured during August to November surveys (KABATA 2006). This pattern is consistent with the local area freshwater runtime peak of July (present during July and August) for adult pink salmon.

Sixmile and Ship creeks support spawning pink salmon (Johnson and Litchfield 2016). Adult pink salmon likely pass through habitat within and adjacent to the Port during migration to spawning habitat, and juveniles may linger in intertidal habitats during out-migration.

#### 3.2.1.5 Chum salmon

Chum salmon spawn between June and November in streams, side-channel sloughs, and intertidal portions of streams (NPFMC 2012). In Knik Arm area streams, freshwater run time peaks for chum salmon in July and August (KABATA 2006). Juvenile chum salmon tend to linger and forage in the intertidal areas at the head of bays; estuaries are important for chum salmon rearing during spring and summer. Chum salmon fry, like pink salmon, do not overwinter in the streams, but migrate out of the streams directly to the sea shortly after emergence. This out-migration occurs between February and June, but most fry leave the streams during April and May (NPFMC 2012).

Shoreline sampling of Knik Arm in 2004 and 2005 yielded few chum salmon juveniles in April, followed by significant increases in May and June (Houghton et al. 2005). Chum salmon were not captured during July in either year sampled. Overall, chum salmon capture numbers were not as high as capture numbers for coho, Chinook, or sockeye salmon. Low numbers of adult chum were caught in beach seine samples during July 2004; no adult chum salmon were captured during August to November beach seine sampling (Houghton et al. 2005).

Habitat in Ship Creek supports chum salmon (Johnson and Litchfield 2016). As with the other salmon species, chum salmon use estuarine habitat during out-migration, return to Knik Arm as adults, and likely use intertidal habitats throughout the Knik Arm during high tidal stages.

## 3.2.2 Forage fish

Forage fish species, including Pacific herring  and anadromous longfin smelt and eulachon, are known to occur in Knik Arm. Longfin smelt was the second most abundant species captured during the 2004 sampling events and third most abundant species captured in beach seines during 2005 (Houghton et al. 2005). Few longfin smelt were captured during a spring 1983 sampling event. Relatively low numbers of Pacific herring have been captured from Knik Arm during the 1983 sampling, 2004-2005 surveys, and sampling efforts at Nearshore Fish Atlas sites (Houghton et al. 2005; NOAA 2016).

### 3.2.2.1 Eulachon

Eulachon, also commonly referred to as hooligan, are anadromous fish that spawn in the lower reaches of coastal streams from northern California to the Bering Sea (Bartlett and Ryan 2012). Eulachon reach up to 25 centimeters (about 10 inches) in length (Mecklenberg et al. 2002), weigh 40–60 grams, and are sexually dimorphic. Eulachon are a valuable prey species for humans and wildlife, including beluga whales and other marine mammals, fish, and birds because of their high lipid content (Bartlett and Ryan 2012).

Adult eulachon migrate to the mouths of spawning streams and gather in large schools typically in April, prior to spawning in May (Bartlett and Ryan 2012).  While eulachon return to the same general area to spawn, they do not necessarily spawn in their natal stream. Eulachon broadcast their eggs, which adhere to sand, gravel, or woody debris. Eggs hatch in 3 to 6 weeks and the young are carried to the sea with the current, where they feed mainly on copepod larvae and other plankton (Bartlett and Ryan 2012). Eulachon are believed to leave estuary habitats within their first year of life (Cambria Gorton Ltd. 2006). Juvenile and adult eulachon feed primarily on plankton. After 3 to 6 years at sea, adults return to their spawning grounds.

In 2004 and 2005, 199 eulachon were captured in beach seine sets at stations within the middle and outer Knik Arm and 8 were caught during tow net sampling (KABATA 2006). Several gravid adults were captured in April, but most fish were caught in May as post-spawn fish, indicating a relatively short spawning period within the streams and rivers of Knik Arm. Eulachon spawning in the Susitna River generally peaks in late May. No eulachon were observed in July through November 2004 or 2005 (KABATA 2007). Data suggest that eulachon use habitat in Knik Arm primarily during migration.

## 3.2.3 Groundfish

### 3.2.3.1 Pacific cod

Pacific cod are demersal schooling fish that concentrate in shelf edge (i.e., 0- to 50-meter [0- to 164-foot] depth) and upper slope habitat from January through April. Spawning occurs in these deeper waters in the spring, followed by a general movement to shallower waters (<100 meters [328 feet]) in summer (DiCosimo 2001). Pacific cod prefer mud, sandy mud, muddy sand, or sand in deep waters (Morrow 1980). Pacific cod eggs are found on the inner and middle continental shelf habitat. Larvae are epipelagic (zone where photosynthesis can occur), occurring in the upper 45 meters (148 feet) of the ocean. Juveniles can be found in water between 60 and 150 meters (197 to 492 feet) deep. Pacific cod adults feed on fishes, octopuses, and large benthic and benthopelagic crustaceans (Cohen et al. 1990), while young are expected to feed on copepods and similar organisms (Morrow 1980; KABATA 2006).

Data suggest that the density of Pacific cod is very low in Knik Arm. The Nearshore Fish Atlas of Alaska documents the capture of low numbers of Pacific cod in nearby waters, including six in Eagle River Bay and two near Fire Island (NOAA 2016). No Pacific cod were collected during the 2004 Knik Arm shoreline sampling or during the subsequent year's shoreline and mid-channel sampling efforts from April through July, or during extensive seine and trawl surveys conducted in Knik Arm in 1983 (Houghton et al. 2005; FHWA and DOT&PF 1983).

#### 3.2.3.2 Walleye pollock

Walleye pollock eggs and larvae are pelagic and are found on the middle and outer continental shelves of the GOA. Juvenile pollock inhabit the inner, middle, and outer continental shelves and oceanographic features such as basins, fronts, and upwelling. Adults are semidemersal (generally demersal but sometimes near the surface). Pollock spawn in waters more than 90 meters (295 feet) deep. Adult walleye pollock congregate where food is concentrated in middle and outer continental shelf areas, feeding on a variety of fishes and crustaceans, but primarily on krill (NPFMC 2016; KABATA 2006).

Only 28 walleye pollock were collected during the 2-year sampling effort of Knik Arm (Houghton et al. 2005). Three were caught in beach seine sampling conducted in April through July 2005, and tow nets captured 25 walleye pollock in July (Houghton et al. 2005). Shoreline sampling of Knik Arm during July through November 2004 and mid-channel sampling in April to July 2005 produced no walleye pollock (KABATA 2006). Walleye pollock were not reported as having been captured during trawl and beach seine sampling conducted throughout Knik Arm in 1983 (FHWA and DOT&PF 1983). Moulton (1997) reports the capture of walleye pollock in Upper Cook Inlet during two net surveys in 1993, including near Fire Island. These data suggest that the density of this species is quite low in Knik Arm. Walleye pollock captures in Knik Arm are not identified by the Nearshore Fish Atlas of Alaska (NOAA 2016).

#### 3.2.3.3 Sculpin

The sculpin family includes numerous species that have successfully adapted to a wide range of salinities and environments. Cottids are found in freshwater as well as in marine and estuarine areas of high and low salinity. Cottids, which are generally small (10–15 centimeters [4–6 inches], but up to 100 centimeters [about 39 inches]) bottom-dwelling fishes, are known to use a wide range of substrates, including rock, sand, mud, cobble, gravel, and sandy mud (NPFMC 2016).

Pacific staghorn sculpin was the only cottid species collected during the 2-year sampling in Knik Arm (KABATA 2006). A total of three Pacific staghorn were captured. The three Pacific staghorn sculpin were captured during the April–July 2005 beach seine sampling near the Port MacKenzie area. Low capture numbers suggest a low species density in Knik Arm. The low density of this species in Knik Arm is also supported by sampling conducted during 1983, wherein only 3 of the 5,455 fish caught by beach seine were Pacific staghorn sculpin, the only sculpin species collected (FHWA and DOT&PF 1983).

Pacific staghorn sculpin spawn in shallow coastal waters during October through March, with a peak in January and February (Jones 1962 as cited in KABATA 2006). Larvae of this species are planktonic, and juveniles and later stages are demersal. Pacific staghorn sculpins become sexually mature near the end of their first year of life, at which time they leave the shallow spawning ground to inhabit deep offshore waters (Tasto 1975 as cited in KABATA 2006). Pacific staghorn sculpin are opportunistic feeders, consuming a wide variety of prey items, including crabs, shrimp, worms, mollusks, and many kinds of juvenile and adult fishes (KABATA 2006). The Nearshore Atlas of Alaska identifies the capture of one great sculpin (*Myoxocephalus polyacanthocephalus*) near Fire Island (NOAA 2016).

# 4 Acoustical Environment

## 4.1 Underwater Sound Descriptors

Sound is a physical property consisting of minute vibrations that travel through a medium, such as air or water. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. In the case of marine construction work, the frequency range of interest is 10 to 10,000 Hz.

Underwater sounds are described by a number of commonly used terms. The instantaneous peak sound pressure level (SPL) is the instantaneous maximum or minimum overpressure observed during each pulse or sound event and is presented as dB (referenced to a pressure of one microPascal [dB re: 1 µPa]). The root-mean-square SPL (dB RMS) is the square root of the energy divided by a defined time period (pulse or over a defined averaging period). RMS is used to describe disturbance-related effects from underwater impulse-type noises (WSDOT 2008). Sound levels throughout this report are presented in dB re: 1 µPa.

Transmission loss (TL) is the term used to describe the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water chemistry, and bottom composition and topography. Cylindrical spreading occurs when sound energy spreads outward in a cylindrical fashion bounded by the bottom sediment and water surface. Spherical spreading occurs when the source encounters little to no refraction or reflection from boundaries (e.g., bottom, surface), such as in deep water.

## 4.2 Ambient Noise in Knik Arm

Ambient noise is background noise comprised of myriad sources from multiple locations (Richardson et al. 1995). Ambient noise can vary with location, time of day, tide, weather, season, and frequency on scales ranging from a second to a year (Richardson et al. 1995). Background noise levels at the Port are known to be variable over time due to a number of biological, physical, and anthropogenic sources. Biological noise includes sounds produced by marine mammals, fish, and invertebrates. Physical noise includes waves at the water surface, currents, earthquakes, moving sediments and silts, ice, and atmospheric noise. Anthropogenic noise includes vessels (small and large), oil and gas operations, maintenance dredging, aircraft overflights, construction noise, and other human-related sources.

Background sound levels were most recently measured in 2016 at two locations during a 3-day break in pile installation activities during the Port Test Pile Program. The median ambient noise levels near the Port's south floating dock and about 1 kilometer offshore were 117 and 122.2 dB re: 1 µPa, respectively (Kiewit Infrastructure West Co. [KIWC] 2016).

## 4.3 Noise Thresholds for Fish

In 2003, a Fisheries Hydroacoustic Working Group[12] (FHWG) formed to address underwater sound impacts to fish and marine mammals associated with marine construction. Specifically, the FHWG developed interim acoustic criteria to protect fish from pile-driving impacts. The acoustic criterion

[12] The FHWG is comprised of NMFS, the U.S. Fish and Wildlife Service, Federal Highway Administration, and multiple state transportation departments and other agencies.

identifies peak SPLs and accumulated sound exposure levels (SELs) noise thresholds (re: 1 µPa) for injury to fish exposed to underwater noise from impact pile driving as follows:

- Peak SPL is 206 dB for all fish;
- Accumulated SEL is 187 dB for fish weighing 2 grams or more; and
- Accumulated SEL is 183 dB for fish less than 2 grams.

The FHWG criteria assume that fish will be injured when exposed to the peak SPL (206 dB) and, depending on size of fish, an accumulated SEL of 183 dB or 187 dB. Injury to fish exposed to these noise levels can range from a brief acoustic annoyance to instantaneous lethal injury (Hastings and Popper 2005; WSDOT 2008). The threshold for behavioral disturbance to fish from impact driving is 150 dB RMS[13] re: 1 µPa (WSDOT 2008). Impacts to fish have not been observed in association with vibratory hammers (WSDOT 2008). Cumulative SEL fish injury criteria do not exist for vibratory pile installation.

## 4.4 Methods for Estimating Distances to Noise Thresholds for Fish during Pile Installation

Installing piles with an impact hammer is anticipated to be the primary underwater sound-generating activity associated with the proposed PCT Project. The NMFS developed an underwater acoustic calculator to predict sound levels at various distances from the source and to predict the distance at which injury thresholds could potentially be reached during impact hammer pile installation[14]. Since the intensity of the underwater noise decreases with increased distance from the source (e.g., pile driving) due to spreading (i.e., spreading loss), the NMFS calculator uses practical spreading model to predict sound levels at various distances. The NMFS typically recommends a default practical spreading loss of 15 dB per tenfold increase (i.e., Log 15) in distance if reliable data are not available.

The Port collected site-specific underwater acoustic data while 48-inch-diameter steel pipe piles were installed using an impact hammers with and without noise attenuation systems[15], during the Test Pile Program (TPP) in spring 2016 (Austin et al. 2016). In 2007, the Port collected underwater acoustic data during impact and vibratory hammer installation of steel H-piles during a previous test pile study (URS 2007). Based largely on these site-specific data, Illingworth & Rodkin (2017) identified median sound levels, frequency characteristics, and TL coefficients for unattenuated pile driving appropriate to predict distances to noise thresholds for impact hammer pile installation during the PCT Project. Illingworth & Rodkin (2017) also made adjustments to these data to predict levels for 36-inch diameter fender piles.

Based on the site-specific TPP acoustic data, Illingworth & Rodkin (2017) computed an average TL of 17 dB (per tenfold increase in distance) for SEL and 19 dB for Peak and RMS for installing 48-inch and 36-inch-diameter piles with an impact hammer. The average TL for H pile installation was 23 dB during vibratory pile installation. These TL estimates were used to predict distances to fish noise thresholds for the PCT Project, using the NMFS calculator, as summarized in **Table 1.**

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[13] RMS is used to describe disturbance-related effects from underwater impulse-type noises (WSDOT 2008).

[14] The formula for transmission loss is TL = X log10 (R/10), where R is the distance from the source, assuming the near source levels are measured at 33 feet, or 10 meters.

[15] A passive resonator system was deployed during installation of four piles and a confined bubble curtain was deployed during the installation of four other piles; two piles were installed without any noise attenuation systems during the spring 2016 TPP.

*Table 1. Summary of unweighted sound levels and transmission loss coefficients for unattenuated pile installation based on acoustic data collected for the Port 2016 and 2007 TPPs.*

| Pile Diameter | Near-Source Level and Transmission Loss (TL) Coefficient | | |
|---|---|---|---|
| | Peak SPL (dB re:1µPa) | SEL per Strike (dB re: 1µPa$^2$sec) | RMS SPL (dB re:1µPa) |
| 48-inch-diameter (12 meters from impact pile strike) | 213 dB TL = 19 | 186 dB TL = 17 | 200 dB TL = 19 |
| 36-inch diameter (12 meters from impact pile strike) | 210 dB TL = 19 | 183 dB TL = 17 | 197 dB TL = 19 |
| H-Type Pile (10 meters from vibrated pile) | <180 dB TL = -- | 164 dB TL = 23 | 164 dB TL = 23 |

Sources: Illingworth & Rodkin 2017; URS 2007.

A bubble curtain was found to be an effective sound attenuation device during the 2016 TPP data collection effort and would therefore be suitable for deployment during impact installation of piles for the PCT Project. Based on review of the TPP data, Illingworth & Rodkin (2017) estimate an approximate 5 dB attenuation reduction can be assumed when a bubble curtain is used during impact hammer installation.

Unweighted sound levels, TL coefficients data were input into the NMFS Pile Driving Calculator (2012) to estimate distances to noise thresholds for fish during both unattenuated and attenuated (e.g., bubble curtain) impact hammer pile installation, as proposed by the PCT Project. While the NMFS calculator assumes that fish are stationary during pile installation, which would not be anticipated since Knik Arm experiences strong tidal currents, the calculator is nonetheless a useful tool for assessing the spatial extent of potential impacts to fish. Estimated distances to noise thresholds for fish during impact hammer driving using the NMFS calculator are summarized in **Section 5**.

# 5 Analysis of Effects to EFH

This section presents an analysis of effects the proposed action may have on EFH and managed fish species. An adverse effect refers to any impact that reduces quality or quantity of EFH, and may include direct (e.g., habitat loss or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 Code of Federal Regulations [CFR] § 600.810).

## 5.1 Direct and Indirect Effects

Impacts to FMP-managed fish species and EFH from activities proposed by the PCT Project may include:

- Fish injury or mortality from underwater noise during pile installation
- Disruption in fish behavior or movement during pile installation and removal
- Addition of overwater structures over intertidal and shallow subtidal habitats
- Reduction in habitat quality and/or modification of habitat function
- Increased turbidity during construction (pile installation and removal)
- Re-suspension and distribution of contaminants during construction, if present
- Physical alteration of habitat after construction

- Changes in hydrologic patterns after construction

Direct effects associated with proposed project components are summarized in the subsections that follow. **Section 6** presents a summary of conservation measures and **Section 7** summarizes potential impacts of the PCT Project to EFH.

### 5.1.1 Pile Installation and Removal

The Port proposes to install up to 203 permanent pipe piles and an estimated 44 temporary H piles in Knik Arm to support the new PCT (**Table 2**). The permanent pipe piles would be installed using an impact hammer. Proposed locations for the permanent piles are shown in **Figure 2**. The temporary H-piles would be installed to guide the installation of the battered piles for dolphins, and subsequently removed, using a vibratory hammer. Pile installation and removal activities are anticipated to occur between April 1 and November 30, 2018.

*Table 2. Pile details and estimated effort required for pile installation (and removal of temporary piles), as proposed by the PCT Project*

| Pile Size, Material, and Purpose | | Number of Piles | Mean Depth (ft) | Strikes per Pile[a] | Estimated Minutes Per Pile | Total Hours | Total Days[b] |
|---|---|---|---|---|---|---|---|
| ***Impact Hammer Installation*** | | | | | | | |
| 48” Composite (Steel pipe with reinforced concrete) | Trestles & Platform | 87 | 99 | 2969 | 86 | 124 | 58 |
| 48” Steel pipe Battered piles | Mooring Dolphins | 48 | 146 | 4410 | 127 | 102 | 32 |
| | Breasting Dolphins | 40 | 188 | 5659 | 163 | 109 | 27 |
| 36” Steel pipe | Fenders | 28 | 26 | 781 | 23 | 11 | 7 |
| ***Vibratory Installation and Removal*** | | | | | | | |
| H-piles (12”x16”x130’) | Temporary Construction | 44 | 30 | | 15-Install 15-Remove | 11 | 11-Install 11-Remove |
| | **PCT Project Totals: 247 piles** | | | | | **356** | **146** |

Note: Durations and strike rates subject to vary based on the Contractor’s means and methods.
[a] Estimate based on mean strike rate of 26.2 strikes per minute, as calculated from TPP data collected at the Port in 2016.
[b] Estimate based on average production rates of 1.5 piles per day for 48-inch piles, 4 piles per day for 36-inch piles, and 4 piles per day for temporary H-type piles; estimate represents total number of days but not necessarily consecutive days.

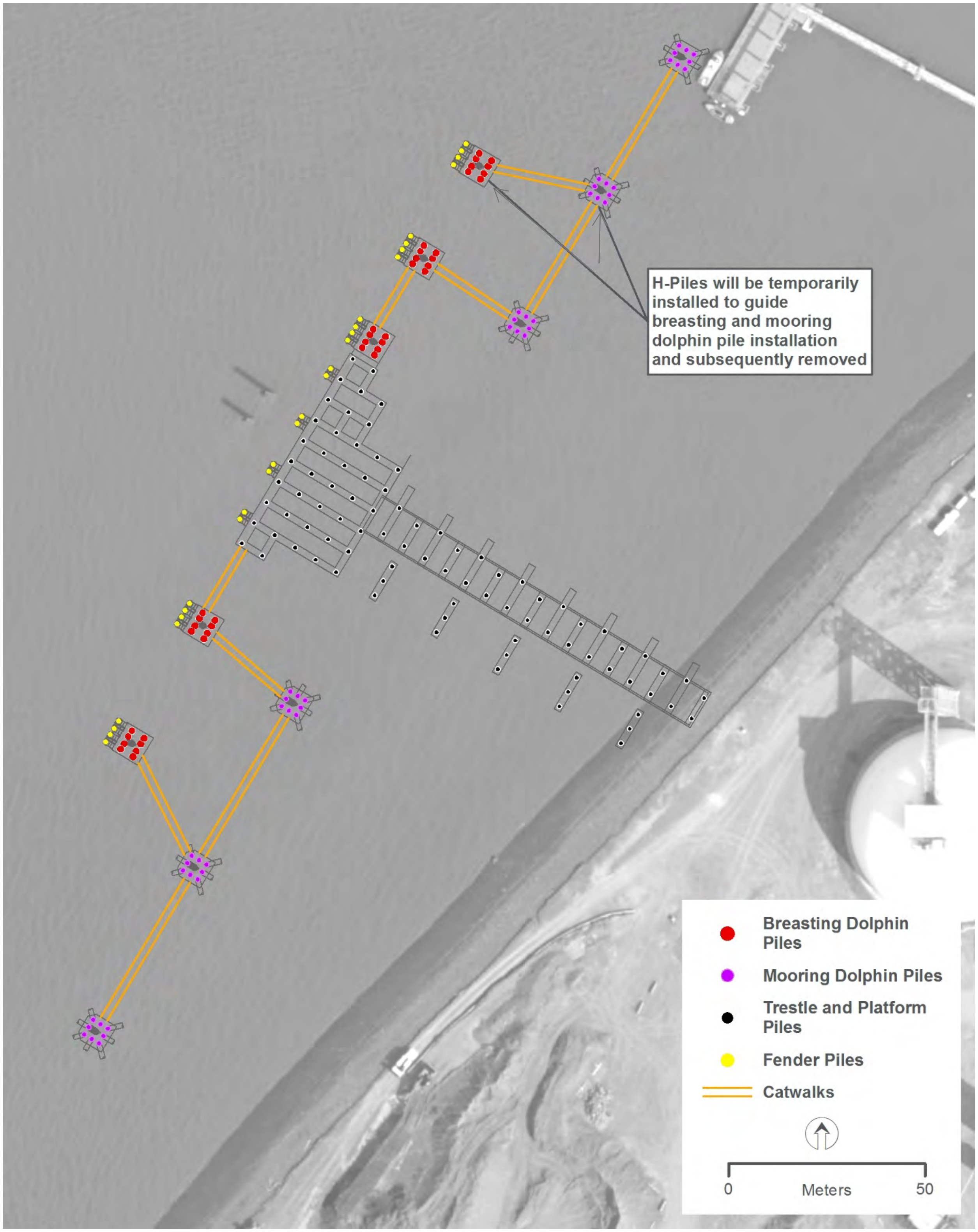


*Figure 2. Locations of permanent piles proposed by the PCT Project*

#### 5.1.1.1 Impact Hammer

Impact hammers lift a heavy weight and then drop it onto the top of a pile, repeatedly, to drive it into the substrate. Impact pile driving produces short, intense pulsed-typed sounds that are typically considered isolated events, or are repeated in some succession. Such sounds have the potential to result in physical injury to fish because they are characterized by a relatively rapid rise in ambient pressure, followed by a period of diminishing, oscillating maximal and minimal pressures. While exposed fish may exhibit a startle response to the first few initial strikes of an impact hammer, that response wanes, and the fish may remain in proximity to potentially harmful sound levels (NMFS 2011, 2016). Therefore, impact hammers are considered more harmful to fish than vibratory hammers since fish are exposed to harmful pressures for longer periods.

It is estimated that impact pile driving would on average occur for a total of **346 hours** over an estimated **146 days** from April 1 through November 30, 2018 (**Table 2**). Installation of 36-inch- and 48-inch-diameter piles with an impact hammer is expected to produce underwater sound pressure waves that may displace, harm, or kill fish in Knik Arm. Adults and juveniles of five Pacific salmon species utilize habitat throughout Knik Arm during the timeframe in which impact pile driving is anticipated to occur. The PCT Project therefore has the potential to adversely affect FMP-managed juvenile and adult Pacific salmon and temporarily affect habitat quality during impact hammer operations. Migrating eulachon would be expected to occur in Knik Arm in the vicinity of the Port during in April, May, and June; therefore, this species would likely be affected when impact hammers are in operation from April through June.

The effects of sound on fish are varied and range from avoidance to acute and sometimes fatal effects (damage to auditory receptors and rupture of the swim bladder to chronic effects (behavioral changes and long-term stress) (Hastings and Popper 2005). Factors that can influence the degree to which an individual fish responds to sound exposure include species and size[16]; vertical location of fish and proximity to source; tidal current, character of surface water waves, and water depth around pile; substrate composition and texture; peak sound, frequency, and rise time (shape of sound wave); effectiveness of attenuation; and the presence of predators (NMFS 2011).

To minimize fish exposure to potentially harmful underwater noise levels, an encapsulated bubble curtain would be deployed during impact hammer pile installation from August through October, during which time beluga whales are likely to occur in the area. Estimates for the extent of SPLs, as distance in meters, to reach fish injury thresholds (impact zones) with and without a 5-dB attenuation reduction are summarized in **Table 3**. These estimates are based on peak and average RMS[17] SPLs and accumulated SELs from impact driving during the TPP, and the practical spreading loss propagation assumptions described in **Section 4**. As demonstrated by these estimates, reducing sound levels by only 5 dB reduces the impact zones considerably.

Accumulated SELs associated with impact pile driving are anticipated to vary daily, depending on the daily number of strikes and size of piles installed. Fish weighing less than 2 grams (e.g., young of the year pink salmon) would be exposed to the interim cumulative SEL 183 dB threshold within about 799 meters of impact driving 48-inch piles when the bubble curtain is deployed. The distance that fish larger than 2 grams would be exposed to interim cumulative SEL 187 dB varies, depending on the number of strikes made per day, from 587 to 799 meters (1,926 to 2,621 feet) during attenuated 48-inch-diameter pile installation (**Figure 3**). The estimated zones for potential injury would be considerably larger during unattenuated impact hammer activity. Estimated distances to noise thresholds during both attenuated

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[16] Fish species may respond differently due to physiological differences such as hearing mechanism, hearing capabilities and thresholds, and presence of swim bladder (Hastings and Popper 2005). In general, smaller fish may be more susceptible to noise impacts than large fish (Yelverton et al. 1975).

[17] RMS is used to describe disturbance-related effects from underwater impulse-type noises (WSDOT 2008).

and unattenuated impact installation of 36-inch-diameter piles are considerably less (**Table 3**;

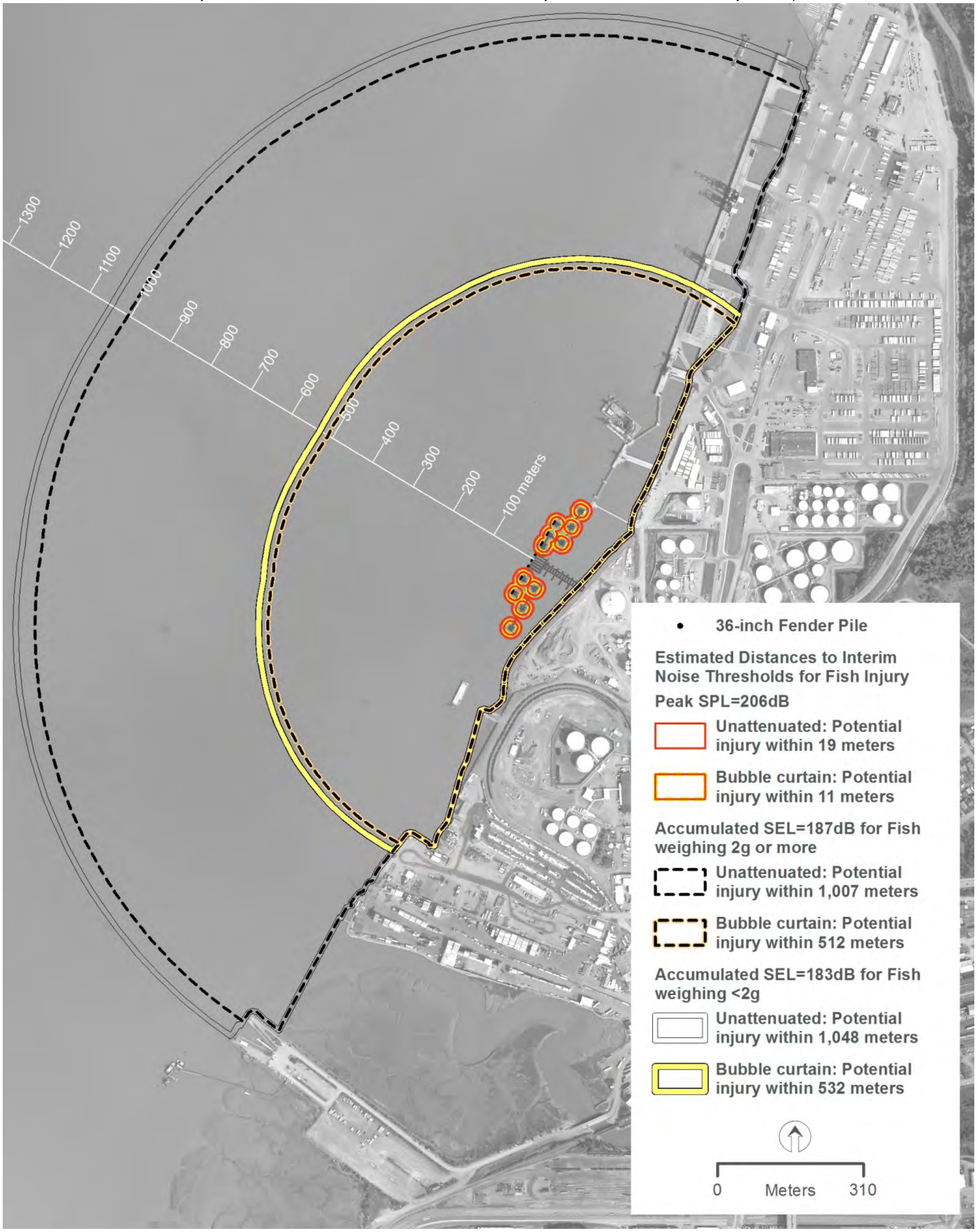


**Figure** 4).

*Table 3. Estimated extent of sound pressure levels as distance in meters to NMFS' Interim Fish Acoustic Criteria for installing one or more 48-inch-diameter piles with an impact hammer or up to six 36-inch diameter piles, with and without the use of a bubble curtain, using the NMFS underwater acoustic calculator*

<table>
<tr><td colspan="3"></td><td colspan="8">Estimated Distances to Noise Thresholds in meters (m)</td></tr>
<tr><td colspan="3"></td><td colspan="4">Impact Hammer Installation<br>Unattenuated (No Bubble Curtain)</td><td colspan="4">Impact Hammer Installation<br>Attenuated by Bubble Curtain[a]</td></tr>
<tr><td colspan="3"></td><td colspan="3">Onset of Physical Injury</td><td>Behavior</td><td colspan="3">Onset of Physical Injury</td><td>Behavior</td></tr>
<tr><td rowspan="2">Pile Diameter and Type</td><td rowspan="2">Strikes per pile[b]</td><td rowspan="2">Piles per day</td><td>Peak[c]</td><td colspan="2">Cumulative SEL[d]</td><td>RMS[c]</td><td>Peak[c]</td><td colspan="2">Cumulative SEL[d]</td><td>RMS[c]</td></tr>
<tr><td>206 dB</td><td>Fish≥2g 187 dB</td><td>Fish<2g 183 dB</td><td>150 dB</td><td>206 dB</td><td>Fish≥2g 187 dB</td><td>Fish<2g 183 dB</td><td>150 dB</td></tr>
<tr><td rowspan="2">48" Composite Trestles & Platform</td><td rowspan="2">2,969</td><td>1</td><td rowspan="5">28 m</td><td>1,156 m</td><td rowspan="2">1,573 m</td><td rowspan="5">5,138 m</td><td rowspan="5">15 m</td><td>587 m</td><td rowspan="5">799 m</td><td rowspan="5">2,083 m</td></tr>
<tr><td>≥2</td><td>1,573 m</td><td>799 m</td></tr>
<tr><td rowspan="2">48" Battered Pipe Mooring Dolphins</td><td rowspan="2">4,410</td><td>1</td><td colspan="2" rowspan="3">1,573 m</td><td>741 m</td></tr>
<tr><td>≥2</td><td rowspan="2">799 m</td></tr>
<tr><td>48" Battered Pipe Breasting Dolphins</td><td>5,659</td><td>≥1</td></tr>
<tr><td rowspan="4">36" Pipe Fenders</td><td rowspan="4">781</td><td>1</td><td rowspan="4">19 m</td><td>351 m</td><td>604 m</td><td rowspan="4">3, 572 m</td><td rowspan="4">11 m</td><td>178 m</td><td>307 m</td><td rowspan="4">1,949 m</td></tr>
<tr><td>2</td><td>528 m</td><td>907 m</td><td>268 m</td><td>461 m</td></tr>
<tr><td>4</td><td>794 m</td><td>1,048 m</td><td>403 m</td><td>532 m</td></tr>
<tr><td>6</td><td>1,007 m</td><td>1,048 m</td><td>512 m</td><td>532 m</td></tr>
</table>

Note: Peak SPL expressed as dB re:1uPa; Cumulative SEL expressed as dB re:1uPa-sec$^2$; RMS expressed as dB re:1uPa.
[a] Assumes a 5 dB sound attention reduction with a bubble curtain based on data collected during the 2016 TPP (Illingworth & Rodkin 2017).
[b] Strike per pile is based on representative data collected during the 2016 TPP.
[c] Assumes a TL coefficient of 19 dB for Peak SPL and RMS, based on review of data collected during the TPP (Illingworth & Rodkin 2017).
[d] Assumes a TL coefficient of 17 dB for SEL, based on review of data collected during the TPP (Illingworth & Rodkin 2017).

The response of fish exposed to interim injury thresholds could range from no effect or a brief acoustic annoyance[18] to instantaneous lethal injury (Hastings and Popper 2005; WSDOT 2008). Fish response is difficult to predict, and the extent of injury or harm to fish is difficult to quantify. Injury could include temporary loss of hearing, permanent loss of hearing, ruptured swim bladder, internal hemorrhaging, or other non-auditory tissue damage. Injured fish would also be more susceptible to predation.

Strong currents within Knik Arm (maximum currents greater than 7 knots) would likely limit exposure of juvenile salmon in proximity to the source and its maximum noise levels. Considering that it will take several hours to drive one pile and there will be multiple tides throughout the day, the likelihood of a juvenile salmon being exposed within the accumulated injury isopleth is assumed to be minimal. However, the potential for juvenile salmon to occupy habitat in proximity to impact hammer operation for extended periods increases during slack tides, when currents are at their lowest. For most tide cycles, slack tide would occur for less than 1 hour during high and low tides.

With the bubble curtain in place, it is estimated that fish within 15 meters (49 feet) of impact hammer installation of 48-inch-diameter piles and those within 11 meters (36 feet) of 36-inch-diameter pile impact driving would be exposed to the peak SPL 206 dB for fish injury. This indicates that fish of any size (e.g., adult and juvenile salmon) within these distances of a single impact strike may be exposed to a peak SPL of 206 dB and therefore may be injured (**Figure 3, Table 3**). Short-term exposure to peak SPLs above 190 dB is thought to impose physical harm on fish (Hastings 2002 in NMFS 2011). Exposure to 155 dB may be sufficient to stun small fish, making those fish more susceptible to predation (NMFS 2011).

[18] No behavioral abnormalities, injuries, or mortalities were observed in juvenile salmon exposed to 177 dB and 195 dB peak and accumulated SELs ranging from 179.2 to 190.6 dB during sheet-pile driving at the Port (Hart Crowser et al. 2009). A study to evaluate effects of impact pile driving sound on juvenile coho salmon exposed salmon to peak SPLs of 208 dB and cumulative SELs of 207 dB during a 4-hour period; no juvenile salmon died, no gross external or internal injuries were observed, and behavioral responses were subtle (Ruggerone et al. 2008).

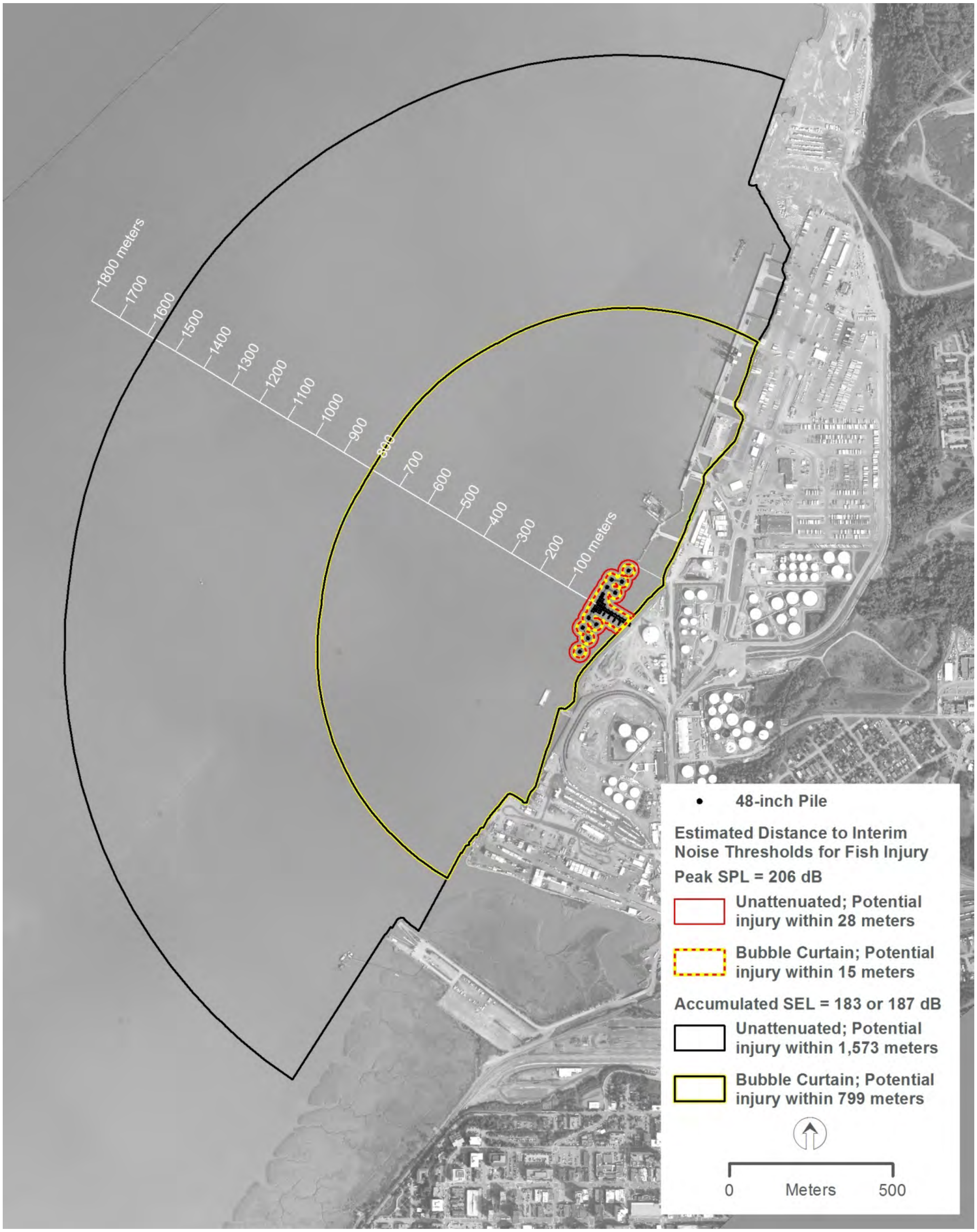


*Figure 3. Estimated distances to interim injury sound level thresholds for fish during impact hammer installation of 48-inch-diameter piles for the PCT Project*

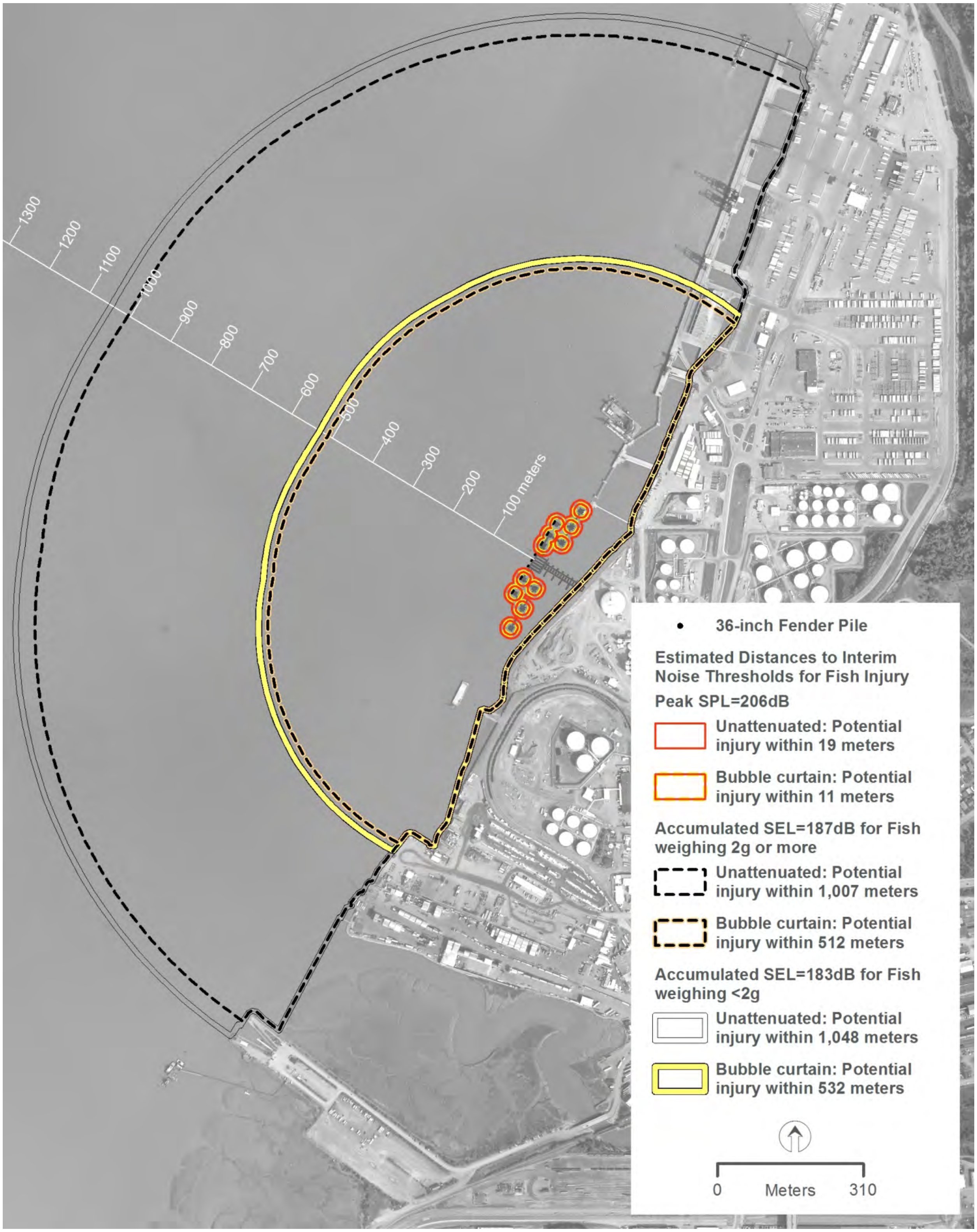


*Figure 4. Estimated distances to interim injury sound level thresholds for fish during impact hammer installation of 36-inch-diameter piles for the PCT Project*

Based on their small body mass (Yelverton et al. 1975) and entrainment within the fast-moving currents of Knik Arm, small or juvenile fishes would be the most vulnerable to noise impacts associated with the peak SPL for a single strike. Small fish are more prone to injury from intense sound than are larger fish of the same species (Yelverton et al. 1975). Driving piles with an impact hammer would likely result in injury and/or mortality of some juvenile salmonids, given their distribution throughout the cross section of Knik Arm during May into August (KABATA 2006).

The threshold for behavioral disturbance to fish from impact hammers is 150 dB RMS re: 1 µPa (WSDOT 2008). Assuming the bubble curtain is place, fish of any size within 2,083 meters (1.3 miles) and 1,949 meters (1.2 miles) of installation of 48-inch- and 36-inch-diameter piles would be exposed to the 150 dB RMS threshold for behavior, during impact hammer operations. Under these conditions, fish within the mid-channel of Knik Arm may be exposed to behavior thresholds. During unattenuated impact hammer pile installation, fish on the west bank of Knik Arm extending south beyond Ship Creek to the mouth of Chester Creek may be exposed to noise thresholds for behavioral disturbance while impact hammers are actively installing 48-inch- and 36-inch-diameter piles (**Figure 5**).

Behavioral changes due to increased noise may include avoidance of the area, changes in migratory routes, and/or interruption of reproduction. Fish may move away from protected shoreline habitat or delay migratory progress due to increased noise, and the noise may also increase predation by masking the sound of approaching predators (Anderson 1990). Increased sound pressure waves from impact hammers has the potential to alter the migratory pathway of migrating fish, as noise has the potential to deter adult salmon from entering spawning habitat and to disturb juveniles in rearing habitat.

Habitat quality of EFH within the noise threshold isopleths may be temporarily degraded and habitat function may be largely eliminated during impact hammer activity. Impact hammers would not be operated continuously throughout each day and would not be operated at night. While some fish within the distance to fish injury criteria may be harmed, impacts would otherwise be short-term and local. The PCT Project is not anticipated to substantially impede migration of adult or juvenile salmon or adversely affect the health and survival of the affected species at the population level.

The substrate removed from inside the 48-inch-diameter piles to allow for the placement of reinforced concrete would be disposed of into surrounding waters and be distributed by currents. The disposal of the estimated 1,500 cubic yards of substrate material is anticipated to cause a temporary increase in turbidity in surrounding waters. While a temporary increase in turbidity may temporarily decrease habitat quality, it is not anticipated to have a substantial effect on fish or EFH, given the naturally turbid nature of Knik Arm. Once impact hammering has ceased and construction of the PCT is complete, habitat quality would be expected to return to pre-PCT conditions. The only exception would be habitat lost due to the presence of piles; however, this amount of habitat is minimal compared to the available habitat in adjacent Knik Arm waters. Fish would be expected to move into and use adjacent available areas. Potential changes in hydrologic patterns from the pile-supported PCT are not anticipated to substantially affect EFH or FMP-managed species.

Tugboats would be used in conjunction with barges to support pile installation and the overall construction of the PCT. Acoustic data collected at the Port found that tugs pulling barges produced sounds of 135 dB at 200 meters (656 feet) from the source (Illingworth and Rodkin 2014). In other places, continuous sounds for tugs pulling barges have been reported to range from 145 to 166 dB RMS at 1 meter (3.3 feet) from the source (Miles et al. 1987; Richardson et al. 1995; Simmonds et al. 2004). Fish exposed to sounds exceeding 150 dB RMS may be temporarily disturbed.

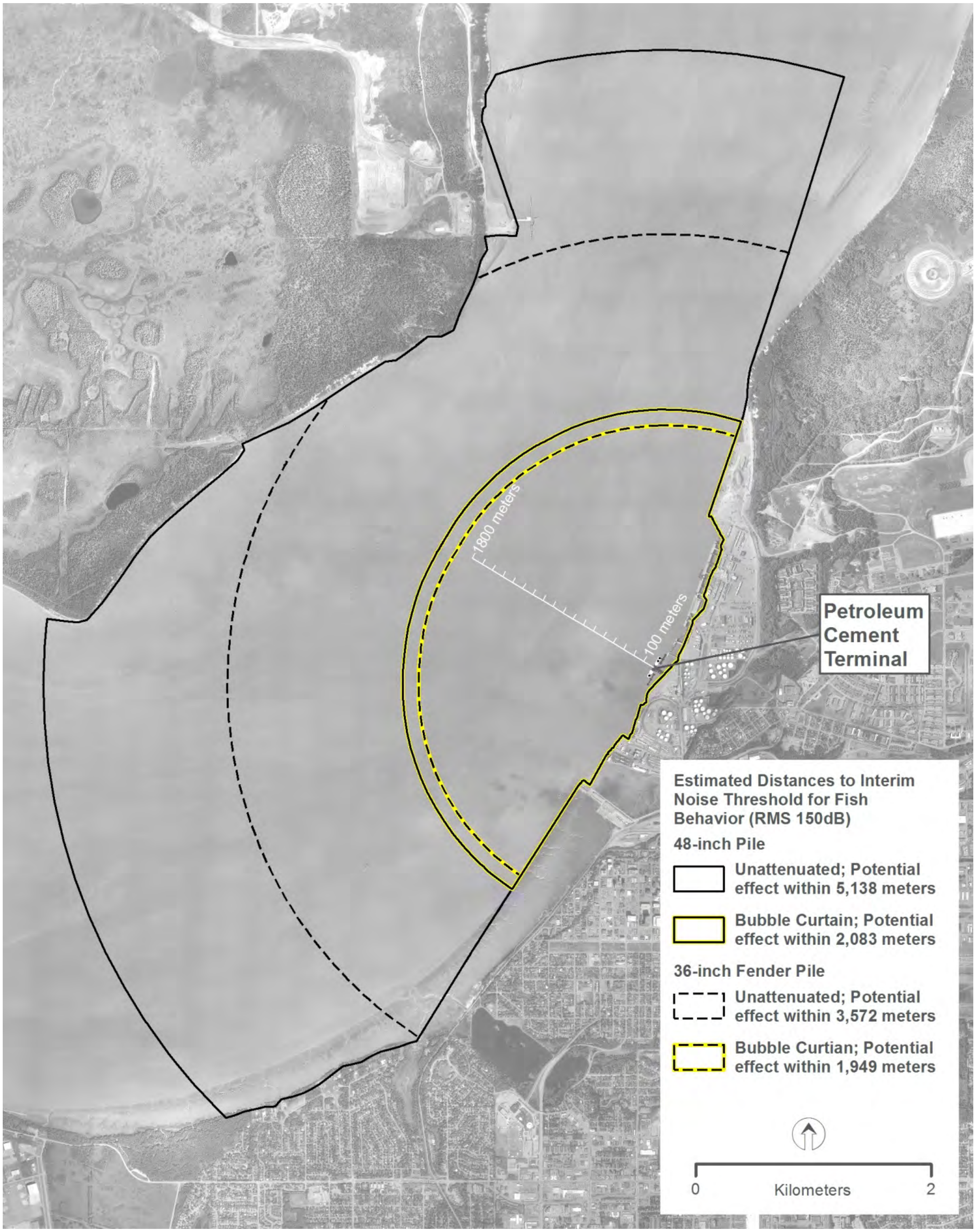


*Figure 5. Estimated distances to interim fish behavior sound level thresholds during impact hammer installation of 48-inch- and 36-inch-diameter piles for the PCT Project*

#### 5.1.1.2 Vibratory Hammer

Vibratory hammers produce continuous or non-pulsed sounds, which tends to elicit an avoidance response in fish (NMFS 2016). Vibratory hammers produce lower amplitude sounds compared to that of impact hammers.

Adverse impacts to fish have not been observed in association with vibratory hammers (WSDOT 2008). This may be due to the slower rise time and the fact that the energy produced is spread out over the time it takes to drive the pile (WSDOT 2008). Studies have shown that when exposed to sounds similar to those produced from vibratory hammers, fish consistently displayed avoidance behaviors and did not habituate to the sound even after repeated exposures (cited in NMFS 2016, NMFS 2011). As such, vibratory driving of piles is generally considered less harmful to fish than impact driving.

Vibratory installation of the temporary piles that support the template is anticipated to occur over 2 days at each location. Additional time would be required for installation of the template structure, which would include welding, surveying the location, and other activities. Each temporary pile would be installed in approximately 15 minutes and removed in approximately 15 minutes. Up to four temporary piles would be installed and removed per day, for a total of up to 120 minutes of vibratory installation and removal per day. Installation of temporary piles would require about 11 days of effort (44 temporary piles / 4 temporary piles per day = 11 days), 1 day per dolphin. Removal of temporary piles at each location is anticipated to occur within 1 day.

Noise generated from the vibratory installation and removal of the temporary H-piles is not anticipated to exceed the interim injury to fish peak noise level threshold of 206 dB. There are no cumulative SEL criteria for vibratory pile driving at this time. Vibratory driving is not expected to result in injury, mortality, or otherwise harmful noise impacts to FMP-managed fish.

NMFS typically considers the primary adverse effect of removal of piles to be the suspension of disturbed sediments, which may result in harmful levels of turbidity and release of contaminants, if present, contained within those sediments (NMFS 2016). As the temporary H-piles are removed, sediments on the seafloor would be disturbed, resulting in a temporary increase in turbidity within the water column. A vibratory hammer would be used to remove the temporary piles. This adheres to NMFS' typical recommendation of using a vibratory hammer for pile removal to minimize the suspension of sediments and disturbance of substrate (NMFS 2016).

Knik Arm is a highly turbid ecosystem with naturally high and variable suspended sediment concentrations subject to strong tidal forces. Pacific salmon and several other fish species have adapted to the naturally high levels of turbidity found in Knik Arm, where strong tides continually shift, suspend, deposit, and re-suspend large volumes of sediment. The increase in turbidity would temporarily decrease habitat quality and may temporarily eliminate or reduce the availability of clearer water microhabitats that appear to be especially important for juvenile salmon. However, temporary increases in turbidity from the PCT Project are not anticipated to cause substantial adverse effects to EFH or stocks of managed species.

### 5.1.2 Overwater Structures

Construction of the PCT would involve the addition of overwater structures, including an estimated 2 acres of cement panels for the platform and trestle and 910 feet (about 0.25 acre) of prefabricated open steel grating for the catwalk. Overwater structures and associated development have the potential to adversely affect EFH by changing ambient light conditions, altering the wave and current energy regime, introducing contaminants into the marine environment (e.g., treated wood piles and platforms), and other activities associated with operation and use of structures (NMFS 2011).

Concrete and steel are relatively inert materials that do not leach contaminants into the water; therefore, the cement panels and steel grating for catwalks as proposed by the PCT Project are not anticipated to introduce contaminants into marine waters. The majority of the overwater structures would extend into relatively deep subtidal waters, minimizing shading affects and impacts to intertidal habitat. The addition of overwater structures associated with the PCT Project is not anticipated to have substantial adverse impacts to EFH or FMP-managed species.

## 5.2 Cumulative Effects

Cumulative effects are impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR § 1508.7). Cumulative effects can result from several individually minor impacts, which may be collectively substantial over time. An analysis of cumulative effects is intended in a generic sense to examine actions occurring within a watershed or marine ecosystem that adversely affect the ecological structure or function of EFH.

The Port is located within an industrialized area that experiences effects from dredging, commercial shipping, and other industrialized uses. Past development throughout Knik Arm has adversely affected the quality and quantity of available EFH. Hundreds of acres of marine and intertidal fill and wetlands have been filled and eliminated due to industrial development (Balsiger 2004). Past and current projects in proximity to the Port include dredging and fill associated with the Port, businesses adjacent to the Port, the Alaska Railroad on either side of Ship Creek north of the Port, and infrastructure associated with Port MacKenzie across Knik Arm (Balsiger 2004).

Reasonably foreseeable future actions include future plans associated with the APMP. While these future projects are not part of the PCT Project, the projects are proposed under Phase 1 of the APMP. Potential impacts to EFH from the two other projects proposed under Phase 1 include:

- *SBS Project (Phase 1).* The Port received DA permit authorization in January 2017 to construct the SBS Project; construction is anticipated to occur in 2017. The SBS Project would place fill across approximately 3.7 acres of EFH, which spans approximately 1,500 feet of shoreline in Knik Arm. The SBS Project would result in an additional 4.6 acres of armored shoreline (3.7 acres of which is EFH).
- *North Extension Stabilization (NES)-Step 1 Project (Phase 1).* The Port submitted a DA application for this proposed project in 2016. If approved, NES-Step 1 would result in a temporary increase in turbidity during excavation and offshore disposal of Anchorage Port Intermodal Expansion Program fill material, removal of the Open Cell Sheet Piles, stabilization of the new bulkhead, and the placement of class IV riprap as armor rock. This project would physically alter the characteristics and quantity of available EFH as it reconfigures the shoreline, resulting in a slight increase in the amount of EFH available. The Port requested approval to complete this project in 2017-2018.
- *Dredging related to PCT Project*. If approved, the PCT will extend approximately 75 feet into the current USACE Anchorage Harbor project dredging limits (as shown in Appendix A of the DA application for the PCT Project). USACE Civil Works would perform excavation and grading work landward of the PCT in order to provide a stable transition zone between the upland edge and the Anchorage Harbor project dredging area. The Port has submitted a request for authorization for this work under Section 408 of the Rivers and Harbors Act of 1899.

Other future APMP projects during Phase 2 and beyond would involve replacing pile-supported infrastructure and further stabilizing the North Extension by removing the remaining Open Cell Sheet Piles, extending the new bulkhead further north, and removing the existing embankment. Pile driving associated with future APMP development, if authorized, will have temporary adverse impacts to EFH and managed fish species in proximity to impact hammer driving, similar to impacts described in the EFH Assessment completed for the PCT Project. The applicant will work with resource agencies during the permitting process to offset unavoidable impacts. The applicant will prepare project-specific EFH Assessments for other APMP construction activities once design for each project has advanced to a level that allows for site-specific impact assessment.

The PCT Project would result in temporary, localized impacts to EFH and managed fish species during construction and would contribute to cumulative impacts from other activities in upper Cook Inlet. Impacts to EFH are not anticipated to be substantial[19] or adversely affect FMP-managed fish species at the population level.

# 6 Proposed Conservation Measures

The following conservation and mitigation measures to avoid and minimize unavoidable impacts to EFH have been incorporated into the project design:

- Confined bubble curtains will be installed around piles, to the extent practicable, prior to and during installation of piles using an impact hammer to attenuate the sound and minimize underwater noise exposure impacts to fish and marine mammals from August through October.
- Standard spill-prevention measures will be implemented during construction; spill cleanup equipment (e.g., oil-absorbent pads) will be available on-site during construction.
- A Storm Water Pollution Prevention Plan will be prepared and adhered to during this project. Best management practices will be used during construction to prevent avoidable impacts to aquatic habitats.
- A vibratory hammer will be used to install and remove the temporary H-piles.
- A ‘‘soft start’’ technique will be used at the beginning of each pile installation and removal to allow marine mammals that may be in the immediate area to leave before pile driving reaches full energy. When the impact hammer is used, operators will be required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period, then two subsequent three-strike sets. When a vibratory hammer is used, the soft start requires the operators to initiate noise from vibratory hammers for 15 seconds at reduced energy, followed by a 1-minute waiting period. The procedure will be repeated two additional times.

# 7 Conclusion

Estuarine and marine waters in the vicinity of the Port are identified as EFH for Chinook, chum, coho, sockeye, and pink salmon. Eulachon and low numbers of Pacific cod, walleye pollock, and Pacific herring; and longfin smelt and Pacific staghorn have also been captured in upper Cook Inlet. Migrating eulachon occur in Knik Arm between April and June. While these species are managed by the FMP for groundfish of the GOA, waters in the vicinity of the Port are not identified as EFH for these species.

The PCT Project proposes to install up to 203 permanent, large-diameter piles using an impact hammer and 44 temporary piles using a vibratory hammer, from April 1 to November 30, 2018. The quality of habitat in proximity to the pile installation would be temporarily degraded during construction. Impact hammers can produce underwater sound pressure waves that have the potential to disturb, injure, and/or kill fish exposed to harmful levels. Sound pressure levels produced by impact hammers also have

[19] Substantial adverse effects are those that may pose a relatively serious threat to EFH and typically could not be alleviated through minor modifications to the proposed action (NMFS 2004).

the potential to alter the migration path of adult salmon. Fish within proximity to impact hammer operation may be affected.

Juvenile salmon may be the most vulnerable EFH species when exposed to peak SPLs for a single strike, based on their small body mass and entrainment within the fast-moving currents of Knik Arm. However, the strong currents within Knik Arm would limit the potential for a juvenile salmon to occupy habitat in proximity to impact hammer operation for extended periods. While some fish within the distance to fish injury criteria may be harmed, impacts would otherwise be short-term and local. The PCT Project is not anticipated to substantially impede migration of adult or juvenile salmon or adversely affect the health and survival of the affected species at the population level.

The vibratory hammer is not anticipated to generate harmful underwater sounds while installing or removing the smaller H-piles. Removing piles may temporarily increase turbidity in surrounding waters; however, the increase in turbidity is anticipated to be minor and not result in substantial impacts to EFH or managed fish species.

Once impact hammering has ceased and construction of the PCT is complete, habitat quality would be expected to return to pre-PCT conditions. The only exception would be habitat lost due to the presence of piles; however, this amount of habitat is minimal compared to the available habitat in adjacent Knik Arm waters. Fish would be expected to move into and use adjacent available areas. Potential changes in hydrologic patterns from the pile-supported PCT are not anticipated to substantially affect EFH or FMP-managed species.

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US Army Corps
of Engineers
Alaska District

# Public Notice of Application for Permit

ANCHORAGE
Regulatory Division (1145)
CEPOA-RD
Post Office Box 6898
JBER, Alaska 99506-0898

**PUBLIC NOTICE DATE:**

**EXPIRATION DATE:** **15 DAY OR 30 DAY**

**REFERENCE NUMBER:**

**WATERWAY:** **Knik Arm**

Interested parties are hereby notified that a Department of the Army permit application has been received for work in waters of the United States as described below and shown on the enclosed project drawings.

Comments on the described work, with the reference number, should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact Amanda Whittier at (907) 753-5582, toll free from within Alaska at (800) 478-2712, by fax at (907) 753-5567, or by email at amanda.l.whittier@usace.army.mil if further information is desired concerning this notice.

APPLICANT: Mr. Stephen Ribuffo, Port Director, Port of Anchorage

AGENT: Mr. Dave Casey, APMP Permitting Lead, 2525 C Street, Suite 500, Anchorage, AK 99503-2633; Phone 907-644-2191; Email Dave.Casey@hdrinc.com

LOCATION: The project site is located within Section 7, T. 13 N., R. 3 W., Seward Meridian; USGS Quad Map Anchorage A-8; Latitude 61.233499º N., Longitude 149.985068º W.; in Anchorage, Alaska.

PURPOSE: The applicant's stated purpose is to construct the Petroleum and Cement Terminal (PCT) to replace the existing Petroleum, Oil, Lubricant (POL 1) terminal with a new structure designed and constructed to exceed current seismic standards.

PROPOSED WORK: The Port of Anchorage (Port) proposes to construct the PCT project to replace the existing POL 1 with a new structure designed and constructed to exceed current seismic standards. The PCT would be a pile-supported platform and trestle structure located at the southernmost shoreline of the Port, and would include both breasting and mooring dolphins to receive and secure ships while in port. Construction of the PCT would include driving of a total of 247 piles (203 permanent and 44 temporary), resulting in direct impacts to approximately 2,400 square feet (0.06 acres) of the marine environment. Please see the attached PCT Project Description (Appendix A) and figures (Appendix C) for additional information.

ADDITIONAL INFORMATION:

APPLICANT PROPOSED MITIGATION: The applicant proposes the following mitigation measures to avoid, minimize, and compensate for impacts to waters of the United States from activities involving discharges of dredged or fill material.

a. Avoidance: Placement of fill into Knik Arm is required to meet the project purpose; therefore, avoiding the discharge of fill is not practicable.

b. Minimization: The number of piles for the PCT was minimized to the quantity necessary to construct a seismically resilient PCT, while maximizing the life of the structure in order to reduce the need for future in-water work. The number of piles for the main trestle has also been reduced to shorten its length. The PCT design includes breasting and mooring dolphins instead of a solid-deck platform, again minimizing the number of required piles. The use of a 75 year design standard is also a method to minimize impacts to the aquatic environment in that reconstruct will be avoided for a substantial period of time. Additionally, catwalks will be constructed of prefabricated high-strength-steel segments, rendering additional piles unnecessary. Encapsulated bubble curtains will be used when seasonally appropriate and technically feasible to reduce auditory impact to marine mammals and the use of a vibratory hammer to install permanent piles has been removed from the project in order to minimize adverse effects on marine mammals (please see Appendix E, Endangered Species Act Technical Memorandum, for additional information regarding marine mammal impact minimization).

c. Compensatory Mitigation: The placement of fill has been minimized to the quantity necessary to construct a stable and earthquake resilient PCT, and is limited to the immediate area of the piles. Due to minimization efforts and small footprint of the project, no compensatory mitigation is proposed.

CULTURAL RESOURCES: The latest published version of the Alaska Heritage Resources Survey (AHRS) has been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the National Register of Historic Places. There are no listed or eligible properties in the vicinity of the worksite. Consultation of the AHRS constitutes the extent of cultural resource investigations by the District Commander at this time, and he is otherwise unaware of the presence of such resources. This application is being coordinated with the State Historic Preservation Office (SHPO). Any comments SHPO may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: The project area is within the known or historic range of the Cook Inlet Beluga Whale (*Delphinapterus leucas*). We have determined the described activity may affect the Cook Inlet Beluga Whale. We have initiated/will initiate the appropriate consultation procedures under Section 7 of the Endangered Species Act with the National Marine Fisheries Service. Any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH).

Estuarine and marine waters in the vicinity of the Port are considered EFH for Chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*), coho (*O. kisutch*), sockeye (*O. nerka*) and pink salmon (*O. gorbuscha*). Eulachon (*Thaleichthys pacificus*) and low numbers of Pacific cod (*Gadus macrocephalus*), walleye pollock (*Theragra chalcogramma*), Pacific herring (*Clupea pallasii*); and longfin smelt (*Spirinchus thaleichthys*) and Pacific staghorn (*Leptocottus armatusspecies*) have also been captured in upper Cook Inlet. While these species are managed by the Fishery Management Plan for groundfish of the Gulf of Alaska, waters in the vicinity of the Port are not identified as EFH for these species.

We have determined the described activity may adversely affect EFH in the project area for five species of Pacific salmon: Chinook, chum, coho, sockeye, and pink salmon. This Public Notice initiates EFH consultation with the NMFS. Any comment or recommendations they may have concerning EFH will be considered in our final assessment of the described work.

TRIBAL CONSULTATION: The Alaska District fully supports tribal self-governance and government-to-government relations between Federally recognized Tribes and the Federal government. Tribes with protected rights or resources that could be significantly affected by a proposed Federal action (e.g., a permit decision) have the right to consult with the Alaska District on a government-to-government basis. Views of each Tribe regarding protected rights and resources will be accorded due consideration in this process. This Public Notice serves as notification to the Tribes within the area potentially affected by the proposed work and invites their participation in the Federal decision-making process regarding the protected Tribal right or resource. Consultation may be initiated by the affected Tribe upon written request to the District Commander during the public comment period.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, reasons for holding a public hearing.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts, which the proposed activity may have on the public interest, requires a careful weighing of all the factors that become relevant in each particular case. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. The outcome of the general balancing process would determine whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur. The decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered including the cumulative effects thereof. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(l) guidelines. Subject to the preceding sentence and any other applicable guidelines or criteria (see Sections 320.2 and 320.3), a permit will be granted unless the District Commander determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

AUTHORITY: This permit will be issued or denied under the following authorities:

(X) Perform work in or affecting navigable waters of the United States – Section 10 Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the United States – Section 404 Clean Water Act (33 U.S.C. 1344). Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).

Project drawings and a Notice of Application for State Water Quality Certification are enclosed with this Public Notice.

District Commander
U.S. Army, Corps of Engineers

Enclosures

BILL WALKER, GOVERNOR

# STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
401 Certification Program
Non-Point Source Water Pollution Control Program

**ANCHORAGE**
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WQM/401 CERTIFICATION
555 CORDOVA STREET
ANCHORAGE, ALASKA 99501-2617
PHONE: (907) 269-7564/FAX: (907) 334-2415

**NOTICE OF APPLICATION
FOR
STATE WATER QUALITY CERTIFICATION**

Any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters, in accordance with Section 401 of the Clean Water Act of 1977 (PL95-217), also must apply for and obtain certification from the Alaska Department of Environmental Conservation that the discharge will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. By agreement between the U.S. Army Corps of Engineers and the Department of Environmental Conservation, application for a Department of the Army permit to discharge dredged or fill material into navigable waters under Section 404 of the Clean Water Act also may serve as application for State Water Quality Certification.

Notice is hereby given that the application for a Department of the Army Permit described in the Corps of Engineers' Public Notice No. **NUMBER, Knik Arm**, serves as application for State Water Quality Certification from the Department of Environmental Conservation.

After reviewing the application, the Department may certify there is reasonable assurance the activity, and any discharge that might result, will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. The Department also may deny or waive certification.

Any person desiring to comment on the project, with respect to Water Quality Certification, may submit written comments to the address above by the expiration date of the Corps of Engineer's Public Notice.

**File Number: XXXX**
**Waterway Name: Knik Arm**

**APPLICANT:** Steve Ribuffo, Port of Anchorage

**AGENT**: Dave Casey, HDR, Inc.

**ADJACENT PROPERTY OWNERS: Alaska Railroad, Pouch 7-2111, Anchorage, AK 99508**