



# **Nanushuk Project**

Applicant Proposed Mitigation Statements



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# Applicant Proposed Mitigation Statements

## Background:

To develop a complete individual permit application under Section 404 of the Clean Water Act, certain information pertaining to how Repsol E&P USA, Inc. (Repsol) is proposing to mitigate impacts to waters of the U.S. (WOUS) is necessary. The information is provided to satisfy box 23 of the ENG Form 4345.

## Applicant's Proposed Mitigation:

### 1. Avoidance of impacts to aquatic ecosystems, including wetlands:

The following measures would be taken to avoid impacts to the greatest extent practicable:

#### WOUS:

- Drill sites are located east of the Colville River and as far east as practicable, while still meeting the Nanushuk Project (Project) purpose and need to produce commercial quantities of crude oil from the target reservoirs, therefore avoiding placement of surface facilities west of the East Channel and associated transportation and pipeline infrastructure to access this area.
- Connection to the existing gravel road system allows use of the existing Deadhorse Airport to support field logistics. This eliminates the need for a new project specific airstrip to transport personnel and associated regular fixed-wing air travel impacts in the project area. As a result, less storage space is required at each drill site to accommodate required site support materials, fuels, hazardous substances, and solid waste, reducing the overall size of each pad.
- Existing gravel sources will be utilized, eliminating the need to develop a new gravel source.
- Existing barge infrastructure at Oliktok Point will be utilized to avoid the need for new additional marine facilities in support of sealift activities.
- Seasonal ice pads and roads will be used to support winter pipeline and gravel infrastructure construction, avoiding the need for additional fill to support construction.
- Trenching will occur during the winter, and all trenched materials will be temporarily sidecast onto an ice pad adjacent to the trench. This will avoid a discharge of fill material into waters of the U.S. (WOUS), since the sidecasting will not change the bottom elevation of a WOUS or replace any portion of a WOUS with dry ground. Trenched materials will be taken off the ice pad and backfilled into the excavation once trenching is complete.
- Power cables and fiber optic cables will be installed on the horizontal support members (HSMs) using messenger cables or strapped directly to the pipelines, avoiding the need for power poles and associated fill.
- Co-location of the existing pipeline and road corridor minimizes impacts to the aquatic environment compared to having the two features spaced farther apart.
- All pipelines, HSMs, and suspended cables will be a minimum of 3 feet above the highest water elevation likely to occur during a 100-year flood event at both river crossings.

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### Wildlife:

- Power and fiber optic cables will be installed on the HSMs using messenger cables or strapped directly to the pipelines, avoiding the use of overhead powerlines as well as the potential for bird strikes and perching for predators.

### Cultural Resources/Subsistence:

- Project facilities will be located outside of a 500-foot buffer from documented cultural resources.

### Noise:

- A new project specific airstrip is not required as part of the Project. Having no regular fixed wing air traffic into the project area reduces noise/disturbance impacts to local residents, subsistence users, and wildlife as well as air quality impacts.
- The Project will provide power from a central location, the central processing facility (CPF), to reduce noise impacts at each of the drill sites.

### 2. Minimization of unavoidable impacts to WOUS, including wetlands:

The following measures would be taken to minimize impacts to the greatest extent possible:

### WOUS:

- Locating drill sites as far east as practicable from the Colville River minimizes the distance of gravel road and pipeline needed to tie into existing infrastructure.
- Gravel roads and pads are located outside of the Alaska Department of Natural Resources (ADNR) half-mile setback from the Colville River, minimizing potential impacts to the watershed and subsistence users in the project vicinity.
- Roads will have standard thickness (5 feet minimum) to protect underlying permafrost by insulating and maintaining stable permafrost conditions.
- Pads will have standard thickness (6 feet minimum) to protect underlying permafrost by insulating and maintaining stable permafrost conditions. Pads are at least 1 foot thicker than roads due to higher thermal loads associated with pads.
- To minimize heat transfer from infrastructure on pads to the underlying permafrost, the following engineering methods will be used:
  - In well conductors, the gap between the well conductor and inner pipe will be filled with polyurethane foam.
  - Thermosyphons will be installed adjacent to well rows and at-grade heated structures (e.g., the warehouse and cold storage).
  - Heated at-grade structures will be constructed with 4 to 8 inches of rigid insulation installed approximately 24 inches below the foundation/floor slabs.
  - Flare stack height will be selected to reduce ground level radiant heat intensity to levels that will protect personnel, structures, and equipment as well as avoid permafrost degradation (typically 1,500 btu/hr/ft<sup>2</sup>).
- Gravel road connection to existing infrastructure provides all-season access to parallel export/import and infield pipelines for visual inspection and routine and emergency maintenance and repairs. This also reduces the need for tundra travel associated with

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these activities. Roads and pipelines will be located within 1,000 feet of each other where feasible.

- Gravel road connection to existing infrastructure provides reliable year-round, rapid access to project facilities in the event of an emergency, including a blowout, oil spill, or need for medical evacuation.
- On-site processing minimizes the length of the multiphase pipeline and potentially allows for a smaller total processing facility footprint relative to constructing pre-processing facilities at each drill site.
- The Nanushuk Pad would co-locate the CPF and drill site 1 (DS1) to reduce the overall gravel footprint.
- No processing of multiphase fluids will occur at drill site 2 (DS2) or drill site 3 (DS3), eliminating the need for processing infrastructure at each site and reducing the overall gravel footprint.
- All on- and off-pad pipelines would be elevated above grade on vertical support members (VSMs) to reduce impacts to permafrost.
- The export/import pipeline would be co-located with an existing pipeline and gravel road associated with the Kuparuk River Unit between drill site 2M (DS2M) and the Kuparuk CPF2.
- All pipelines will be constructed of fusion bonded epoxy coated pipe and will include pig launchers and receivers capable of handling state-of-the-art in-line inspection. The pipelines will have a factory-installed insulation system (polyurethane foam) covered with an interlocked sheet metal jacket.
- Where pipelines cross road embankments, coated and insulated pipelines will be located inside oversized steel casings with additional insulation beneath the casing incorporated into the road design. Casings for pipeline-road crossings will extend a minimum of 2 feet beyond the road embankment toe and will be installed at a higher elevation than the nearest culvert to prevent water accumulation.
- Project roads were located to reduce impacts to hydrology through minimization of the placement of gravel fill within the floodplain. In addition, the location of the Miluveach and Kachemach River Bridges in narrow portions of the rivers minimizes placement of gravel fill in the floodplain and piers below ordinary high water.
- Road widths have been designed, in part, based on the weight and size of vehicles expected to travel on them. Infield roads will be constructed at 34 feet wide at crown to minimize gravel fill relative to the 38-foot wide gravel access road, which is designed for heavy transport vehicles.
- Project facilities were located to reduce impacts to hydrology through minimization of the footprint of gravel fill within 100 feet of non-fish-bearing water bodies, where feasible.
- Pad and road layouts consider maintenance of natural drainage patterns and avoid ponds, lakes, and streams, where possible. Layout design also considers the effects of spring breakup, and other flood events.
- Pads are oriented from northeast to southwest along the prevailing winds to minimize snow drift and related maintenance activities. Pad orientation could minimize potential effects on hydrology during spring breakup.
- Drill site locations are designed to minimize distances of infield roads and pipelines, with considerations for hydrology, wetlands, and subsistence use.

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- All pads have been sized to minimize overall gravel requirements while maintaining space for a sufficient number of well heads at 30-foot spacing to meet the overall project purpose.
- Pipeline crossings at the Miluveach and Kachemach Rivers are designed to minimize placement of fill within the floodplain and placement of piers below ordinary high water. All pipeline crossings are designed to maintain a minimum of 5-foot freeboard above 50-year high water mark to minimize impacts to hydrology.
- Pipelines will cross the Miluveach and Kachemach Rivers aboveground and in the vicinity of proposed roads, allowing for better access for leak detection, maintenance, and potential spill response.
- Repsol will use a sheet pile design for bridge abutments to minimize the gravel fill footprint, road embankment erosion, and stream scour.
- To minimize the potential for a spill, periodic surveillance of the pipelines will be conducted in accordance with federal regulatory and American Society of Mechanical Engineers (ASME) B31.4 requirements and in accordance with Alaska Department of Environmental Conservation (ADEC) regulations (18 Alaska Administrative Code [AAC] 75). The oil export pipeline will be equipped with a leak detection system based on real time statistical analysis compliant with 18 AAC 75.055 and 49 Code of Federal Regulations (CFR) 195.444.
- To minimize the potential for a spill, the following design features are planned or being considered. For pipelines in liquid service, isolation devices activated by a low pressure signal will be placed on either side of water crossings over 100 feet wide. For oil export and water pipelines, passive isolation devices, such as vertical loops, may also be considered in lieu of automated valves.
- Drainage culverts will be sited and designed at streams and primary conveyance paths based on 50-year flood flows with consideration for both 50-year flows, plus 3 feet, and 200-year flows, plus 1 foot, to minimize the potential for road overtopping. Final culvert locations will be field verified by an engineer to confirm natural drainage patterns are maintained. Typical drainage culverts will be corrugated steel pipe with a minimum 24-inch diameter. All culvert crossings over fish-bearing drainages will be designed to meet Alaska Department of Fish and Game (ADF&G) Title 16 fish passage standards and will generally follow the ADF&G and Alaska Department of Transportation Memorandum of Understanding
- Cross-drainage culverts will be installed within the access and infield road at approximately 500-foot intervals to accommodate meltwater flooding during spring breakup. Cross-drainage culverts will be designed to minimize ponding after flood recession on the downstream side of the road, such that the water surface elevation on the upstream side of the road does not exceed the downstream side by more than 0.5 feet for longer than 1 week. Culverts will be installed in the first summer following winter construction during gravel farming and re-compaction.
- Regular ice road use will be limited to construction activities to minimize the need for annual withdrawal of water for ice road construction. Ice roads are not planned for use on a regular basis to support drilling and operations.
- In accordance with permits, ice road crossings of designated streams and rivers will be slotted, breached, or weakened upon completion of use.

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- Pending commercial agreements and availability of supply, the existing ConocoPhillips Alaska, Inc. seawater treatment plant would be used to supply make up water, minimizing use of local freshwater sources.
- During drilling operations, grind and inject facilities (Underground Injection Control Class I well) will be available at DS1 for disposal of Resource Conservation and Recovery Act (RCRA) exempt and non-hazardous waste. This will minimize the risk of fluid spills during transport of fluids to an off-site disposal facility.
- There will be no discharge of drilling waste or domestic wastewater to the tundra. As a result, a number of impacts would be minimized, including the potential for soil erosion from water discharge and potential impacts to water quality, vegetation, birds, and wildlife.
- Personnel will be required to stay on gravel or ice surfaces to minimize impacts to the tundra unless their specific job duties require them to be on the tundra, and that activity is properly permitted.
- Dust control measures would be implemented to reduce the incidence of dust on vegetation or snow.
- Snow removal management measures would be implemented to reduce the potential for gravel fill to be pushed off pad during snow removal.
- At the conclusion of production, drill sites, roads, and facilities directly associated with the Project will be removed or modified, and the site restored in compliance with all permit and lease requirements.

### Vegetation:

- Ice roads will be routed and constructed to minimize impacts to sensitive vegetation such as willow, per North Slope Borough requirements

### Air Quality:

- Air emissions will be minimized through compliance with ambient air quality standards as demonstrated through computer modeling approved by ADEC.
- No incinerator will be located on site, thereby reducing overall project air emissions.

### Wildlife:

- Roads and pipelines will be separated by 500 feet, where feasible, to minimize caribou disturbance and excessive snow drift accumulation.
- Gravel roads have 3:1 side slopes to facilitate crossing by subsistence users and caribou. This results in a larger project footprint, but minimizes impacts to subsistence users and resources.
- Project facilities were located to reduce impacts to wildlife through moving the Miluveach River Bridge and access road away from ADF&G-identified sensitive brown bear denning habitat.
- Facility lighting will be designed to minimize the impact of lighting on visual aesthetics and minimize the occurrence of bird strikes.
- Placement of new gravel fill on tundra would not occur during the bird nesting season to minimize the potential for disturbances to nesting birds and broods.

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- Pipelines will be covered with a non-reflective surface treatment to reduce potential impacts to wildlife from visual disturbances.
- Project facilities were located to reduce impacts to hydrology and fish through minimization of the gravel fill footprint within 500 feet of fish-bearing water bodies, where feasible.
- All water withdrawal will be conducted in compliance with water withdrawal authorizations and fish habitat permit stipulations to maintain adequate lake volumes in fish-bearing lakes.
- A Wildlife Avoidance and Interaction Plan will be developed to provide personnel with guidance to minimize the possibility of wildlife encounter incidents.

### Cultural Resources/Subsistence:

- Impacts to subsistence use areas will be minimized through location of project facilities (including the Miluveach River Bridge) away from subsistence use areas near the mouth of the Miluveach River.
- Bridge locations have been chosen to minimize impacts to local boat users by placing the bridges as far from subsistence use areas as possible.
- Repsol will work with the Kuukpik Corporation to establish access agreements for use of project gravel roads and ice roads to increase potential access routes for subsistence activities.
- Repsol will provide regular project updates to the community and leadership in Nuiqsut during project development, and will incorporate measures to address concerns into project designs, where practicable. Additionally, Repsol will continue to communicate regularly with the community and leadership in Nuiqsut throughout construction and operations.
- Repsol will interface with the Kuukpik Subsistence Oversight Panel.

### Spill Prevention and Response Planning:

- Trained North Slope employees and contractors who are familiar with North Slope oilfields will be employed, providing personnel who are familiar with industry requirements regarding environmental and regulatory compliance standards. Personnel will be trained on Nanushuk Operational Plans, including snow removal, spill prevention, and wildlife interaction, which will minimize the potential for impacts during daily operations.
- Secondary containment for fuel storage tanks will be at least 100% of the volume of the single largest tank plus an additional 10% to allow for precipitation, minimizing the potential for releases to the environment.
- Spill response equipment will be pre-staged at each drill site to minimize spill response time. This allows responders to address a potential spill and start response as soon as possible, while minimizing the amount of fluid that may be released and associated impacts.

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- Repsol will continue to be a member of Alaska Clean Seas and the Mutual Aid Agreement to provide resources to respond to spills, which may require resources other than those readily staged on pad. Membership in Alaska Clean Seas generally supports faster response time, especially if additional equipment or personnel are required to address an accidental release.

### Noise:

- Routine helicopter use is not planned during regular development drilling or production activities, minimizing noise and related impacts to aesthetics, wildlife, and subsistence.
3. Compensation for unavoidable impacts to waters of the U.S., including wetlands:

Repsol proposes to follow 2008 Guidelines for Compensatory Mitigation for Losses of Aquatic Resources (40 CFR 230), understanding that priorities for these guidelines include mitigation banking, in-lieu fees, and permittee responsible mitigation. Repsol proposes to provide appropriate and practicable compensatory mitigation for unavoidable impacts to WOUS in the form of purchasing credits from a mitigation bank, in-lieu fee program, and/or work with the U.S. Army Corps of Engineers to identify permittee responsible mitigation options.