

ALASKA LNG PROJECT	DOCKET No. CP17-____-000 RESOURCE REPORT No. 2 APPENDIX N – APPLICANT’S WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES	Doc No: USAI-PE-SRREG-00- 000002-000 DATE: APRIL 14, 2017 REVISION: 0
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**APPENDIX N APPLICANT’S WETLAND AND WATERBODY
 CONSTRUCTION AND MITIGATION PROCEDURES
 (APPLICANTS’ PROCEDURES)**

ALASKA LNG

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES (APPLICANT'S PROCEDURES)

USAI-PE-SRREG-00-000002-015

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**WETLAND AND WATERBODY CONSTRUCTION,
AND MITIGATION PROCEDURES**

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I. APPLICABILITY

- A. The intent of these Procedures is to identify baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies. The **Alaska LNG Project (Project)** shall specify in their application for a new FERC authorization, and in prior notice and advance notice filings, any individual measures in these Procedures considered unnecessary, technically infeasible, or unsuitable due to local conditions and fully describe any alternative measures that would be used. **The Project** shall also explain how those alternative measures would achieve a comparable level of mitigation.

Once **the Project** is authorized, **the Project** can request further changes as modifications to the measures in these Procedures (or the applicant's approved procedures). The Director of the Office of Energy Projects (Director) will consider approval of modifications upon the Project's written request, if the Director agrees that a modification:

1. provides equal or better environmental protection;
2. is necessary because a portion of these Procedures is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Project-related impacts on non-wetland areas are addressed in the **Applicant's Upland Erosion Control, Revegetation, and Maintenance Plan (Applicant's Plan)** Appendix D of Resource Report 7.

B. DEFINITIONS

1. "Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:
 - a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;
 - b. "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and
 - c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
2. "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands.

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II. PRECONSTRUCTION FILING

- A. The following information must be filed with the Secretary of the FERC (Secretary) prior to the beginning of construction, for the review and written approval by the Director:
1. site-specific justifications for additional temporary work space (ATWS) that would be closer than 50 feet from a waterbody or wetland; and
 2. site-specific justifications for the use of a construction right-of-way greater than 110-feet-wide in wetlands.
- B. The following information must be filed with the Secretary prior to the beginning of construction:
1. Spill Prevention and Response Procedures specified in section IV.A;
 2. a schedule identifying when trenching or blasting will occur within each waterbody greater than 10 feet wide, **that are subject to Alaska Department of Fish and Game (ADF&G) Title 16 fish passage requirements**, and within any waterbody identified as habitat for federally-listed threatened or endangered species. **The Project** will revise the schedule as necessary to provide FERC staff at least 14 days advance notice. Changes within this last 14-day period must provide for at least 48 hours advance notice;
 3. plans for **Buried Trenchless crossings (i.e., Horizontal Directional Drills or Direct Pipe)** under wetlands or waterbodies, specified in section V.B.6.d;
 4. site-specific plans for major waterbody crossings, described in section V.B.9;
 5. a wetland delineation report as described in section VI.A.1, if applicable; and
 6. the hydrostatic testing information specified in section VII.B.3.

III. ENVIRONMENTAL INSPECTORS

- A. At least one Environmental Inspector having knowledge of the wetland and waterbody conditions in the project area is required for each construction spread. The number and experience of Environmental Inspectors assigned to each construction spread shall be appropriate for the length of the construction spread and the number/significance of resources affected.
- B. The Environmental Inspector's responsibilities are outlined in the **Applicant's Plan**.

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IV. PRECONSTRUCTION PLANNING

- A. **The Project** shall develop project-specific Spill Prevention and Response Procedures that meet applicable requirements of state and federal agencies. A copy must be filed with the Secretary prior to construction and made available in the field on each construction spread.
1. It shall be the responsibility of **the Project** and its contractors to structure their operations in a manner that reduces the risk of spills or the accidental exposure of fuels or hazardous materials to waterbodies or wetlands. **The Project** and its contractors must, at a minimum, ensure that:
 - a. all employees handling fuels and other hazardous materials are properly trained;
 - b. all equipment is in good operating order and inspected on a regular basis;
 - c. fuel trucks transporting fuel to on-site equipment travel only on approved access roads, **construction right-of-way, Additional Temporary Work Space ATWS**);
 - d. all equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the **Project** and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.
 - e. hazardous materials, including chemicals, fuels, and lubricating oils, are not stored within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas;
 - f. concrete coating activities are not performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use. These activities can occur closer only if the Environmental Inspector determines that there is no reasonable alternative, and the Project and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill;
 - g. pumps operating within 100 feet of a waterbody or wetland boundary utilize appropriate secondary containment systems to prevent spills; and
 - h. bulk storage of hazardous materials, including chemicals, fuels, and lubricating oils have appropriate secondary containment systems to prevent spills.
 2. **The Project** and its contractors must structure their operations in a manner that provides for the prompt and effective cleanup of spills of fuel and other hazardous materials. At a minimum, **the Project** and its contractors must:
 - a. ensure that each construction crew (including cleanup crews) has on hand sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and knows the procedure for reporting spills and unanticipated discoveries of contamination;
 - b. ensure that each construction crew has on hand sufficient tools and material to stop leaks;
 - c. know the contact names and telephone numbers for all local, state, and federal

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agencies (including, if necessary, the U. S. Coast Guard and the National Response Center) that must be notified of a spill; and

- d. follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

B. AGENCY COORDINATION

The Project must coordinate with the appropriate local, state, and federal agencies as outlined in these Procedures and in the FERC's Order.

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V. WATERBODY CROSSINGS

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply to the U.S. Army Corps of Engineers (COE), or its delegated agency, for the appropriate wetland and waterbody crossing permits.
2. Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.
3. Apply for state-issued waterbody crossing permits and obtain individual or generic section 401 water quality certification or waiver.
4. Notify appropriate federal and state authorities at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in applicable permits.

B. INSTALLATION

1. Time Window for Construction

Unless expressly permitted or further restricted by the appropriate federal or state agency in writing on a site-specific basis, instream work, except that required to install or remove equipment bridges, must occur during the following time windows:

- a. coldwater fisheries - June 1 through September 30; or
- b. in accordance with AS 16.05.871 (d)

2. Additional Temporary Work Space

- a. Locate all ATWS (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. **In areas where it is determined that no reasonable alternative exists, additional temporary work space may be located in or within 50 feet of a waterbody.**
- b. **The Project** shall file with the Secretary for review and written approval by the Director, site-specific justification for each ATWS with a less than 50-foot setback from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the conditions that will not permit a 50-foot setback and measures to ensure the waterbody is adequately protected.

- c. Limit the size of ATWS to the minimum needed to construct the waterbody crossing.

3. General Crossing Procedures

- a. Comply with the COE, or its delegated agency, permit terms and conditions.
- b. Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.
- c. Where pipelines parallel a waterbody, maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction right-of-way, except where maintaining this offset will result in greater environmental impact.

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- d. Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.
 - e. Maintain adequate waterbody flow rates to protect aquatic life, and prevent the interruption of existing downstream uses.
 - f. Waterbody buffers (e.g., ATWS setbacks, refueling restrictions) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
 - g. Crossing of waterbodies when they are dry or frozen and not flowing may proceed using standard upland construction techniques in accordance with the Plan, provided that the Environmental Inspector verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature. In the event of perceptible flow, **the Project** must comply with all applicable Procedure requirements for “waterbodies” as defined in section I.B.1.
4. Spoil Pile Placement and Control
- a. All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction right-of-way at least 10 feet from the water’s edge or in additional ATWS’ as described in section V.B.2.
 - b. Use sediment barriers to prevent the flow of spoil or silt-laden water into any waterbody.
5. Equipment Bridges
- a. Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment.
 - b. Construct and maintain equipment bridges to allow unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:
 - 1) equipment pads and culvert(s);
 - 2) **single-span structures**, equipment pads or railroad car bridges without culverts;
 - 3) clean rock fill and culvert(s);
 - 4) flexi-float or portable bridges; and
 - 5) **ice or snow fill, and ice bridges.**

Additional options for equipment bridges may be utilized that achieve the performance objectives noted above. Do not use soil to construct or stabilize equipment bridges.
 - c. Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.
 - d. Design and maintain equipment bridges to prevent soil from entering the waterbody.
 - e. Remove temporary equipment bridges as soon as practicable after **restoration is complete.**
 - f. If there will be more than 1 month between final cleanup and the beginning of **site**

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stabilization and reasonable alternative access to the right-of-way is available, remove temporary equipment bridges as soon as practicable after final cleanup.

- g. Obtain any necessary approval from the COE, or the appropriate state agency for permanent bridges.

6. Dry-Ditch Crossing Methods

- a. Unless approved otherwise by the appropriate federal or state agency, install the pipeline using one of the dry-ditch methods outlined below for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are **subject to ADF&G Title 16 fish passage requirements**, or federally-designated as critical habitat.

b. Dam and Pump

- 1) The dam-and-pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage.
- 2) Implementation of the dam-and-pump crossing method must meet the following performance criteria:
 - i. use sufficient pumps, including on-site backup pumps, to maintain downstream flows;
 - ii. construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
 - iii. screen pump intakes to minimize entrainment of fish;
 - iv. prevent streambed scour at pump discharge; and
 - v. continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

c. Flume Crossing

The flume crossing method requires implementation of the following steps:

- 1) install flume pipe after blasting (if necessary), but before any trenching;
- 2) use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required to achieve an effective seal);
- 3) properly align flume pipe(s) to prevent bank erosion and streambed scour;
- 4) do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts; and
- 5) remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.

d. Channel Diversion

The channel diversion method may be used at waterbodies with one or more channels, such as braided streams, and in wide, high gradient alluvial floodplains where the flowing channel location can be varied between alternate locations within the floodplain. For each waterbody that would be crossed using the channel diversion method, file with the Secretary for the

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review and written approval by the Director, a plan that includes:

- 1) site-specific construction diagrams that show the location of dams and diversion channels required for construction, and all areas to be disturbed or cleared for construction;
- 2) justification that disturbed areas are limited to the minimum needed to construct the crossing;
- 3) identification of any aboveground disturbance or clearing;

Typical construction procedures include:

- 1) use sandbag or sandbag and plastic sheeting diversion structure or equivalent, such as a water filled flexible barrier dam to develop an effective seal and to divert stream flow away from the channel where the pipe section will be installed to another channel away from the installation section (some modifications to the stream bottom may be required to achieve an effective seal);
- 2) install the pipe section, backfill the trench, remove excess spoil, and stabilize the dewatered channel prior to removing diversion dams before proceeding with diversion of the next channel section;
- 3) complete tie-ins in areas that are isolated from stream flow; and
- 4) remove dams that are not also part of an equipment bridge.

7. Buried Trenchless

For each waterbody or wetland that would be crossed using a Buried Trenchless method (i.e. Horizontal Directional Drilling (HDD) or Direct Pipe), file with the Secretary for the review and written approval by the Director, a plan that includes:

- 1) site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction;
- 2) justification that disturbed areas are limited to the minimum needed to construct the crossing;
- 3) identification of any aboveground disturbance or clearing between the entry and exit workspaces during construction;
- 4) a description of how an inadvertent release of drilling mud would be contained and cleaned up;
- 5) a contingency plan for crossing the waterbody or wetland in the event the Buried Trenchless method is unsuccessful and how the abandoned drill hole would be sealed, if necessary; and
- 6) a description of site specific stabilization and restoration measures that would be implemented at the buried trenchless entry and exit locations if thaw sensitive permafrost was disturbed.

8. Aerial Span

For each waterbody that would be crossed using the aerial method, file with the Secretary for

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review and written approval by the Director, a plan that includes:

- a. site-specific construction diagrams that show the location of abutments and piers, and all areas to be disturbed or cleared for construction;
- b. justification that disturbed areas are limited to the minimum needed to construct the crossing; and
- c. identification of any aboveground disturbance or clearing.

9. Crossings of Minor Waterbodies

Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. except for blasting and other rock breaking measures, complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and
- c. equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification or protected status (e.g., agricultural or intermittent drainage ditches). However, if an equipment bridge is used it must be constructed as described in section V.B.5.

10. Crossings of Intermediate Waterbodies

Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and
- c. all other construction equipment must cross on an equipment bridge as specified in section V.B.5.

11. Crossings of Major Waterbodies

Before construction, **the Project** shall file with the Secretary for the review and written approval by the Director a detailed, site-specific construction plan and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing (the scaled drawings are not required for any offshore portions of pipeline projects). This plan must be developed in consultation with the appropriate state and federal agencies and shall include ATWS', spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

The Environmental Inspector may adjust the final placement of the erosion and sediment control structures in the field to maximize effectiveness.

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12. Temporary Erosion and Sediment Control

Install sediment barriers (as defined in section IV.F.3.a of the **Applicant's Plan**) immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the **Applicant's Plan**; however, the following specific measures must be implemented at stream crossings:

- a. install sediment barriers across the entire construction right-of-way at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. Removable sediment barriers (or driveable berms) must be installed across the travel lane. These removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent;
- b. where waterbodies are adjacent to the construction right-of-way and the right-of-way slopes toward the waterbody, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil within the construction right-of-way and prevent sediment flow into the waterbody; and
- c. use temporary trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody.

13. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in silt-laden water flowing into any waterbody. Remove the dewatering structures as soon as practicable after the completion of dewatering activities.

C. RESTORATION

1. Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies **that are subject to ADF&G Title 16 fish passage requirements.**
2. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.
3. Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector.
4. Install erosion control fabric or a functional equivalent on waterbody banks at the time of final bank recontouring. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.
5. Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.

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6. Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.
7. Revegetate disturbed riparian areas with native species of conservation grasses, legumes, and woody species, **in accordance with the Project Restoration Plan, developed in consultation with federal and state regulatory agencies (See Appendix P in Resource Report 3).**
8. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the **Applicant's Plan**.

In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

9. Sections V.C.3 through V.C.7 above also apply to those perennial or intermittent streams not flowing at the time of construction.

D. POST-CONSTRUCTION MAINTENANCE

1. Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate across the entire construction right-of-way **in accordance with the Project Restoration Plan**. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in riparian areas that are between Buried Trenchless entry and exit points.
2. Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.
3. Time of year restrictions specified in section VII.A.5 of the **Applicant's Plan** apply to routine mowing and clearing of riparian areas.

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VI. WETLAND CROSSINGS

A. GENERAL

1. **The Project** shall conduct a wetland delineation using the current federal methodology and file a wetland delineation report with the Secretary before construction.

This report shall identify:

- a. by milepost all wetlands that would be affected;
- b. the National Wetlands Inventory (NWI) classification for each wetland;
- c. the crossing length of each wetland in feet; and
- d. the area of permanent and temporary disturbance that would occur in each wetland by NWI classification type.

The requirements outlined in this section do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures, including workspace and topsoiling requirements, apply to these agricultural wetlands.

2. Route the pipeline to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided or crossed by following an existing right-of-way, route the new pipeline in a manner that minimizes disturbance to wetlands.
3. Limit the width of the construction right-of-way to **110** feet or less. Prior written approval of the Director is required where topographic conditions, soil limitations, **safety, construction efficiency and/or logistics practicability** require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond **110** feet. Early in the planning process the Project is encouraged to identify site-specific areas where excessively wide trenches could occur and/or where spoil piles could be difficult to maintain because existing soils lack adequate unconfined compressive strength.
4. Wetland boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
5. Implement the measures of sections V and VI in the event a waterbody crossing is located within or adjacent to a wetland crossing. If all measures of sections V and VI cannot be met, **the Project** must file with the Secretary a site-specific crossing plan for review and written approval by the Director before construction. This crossing plan shall address at a minimum:
 - a. spoil control;
 - b. equipment bridges;
 - c. restoration of waterbody banks and wetland hydrology;
 - d. timing of the waterbody crossing;
 - e. method of crossing; and
 - f. size and location of all ATWS.

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6. Do not locate aboveground facilities in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with U.S. Department of Transportation regulations **or as allowed by the FERC Order**.

B. INSTALLATION

1. Additional Temporary Work Spaces and Access Roads

- a. Locate all ATWS' (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. **In areas with long stretches of contiguous wetlands where it is determined that no reasonable alternative exists, additional temporary work space may be located in or within 50 feet of a wetland.**
- b. **The Project** shall file with the Secretary for review and written approval by the Director, site-specific justification for each ATWS with a less than 50-foot setback from wetland boundaries, except where adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the site-specific conditions that will not permit a 50-foot setback and measures to ensure the wetland is adequately protected.
- c. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, terra mats **or frost packing**).

In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in **wetland soils that are stable (i.e. can support equipment without soil mixing)** or upland areas. Where access roads in **stable wetlands** or upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way, **where practical**.

- d. **Use existing access roads where possible. The Project will request approval by the Director for the construction of new roads or modification of existing roads in wetlands.**

2. Crossing Procedures

- a. Comply with COE, or its delegated agency, permit terms and conditions. **Off-road access on the North Slope coastal and foothill zones will comply with the tundra travel criteria as specified by the Alaska Department of Natural Resources (ADNR) and North Slope Borough (NSB).**
- b. Assemble the pipeline in an upland area unless the wetland is **firm** enough to adequately support skids and pipe.
- c. Use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow.
- d. Minimize the length of time that **organic material** is segregated and the trench is open. Do not trench the wetland until the pipeline is assembled and ready for lowering in.
- e. Limit construction equipment operating in wetland areas **that will be crossed using ROW construction mode 3 (summer matted wetlands)** to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.

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- f. Cut vegetation just above ground level, **grind stumps to achieve a trafficable working surface**, leaving existing root systems in place, and remove it from the wetland for disposal.

The Project can burn woody debris in wetlands, if approved by the COE and in accordance with state and local regulations, ensuring that all remaining woody debris is removed for disposal.
- g. Limit pulling of tree stumps to directly over the trenchline **and the spoil side where grading is performed**. Do not grade or remove stumps or root systems from the rest of the construction right-of-way in wetlands unless the Chief Inspector and Environmental Inspector determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction right-of-way.
- h. Segregate **approximately** the top 1 foot of **organic material** from the area disturbed by **grading (trench and spoil side)**, except in areas where standing water is present, soils are saturated **or frozen, or where the ditch is opened by “Drill & Shoot”**. Immediately after backfilling is complete, restore the segregated **organic material back to the trench**.
- i. Do not use tree stumps, or brush riprap to support equipment on the construction right-of-way. **Gravel fill work pads may be used to provide safe working conditions for equipment and personnel and minimize disturbance to the underlying permafrost and thaw sensitive soil regime**.
- j. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the **organic material** and subsoil in wetlands, use low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra mats. **Soil fill or rock riprap may be used to stabilize the right-of-way where authorized as permanent fill by the COE for jurisdictional wetlands. Frost-packing may be utilized during winter construction in thaw stable permafrost and non-permafrost areas**.
- k. Remove all project-related material used to support equipment on the construction right-of-way upon completion of construction **except where permanent fill is authorized by the COE for jurisdictional wetlands**.

3. Temporary Sediment Control

Install sediment barriers as defined in **section IV.F.3.a of the Applicant’s Plan** immediately after initial disturbance of the wetland or adjacent **upland in summer or in winter prior to the spring snow melt**. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench). Except as noted below in section VI.B.3.c, maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the **Applicant’s Plan**.

- a. Install sediment barriers across the entire construction right-of-way immediately upslope of the wetland boundary at all wetland crossings where necessary to prevent sediment flow into the wetland.
- b. Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, install sediment barriers along the edge of the construction right-of-way

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as necessary to contain spoil within the construction right-of-way and prevent sediment flow into the wetland.

- c. Install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way through wetlands. Remove these sediment barriers during right-of-way cleanup.

4. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way), in a manner that does not cause erosion and does not result in silt-laden water flowing into any wetland. Remove the dewatering structures as soon as practicable after the completion of dewatering activities.

C. RESTORATION

1. Where the pipeline trench may drain a wetland, construct trench breakers at the wetland boundaries and/or seal the trench bottom as necessary to maintain the original wetland hydrology.
2. Restore pre-construction wetland contours to maintain the original wetland hydrology.
3. For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers as outlined in the **Applicant's Plan**. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.
4. Do not use fertilizer, lime, or mulch unless required in writing by the appropriate federal or state agency.
5. Consult with the appropriate federal or state agencies to develop a project-specific wetland restoration plan. The restoration plan shall include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of invasive species and noxious weeds (e.g., purple loosestrife and phragmites), and monitoring the success of the revegetation and weed control efforts. Provide this plan to the FERC staff upon request.
6. Temporarily revegetate the construction right-of-way **in accordance with the Project Restoration Plan** (unless standing water is present).
7. Ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species **except where surface stabilization measures or native conditions preclude revegetation such as on slopes covered with wood chips to control permafrost degradation or exposed bedrock**.
8. Remove temporary **synthetic** sediment barriers located at the boundary between wetland and adjacent upland areas after **initial** revegetation and/or stabilization of adjacent upland areas are judged to be successful as specified in the **Project Restoration Plan**.

VII. POST-CONSTRUCTION MAINTENANCE AND REPORTING

1. Do not conduct routine vegetation mowing or clearing over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary

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to maintain the 10-foot corridor in an herbaceous state. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in wetlands that are between **buried trenchless** entry and exit points.

2. **Where it is necessary for helicopters to land, an area up to 170 feet wide and 300 feet long may be cleared of all vegetation greater than 8 inches high.**
3. Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or state agency.
4. Time of year restrictions specified in section VII.A.5 of the **Applicant's** Plan apply to routine mowing and clearing of wetland areas.
5. Monitor and record the success of wetland revegetation **on a monitoring cycle agreed to in the Project Restoration Plan** until wetland revegetation is successful.
6. Wetland revegetation shall be considered successful if criteria **as defined in the Project Restoration Plan are met. Example criteria could include but are not limited to: wetland functions, noxious weeds, invasive species and agency-approved performance criteria.**
7. Within 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts and documenting success as defined in the **Project Restoration Plan**. Continue revegetation efforts and file periodic reports as agreed to with regulatory agencies that document revegetation progress until the performance criteria are met as set out in the Alaska LNG Restoration Plan.

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VIII. HYDROSTATIC TESTING

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply for state-issued water withdrawal permits, as required.
2. Apply for Alaska Pollutant Discharge Elimination System (APDES) or state-issued discharge permits, as required.
3. Notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities unless they waive this requirement in writing.

B. GENERAL

1. Perform 100 percent **non-destructive testing** of all pipeline section welds or hydrotest the pipeline sections, before installation under waterbodies **in accordance with U.S. Department of Transportation requirements**.
2. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, address secondary containment and refueling of these pumps in the project's Spill Prevention and Response Procedures.
3. **The Project** shall file with the Secretary before construction a list identifying the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location.

C. INTAKE SOURCE AND RATE

1. Screen the intake hose to minimize the potential for entrainment of fish.
2. Do not use state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and/or local permitting agencies grant written permission.
3. Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.
4. Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

D. DISCHARGE LOCATION, METHOD, AND RATE

1. Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive streamflow.
2. Do not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission.