UNIT PLAN OF OPERATIONS APPLICATION

State of Alaska
Department of Natural Resources, Division of Oil & Gas
550 W. 7th Ave, Suite 1100, Anchorage, AK 99501-3563
Phone: 907-269-8800 Fax: 907-269-8943
Permitting Email: dog.permitting@alaska.gov

SECTION I: APPLICANT INFORMATION

1. Applicant:

Name: Hilcorp Alaska, LLC

Mailing Address: 3800 Centerpoint Dr, Ste 1400

City: Anchorage

State: AK Zip Code: 99503

Phone: 907-777-8300 Fax: 907-777-8560

Email: Enter Email.

2. Applicant Contact:

First Name: Kate Last Name: Kaufman

Title: Environmental Specialist

Is the Mailing Address the same as Applicant's Mailing Address? If "No", please provide information below: ☒ Yes

Mailing Address: Enter Mailing Address.

City: Enter City. State: Enter State. Zip Code: Enter Zip Code.

Phone: 907-777-8329 Fax: 907-777-8560

Email: kkaufman@hilcorp.com

3. Unit Name Milne Point Unit

4. Unit Operator Contact:

Is The Unit Operator Contact the same as the Applicant Contact? If "No", please provide information below: ☒ Yes

First Name: N/A Last Name: Enter Last Name. Title: Enter Title.

Mailing Address: Enter Mailing Address.

City: Enter City. State: Enter State. Zip Code: Enter Zip Code.

Phone: Enter Phone. Fax: Enter Fax. Email: Enter Email.

Describe the relationship between the Unit Operator and the Applicant:

Click here to enter text.

SECTION II: THIRD PARTY INFORMATION

(Fill out this section only if you are applying for the Applicant)

Third Party Company Name: N/A

First Name: Enter First Name. Last Name: Enter Last Name.

Title: Enter Title.

Mailing Address: Enter Mailing Address.

City: Enter City.

State: Enter State. Zip Code: Enter Zip Code.

Phone: Enter Phone. Fax: Enter Fax.

Email: Enter Email.

Describe the affiliation to the Applicant:

Describe your affiliation to the Applicant.

SECTION III: APPLICATION DATE AND NUMBER

(FOR OFFICE USE ONLY)

Application Date:

Application Number:

SECTION IV: PROJECT INFORMATION

1. Project Name:	Moose Pad Development Project
2. Proposed Start Date:	12/1/2016

3. Project Description:

Is activity discussed in the approved Plan of Development on file with the Division's Units Section? ☒ Yes ☐ No

Describe what and where:

The Moose Pad Development Project would provide access to approximately 7 square miles of undeveloped oil reserves within the Milne Point Unit. The project will involve the construction of a gravel pad and access road. To support new oil production, an oil production pipeline, a small tie-in pad, and new pad infrastructure will also be installed.

SECTION V: LAND STATUS

1. State Mineral Estate:

Are supplemental pages for land status included in Appendix C? ☐ Yes ☒ No

Affected ADL: 25514 Date Effective: 2/1/1965 Date Assigned: 11/1/2014

Oil And Gas Lessee(s): Hilcorp Alaska, LLC50%WI; BP Exploration (Alaska) Inc. 50% WI

Surface Ownership: State of Alaska

Do you have, or anticipate having an Access Agreement: ☐ Yes ☐ No

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
Moose Production Pad	U013N009E Sec. 13 and Sec. 14	LAT_DD_N83: 70.486773; LON: -149.728837
Moos Pad Access Route - END	U013N0009E Sec. 13	LAT_DD_N83: 70.486144; LON: -149.722871
Click here to enter text.	Click here to enter text.	Click here to enter text.

Affected ADL: 25515 Date Effective: 2/1/1965 Date Assigned: 11/1/2014

Oil And Gas Lessee(s): Hilcorp Alaska, LLC 50%WI; BP Exploration (Alaska) Inc. 50%WI

Surface Ownership: State of Alaska

Do you have, or anticipate having an Access Agreement: ☐ Yes ☐ No

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
Moose Pad Access Route - MIDPOINT	U013N010E Sec. 18	LAT_DD_N83: 70.481768; LON_DD_N83:-149.670223
Moose Pad Access Route - START	U013N010E Sec. 17	LAT_DD_N83: 70.487545; LON_DD_N83:-149.615875
Moose Pad TIE-IN Pad	U013N010E Sec. 17	LAT_DD_N83: 70.487726; LON_DD_N83:-149.615483

Affected ADL: 25509 Date Effective: 2/1/1965 Date Assigned: 11/1/2016

Oil And Gas Lessee(s): Hilcorp Alaska, LLC 50%WI; BP Exploration (Alaska) Inc. 50%WI

Surface Ownership: State of Alaska

Do you have, or anticipate having an Access Agreement: ☐ Yes ☐ No

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates

Moose Pad TIE-IN Pad	U013N010E Sec. 8	LAT_DD_N83: 70.487726; LON_DD_N83:-149.615483
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

Affected ADL: Enter ADL. Date Effective: Enter Date. Date Assigned: Enter Date.

Oil And Gas Lessee(s): Click here to enter text.

Surface Ownership: Click here to enter text.

Do you have, or anticipate having an Access Agreement: ☐ Yes ☐ No

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

Affected ADL: Enter ADL. Date Effective: Enter Date. Date Assigned: Enter Date.

Oil And Gas Lessee(s): Click here to enter text.

Surface Ownership: Click here to enter text.

Do you have, or anticipate having an Access Agreement: ☐ Yes ☐ No

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

2. State of Alaska Surface Lands:

Are supplemental pages for land status included in Appendix C? ☐ Yes ☐ No

Oil And Gas Mineral Estate Owner: Click here to enter text.

Access Authorization(s): Click here to enter text.

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Oil And Gas Mineral Estate Owner: Click here to enter text.

Access Authorization(s): Click here to enter text.

Special Use Lands: Click here to enter text.

Jointly Managed Lands: Click here to enter text.

Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Click here to enter text.	Click here to enter text.	Click here to enter text.

Oil And Gas Mineral Estate Owner: Click here to enter text.
Access Authorization(s): Click here to enter text.
Special Use Lands: Click here to enter text.
Jointly Managed Lands: Click here to enter text.
Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Click here to enter text.	Click here to enter text.	Click here to enter text.

3. Private Lands:

Are supplemental pages for land status included in Appendix C? ☐ Yes ☐ No

Oil And Gas Mineral Estate Owner: State of Alaska – No private surface or mineral estate.
Surface Ownership And Access Agreement(s): None.
Special Use Lands: Click here to enter text.
Jointly Managed Lands: Click here to enter text.
Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

Oil And Gas Mineral Estate Owner: Click here to enter text.
Surface Ownership And Access Agreement(s): Click here to enter text.
Special Use Lands: Click here to enter text.
Jointly Managed Lands: Click here to enter text.
Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
Click here to enter text.	Click here to enter text.	Click here to enter text.
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Oil And Gas Mineral Estate Owner: Click here to enter text.
Surface Ownership And Access Agreement(s): Click here to enter text.
Special Use Lands: Click here to enter text.
Jointly Managed Lands: Click here to enter text.
Other Considerations: Click here to enter text.

Project Components	Meridian, Township, Range, And Section(s)	GPS Coordinates
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Click here to enter text.	Click here to enter text.	Click here to enter text.

SECTION VI: BOND INFORMATION

Bonded Company: Hilcorp Alaska, LLC
Type: Surety Bond Number: 022035257 Amount: $500,000
Bonding Company: Liberty Mutual Insurance Company

Mailing Address: 175 Berkley St
City: Boston State: MA Zip Code: 02117
Phone: Enter Phone. Fax: Enter Fax. Email: Enter Email.

SECTION VII: SEQUENCE AND SCHEDULE OF OPERATIONS

Project Milestone #	Project Milestone	Proposed Start Date	Proposed End Date
1.	Season 1 Ice Road Construction	12/1/2016	2/1/2017
2.	Gravel Mining and Placement (Moose Pad, Access Road, and Tie-In Pad)	12/15/2016	3/31/2017
3.	Gravel Turning and Compaction (Moose Pad, Access Road, and Tie-In Pad)	7/1/2017	8/31/2017
4.	Culvert Placement	7/1/2017	8/31/2017
5.	Power & Fiber Installation	7/1/2017	8/31/2017
6.	Season 2 Ice Road Construction	12/1/2017	2/1/2018
7.	Pipeline Installation	12/15/2017	3/31/2018
8.	Facility Installation	5/1/2018	9/31/2018
9.	Drilling Program	9/1/2018	NA
10.	Note: The project milestone schedule above is flexible and dates may move forward or back. Project schedule and milestone completion is driven by economic benefit of executing project components, and as such the project may be accelerated or decelerated to accommodate business needs.	NA	NA

SECTION VIII: PROJECTED USE REQUIREMENTS

1. Describe the proposed operations, including the location and design, of **Well Sites**:

Hilcorp Alaska, LLC (Hilcorp) plans to expand oil resource development within the Milne Point Unit (MPU) Schrader Bluff reservoir by constructing a new pad and corresponding access road. In addition, Hilcorp plans to expand the existing pipeline, electrical, and communication infrastructure in the western portion of MPU to accommodate additional future oil production. The proposed new pad (Moose Pad) will provide Hilcorp access to approximately 7 square miles of undeveloped oil reserves within the MPU. Initial development plans for Moose Pad will include up to 44 new wells to be developed using directional drilling technology. To increase the amount of crude oil that can be extracted from the Schrader Bluff reservoir, the new wells will include both oil production wells and enhanced oil recovery (EOR) injection wells. The Moose Pad Development Project will occur within the MPU lease area at Alaska Division of Lands (ADLs) 025514, 025515, 025509. MPU is currently operated by Hilcorp and ownership is divided between Hilcorp (50%) and BP Alaska, Inc. (BPXA) (50%). The Moose Pad Development Project will involve the construction of Moose Pad and an access road located on the west side of Milne Point Road. To support new oil production wells on Moose Pad, an oil production pipeline, a small tie-in pad, and new pad infrastructure will also be installed. A total of 266,550 cubic yards of gravel fill into 34.83 acres of footprint (30.43 acres of wetlands and 4.40 acres of uplands) is anticipated to be placed for all components of the project.

2. Describe the proposed operations, including the location and design, of **Buildings**:

The Moose Pad Development Project will require specific infrastructure to be installed on the pad including: a test separator building, a pig launcher building, and an electric submersible pump (ESP) drive building. A pig launcher building approximately 10 ft. by 30 ft. (300 sqft.) will be constructed at the tie-in pad to facilitate pigging operations at the pipeline intersection.

3. Describe the proposed operations, including the location and design, of **Fuel and Hazardous Substances**:

A diesel fuel storage tank (~14,000 gallons and two 300 gallon day tanks) for equipment refueling will be onsite temporarily to support drilling efforts. Up to two 1,000 barrel tanks of methanol, stored within secondary containment will be located on Moose Pad. Up to 2,000 gallons each of treatment chemicals including anti-foam, corrosion inhibitor, and demulsifier would be stored in tanks located inside a permanent process module on the pad. Secondary containment is provided for fuel and hazardous substances as required by State, Federal, and Local requirements, consisting of an impermeable diked area with 110% available volume of the largest container stored within the containment. Fuel and Hazardous substances will not be stored within 100 ft. of a surface water source. Drip pans and surface liners are placed under leaking or dripping equipment. Any dripping or leaking equipment is required to be repaired in a timely manner. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, is on hand during any transfer or handling of fuel or hazardous substances. All fuel and hazardous substance containers at Milne Point are

labeled with the contents and lessee's or contractor's name.

4. Describe the proposed operations, including the location and design, of **Solid Waste Sites**:

Waste will be handled consistent with Hilcorp waste management practices as outlined below: • Waste will be properly segregated and containers labeled to ensure proper disposal. • Closed-top dumpsters will be onsite for food trash and household waste and will be hauled away from the site regularly to prevent overfilling. • Household waste/paper trash will be sent to the North Slope Borough Landfill for disposal. • Oily waste will be segregated and sent to a specialty waste contractor for offsite disposal. • Waste drilling mud and cuttings will be hauled via vacuum truck or supersucker directly from the rig process tank to an offsite, permitted underground injection disposal facility. The only anticipated storage of drilling waste on location would be in the event of an issue at the disposal facility that prevented immediate shipment, in which case Hilcorp would obtain Alaska Department of Environmental Conservation (ADEC) Temporary Drilling Waste Storage plan approval.• Produced water tanks will be routinely emptied and produced water hauled offsite for underground injection.

5. Describe the proposed operations, including the location and design, of **Water Supplies**:

Fresh water will be utilized from existing permitted water sources within the Milne Point Unit for ice road construction and gravel compaction purposes. In addition, future operations at Moose Pad are anticipated to require two water source wells to support the EOR injection wells. Water source wells will utilize canned pumps and will be permitted prior to installation.

6. Describe the proposed operations, including the location and design, of **Utilities**:

Moose Pad will be tied into existing power and communication sources in MPU by installing power and fiber optic cables within the bed of the access road. Power and fiber optic cables installed within the access road bed will tie into existing MPU power and communication systems at the tie-in pad. Development of the Schrader Bluff reservoir at Moose Pad will require the addition of a new oil production pipeline to transport 3-phase flow back to the Central Facilities Pad (CFP). The new pipeline will be installed 500' north of the Moose Pad Access Road to the maximum extent practicable to facilitate caribou crossing concerns raised by the NSB and ADF&G during initial review of the Moose Pad Permit Application. The agreed upon Moose Pad Pipeline route and orientation is shown in figure 3. The pipeline will be separated from the access road at varying distances in the following areas based on environmental and topographical conditions that exist in the project area: (1) Initial 500' Separation – After crossing under the MPU spine road, the Moose Pad Pipeline immediately begins to angle away from the Moose Pad access road to create the recommended 500' separation for caribou crossing. This separation is maintained as the pipeline continues west for approximately 1.57 miles, until the pipeline corridor encounters multiple large surface water bodies in Section 13. (2) Primary Bottleneck – In the center of section 13, the pipeline corridor encounters multiple large and impassable water bodies that must be constructed around. Constructing the pipeline to the north of these water bodies places the pipeline outside of the NSB recommended maximum separation of 1000'and placing the pipeline to the south of these water bodies places the pipeline inside of the NSB and ADF&G recommended separation of 500'. A decision was reached with the NSB, ADF&G, and Hilcorp to route the pipeline to the south (closer to the access road) for the segment where the impassable water bodies exists. In this area, the pipeline angles in towards the Moose Pad Access Road and the separation ranges from 50 to 500' for approximately 0.6 Miles where the water bodies are passed, and recommended separation can be gained again. (3) Secondary 500' Separation –Where the Moose Pad Pipeline meets the gravel pad, achieving the recommended 500' separation is difficult due the presence of surface water bodies and relic lake beds. Relic lake beds pose engineering challenges due to the presence of underlying thaw bulbs and/or ice lenses that are problematic for VSM installation and Pipeline Integrity. As the Moose Pad Pipeline moves past the previously described surface water body bottleneck, the pipeline angles away from the moose pad access road, allowing for approximately 0.22 miles of 500' separation, which is the maximum amount geographically allowable from an engineering and constructability standpoint.The new oil production pipeline will be installed on vertical support members (VSMs) designed similar to the existing VSMs along Milne Point Road. Pipeline VSM installation is anticipated to cover approximately 0.05 acres of footprint and utilize an additional 50 Cu yds. of gravel fill. The new oil production pipeline will transition from VSMs to a buried pipeline to cross the Milne Point Road and will return to VSMs to tie into the common carrier pipeline on the east side of Milne Point Road. At this time, water or gas injection pipelines are not anticipated to be required at Moose Pad.

7. Describe the proposed operations, including the location and design, of **Material Sites**:

The Moose Pad Development project will require approximately 266,550 Cu yd. of gravel which will be obtained from the Ugnu/E-Pit Mine Site under the existing Material Sale Contract with the Alaska Department of Natural Resources, Division of Mining Land and Water. If for any reason, material sources are not available, Hilcorp will utilize material from the Milne Point Mine Site as a secondary option.

8. Describe the proposed operations, including the location and design, of **Roads**:

An access road will be constructed to connect Moose Pad to the existing Milne Point Road between MPU C Pad and L Pad. The proposed access

road will be located within Sections 17 and 18, Township 13 North, Range 10 East, Umiat Meridian, and Section 13, Township 13 North, Range 9 East, Umiat Meridian, Alaska. The proposed access road footprint is estimated to be approximately 2.83 miles (14,980 feet) long and 35 ft. wide at the top and 55 ft. wide at the base (17.20 acre total footprint). Within the proposed 17.21 acre access road footprint, 4.40 acres of uplands "tractor tracks" have been identified, leaving 12.80 acres of wetlands to be filled during access road construction. Construction of the access road is estimated to require approximately 125,000 Cu yd of gravel fill. In addition, to avoid disrupting the natural drainage and to allow fish passage, culverts will be sized accordingly and installed within the roadbed. To provide for fish passage at stream crossings, culverts will be designed based on recommendations of a consulting hydrologist and Alaska Department of Fish and Game personnel.

9. Describe the proposed operations, including the location and design, of **Airstrips**:

N/A

10. Describe the proposed operations, including the location and design, of **All Other Facilities and Equipment**:

The new oil production pipeline will require the addition of a small tie-in pad to allow access to the pigging equipment. This new tie-in pad will be approximately 50 ft. by 140 ft. at the top and 60 ft. by 160 ft. at the base (0.36 acres) 2:1 side slopes, and is estimated to require approximately 1500 Cu yd of gravel fill. The final location of the tie-in pad will be dependent on the final routes selected for the access road and oil production pipeline.

11. If another permit(s) is required for the above described Projected Use Requirements, provide the following information:

Are supplemental pages for land status included in Appendix C? ☐ Yes ☒ No

Agency	Permit Type	Permit Number	Application Status	Projected Use Requirement(s)
U.S. Army Corps of Engineers (USACE)	Section 404 Authorizaation for placement of fill in wetlands	--	Application submitted 8/15/2016	Waters of the U.S., placement of fill for access road and pad.
Alaska Dept. of Natural Resources (ADNR) Division of Mining, Land and Water	Temporary Water Use Authorizations	Various Existing	Permits Issued / Existing	Water Use
North Slope Borough	Development Permit	--	Application Submitted 9/2/2016	Land Use
North Slope Borough	IHLC Clearance	--	Clearance issued 9/7/2016	Fill placement
State Historic Preservation Office (SHPO)	Concurence with "No Historic Properties affected" determination	3130-3R NSB	Concurrence issued 8/23	Fill placement
ADNR, Division of Oil and Gas (DOG)	Unit Plan of Operations approval	--	Submitted	Gravel road and pad construction
Alaska Dept. of Environmental Conservation (ADEC)	Minor Air Quality Permit	Enter Permit Number.	Applicability Determination Underway	Facility installation
Alaska Dept. of Environmental Conservation (ADEC)	Transportable Drill Rig Permit	AQ1399MSS01	Permits Issued / Existing	Drilling Operations
Alaska Dept. of Fish and Game (ADF&G)	Culvert Installation Permit	--	Application in development	Culvert Installation
Alaska Oil and Gas Conservation Comission (AOGCC)	Permits to drill and sundry approvals	Enter Permit Number.	Not yet submitted	Drilling Operations
U.S. Environmental Protection Agency	Underground Injection Control (UIC) Permit	--	Not yet submitted	Injection of non-hazardous waste
Enter Agency.	Enter Permit Type.	Enter Permit Number.	Enter Application Status.	Enter Projected Use Requirement(s).
Enter Agency.	Enter Permit Type.	Enter Permit Number.	Enter Application Status.	Enter Projected Use Requirement(s).

Enter Agency.	Enter Permit Type.	Enter Permit Number.	Enter Application Status.	Enter Projected Use Requirement(s).
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Enter Agency.	Enter Permit Type.	Enter Permit Number.	Enter Application Status.	Enter Projected Use Requirement(s).

SECTION IX: REHABILITATION PLAN

1. Proposed Level of Infrastructure, Facilities and Equipment Removal:

Facility infrastructure will be removed from the Milne Point Unit Pads at the time of facility decommissioning.

2. Description of Restoration and Rehabilitation Activities for Vegetation, Habitat, Impacted Wildlife, and Other Applicable Resources:

After the unit is no longer producing, the road and pad will be cleaned and reclaimed in compliance with applicable laws and regulations.

SECTION X: OPERATING PROCEDURES DESIGNED TO MINIMIZE ADVERSE EFFECTS

Describe operating procedures designed to prevent or minimize adverse effects on other natural resources and other uses of the Unit area and adjacent areas including:

Fish and Wildlife Habitats:	Wetlands delineation surveys were performed in July 2016 by ASRC Energy Services (AES) and documented in a Wetland Delineation Report submitted to the U.S. Army Corps of Engineers in August. The proposed Moose pad and access road will impact approxiamately 30.4 acres of wetlands, 4.4 acres of uplands and is utilizing a previously disturbed road bed to access the pad. Culverts will be installed in the access road to minimize impacts to natural drainage patterns & partially restore local hydrology. Impacts to migratory birds are avoided by utilizing winter time construction. Hilcorp will implement the appropriate monitoring and mitigation to minimize impacts to polar bears. The Moose Pad access road will cross No-Point creek, which likely supports anadrmous fish species in the summer months. A culvert will be installed at this stream crossing to allow for fish passage.
Historic and Archeological Sites:	Hilcorp contracted with Norhtern Land Use Research, Alaska (NLUR) in 2015 to identify cultural resources in the project area. Three previously reported and verified AHRS sites have been identified in the vicinity of the project area, the closest within 700 m (2,280 ft). All previously identified sites will be protected by a 500-ft exclusion zone to ensure they remain unaffected by field operations. Hilcorp received State Historic Preservation Office (SHPO) concurrence that no historic properties would be affected by the proposed action. If the proposed construction site reveals any site, structure, or object of prehistoric, historic, or archeological sifnificance, Hilcorp will make every effort to preserve and protect the discovered site or oject and consulte with SHPO and the NSB IHLC as to deterime the course of action for preservation efforts.
Public Use Areas:	There is no public access to the Milne Point Unit. Access is limited and controlled with security checkpoints at the access points to the field. The proposed project does not effect public access to Milne Point Unit.
Other Uses:	Click here to enter text.

SECTION XI: GLOSSARY OF TERMS

Term #	Term	Term Definition
1	Enter Term.	Enter Term Definition.
2	Enter Term.	Enter Term Definition.
3	Enter Term.	Enter Term Definition.
4	Enter Term.	Enter Term Definition.
5	Enter Term.	Enter Term Definition.
6	Enter Term.	Enter Term Definition.
7	Enter Term.	Enter Term Definition.
8	Enter Term.	Enter Term Definition.
9	Enter Term.	Enter Term Definition.
10	Enter Term.	Enter Term Definition.

SECTION XII: CONFIDENTIALITY			
The undersigned hereby requests that each page/section of this application marked confidential be held confidential under AS 38.05.035(a)(8). APPLICANT CONTACT:			
Sign here.	Enter Name.	Enter Title.	Enter Date.
Signature	Name	Title	Date

APPENDIX A: MAPS

Include maps here.

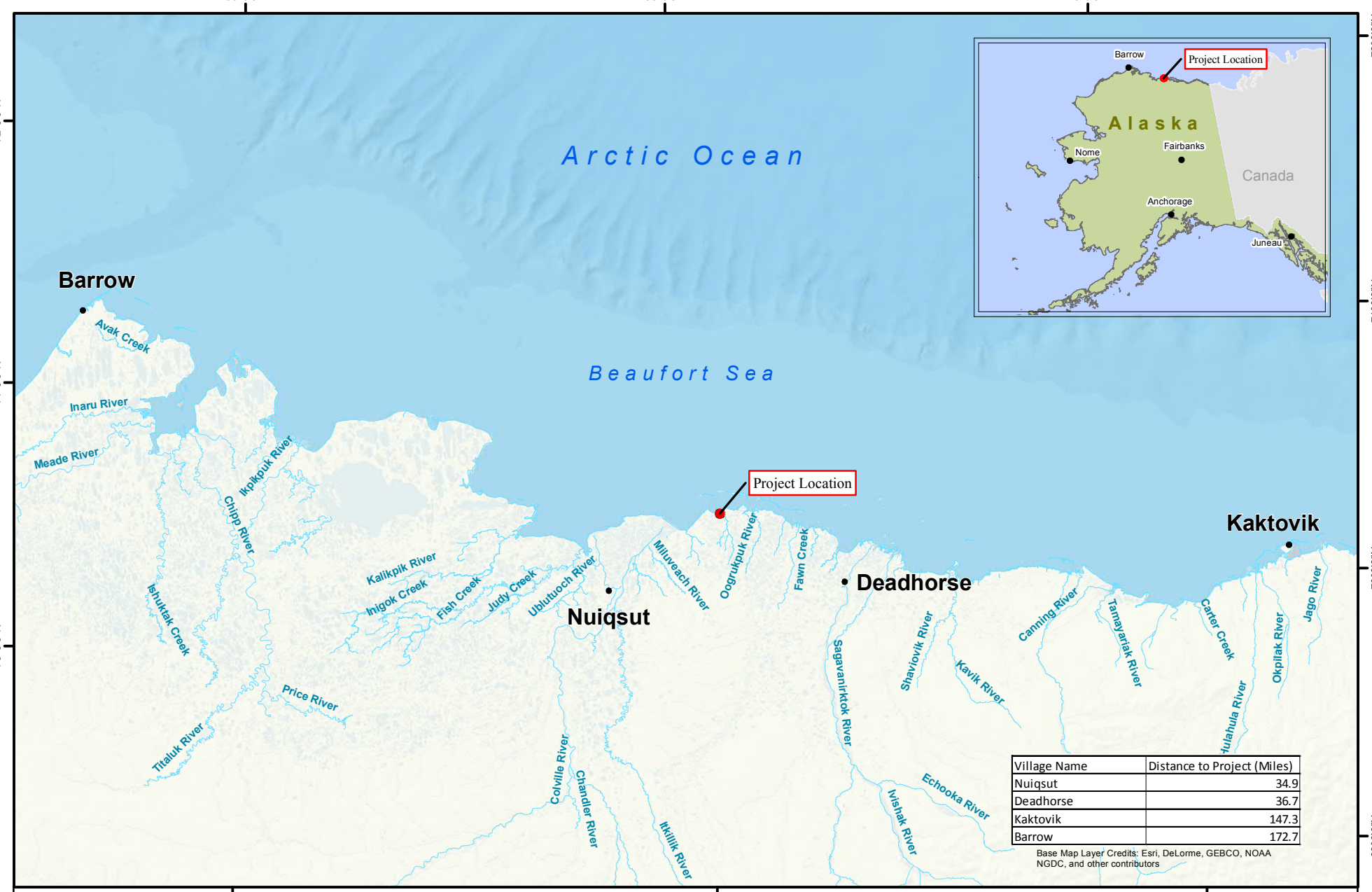
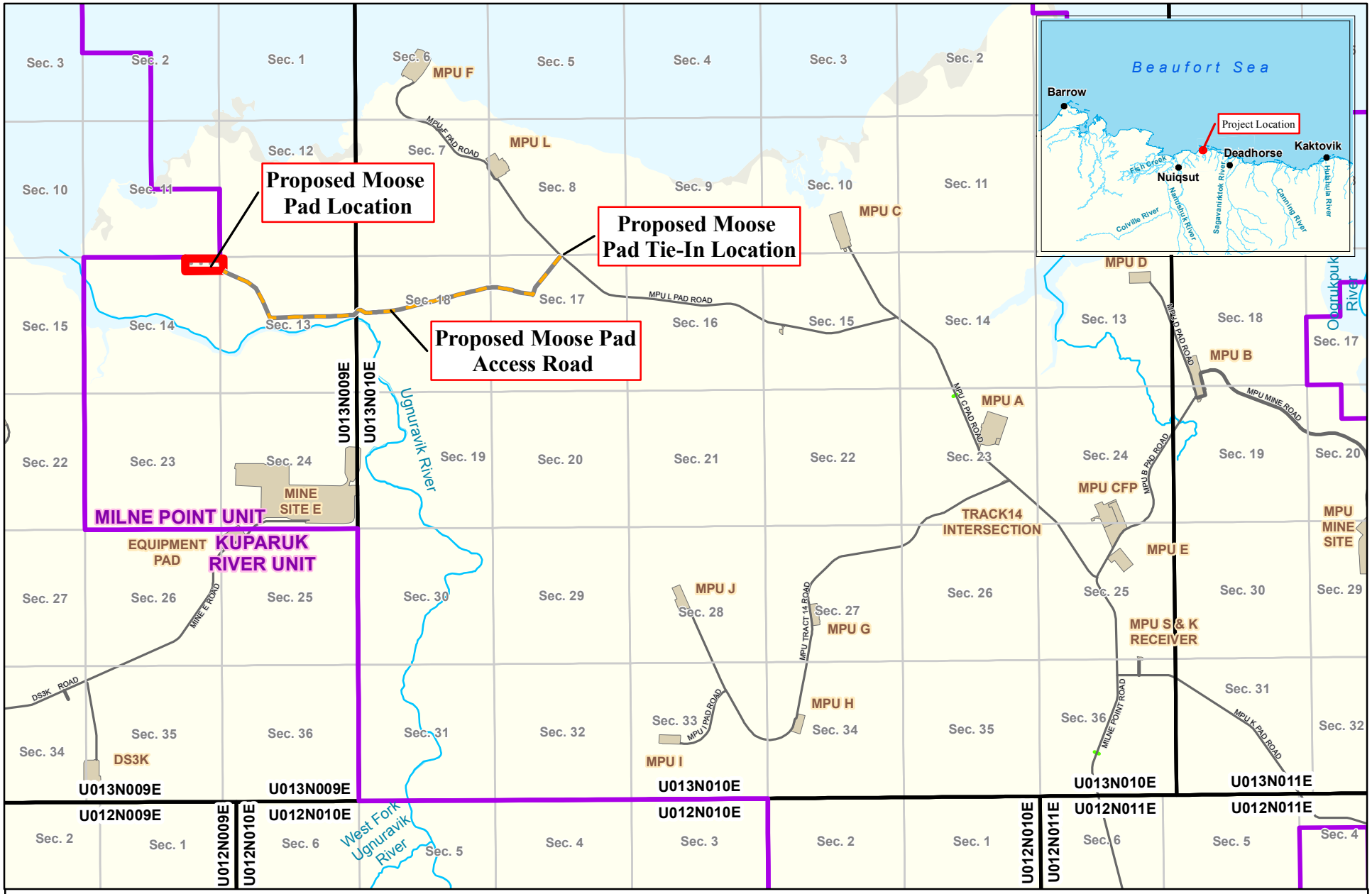

155°0'0"W
150°0'0"W
145°0'0"W
72°0'0"N
71°0'0"N
70°0'0"N
69°0'0"N
Arctic Ocean
Beaufort Sea
Barrow
Avak Creek
Inaru River
Meade River
Ikpikpuk River
Chipp River
Ishuktak Creek
Titaluk River
Price River
Kalikpik River
Inigok Creek
Fish Creek
Judy Creek
Ublutuoch River
Nuiqsut
Colville River
Chandler River
Miluveach River
Ikkillik River
Oogrukpuk River
Fawn Creek
Project Location
Deadhorse
Sagavanirktok River
Shaviovik River
Kavik River
Echooka River
Ivishak River
Canning River
Tamayariak River
Hulahula River
Carter Creek
Okpilak River
Jago River
Kaktovik
Alaska
Fairbanks
Nome
Anchorage
Juneau
Canada
Village Name | Distance to Project (Miles)
Nuiqsut | 34.9
Deadhorse | 36.7
Kaktovik | 147.3
Barrow | 172.7
Base Map Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors
Hilcorp Alaska, LLC
Map Date: 8/26/2016
North Slope Borough
Milne Point Unit
Proposed Moose Pad Location
Vicinity
Legend
MPU Proposed Moose Pad Location
Alaska Albers Equal Area NAD 1983
0 10 20 30 40 50
Miles
N

Figure 1



Hilcorp Alaska, LLC

Map Date: 8/26/2016

North Slope Borough
Milne Point Unit
Proposed Moose Pad Location
Project Area

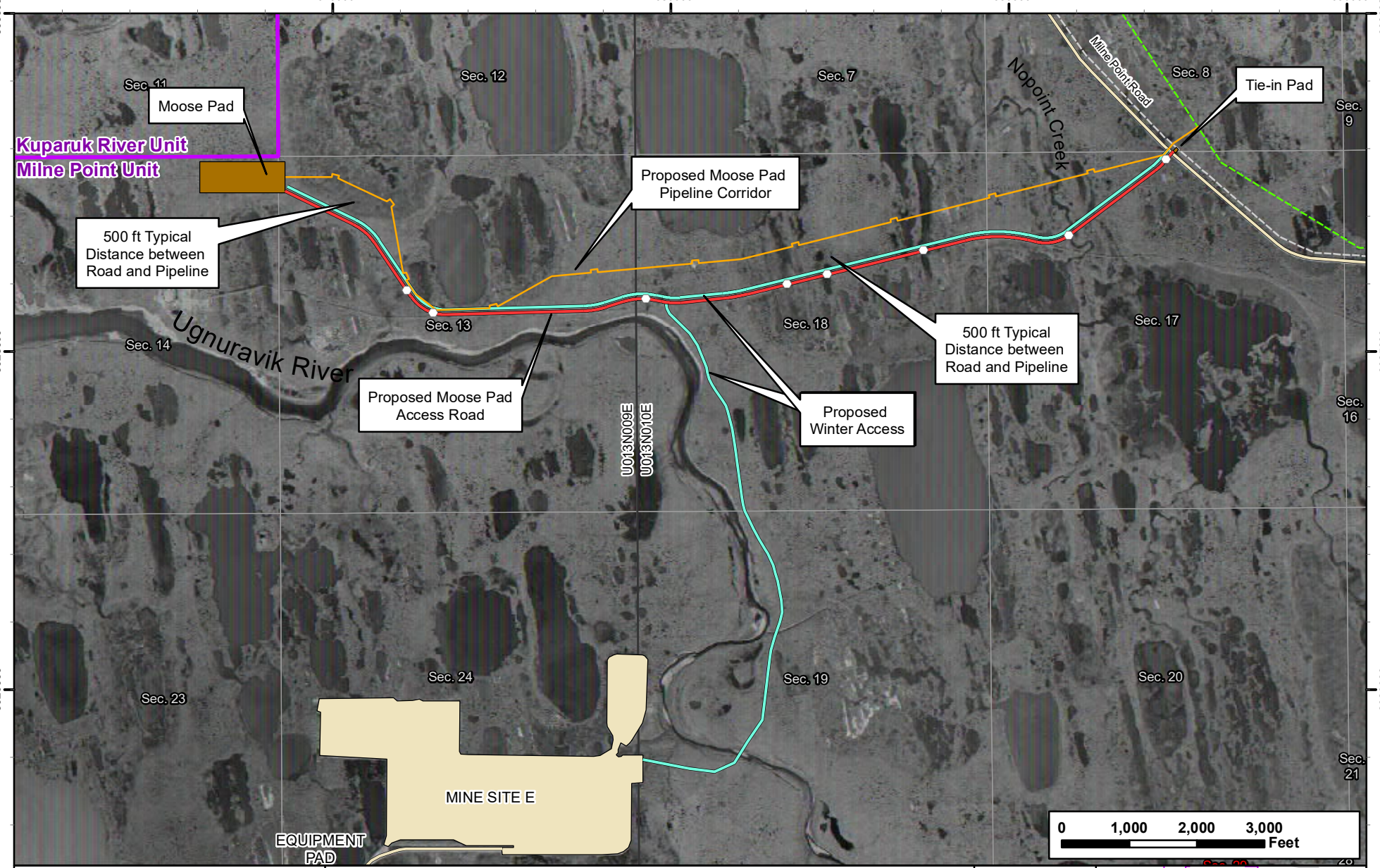
Proposed Access Road
MPU Proposed Moose Pad Location
Oil and Gas Unit Boundaries

Alaska StatePlane Zone 4 NAD 1983 (Feet)

0 2,500 5,000 7,500 10,000 Feet

N

Figure 2



HILCORP - Moose Pad
Proposed Infrastructure
Figure 3
Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 Alaska SPCS Z4 (Feet)
Imagery/Existing Infra. from Hilcorp Alaska

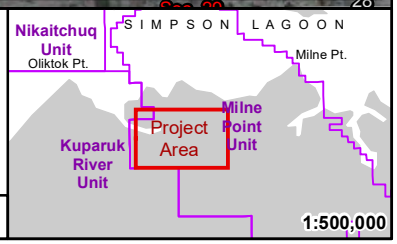
Legend

- Proposed Access Road
- Proposed Winter Access Road
- Proposed Pipeline
- Proposed Pad
- Proposed Culvert
- Existing Road
- Existing Pipeline (Above Ground)
- Existing Power Line
- Existing Facility
- Oil & Gas Unit Boundary

N

1:24,000

11/1/2016



MoosePad_8x11L_BlkB

APPENDIX B: MITIGATION MEASURES

Include mitigation measures here.

Alaska Department of Natural Resources
Division of Oil & Gas
550 W 7th Ave. Suite 800
Anchorage, Alaska 99501

Revised: March 2013

MITIGATION MEASURE ANALYSIS: NORTH SLOPE

The following instructions are provided for guidance to adequately complete the Mitigation Measure Analysis form.

1. The applicant shall respond to each Mitigation Measure, and all subsets of mitigation measures; i.e. A.2.d.i should be addressed and A.2.d.ii, and so forth.

2. The applicant's response shall begin by clearly indicating if the **mitigation measure is satisfied**, an **exception is requested**, or if the mitigation measure is **not applicable**.

3. The applicants' response shall then address how the proposed project clearly satisfies the mitigation measure, meets the intent of the mitigation measure, is not practicable, or is not applicable.

4. The applicant shall verify working 'in consultation with' parties other than Department of Natural Resources (DNR), Division of Oil and Gas (DO&G) by reporting meeting dates and parties present for Mitigation Measures which require consultation with parties other than DNR, DO&G; i.e. Mitigation Measure 1.b.

Please note that this form, along with the Plan of Operations Application form and the Plan of Operations, must be adequately completed before DNR DO&G will review an application for potential approval.

NORTH SLOPE **A. Mitigation Measures**	**Company Response**
1. Facilities and Operations	
a. A plan of operations must be submitted and approved before conducting exploration, development or production activities, and must describe the lessee's efforts to minimize impacts on residential, commercial, and recreational areas, Native allotments and subsistence use areas. At the time of application, lessee must submit a copy of the proposed plan of operations to all surface owners whose property will be entered.	A.1.a. Mitigation measure satisfied – The proposed project is within the Milne Point Unit on State owned land, approximately 35 miles west of Prudhoe Bay. There are no residential, commercial, recreational areas, Native Allotments or subsistence use areas impacted by the proposed project. Ongoing mitigation measures, such as seasonal restrictions on specific activities in certain areas, reduce the impact on bird, fish and mammal populations. The Moose Pad Development has been included in the Milne Point Unit Plan of Development, and was provided to the North Slope Borough (NSB) at the NSB pre-application meeting held 9.15.2016.
b. Facilities must be designed and operated to minimize sight and sound impacts in areas of high residential, commercial, recreational, and subsistence use and important wildlife habitat. Methods may include providing natural buffers and screening to conceal facilities, sound insulation of facilities, or by using alternative means approved by the Director, in consultation with ADF&G and the NSB.	A.1.b. Mitigation measure satisfied – the proposed project is within the Milne Point unit, and is surrounded by established oil and gas development infrastructure. There are no residential, commercial, recreational areas, or Native Allotments impacted by this project in the Milne Point Unit. While subsistence activities occur across the North Slope, they generally do not occur directly within oil and gas exploration and development areas. Sound impacts associated with drilling operations will be temporary and no long term sound impacts associated with facility installations will be added with this pad development.
c. To the extent practicable, the siting of facilities will be prohibited within 500 feet of all fish-bearing streams and waterbodies and 1,500 feet from all current surface drinking water sources. Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the main channel of the Colville, Canning,	A.1.c. Mitigation waiver requested – the proposed Moose Pad access road placement was designed to follow an existing road bed, (referred to as the "tractor tracks") to minimize impacts to wetlands. Following the tractor tracks brings the access road within 175 feet of the

Sagavanirktok, Kavik, Shaviovik, Kadleroshilik, Echooka, Ivishak, Kuparuk, Toolik, Anaktuvuk and Chandler Rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the Director, in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.	Ugnuravik River which is listed in the Catalog of Water important for spawning, rearing or migration of Anadramous Fishes (Catalog). The proposed access road also crosses No Point Creek. Although No Point Creek is not listed in the Catalog, it likely supports anadramaous fish species (ninespine stickleback) during the summer months. The proposed road alignment was selected to utilize previously disturbed areas/uplands and to minimize impacts to wetlands. Appropriate construction methods will be utilized to avoid impacts during winter construction and spring breakup.
d. No facilities will be sited within one-half mile of identified Dolly Varden overwintering and/or spawning areas on the Canning, Shaviovik, and Kavik rivers. Notwithstanding the previous sentence, road and pipeline crossings may only be sited within these buffers if the lessee demonstrates to the satisfaction of the Director and ADF&G in the course of obtaining their respective permits, that either (1) the scientific data indicate the proposed crossing is not within an overwintering and/or spawning area; or (2) the proposed road or pipeline crossing will have no significant adverse impact to Dolly Varden overwintering and/or spawning habitat.	A.1.d. A.1.d. Mitigation measure satisfied – The proposed project is associated with existing facilities in the Milne Point Unit. The project is not located within one-half mile of identified Dolly Varden overwintering and/or spawning areas on the Canning, Shaviovik, and Kavik rivers.
e. Impacts to important wetlands must be minimized to the satisfaction of the Director, in consultation with ADF&G and ADEC. The Director will consider whether facilities are sited in the least sensitive areas. Further, all activities within wetlands require permission from the US Army Corps of Engineers.	A.1.e. Mitigation measure satisfied - The Moose Pad and access road locations were selected to avoid and minimize placement of fill in wetlands in the area to the extent practicable. A permit application for authorization of fill in wetlands was submitted to the USACE on August 15, 2016 and is currently being processed.
f. Exploration facilities, including exploration roads and pads, must be temporary and must be constructed of ice unless the Director determines that no practicable alternative exists. Re-use of abandoned gravel structures may be permitted on a case-by-case basis by the Director, after consultation with the director, DMLW, and ADF&G. Approval for use of abandoned structures will depend on the extent and method of restoration needed to return these structures to a usable condition.	A.1.f. Not Applicable – This is not an Exploration facility, exploration road or pad. The gravel pad and access road are in support of Milne Point Field development activities.
g. Pipelines must utilize existing transportation corridors where conditions permit.	A.1.g. Mitigation waiver requested – the Moose Pad pipeline will be

Pipelines must be designed to facilitate the containment and cleanup of spilled fluids. Where practicable, onshore pipelines must be located on the upslope side of roadways and construction pads, unless the director, DMLW, determines that an alternative site is environmentally acceptable. Wherever possible, onshore pipelines must utilize existing transportation corridors and be buried where soil and geophysical conditions permit. All pipelines, including flow and gathering lines, must be designed, constructed and maintained to assure integrity against climatic conditions, geophysical hazards, corrosion and other hazards as determined on a case-by-case basis.	installed along the north, upslope side of the pad access road. The pipeline will be VSM mounted adjacent to the road to minimize impacts to the tundra, allow for routine visual inspections and easy access for maintenance and repair. The new pipeline will be installed 500' north of the Moose Pad Access Road to the maximum extent practicable to facilitate caribou crossing concerns raised by the NSB and ADF&G during initial review of the Moose Pad Permit Application. The agreed upon Moose Pad Pipeline route and orientation is shown in figure 3 of the attached project description. The pipeline will be separated from the access road at varying distances based on environmental and topographical conditions that exist in the project area. The pipeline will be designed, constructed and maintained to assure integrity against climate conditions, geophysical hazards, corrosion and other hazards.
h. Pipelines shall be designed and constructed to avoid significant alteration of caribou and other large ungulate movement and migration patterns. At a minimum, above-ground pipelines shall be elevated 7 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a road, pad, or a ramp installed to facilitate wildlife passage. Lessees shall consider increased snow depth in the sale area in relation to pipe elevation to ensure adequate clearance for wildlife. ADNR may, after consultation with ADF&G, require additional measures to mitigate impacts to wildlife movement and migration. i. The state of Alaska discourages the use of continuous-fill causeways. Environmentally preferred alternatives for field development include use of buried pipelines, onshore directional drilling, or elevated structures. Approved causeways must be designed, sited, and constructed to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedances of water quality criteria, and must maintain free passage of marine and anadromous fish. ii. Causeways and docks shall not be located in river mouths or deltas. Artificial	A.1.h.Mitigation measure satisfied – pipeline will be elevated at least 7 feet above grade on VSMs (measured at the VSM). A.1.h.i. Not Applicable – No causeways, docks or gravel islands are associated with the project. A.1.h.ii. Not Applicable – No causeways, docks or gravel islands are associated with the project. A.1.h.iii. Not Applicable – No causeways, docks or gravel islands are associated with the project.

gravel islands and bottom founded structures shall not be located in river mouths or active stream channels on river deltas, except as provided for in (iii). iii. Each proposed structure will be reviewed on a case-by-case basis. Causeways, docks, artificial gravel islands and bottom founded structures may be permitted if the Director, in consultation with ADF&G, ADEC, and the NSB determines that a causeway or other structures are necessary for field development and that no practicable alternatives exist. A monitoring program may be required to address the objectives of water quality and free passage of fish, and mitigation shall be required where significant deviation from objectives occurs.	
i. Dismantlement, Removal and Rehabilitation (DR&R): Upon abandonment of material sites, drilling sites, roads, buildings or other facilities, such facilities must be removed and the site rehabilitated to the satisfaction of the Director, unless the Director, in consultation with DMLW, ADF&G, ADEC, NSB, and any non-state surface owner, determines that such removal and rehabilitation is not in the state's interest.	A.1.i. Mitigation measure satisfied – Material sites, drilling sites, roads, buildings or other facilities will be removed and the site rehabilitated at the end of field life to the satisfaction of the Director, unless the Director, in consultation with DMLW, ADF&G, ADEC, NSB, and any non-state surface owner, determines that such removal and rehabilitation is not in the state's interest.
j. Gravel mining sites required for exploration and development activities will be restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage. Where practicable, gravel sites must be designed and constructed to function as water reservoirs for future use. Gravel mine sites required for exploration activities must not be located within an active floodplain of a watercourse unless the director, DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed and the site is closed. Mine site development and rehabilitation within floodplains must follow the procedures outlined in McLean, R. F. 1993, North Slope Gravel Pit Performance Guidelines, ADF&G Habitat and Restoration Division Technical Report 93-9, available from ADF&G.	A.1.j. Mitigation measure satisfied – Gravel will be sourced from existing mine sites under existing material sales contracts with ADNR and authorized by ADF&G, NSB and the US Army Corps of Engineers. The gravel will be from either Mine Site E in Kuparuk, or the Milne Point Mine Site in the Milne Point Unit. The existing mine sites, which will be the source of gravel, have been constructed in consultation with ADNR, ADF&G, the NSB and The US Army Corps of Engineers. These agencies have also approved the Mining and Rehabilitation Plan for the existing mine sites.
2. Fish and Wildlife Habitat	

a. Detonation of explosives within or in proximity to fish-bearing waters must not produce instantaneous pressure changes that exceed 2.7 pounds per square inch in the swim bladder of a fish. Detonation of explosives within or in close proximity to a fish spawning bed during the early stages of egg incubation must not produce a peak particle velocity greater than 0.5 inches per second. Blasting criteria have been developed by ADF&G and are available upon request from ADF&G. The location of known fish-bearing waters within the project area can also be obtained from ADF&G. The lessee will consult with the NSB prior to proposing the use of explosives for seismic surveys. The Director may approve the use of explosives for seismic surveys after consultation with the NSB.	A.2.a. Not Applicable – No explosives will be used in the proximity of fish-bearing waters for this project. Explosives use and blasting is anticipated to occur at the established material source(s), but will be conducted under existing authorizations for the use and operation of the mine site.
b. Water intake pipes used to remove water from fish-bearing waterbodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall be no greater than 1 mm (0.04 inches), unless another size has been approved by ADF&G. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.1 foot per second, unless an alternative velocity has been approved by ADF&G.	A.2.b. Mitigation measure satisfied – Water withdrawals for this project will be from water sources permitted by ADNR using previously approved intake structures & fish screens.
c. Removal of snow from fish-bearing rivers, streams and natural lakes shall be subject to prior written approval by ADF&G. Compaction of snow cover overlying fish-bearing waterbodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, ice or snow bridges may be required.	A.2.c. Mitigation measure satisfied – Permission will be obtained from ADF&G prior to removal of snow from fish-bearing rivers, streams and natural lakes. An ice bridge will be constructed at No-Point creek to support construction operations. Information provided by site personnel indicate No Point Creek typically freezes over during winter months suggesting the construction of the ice bridge is not anticipated to require any damming of the creek water flow. The ice road stream crossing will be slotted, breached or weakened upon completion of use to facilitate breakup and to minimize potential adverse impacts to stream banks.
d. Bears: i. Before commencement of any activities, lessees shall consult with ADF&G (907-459-7213) to identify the locations of known brown bear den sites that	A.2.d. A.2.d.i. Mitigation measure satisfied – Hilcorp will consult with ADF&G to ensure no brown bear dens exist within one-half mile of the project

are occupied in the season of proposed activities. Exploration and production activities must not be conducted within one-half mile of occupied brown bear dens, unless alternative mitigation measures are approved by ADF&G. A lessee who encounters an occupied brown bear den not previously identified by ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation measures are approved by the Director, with concurrence from ADF&G. Non-mobile facilities will not be required to relocate.	area. If an occupied brown bear den not previously identified by ADF&G is located, it will be reported to the Division of Wildlife Conservation, ADF&G, within 24 hours.
ii. Before commencement of any activities, lessees shall consult with the USFWS (907-786-3800) to identify the locations of known polar bear den sites. Operations must avoid known polar bear dens by 1 mile. A lessee who encounters an occupied polar bear den not previously identified by USFWS must report it to the USFWS within 24 hours and subsequently avoid the new den by 1 mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance.	A.2.d.ii. Mitigation measure satisfied – Hilcorp consults with USFWS every year during polar bear denning season to determine if any den sites have been located in or near the Milne Point Unit. Hilcorp halts all activities within a 1 mile buffer of any suspected den sites. Hilcorp halts all activities and contacts USFWS if a den is identified during normal field activity or project work.
iii. For projects in proximity to areas frequented by bears, lessees are required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan should include measures to:	A.2.d.iii.A. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. A.2.d.iii.B Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly.
A. minimize attraction of bears to facility sites; B. organize layout of buildings and work areas to minimize interactions between humans and bears; C. warn personnel of bears near or on facilities and the proper actions to take; D. if authorized, deter bears from the drill site; E. provide contingencies in the event bears do not leave the site;	A.2.d.iii.C. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. All personnel receive annual training on the Polar Bear Interaction Plan. A.2.d.iii.D. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Hilcorp has approved USFWS Letter of Authorization (LOA) for bear hazing. A.2.d.iii.E. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Hilcorp has approved USFWS LOA for bear hazing.

F. discuss proper storage and disposal of materials that may be toxic to bears; and G. provide a systematic record of bears on the site and in the immediate area.	A.2.d.iii.F. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. A.2.d.iii.G. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Bear sightings and interactions are reported to security personnel who log the sightings and interactions and then file the reports with all applicable agencies.
e. Permanent, staffed facilities must be sited to the extent practicable outside identified brant, white-fronted goose, snow goose, tundra swan, king eider, common eider, Steller's eider, spectacled eider, and yellow-billed loon nesting and brood rearing areas.	A.2.e. Mitigation measure satisfied – The proposed project is within the Milne Point Unit, and is surrounded by established oil and gas development infrastructure. Gravel will not be placed on the tundra during migratory bird nesting season.
3. Subsistence, Commercial and Sport Harvest Activities	

a. i. Exploration, development and production operations shall be conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Lease-related use will be restricted when the Director determines it is necessary to prevent conflicts with local subsistence, commercial and sport harvest activities. In enforcing this term DO&G will consult with other agencies, the affected local borough(s) and the public to identify and avoid potential conflicts that are brought to the division's attention both in the planning and operational phases of lease-related activities. In order to avoid conflicts with subsistence, commercial and sport harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling restrictions, and other technologies deemed appropriate by the Director. ii. Prior to submitting a plan of operations for either onshore or offshore activities which have the potential to disrupt subsistence activities, the lessee shall consult with the potentially affected subsistence communities and the NSB (collectively "parties") to discuss the siting, timing, and methods of proposed operations and safeguards or mitigating measures which could be implemented by the operator to prevent unreasonable conflicts. The parties shall also discuss the reasonably foreseeable effect on subsistence activities of any other operations in the area that they know will occur during the lessee's proposed operations. Through this consultation, the lessee shall make reasonable efforts to assure that exploration, development, and production activities are compatible with subsistence hunting and fishing activities and will not result in unreasonable interference with subsistence harvests. iii. A discussion of agreements reached or not reached during the consultation process and any plans for continued consultation shall be included in the plan of operations. The lessee shall identify who participated in the consultation and send copies of the plan to participating communities and the NSB when it is submitted to the division.	A.3.a.i. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not conflict with any local subsistence, commercial and sport harvest activities. Our operations are conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Hilcorp participated in a pre-application meeting with the North Slope Borough Planning Department on September 15, 2016. A.3.a.ii. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not conflict with any local subsistence, commercial and sport harvest activities. Our operations are conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Hilcorp participated in a pre-application meeting with the North Slope Borough Planning Department on September 15, 2016. A.3.a.iii. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not conflict with any local subsistence, commercial and sport harvest activities. Our operations are conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Hilcorp participated in a pre-application meeting with the North Slope Borough Planning Department on September 15, 2016.

iv. If the parties cannot agree, then any of them may request the Commissioner of DNR or his/her designee to intercede. The commissioner may assemble the parties or take other measures to resolve conflicts among the parties. v. The lessee shall notify the Director of all concerns expressed by subsistence hunters during operations and of steps taken to address such concerns.	A.3.a.iv. Not applicable A.3.a.v. Mitigation measure satisfied- Although not anticipated, Hilcorp will notify the Director if concerns are expressed by subsistence hunters during operations and the steps taken to address such concerns.
b. Traditional and customary access to subsistence areas shall be maintained unless reasonable alternative access is provided to subsistence users. “Reasonable access” is access using means generally available to subsistence users. Lessees will consult the NSB, nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.	A.3.b. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not limit access to any subsistence users.
4. Fuel, Hazardous Substances and Waste	
a. Secondary containment shall be provided for the storage of fuel or hazardous substances.	A.4.a. Mitigation measure satisfied- secondary containment is provided for fuel and hazardous substances as required by State, Federal, and Local requirements.
b. Containers with an aggregate storage capacity of greater than 55 gallons which contain fuel or hazardous substances shall not be stored within 100 feet of a waterbody, or within 1,500 feet of a current surface drinking water source.	A.4.b. Mitigation measure satisfied- Fuel and hazardous substances are not stored within 100 ft. of a water source. No drinking water sources are located within or near the project area.
c. During equipment storage or maintenance, the site shall be protected from leaking or	A.4.c. Mitigation measure satisfied- drip pans and surface liners are

dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.	placed under leaking or dripping equipment. Equipment is required to be repaired in a timely manner.
d. During fuel or hazardous substance transfer, secondary containment or a surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, must be on hand during any transfer or handling of fuel or hazardous substances. Trained personnel shall attend transfer operations at all times.	A.4.d. Mitigation measure satisfied- drip pans and surface liners are placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, is on hand during any transfer or handling of fuel or hazardous substances. Trained personnel attend transfer operations at all times.
e. Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.	A.4.e. Mitigation measure satisfied- fueling will not occur within the annual floodplain.
f. All independent fuel and hazardous substance containers shall be marked with the contents and the lessee's or contractor's name using paint or a permanent label.	A.4.f. Mitigation measure satisfied- All fuel and hazardous substance containers at Milne Point are labeled with the contents and lessee's or contractor's name.
g. A fresh water aquifer monitoring well, and quarterly water quality monitoring, is required down gradient of a permanent storage facility, unless alternative acceptable technology is approved by ADEC.	A.4.g. Not applicable – the proposed project does not include the installation of a permanent waste storage facility.
h. Waste from operations must be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated whenever possible or disposed of at an approved site in accordance with 18 AAC 60.	A.4.h. Mitigation measure satisfied- Milne Point practices waste minimization to the extent possible including recycling of scrap metal, wood, chemicals and used oil. Garbage and domestic combustibles are properly disposed of at the North Slope Serve Area 10 landfill. Putrescible wastes are stored in bear proof containers prior to disposal at the North Slope Borough Service Area 10 landfill.

i. New solid waste disposal sites, other than for drilling waste, will not be approved or located on state property during the exploration phase of lease activities. Disposal sites may be provided for drilling waste if the facility complies with 18 AAC 60.	A.4.i. Mitigation measure satisfied- No new solid waste disposal sites are planned for this project. If temporary drilling waste storage is required during drilling operations, as separate authorization from Alaska Department of Environmental Conservation, Division of Solid Waste will be obtained prior to use.
j. The preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. Drilling mud and cuttings cannot be discharged into lakes, streams, rivers, or important wetlands. On pad temporary cuttings storage will be allowed as necessary to facilitate annular injection and/or backhaul operations. Impermeable lining and diking, or equivalent measures, will be required for reserve pits. Surface discharge of drilling muds and cuttings into reserve pits shall be allowed only when the Director, in consultation with ADF&G, determines that alternative disposal methods are not practicable. Injection of non-hazardous oilfield wastes is regulated by AOGCC through its Underground Injection Control (UIC) Program for oil and gas wells. See also Mitigation Measure 8.a.vi.	A.4.j. Mitigation measure satisfied – Drilling muds and cuttings from wells drilled on the proposed Moose Pad will be hauled to an approved Point Grind and Inject facility. There will be no discharge of drilling muds and cuttings into water bodies or to reserve pits. Permitted on pad temporary storage may be used prior to transporting muds and cuttings to an approved Point Grind and Inject facility with prior approval from Alaska Department of Environmental Conservation, Division of Solid Waste.
k. Proper disposal of garbage and putrescible waste is essential to minimize attraction of wildlife. The lessee must use the most appropriate and efficient method to achieve this goal. The primary method of garbage and putrescible waste is prompt, on-site incineration in compliance with state of Alaska air quality regulations. The secondary method of disposal is on-site frozen storage in animal-proof containers with backhaul to an approved waste disposal facility. The tertiary method of disposal is on-site non-frozen storage in animal proof containers with backhaul to an approved waste disposal facility. Daily backhauling of non-frozen waste must be achieved unless safety considerations prevent it.	A.4.k. Mitigation measure satisfied- garbage and putrescible waste will be stored in bear proof containers prior to disposal at the North Slope Borough Service Area 10 landfill.

5. Access	
a. Except for approved off-road travel, exploration activities must be supported only by ice roads, winter trails, existing road systems or air service. Wintertime off-road travel across tundra and wetlands may be approved in areas where snow and frost depths are sufficient to protect the ground surface. Summertime off-road travel across tundra and wetlands may be authorized subject to time periods and vehicle types approved by DMLW. Exceptions may be granted by the director of the DMLW, and the Director, if an emergency condition exists; or, if it is determined, after consulting with ADF&G that travel can be accomplished without damaging vegetation or the ground surface. Exceptions, including the use of gravel, may also be granted on a site specific basis, if it is determined, after consulting with ADF&G and DMLW, that no practicable alternatives exist for constructing an exploration road or pad in the area south of the boundary described below and depicted in the map below:	A.5.a. Not applicable – Project is not an exploration project. Placement of gravel for this project will be done during the winter time, via ice road access to the project site. Wintertime off-road travel across tundra will occur with approval from ADNR DMLW in accordance with established tundra travel requirements.

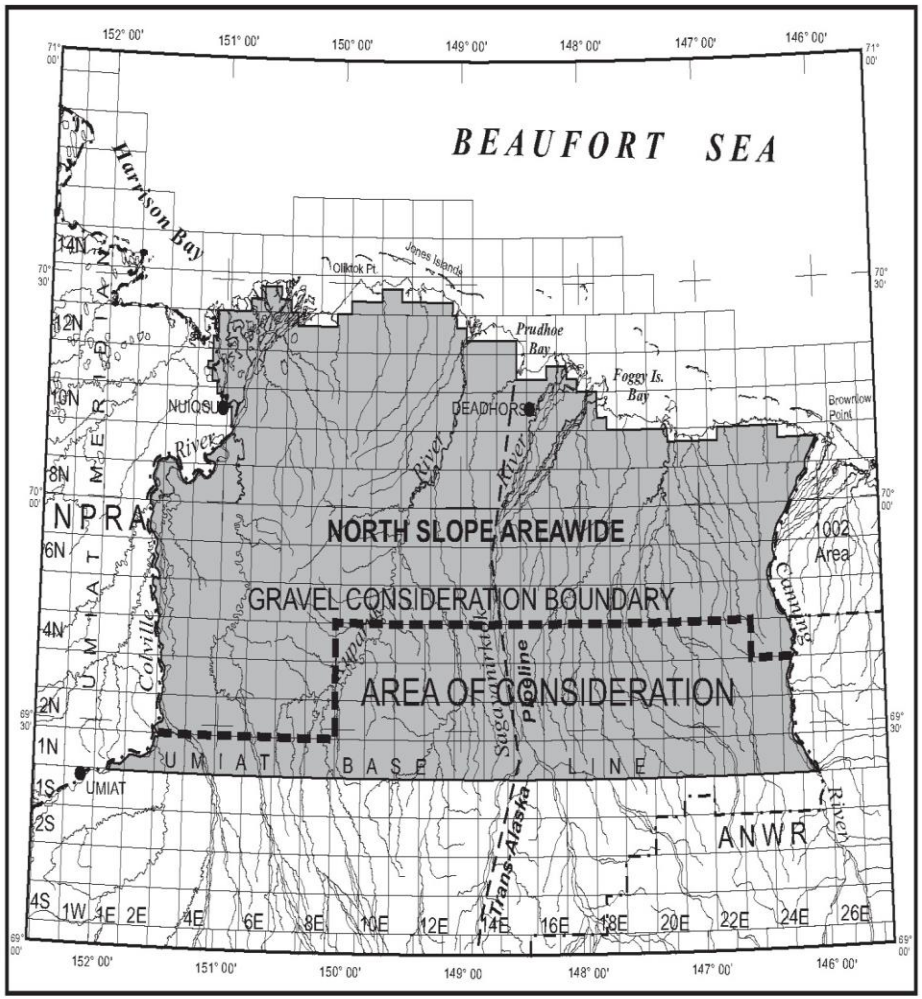


Figure 7.1: Gravel Consideration Boundary

Beginning at the NPR-A boundary, from the northeast corner of T 1N, R 2E,

Figure 7.1: Gravel Consideration Boundary Beginning at the NPR-A boundary, from the northeast corner of T 1N, R 2E, • east to the northwest corner of T 1N, R 9E, then • north to the northwest corner of T 4N, R 9E, then • east to the northwest corner of T 4N, R 23E, then • south to the southwest corner of T 4N, R 23E, and then • east along the top of T 3N to the ANWR boundary.	
b. Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.	A.5.b. Mitigation measure satisfied- The Oil and Gas Lease area is not restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. The project area is within existing oil and gas development infrastructure in the Milne Point Unit. Access is controlled through security checkpoints. Lease facilities and operations will not block access to or along navigable or public waters as defined in AS 38.05.

6. Prehistoric, Historic, and Archeological Sites	
a. Prior to the construction or placement of any structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the NSB, nearby communities, Native organizations, and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity.	A.6.a. Mitigation measure satisfied – Northern Land Use Research, Alaska prepared a Cultural Resources Report dated July 15, 2016, documenting cultural resources in the vicinity of the project area. The report was submitted to the State Historic Preservation Office (SHPO) on August 15, 2016 and SHPO provided concurrence that No Historic Properties are Affected on August 23, 2016. A Traditional Land Use Inventory (TLUI) Clearance request was submitted to the North Slope Borough on August 23, 2016 and the NSB issued TLUI clearance on September 7, 2016.
b. The inventory of prehistoric, historic, and archeological sites must be submitted to the Director, and to SHPO who will coordinate with the NSB for review and comment. If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the Director, after consultation with SHPO and the NSB, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.	A.6.b. Mitigation measure satisfied – see response to A.6.a.
c. If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee must report the discovery to the Director as soon as possible. The lessee must make reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the Director, after consultation with the SHPO and the NSB, has directed the lessee as to the course of action to take for its preservation.	A.6.c. Mitigation measure satisfied: EH&S training includes instruction to site workers to stop work if any archaeological/historic sites or artifacts are discovered. Discovery of archeological/historic sites or artifacts will be reported as soon as possible, as required, to the appropriate agencies.

7. Local Hire, Communication, and Training	
a. Lessees are encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. Lessees shall submit, as part of the plan of operations, a proposal detailing the means by which the lessee will comply with the measure. The proposal must include a description of the operator's plans for partnering with local communities to recruit, hire and train local and Alaska residents and contractors. The lessee is encouraged, in formulating this proposal, to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.	A.7.a. Mitigation measure satisfied- Hilcorp will use existing contractor support for the pad construction and infrastructure installations. Hilcorp employs Arctic Slope Regional Corporation (ASRC) subsidiaries for our Roads and Pads Maintenance Work.. In addition, more than 95 percent of Hilcorp's Alaska workforce is comprised of Alaska residents. Hilcorp works with local organizations to encourage growth in the local service sector. Hilcorp strives to do business locally whenever possible.
b. A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.	A.7.b. Mitigation measure satisfied - Hilcorp employs Arctic Slope Regional Corporation (ASRC) subsidiaries for our Roads and Pads Maintenance Work. Hilcorp also employs ASRC and Kuukpik Corporation subsidiaries in many areas of our North Slope operations. Northstar employs ASRC subsidiary Alaska Petroleum Contractors (APC). APC provides maintenance and operations support for Northstar activities. Kuukpik Arctic Catering provides camp catering and housekeeping services at Northstar. Jobs and training opportunities for their Native Shareholders are of paramount importance to ASRC and Kuukpik. Kuukpik is the village corporation for Nuiqsut and they provide application materials and assistance for filing applications in the village.
c. A plan of operations application must include a training program for all personnel including contractors and subcontractors. The program must be designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job. The program must use methods to ensure that personnel understand and use techniques necessary to preserve geological, archeological, and biological resources. In addition, the program must be designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles	A.7.c. Mitigation measure satisfied- All employees and contractors receive Environmental, Health, and Safety (EH&S) training, either provided by Hilcorp or their employer. Topics covered include, but are not limited to, the following: • Job hazards • Safe work practices

in areas where they will be operating.	• Drug and alcohol policies • Permits and regulations • Wildlife interactions • Spill prevention and reporting • Waste management In addition to the general EH&S orientation program, individuals are trained according to job-specific requirements, such as drilling operations and construction equipment operations.
8. Definitions	

a. In this document: i. "Facilities" means any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps and buildings; ii. "Important wetlands" means those wetlands that are of high value to fish, waterfowl, and shorebirds because of their unique characteristics or scarcity in the region or that have been determined to function at a high level using the hydrogeomorphic approach; iii. "Minimize" means to reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction; iv. "Plan of operations" means a lease Plan of operations under 11 AAC 83.158 and a unit Plan of operations under 11 AAC 83.346; v. "Practicable" means feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the standard; vi. "Secondary containment" means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container plus 12 inches of freeboard. Double walled tanks do not qualify as Secondary Containment unless an exception is granted for a particular tank. vii. "Temporary" means no more than 12 months.	

Alaska Department of Natural Resources
Division of Oil & Gas
550 W 7th Ave. Suite 800
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MITIGATION MEASURE ANALYSIS: BEAUFORT SEA

The following instructions are provided for guidance to adequately complete the Mitigation Measure Analysis form.

1. The applicant shall respond to each Mitigation Measure, and all subsets of mitigation measures; i.e. A.2.d.i should be addressed and A.2.d.ii, and so forth.

2. The applicant's response shall begin by clearly indicating if the **mitigation measure is satisfied**, an **exception is requested**, or if the mitigation measure is **not applicable**.

3. The applicants' response shall then address how the proposed project clearly satisfies the mitigation measure, meets the intent of the mitigation measure, is not practicable, or is not applicable.

4. The applicant shall verify working 'in consultation with' parties other than Department of Natural Resources (DNR), Division of Oil and Gas (DO&G) by reporting meeting dates and parties present for Mitigation Measures which require consultation with parties other than DNR, DO&G; i.e. Mitigation Measure 1.b.

Please note that this form, along with the Plan of Operations Application form and the Plan of Operations, must be adequately completed before DNR DO&G will review an application for potential approval.

Beaufort Sea **A. Mitigation Measures**	**Company Response**
1. Facilities and Operations	
a. A plan of operations must be submitted and approved before conducting exploration, development, or production activities, and must describe the lessee's plans to avoid or minimize impacts on residential, commercial, and recreational areas, Native allotments and subsistence use areas. At the time of application, lessee must submit a copy of the proposed plan of operations to all surface owners whose property will be entered.	A.1.a. Mitigation measure satisfied – The proposed project is within the Milne Point Unit on State owned land, approximately 35 miles west of Prudhoe Bay. There are no residential, commercial, recreational areas, Native Allotments or subsistence use areas impacted by the proposed project. Ongoing mitigation measures, such as seasonal restrictions on specific activities in certain areas, reduce the impact on bird, fish and mammal populations. The Moose Pad Development has been included in the Milne Point Unit Plan of Development, and was provided to the North Slope Borough (NSB) at the NSB pre-application meeting held 9.15.2016.
b. Facilities must be designed and operated to avoid or minimize sight and sound impacts in areas of high residential, commercial, recreational, and subsistence use and important wildlife habitat. Methods may include providing natural buffers and screening to conceal facilities, sound insulation of facilities, or by using alternative means approved by the director, in consultation with ADF&G and the NSB.	A.1.b. Mitigation measure satisfied – the proposed project is within the Milne Point unit, and is surrounded by established oil and gas development infrastructure. There are no residential, commercial, recreational areas, or Native Allotments impacted by this project in the Milne Point Unit. While subsistence activities occur across the North Slope, they generally do not occur directly within oil and gas exploration and development areas. Sound impacts associated with drilling operations will be temporary and no long term sound impacts associated with facility installations will be added with this pad development.
c. To the extent practicable, the siting of facilities, other than docks, roads, utility, and pipeline crossings will be prohibited within 500 feet of all fish-bearing streams and water bodies and 1,500 feet from all current surface drinking water sources. Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the main channel of the Colville, Canning, Sagavanirktok, Shaviovik, Kadleroshilik, and Kuparuk rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the director, in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally	A.1.c. Mitigation waiver requested – the proposed Moose Pad access road placement was designed to follow an existing road bed, (referred to as the "tractor tracks") to minimize impacts to wetlands. Following the tractor tracks brings the access road within 175 feet of the Ugnuravik River which is listed in the Catalog of Water important for spawning, rearing or migration of Anadramous Fishes (Catalog). The proposed access road also crosses No Point Creek. Although No Point Creek is not listed in the Catalog, it likely supports anadramaous fish species (ninespine stickleback) during the summer

preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.	months. The proposed road alignment was selected to utilize previously disturbed areas/uplands and to minimize impacts to wetlands. Appropriate construction methods will be utilized to avoid impacts during winter construction and spring breakup.
d. Impacts to identified wetlands must be minimized to the satisfaction of the director, in consultation with ADF&G and ADEC. The director will consider whether facilities are sited in the least sensitive areas. Further, certain activities within wetlands require permission from the U.S. Army Corps of Engineers.	A.1.d. Mitigation measure satisfied - The Moose Pad and access road locations were selected to avoid and minimize placement of fill in wetlands in the area to the extent practicable. A permit application for authorization of fill in wetlands was submitted to the USACE on August 15, 2016 and is currently being processed.
e. Exploration facilities must be temporary and must be constructed of ice unless the director determines that no practicable alternative exists. Use of gravel structures may be permitted on a case-by-case basis by the director, after consultation with DMLW, and ADF&G. Approval for use of existing structures will depend on the extent and method of restoration needed to return these structures to a usable condition.	A.1.e. Not Applicable – This is not an Exploration facility, exploration road or pad. The gravel pad and access road are in support of Milne Point Field development activities.
f. Pipelines must utilize existing transportation corridors where conditions permit. Pipelines and gravel pads must be designed to facilitate the containment and cleanup of spilled fluids. Where practicable, onshore pipelines must be located on the upslope side of roadways and construction pads unless DMLW determines that an alternative site is environmentally acceptable. Wherever possible, onshore pipelines must be buried where soil and geophysical conditions permit. All pipelines, including flow and gathering lines, must be designed, constructed and, maintained to assure integrity against climatic conditions, geophysical hazards, corrosion and other hazards as determined on a case-by-case basis.	A.1.f. Mitigation waiver requested – the Moose Pad pipeline will be installed along the north, upslope side of the pad access road. The pipeline will be VSM mounted adjacent to the road to minimize impacts to the tundra, allow for routine visual inspections and easy access for maintenance and repair. The new pipeline will be installed 500' north of the Moose Pad Access Road to the maximum extent practicable to facilitate caribou crossing concerns raised by the NSB and ADF&G during initial review of the Moose Pad Permit Application. The agreed upon Moose Pad Pipeline route and orientation is shown in figure 3 of the attached project description. The pipeline will be separated from the access road at varying distances based on environmental and topographical conditions that exist in the project area. The pipeline will be designed, constructed and maintained to assure integrity against climate conditions, geophysical hazards, corrosion and other hazards.
g. Onshore pipelines shall be designed and constructed to minimize alteration of caribou and other large ungulate movement and migration patterns. At a minimum, above-ground pipelines shall be elevated 7 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a	A.1.g. Mitigation measure satisfied – pipeline will be elevated at least 7 feet above grade on VSMs (measured at the VSM).

road, pad, or a ramp installed to facilitate wildlife passage. Lessees shall consider increased snow depth in the sale area in relation to pipe elevation to ensure adequate clearance for wildlife. ADNR may, after consultation with ADF&G, require additional measures to mitigate impacts to wildlife movement and migration.	
h. All pipelines, including flow and gathering lines, must be designed and constructed to provide adequate protection from water currents, storm and ice scouring, subfreezing conditions, coastal erosion, permafrost thawing, and other hazards as determined on a case-by-case basis.	A.1.h. Mitigation measure not applicable – the proposed project does not include or intend to include any offshore pipelines, or pipelines subject to impact from water currents, storm and ice scouring, subfreezing conditions, coastal erosion, permafrost thawing.
i. Offshore oil and gas transportation pipelines will be encouraged if the director determines that the laying of such pipelines is technically feasible and environmentally preferable to transport by oil tanker or other means.	A.1.i. Mitigation measure not applicable – the proposed project does not include or intend to include any offshore pipelines.
j. Following the installation of a pipeline of sufficient capacity, no crude oil will be transported by surface vessel from offshore production sites, except in an emergency. The director will evaluate the emergency and determine an appropriate response to the condition.	A.1.j. Mitigation measure not applicable – the proposed project does not include or intend to include any offshore production sites, and as such crude oil will not be transported by surface vessel.
k. Causeways i. Continuous-fill causeways are prohibited. Environmentally preferred alternatives for field development include use of buried pipelines, onshore directional drilling, or elevated structures. Non-continuous-fill causeways must be designed, sited, and constructed to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics (e.g., salinity, temperature, suspended sediments) that exceed water quality criteria, and must maintain free passage of marine and anadromous fish. ii. Causeways and docks shall not be located in river mouths or deltas. Artificial gravel islands and bottom founded structures shall not be located in river mouths or active stream channels on river deltas, except as provided for in measure iii below. iii. Each proposed structure will be reviewed on a case-by-case basis. Causeways, docks, artificial gravel islands, and bottom-	A.1.k. A.1.k.i. Not Applicable – No causeways, docks or gravel islands are associated with the project. A.1.k.ii. Not Applicable – No causeways, docks or gravel islands are associated with the project. A.1.k.iii. Not Applicable – No causeways, docks or gravel islands are associated with the project.

founded structures may be permitted if the director, in consultation with ADF&G, ADEC, and the NSB determines that a causeway or other structures are necessary for field development and that no practicable alternatives exist. A monitoring program may be required to address the objectives of water quality and free passage of fish, and mitigation shall be required where significant deviation from objectives occurs.	
l. Dismantlement, Removal and Rehabilitation (DR&R): Upon abandonment of material sites, drilling sites, roads, buildings, or other facilities, such facilities must be removed and the site rehabilitated to the satisfaction of the director, unless the director, in consultation with DMLW, ADF&G, ADEC, NSB, and any non-state surface owner, determines that such removal and rehabilitation is not in the state's interest.	A.1.l. Mitigation measure satisfied – Material sites, drilling sites, roads, buildings or other facilities will be removed and the site rehabilitated at the end of field life to the satisfaction of the Director, unless the Director, in consultation with DMLW, ADF&G, ADEC, NSB, and any non-state surface owner, determines that such removal and rehabilitation is not in the state's interest.
m. Gravel mining sites required for exploration and development activities will be restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage. Where practicable, gravel sites must be designed and constructed to function as water reservoirs for future use. Gravel mine sites required for exploration activities must not be located within an active floodplain of a watercourse unless DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed and the site is closed. Mine site development and rehabilitation within floodplains must follow the procedures outlined in McLean, R. F. 1993, North Slope Gravel Pit Performance Guidelines, ADF&G Habitat and Restoration Division Technical Report 93-9, available from ADF&G.	A.1.m. Mitigation measure satisfied – Gravel will be sourced from existing mine sites under existing material sales contracts with ADNR and authorized by ADF&G, NSB and the US Army Corps of Engineers. The gravel will be from either Mine Site E in Kuparuk, or the Milne Point Mine Site in the Milne Point Unit. The existing mine sites, which will be the source of gravel, have been constructed in consultation with ADNR, ADF&G, the NSB and The US Army Corps of Engineers. These agencies have also approved the Mining and Rehabilitation Plan for the existing mine sites.
2. Habitat, Fish, and Wildlife	
a. Detonation of explosives will be prohibited in open water areas of fish-bearing streams and lakes. Explosives must not be detonated beneath, or in proximity to fish-bearing streams and lakes if the detonation of the explosive produces a pressure rise in the water body of greater than 2.7 pounds per square inch, or unless the water body, including its substrate, is solidly frozen. Detonation of explosives within or in close proximity to a fish spawning bed during the early stages of egg incubation must not produce a peak particle	A.2.a. Not Applicable – No explosives will be used in the proximity of fish-bearing waters for this project. Explosives use and blasting is anticipated to occur at the established material source(s), but will be conducted under existing authorizations for the use and operation of the mine site.

velocity greater than 0.5 inches per second. Blasting criteria have been developed by ADF&G and are available upon request from ADF&G. The location of known fish-bearing waters within the project area can also be obtained from ADF&G. The lessee will consult with the NSB before proposing the use of explosives for seismic surveys. The director may approve the use of explosives for seismic surveys after consultation with the NSB.	
b. Removal of water from fish-bearing rivers, streams, and natural lakes shall be subject to prior written approval by DMLW and ADF&G. Water intake pipes used to remove water from fish-bearing water bodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall be no greater than 1 mm (0.04 inches), unless another size has been approved by ADF&G. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.1 foot per second, unless an alternative velocity has been approved by ADF&G.	A.2.b. Mitigation measure satisfied – Water withdrawals for this project will be from water sources permitted by ADNR using previously approved intake structures & fish screens.
c. Removal of snow from fish-bearing rivers, streams, and natural lakes shall be subject to prior written approval by ADF&G. Compaction of snow cover overlying fish-bearing water bodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, ice or snow bridges may be required.	A.2.c. Mitigation measure satisfied – Permission will be obtained from ADF&G prior to removal of snow from fish-bearing rivers, streams and natural lakes. An ice bridge will be constructed at No-Point creek to support construction operations. Information provided by site personnel indicate No Point Creek typically freezes over during winter months suggesting the construction of the ice bridge is not anticipated to require any damming of the creek water flow. The ice road stream crossing will be slotted, breached or weakened upon completion of use to facilitate breakup and to minimize potential adverse impacts to stream banks.

d. Bears: i. Lessees are required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan should include measures to: A. minimize attraction of bears to facility sites, including garbage and food waste; B. organize layout of buildings and work areas to minimize interactions between humans and bears such as including the use of electric fencing; C. warn personnel of bears near or on facilities and the proper actions to take; D. if authorized, deter bears from the drill site; E. provide contingencies in the event bears do not leave the site; F. provide for proper storage and disposal of materials that may be toxic to bears; and G. document and communicate the sighting of bears onsite or in the immediate area to all shift employees. ii. Before commencement of any activities, lessees shall consult with ADF&G to identify the locations of any known brown bear den sites that are occupied in the season of proposed activities. Exploration and development activities started between September 20 and May 15may not be conducted within one-half mile of known occupied brown bear dens, unless alternative mitigation measures are approved by ADF&G. A lessee who encounters an occupied brown bear den not previously identified by ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation measures are approved by DO&G with concurrence from ADF&G. Non-mobile facilities will not be required to	A.2.d A.2.d.i.A. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. A.2.d.i.B. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. A.2.d.i.C. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. All personnel receive annual training on the Polar Bear Interaction Plan. A.2.d.i.D. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Hilcorp has approved USFWS Letter of Authorization (LOA) for bear hazing. A.2.d.i.E. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Hilcorp has approved USFWS LOA for bear hazing. A.2.d.i.F. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. A.2.d.i.G. Mitigation measure satisfied – Hilcorp has a Bear interaction plan that is reviewed and updated regularly. Bear sightings and interactions are reported to security personnel who log the sightings and interactions and then file the reports with all applicable agencies. A.2.d.ii Mitigation measure satisfied – Hilcorp will consult with ADF&G to ensure no brown bear dens exist within one-half mile of the project area. If an occupied brown bear den not previously identified by ADF&G is located, it will be reported to the Division of Wildlife Conservation, ADF&G, within 24 hours.

relocate. iii. Before commencement of any activities, lessees shall consult with the USFWS to identify the locations of known polar bear den sites. Operations must avoid known polar bear dens by 1 mile. A lessee who encounters an occupied polar bear den not previously identified by USFWS must report it to the USFWS within 24 hours and subsequently avoid the new den by 1 mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance.	A.2.d.iii. Mitigation measure satisfied – Hilcorp consults with USFWS every year during polar bear denning season to determine if any den sites have been located in or near the Milne Point Unit. Hilcorp halts all activities within a 1 mile buffer of any suspected den sites. Hilcorp halts all activities and contacts USFWS if a den is identified during normal field activity or project work.
e. Permanent, staffed facilities must be sited to the extent practicable outside identified brant, white-fronted goose, snow goose, tundra swan, king eider, common eider, Steller's eider, spectacled eider, and yellow-billed loon nesting and brood rearing areas.	A.2.e. Mitigation measure satisfied – The proposed project is within the Milne Point Unit, and is surrounded by established oil and gas development infrastructure. Gravel will not be placed on the tundra during migratory bird nesting season.
f. Due to high concentrations of staging and molting brant and other waterbirds within the coastal habitats along the Teshekpuk Lake Special Area (TLSA) and other areas, operations that create high levels of disturbance, including but not limited to dredging, gravel washing, and boat and barge traffic along the coast, will be prohibited from June 20 to September 15 within one-half mile of coastal salt marshes, specifically tracts 187, 209, 320, 483-485, 493, 494, 496, 497, 500-514, 517-519, 524, and 530. In addition, tracts 228 and 231, and tracts 521-526 are subject to the same restrictions between May 15 and July 30 to protect large concentrations of breeding snow geese. The construction and siting of facilities within one mile of these areas may be allowed on a case-by-case basis if the director and ADF&G determine that no other feasible and prudent location exists.	A.2.f. Mitigation measure not applicable – The proposed project is within Beaufort Sea Lease Tracts BS 0357 & BS 0342, and not within a tract of listed specific concern. In addition the proposed project does not include dredging, gravel washing, or boat and barge traffic.
g. To protect hauled-out spotted seals, boat and barge traffic will be prohibited between July 15 and October 1 within one-half mile of the Piasuk River delta and Oarlock Island.	A.2.g. Mitigation measure not applicable – No boat or barge traffic is associated with the project.

3. Subsistence, Commercial, and Sport Harvest Activities	
a. i. Before submitting a plan of operations for either onshore or offshore activities that have the potential to disrupt subsistence activities, the lessee shall consult with the potentially affected subsistence communities, the AEWC, and the NSB (collectively "parties") to discuss the siting, timing, and methods of proposed operations and safeguards or mitigating measures that could be implemented by the operator to prevent unreasonable conflicts. The parties shall also discuss the reasonably foreseeable effect on subsistence activities of any other operations in the area that they know will occur during the lessee's proposed operations. Through this consultation, the lessee shall make reasonable efforts to assure that exploration, development, and production activities are compatible with subsistence hunting and fishing activities and will not result in unreasonable interference with subsistence harvests. In order to avoid conflicts with subsistence, commercial, and sport harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling restrictions, and other technologies deemed appropriate by DO&G. ii. A discussion of resolutions reached or not reached during the consultation process and any plans for continued consultation shall be included in the plan of operations. The lessee shall identify who participated in the consultation and send copies of the plan to participating communities and the NSB when it is submitted to the division. iii. If the parties cannot agree, then any of them may request that the commissioner of ADNR or his/her designee to intercede. The commissioner may assemble the parties or take other measures to resolve conflicts among the parties. iv. The lessee shall notify the director of all concerns expressed by	A.3.a.i. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not conflict with any local subsistence, commercial and sport harvest activities. Our operations are conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Hilcorp participated in a pre-application meeting with the North Slope Borough Planning Department on September 15, 2016. A.3.a.ii. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not conflict with any local subsistence, commercial and sport harvest activities. Our operations are conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Hilcorp participated in a pre-application meeting with the North Slope Borough Planning Department on September 15, 2016. A.3.a.iii. Not applicable A.3.a.iv. Mitigation measure satisfied- Although not anticipated, Hilcorp will notify the Director if concerns are expressed by subsistence hunters during operations and the steps taken to address such concerns.

subsistence hunters during operations and of steps taken to address such concerns.	
b. Traditional and customary access to subsistence areas shall be maintained unless reasonable alternative access is provided to subsistence users. "Reasonable access" is access using means generally available to subsistence users. Lessees will consult the NSB, nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.	A.3.b. Mitigation measure satisfied- project area is within the Milne Point Unit and is surrounded by existing oil and gas development infrastructure. The project will not limit access to any subsistence users.
c. Whale Harvest Protection: i. Permanent facility siting on Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the NSB, in consultation with the AEWC, that the development will not preclude reasonable access to whales as defined in Section A8 and as may be determined in a conflict avoidance agreement, if required by the NSB. With the approval of the NSB, the director may authorize permanent facilities. ii. Permanent facility siting in state waters within 3 miles of Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEWC, that the development will not preclude reasonable access to whales as defined in Section A8 and as may be determined in a conflict avoidance agreement if required by the NSB. iii Permanent facility siting in state waters between the west end of Arey Island and the east end of Barter Island (Tracts 40 through 45) will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEWC, that the development will not preclude reasonable access to whales as defined in Section A8 and as may be determined in a conflict avoidance agreement if required by the NSB.	A.3.c. A.3.c.i. Mitigation measure not applicable – No facility siting will take place on Cross Island in association with this project. A.3.c.ii. Mitigation measure not applicable – No facility siting will take place in state waters within 3 miles of Cross Island in association with this project A.3.c.iii. Mitigation measure not applicable – No facility siting will take place in state waters between the west end of Arey Island and the east end of Barter Island (Tracts 40 through 45) in association with this project
d. Any tract or portion thereof in the Beaufort Sea Areawide lease sale area may be subject to seasonal drilling restrictions in conjunction with the submission of a plan of operations permit application by the lessee.	A.3.d. Mitigation measure not applicable – The proposed project is land based, does not include any drilling from floating drilling structures, and will not interfere with any whale migrations or subsistence whale hunts.

i. Exploratory Drilling From Bottom-founded Drilling Structures and Natural and Gravel Islands: Subject to measure iii below, exploratory drilling operations and other downhole operations from bottom-founded drilling structures and natural and gravel islands are allowed year-round in the Central Subsistence Whaling Zone (SWZ).[1] In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead whale migration until whaling quotas have been met.	A.3.d.i. Mitigation measure not applicable – The proposed project is land based, does not include any drilling from floating drilling structures, and will not interfere with any whale migrations.
ii. Exploratory Drilling Operations from Floating Drilling Structures: Subject to measure iii below, exploratory drilling below a predetermined threshold depth and other downhole operations from floating drilling structures is prohibited throughout the Beaufort Sea upon commencement of the fall bowhead whale migration until the whale migration mid-point.[2] In addition to the above restriction, exploratory drilling above and below a predetermined threshold depth in the Eastern SWA from floating drilling structures is prohibited upon commencement of the fall bowhead whale migration until the whaling quotas have been met. In the Central and Western SWZ, exploratory drilling above and	A.3.d.ii. Mitigation measure not applicable – The proposed project is land based, does not include any drilling from floating drilling structures, and will not interfere with any whale migrations.

1 *Subsistence Whaling Zones:*
Eastern SWZ is that area within 20 nautical miles of the shoreline between 141° and 144° W longitude.
Central SWZ is that area within 20 nautical miles of the shoreline between 144° and 151° W longitude.
Western SWZ is that area within 20 nautical miles of the shoreline between 154° and 157° W longitude.

2 *Migration Dates:*
Eastern SWZ - September 1 - October 10 with the midpoint of the migration on September 20.
Central SWZ and Western SWZ - September 10 - October 20 with the midpoint of the migration on September 28.
Outside SWZ - Seaward of the Eastern SWZ - September 1 - October 10 with the midpoint of the migration on September 20; Seaward and west of the Central SWZ - September 10 - October 20 with the midpoint of migration on September 28. The midpoint of the migration is when 50 percent of the whales have been deemed to have passed the drill site.

below a predetermined threshold depth may be prohibited on a case-by-case basis until the whaling quotas have been met.[3] The following criteria will be used to evaluate these operations: 1) proximity of drilling operations to active or proposed whaling areas, 2) drilling operation type and feasible drilling alternatives, 3) number of drilling operations in the same area, 4) number of whaling crews in the area, and 5) the operator's plans to coordinate activities with the whaling crews in accordance with Mitigation Measure A3a. All non-essential activities associated with drilling are prohibited in the Central SWZ during the whale migration until whaling quotas have been met. Essential support activity associated with drilling structures occurring within active whaling areas shall be coordinated with local whaling crews in accordance with Mitigation Measure A3a. "Essential activities" include those necessary to maintain well control, maintain physical integrity of the drilling structure, and scheduled crew changes. Support craft include aircraft, boats, and barges. "Non-essential activity," by exclusion, are those activities that do not fit the definition of essential activities. Both types of activities must be described by the operators in their exploration plans submitted for state review. To the extent feasible, mobilization or demobilization of the drilling structures should not occur during the whale migration. If operators propose to mobilize or demobilize during the whale migration, they must describe the activity in their exploration plan and must demonstrate why the activity must occur during the migration period. iii. Exploratory Drilling in Broken Ice: Lessees conducting drilling operations during periods of broken ice must:	

3 *If upon review of the proposed operation using the above described criteria, the state determines that conflict with subsistence whaling activities may occur, additional drilling restrictions, similar to those imposed for the Eastern SWZ, may be imposed in the Central and Western SWZ's. In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead migration until whaling quotas have been met.*

A. be trained and qualified in accordance with Minerals Management Service standards pertaining to well-control equipment and techniques; and B. have an oil spill contingency plan approved by the state that includes requirements for in situ igniters, fire resistant boom, relief well plans, and a decision process for igniting an uncontrolled release of oil; C. participate in an oil spill research program.	A.3.d.iii.A. Mitigation measure not applicable – The proposed project is land based and does not include any drilling in broken ice. A.3.d.iii.B. Mitigation measure not applicable – The proposed project is land based and does not include any drilling in broken ice. A.3.d.iii.C. Mitigation measure not applicable – The proposed project is land based and does not include any drilling in broken ice.
e. Exploration, development and production activities located on lease tracts 1 through 26 shall be conducted in a manner that prevents unreasonable conflicts between oil and gas activities and subsistence whale hunting. i. Before submitting a plan of operations for activities on lease tracts 1 through 26, the lessee shall consult with the NSB, the AEWC, and the community of Kaktovik to discuss how the siting, timing, and methods of proposed operations can be planned and carried out to avoid potential conflicts with subsistence whale hunting. Through this consultation, which may include the negotiation of a conflict avoidance agreement, the lessee shall make every reasonable effort to ensure that their activities will not result in unreasonable interference with subsistence whale hunting. ii. A plan of operations for activities on lease tracts 1 through 26 shall include a discussion of the consultation process and any resulting conflict avoidance agreements. In the event that no agreement is reached, the lessee, the NSB, the AEWC, or the community of Kaktovik may request that ADNR call a meeting of representatives of the NSB, the AEWC, the community of Kaktovik, and the lessee to discuss the potential conflict caused by the proposed activities, and attempt to resolve the issues. If the parties are still unable to reach an agreement, then ADNR will make a final determination of the measures proposed to be taken to prevent unreasonable interference with subsistence whale hunting.	A.3.e Mitigation measure not applicable – The proposed project is within Beaufort Sea Lease Tracts BS 0357 & BS 0342, and not within tracts 1-26. In addition the proposed project is land based, and will not interfere with any subsistence whale hunting. A.3.e.i. Mitigation measure not applicable – The proposed project is within Beaufort Sea Lease Tracts BS 0357 & BS 0342, and not within tracts 1-26. In addition the proposed project is land based, and will not interfere with any subsistence whale hunting. A.3.e.ii. Mitigation measure not applicable – The proposed project is within Beaufort Sea Lease Tracts BS 0357 & BS 0342, and not within tracts 1-26. In addition the proposed project is land based, and will not interfere with any subsistence whale hunting.

4. Fuel, Hazardous Substances, and Waste	
a. Secondary containment (see definition) shall be provided for the storage of fuel or hazardous substances.	A.4.a. Mitigation measure satisfied- secondary containment is provided for fuel and hazardous substances as required by State, Federal, and Local requirements.
b. Containers with a storage capacity larger than 55 gallons that contain fuel or hazardous substances shall not be stored within 100 feet of a water body, or within 1,500 feet of a current surface drinking water source.	A.4.b. Mitigation measure satisfied- Fuel and hazardous substances are not stored within 100 ft. of a water source. No drinking water sources are located within or near the project area.
c. During equipment storage or maintenance, the site shall be protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.	A.4.c. Mitigation measure satisfied- drip pans and surface liners are placed under leaking or dripping equipment. Equipment is required to be repaired in a timely manner.
d. During fuel or hazardous substance transfer, secondary containment or a surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to 5 gallons, must be on hand during any transfer or handling of fuel or hazardous substances. Trained personnel shall attend transfer operations at all times.	A.4.d. Mitigation measure satisfied- drip pans and surface liners are placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, is on hand during any transfer or handling of fuel or hazardous substances. Trained personnel attend transfer operations at all times.
e. Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.	A.4.e. Mitigation measure satisfied- fueling will not occur within the annual floodplain.
f. All independent fuel and hazardous substance containers shall be marked with the contents and the lessee's or contractor's name using paint or a permanent label.	A.4.f. Mitigation measure satisfied- All fuel and hazardous substance containers at Milne Point are labeled with the contents and lessee's or contractor's name.
g. A fresh water aquifer monitoring well, and quarterly water quality monitoring, may be required down gradient of a permanent above-ground liquid hydrocarbon storage facility.	A.4.g. Not applicable – the proposed project does not include the installation of a permanent waste storage facility.
h. Waste from operations must be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated or	A.4.h. Mitigation measure satisfied- Milne Point practices waste minimization to the extent possible including recycling of scrap metal, wood, chemicals and

disposed of at an approved site in accordance with 18 AAC 60. (See also Section B2, below.)	used oil. Garbage and domestic combustibles are properly disposed of at the North Slope Serve Area 10 landfill. Putrescible wastes are stored in bear proof containers prior to disposal at the North Slope Borough Service Area 10 landfill.
i. New solid waste disposal sites will not be approved or located on state property during the exploration phase. Exceptions may be provided for drilling waste if the facility will comply with the applicable provisions of 18 AAC 60.	A.4.i. Mitigation measure satisfied- No new solid waste disposal sites are planned for this project. If temporary drilling waste storage is required during drilling operations, as separate authorization from Alaska Department of Environmental Conservation, Division of Solid Waste will be obtained prior to use.
j. Wherever practicable, the preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. Other methods of disposal shall be allowed only upon approval by the director, in consultation with ADEC and ADF&G.	A.4.j. Mitigation measure satisfied – Drilling muds and cuttings from wells drilled on the proposed Moose Pad will be hauled to an approved Point Grind and Inject facility. There will be no discharge of drilling muds and cuttings into water bodies or to reserve pits. Permitted on pad temporary storage may be used prior to transporting muds and cuttings to an approved Point Grind and Inject facility with prior approval from Alaska Department of Environmental Conservation, Division of Solid Waste.
k. Proper disposal of garbage and putrescible waste is essential to minimize attraction of wildlife. The lessee must use the most appropriate and efficient method to achieve this goal. The primary method of garbage and putrescible waste disposal is prompt, on-site incineration in compliance with state air quality control regulations (18 AAC 50). The secondary method of disposal is on-site frozen storage in animal-proof containers with backhaul to an approved waste disposal facility. The tertiary method of disposal is on-site non-frozen storage in animal proof containers with backhaul to an approved waste disposal facility. Daily backhauling of non-frozen waste must be achieved unless safety considerations prevent it.	A.4.k. Mitigation measure satisfied- garbage and putrescible waste will be stored in bear proof containers prior to disposal at the North Slope Borough Service Area 10 landfill.

5. Access	
a. Except for approved off-road travel, exploration activities must be supported only by ice roads, winter trails, existing road systems or air service. Wintertime off-road travel across tundra and wetlands may be approved in areas where snow and frost depths are sufficient to protect the ground surface. Summertime off-road travel across tundra and wetlands may be authorized subject to time periods and vehicle types approved by DMLW. Exceptions may be granted by DMLW, and the director, if an emergency condition exists; or, if it is determined, after consulting with ADF&G that travel can be accomplished without damaging vegetation or the ground surface.	A.5.a. Not applicable – Project is not an exploration project. Placement of gravel for this project will be done during the winter time, via ice road access to the project site. Wintertime off-road travel across tundra will occur with approval from ADNR DMLW in accordance with established tundra travel requirements.
b. Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.965.	A.5.b. Mitigation measure satisfied- The Oil and Gas Lease area is not restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. The project area is within existing oil and gas development infrastructure in the Milne Point Unit. Access is controlled through security checkpoints. Lease facilities and operations will not block access to or along navigable or public waters as defined in AS 38.05.
6. Prehistoric, Historic, and Archaeological Sites	
a. Before the construction or placement of any gravel, or other structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archaeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the NSB, nearby communities, Native organizations, and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity.	A.6.a. Mitigation measure satisfied – Northern Land Use Research, Alaska prepared a Cultural Resources Report dated July 15, 2016, documenting cultural resources in the vicinity of the project area. The report was submitted to the State Historic Preservation Office (SHPO) on August 15, 2016 and SHPO provided concurrence that No Historic Properties are Affected on August 23, 2016. A Traditional Land Use Inventory (TLUI) Clearance request was submitted to the North Slope Borough on August 23, 2016 and the NSB issued TLUI clearance on September 7, 2016.
b. The inventory of prehistoric, historic, and archaeological sites must be submitted to the director and to DPOR Office of History and Archaeology who will coordinate with the NSB for review and comment. If a prehistoric, historic,	A.6.b. Mitigation measure satisfied – see response to A.6.a.

or archaeological site or area could be adversely affected by a lease activity, the director, after consultation with DPOR Office of History and Archaeology and the NSB, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.	
c. If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee must report the discovery to the director as soon as possible. The lessee must make reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the director, after consultation with DPOR Office of History and Archaeology and the NSB, has directed the lessee as to the course of action to take for its preservation.	A.6.c. Mitigation measure satisfied: EH&S training includes instruction to site workers to stop work if any archaeological/historic sites or artifacts are discovered. Discovery of archeological/historic sites or artifacts will be reported as soon as possible, as required, to the appropriate agencies.
7. Local Hire, Communication, and Training	
a. Lessees are encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. Lessees shall submit, as part of the plan of operations, a proposal detailing the means by which the lessee will comply with the measure. The proposal must include a description of the operator's plans for partnering with local communities to recruit, hire and train local and Alaska residents and contractors. The lessee is encouraged, in formulating this proposal, to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.	A.7.a. Mitigation measure satisfied- Hilcorp will use existing contractor support for the pad construction and infrastructure installations. Hilcorp employs Arctic Slope Regional Corporation (ASRC) subsidiaries for our Roads and Pads Maintenance Work.. In addition, more than 95 percent of Hilcorp's Alaska workforce is comprised of Alaska residents. Hilcorp works with local organizations to encourage growth in the local service sector. Hilcorp strives to do business locally whenever possible.
b. A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.	A.7.b. Mitigation measure satisfied - Hilcorp employs Arctic Slope Regional Corporation (ASRC) subsidiaries for our Roads and Pads Maintenance Work. Hilcorp also employs ASRC and Kuukpik Corporation subsidiaries in many areas of our North Slope operations. Northstar employs ASRC subsidiary Alaska Petroleum Contractors (APC). APC provides maintenance and operations support for Northstar activities. Kuukpik Arctic Catering provides camp catering and housekeeping services at Northstar. Jobs and training opportunities for their Native Shareholders are of paramount importance to ASRC and Kuukpik. Kuukpik is the village corporation for Nuiqsut and they provide application materials and assistance for filing applications in the village.
c. A plan of operations application must include a training program for all personnel including contractors and subcontractors. The program must be	A.7.c. Mitigation measure satisfied- All employees and contractors receive Environmental, Health, and Safety (EH&S) training, either provided by Hilcorp

designed to inform each person working on the project of environmental, social, cultural, health, and safety concerns that relate to that person's job. The program must use methods to ensure that personnel understand and use techniques necessary to preserve geological, archaeological, and biological resources. In addition, the program must be designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.	or their employer. Topics covered include, but are not limited to, the following: • Job hazards • Safe work practices • Drug and alcohol policies • Permits and regulations • Wildlife interactions • Spill prevention and reporting • Waste management In addition to the general EH&S orientation program, individuals are trained according to job-specific requirements, such as drilling operations and construction equipment operations.
8. Definitions	
Facilities means any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps and buildings. ***Hazardous substance*** means (A) an element or compound that, when it enters into or on the surface or subsurface land or water of the state, presents an imminent and substantial danger to the public health or welfare, or to fish, animals, vegetation, or any part of the natural habitat in which fish, animals, or wildlife may be found; or (B) a substance defined as a hazardous substance under 42 USC 9601 - 9675 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980); "hazardous substance" does not include uncontaminated crude oil or uncontaminated refined oil (AS 46.09.900). ***Identified wetlands*** are those areas that have been identified as wetlands by the U. S. Army Corps of Engineers under Section 404 of the Clean Water Act.[4].	

4 ***Wetlands*** *means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR Parts 122.2, 230.3, and 232.2).*

Minimize means to reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction. ***Plan of operations*** means a lease plan of operations under 11 AAC 83.158 and a unit plan of operations under 11 AAC 83.346. ***Practicable*** means feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the standard. ***Reasonable access*** means access using means generally available to subsistence users. ***Secondary containment*** means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container. Double walled tanks do not qualify as Secondary Containment unless an exception is granted for a particular tank. ***Temporary*** means no more than 12 months.	

APPENDIX C: OTHER

Insert other information here.

Hilcorp Alaska, LLC

PROJECT DESCRIPTION
FOR THE
MILNE POINT UNIT
MOOSE PAD DEVELOPMENT

NOVEMBER 2016

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1.0 INTRODUCTION

The Schrader Bluff reservoir on the North Slope is estimated to contain 10 to 20 billion barrels of oil reserves. Hilcorp Alaska, LLC (Hilcorp) plans to expand oil resource development within the Milne Point Unit (MPU) Schrader Bluff reservoir by constructing a new pad and corresponding access road. In addition, Hilcorp plans to expand the existing pipeline, electrical, and communication in the western portion of MPU to accommodate additional future oil production. The proposed new pad (Moose Pad) will provide Hilcorp access to approximately 7 square miles of undeveloped oil reserves within the MPU. Initial development plans for Moose Pad will include approximately 44 new wells to be developed using directional drilling technology. To increase the amount of crude oil that can be extracted from the Schrader Bluff reservoir, the new wells will include both oil production wells and enhanced oil recovery (EOR) injection wells.

2.0 PROJECT DESCRIPTION

The Moose Pad Development Project will occur within the MPU lease area at Alaska Division of Lands (ADLs) 025514, 025515, 025509. MPU is currently operated by Hilcorp and ownership is divided between Hilcorp (50%) and BP Alaska, Inc. (BPXA) (50%). The Moose Pad Development Project will involve the construction of Moose Pad and an access road located on the west side of Milne Point Road (Figure 1).

To support new oil production wells on Moose Pad, an oil production pipeline, a small tie-in pad, and new pad infrastructure will also be installed. A total of 266,550 cubic yards of gravel fill into 34.83 acres of footprint (30.43 acres of wetlands and 4.40 acres of uplands) is anticipated to be placed for all components of the project. Additional details for each of the Moose Pad Development Project components are described in this section.

2.1. Moose Pad

As shown in the attached Figure 2, the approximate location for the proposed Moose Pad will be within Sections 13 and 14, Township 13 North, Range 9 East, Umiat Meridian, Alaska with an approximate pad center at latitude 70˚29’12”N and longitude -149˚43’44”W (NAD83). The exact location of Moose Pad may vary slightly based on environmental and topographical conditions encountered during installation.

The Moose Pad footprint will be approximately 1,500 ft. long by 500 ft wide at the base, and 1,480 ft. by 480 ft. at the top (17.22 acres) requiring approximately 140,000 cubic yards (Cu yd) of gravel fill. Initial plans for Moose Pad include drilling approximately 44 new wells with a well layout similar to the existing well layout on MPU H Pad. The orientation for Moose Pad is proposed to be in an east-west direction to correspond with the prevailing winds in the area. This orientation will greatly facilitate snow removal on the pad during winter months. Detailed design drawing for the Moose Pad can be found in Appendix A

2.2. Access Road

An access road will be constructed to connect Moose Pad to the existing Milne Point Road between MPU C Pad and L Pad. The proposed access road will be located within Sections 17 and 18, Township 13 North, Range 10 East, Umiat Meridian, and Section 13, Township 13 North, Range 9 East, Umiat Meridian, Alaska. Long-term field personnel interviews, historical photos, and field verification have identified an area of previously disturbed tundra in the vicinity of the Moose Pad Development Project. This area, known as “Tractor Tracks” consists of 4.4 acres of uplands complex, consisting of a relic road bed, where gravel between 6” and 24” exists from previous development activities. The Moose pad road

has been designed to utilize this relic road bed to the maximum extent practicable in an effort to minimize impacts on intact wetlands. The exact route for the access road may vary slightly based on environmental and topographical conditions encountered during installation.

The proposed access road footprint is estimated to be approximately 2.83 miles (14,980 feet) long and 35 ft. wide at the top and 55 ft. wide at the base (17.20 acre total footprint). Within the proposed 17.21 acre access road footprint, 4.40 acres of uplands "tractor tracks" have been identified, leaving 12.80 acres of wetlands to be filled during access road construction. Construction of the access road is estimated to require approximately 125,000 Cu yd of gravel fill. Detailed design drawing for the Moose Pad Access Road can be found in Appendix A. A typical road design cross section is provided in Appendix A – Sheet 3.

The Moose Pad will be tied into existing power and communication sources in MPU by installing power and fiber optic cables within the bed of the access road. In addition, to avoid disrupting the natural drainage and to allow fish passage, culverts will be sized accordingly and installed within the roadbed. To provide for fish passage at stream crossings, culverts are being designed based on recommendations of a consulting hydrologist and Alaska Department of Fish and Game personnel. A typical design for culvert installation in a roadway is shown in Appendix A – Sheet 3.

2.3. Pipelines and Tie-In Pad

Development of the Schrader Bluff reservoir at Moose Pad will require the addition of a new oil production pipeline to transport 3-phase flow back to the Central Facilities Pad (CFP). The new pipeline will be installed 500' north of the Moose Pad Access Road to the maximum extent practicable to facilitate caribou crossing concerns raised by the NSB and ADF&G during initial review of the Moose Pad Permit Application. The agreed upon Moose Pad Pipeline route and orientation is shown in figure 3. The pipeline will be separated from the access road at varying distances in the following areas based on environmental and topographical conditions that exist in the project area:

- Initial 500' Separation – After crossing under the MPU spine road, the Moose Pad Pipeline immediately begins to angle away from the Moose Pad access road to create the recommended 500' separation for caribou crossing. This separation is maintained as the pipeline continues west for approximately 1.57 miles, until the pipeline corridor encounters multiple large surface water bodies in Section 13.
- Primary Bottleneck – In the center of section 13, the pipeline corridor encounters multiple large and impassable water bodies that must be constructed around. Constructing the pipeline to the north of these water bodies places the pipeline outside of the NSB recommended maximum separation of 1000'and placing the pipeline to the south of these water bodies places the pipeline inside of the NSB and ADF&G recommended separation of 500'. A decision was reached with the NSB, ADF&G, and Hilcorp to route the pipeline to the south (closer to the access road) for the segment where the impassable water bodies exists. In this area, the pipeline angles in towards the Moose Pad Access Road and the separation ranges from 50 to 500' for approximately 0.6 Miles where the water bodies are passed, and recommended separation can be gained again.
- Secondary 500' Separation –Where the Moose Pad Pipeline meets the gravel pad, achieving the recommended 500' separation is difficult due the presence of surface water bodies and relic lake beds. Relic lake beds pose engineering challenges due to the presence of underlying thaw bulbs and/or ice lenses that are problematic for VSM installation and Pipeline Integrity. As the Moose Pad Pipeline moves past the previously described surface water body bottleneck, the pipeline angles away from the moose pad access road, allowing for approximately 0.22 miles of 500' separation, which is the maximum amount geographically allowable from an engineering and constructability standpoint.

The new oil production pipeline will be installed on vertical support members (VSMs) designed similar to the existing VSMs along Milne Point Road. Pipeline VSM installation is anticipated to cover approximately 0.05 acres of footprint and utilize an additional 50 Cu yds. of gravel fill. The new oil production pipeline will transition from VSMs to a buried pipeline to cross the Milne Point Road and will return to VSMs to tie into the common carrier pipeline on the east side of Milne Point Road. At this time, water or gas injection pipelines are not anticipated to be required at Moose Pad.

The new oil production pipeline will require the addition of a small tie-in pad to allow access to the pigging equipment. This new tie-in pad will be approximately 50 ft. by 140 ft. at the top and 60 ft. by 160 ft. at the base (0.36 acres) 2:1 side slopes, and is estimated to require approximately 1500 Cu yd of gravel fill. The final location of the tie-in pad will be dependent on the final routes selected for the access road and oil production pipeline. Current plans indicate the tie-in pad will likely be constructed at the intersection of Milne Point Road and the proposed Moose Pad access road. A pig launcher building approximately 10 ft. by 30 ft. (300 sqft.) will be constructed at the tie-in pad to facilitate pigging operations at the pipeline intersection. Power and fiber optic cables installed within the access road bed will also tie into existing MPU power and communication systems at the tie-in pad.

2.4. Moose Pad Infrastructure

The Moose Pad Development Project will require specific infrastructure to be installed on the pad including: a test separator building, a pig launcher building, and an electric submersible pump (ESP) drive building. In addition, future operations at Moose Pad are anticipated to require two water source wells to support the EOR injection wells. Water source wells will utilize canned pumps and will be permitted prior to drilling. At this time, a water disposal well is not anticipated for Moose Pad. Any liquid wastes generated at Moose Pad will be manifested and transported to an approved disposal facility in accordance with the *Alaska Waste Disposal and Reuse Guide*, also referred to as the “Red Book.”

3.0 PROJECT CONSTRUCTION AND OPERATIONS

Construction of the Moose Pad Development will include the construction of an ice road, installation of the oil production pipeline and placement of gravel fill. Hilcorp proposes to utilize standard winter construction techniques for the North Slope. Additional details for each of these construction and operational components are described in this section.

3.1. Ice Road

Access to the Moose Pad Development area will require the construction of an approximately 1.5 mile long ice road from the Ugnu/E-Pit Mine Site to the Moose Pad Project location, and then approximately 2.83 miles long alongside the proposed access road corridor. The ice road will be utilized to protect the tundra from truck and equipment traffic during access road construction. The timing for the construction of the ice road will correspond with state and local approval for tundra travel which is determined using accumulated snowfall and soil temperature. The ice road will be constructed approximately 12" thick (or deemed sufficient to protect the underlying tundra), 50' wide.

The oil production pipeline will be installed on VSMs using the ice road for access to the tundra. VSMs will be designed similar to those existing along Milne Point Road and will be set in a sand slurry. Cuttings will be removed and hauled to an approved disposal site or utilized in the sand/water slurry for VSM setting.

Water sources used for ice road construction and pipeline hydrotesting will be obtained from nearby permitted tundra lakes and ponds. Snow will be prepacked to establish travel corridors to and from water sources as well as alongside the proposed access road route. Additional snow required will be stockpiled from surrounding lakes and utilized as needed.

3.2. Gravel Placement

The Moose Pad Development project will require approximately 266,550 Cu yd. of gravel which will be obtained from the Ugnu/E-Pit Mine Site under the existing Material Sale Contract with the Alaska Department of Natural Resources, Division of Mining Land and Water. If for any reason, material sources are not available, Hilcorp will utilize material from the Milne Point Mine Site as a secondary option. Hilcorp will begin mining operations at the Ugnu/E-Pit Mine Site during ice road construction operations in preparation for gravel placement following ice road completion. Mining operations at the Milne Point Mine Site may include blasting during winter months.

Gravel will be placed with a minimum compacted depth of 5 feet (ft) and will utilize a 2:1 edge slope. Culverts will be installed ahead of the road construction crews and using the ice road for access.

Construction of the first ¼ mile of the access road may begin prior to the completion of the ice road. Trucks hauling and placing gravel fill material will begin placing gravel fill from the Milne Point Road and continue moving outwards as new material is placed and compacted. Dozers and sheep's foot rollers will be used to grade the material in 1.5 ft – 2 ft lifts and compact material prior to truck access. Trucks hauling gravel fill material and additional support equipment will require additional space to turnaround after the initial ¼ mile of the access road is constructed. Construction activities will be coordinated to allow trucks and equipment to begin using the ice road to turnaround once the ice road reaches its full thickness.

Gravel fill material will be compacted at the time of placement. Because construction activities will be occurring during winter months, the road bed and pad surface will be excavated and re-compacted during the summer months to ensure adequate compaction.

3.3. Construction Quantities

The following table summarizes estimated construction footprint and fill quantities to wetlands and uplands for the Moose Pad Development Project:

Project Component	Total Footprint (acres)	Wetlands Footprint (acres)	Uplands Footprint (acres)	Total Fill (Cu yds.)	Wetlands Fill (Cu yds.)	Uplands Fill (Cu yds.)
Moose Pad	17.22	17.22	0	140,000	140,000	0
Access Road	17.20	12.80	4.40	125,000	95,000	30,0000
Tie-In Pad	0.36	0.36	0	1,500	1,500	0
Pipeline VSM's	0.05	0.05	0	50	50	0
Totals	34.83	30.43	4.40	266,550	236,550	30,000

Note: All footprints and gravel quantities are estimated, and represent the most accurate information available for project planning purposes. Actual footprints and volume quantities may vary slightly based on local topography, gravel source quality, and compaction, as well as various other environmental and physical factors present during the extraction and installation of gravel resources.

3.4. General Operations during Construction

During construction, existing facilities and infrastructure at MPU will be used for housing of construction crews and for mobilizing/transporting materials, supplies, and other equipment. Communications from the site during construction operations would be by radio and/or cellular phone. Portable toilets will be provided on site for construction workers. No food waste or other material that could attract wildlife will be stored at the site. Any C&D or MSW wastes generated on site will be bagged up and hauled to the North Slope Borough waste disposal facility on a regular basis.

Any fuel tanks and/or generators utilized at the construction site would be located and contained within a bermed, lined, impermeable area sufficient to contain 110 percent of the largest tank capacity. The fuel storage capacity would be that required to meet daily operational and bulk re-supply needs during construction activities.

During winter months, drifting snow will be cleared as needed on the pad location or as weather permits. Snow will be removed from the pad to the nearest available area permitted for snow storage.

4.0 PROJECT SCHEDULE

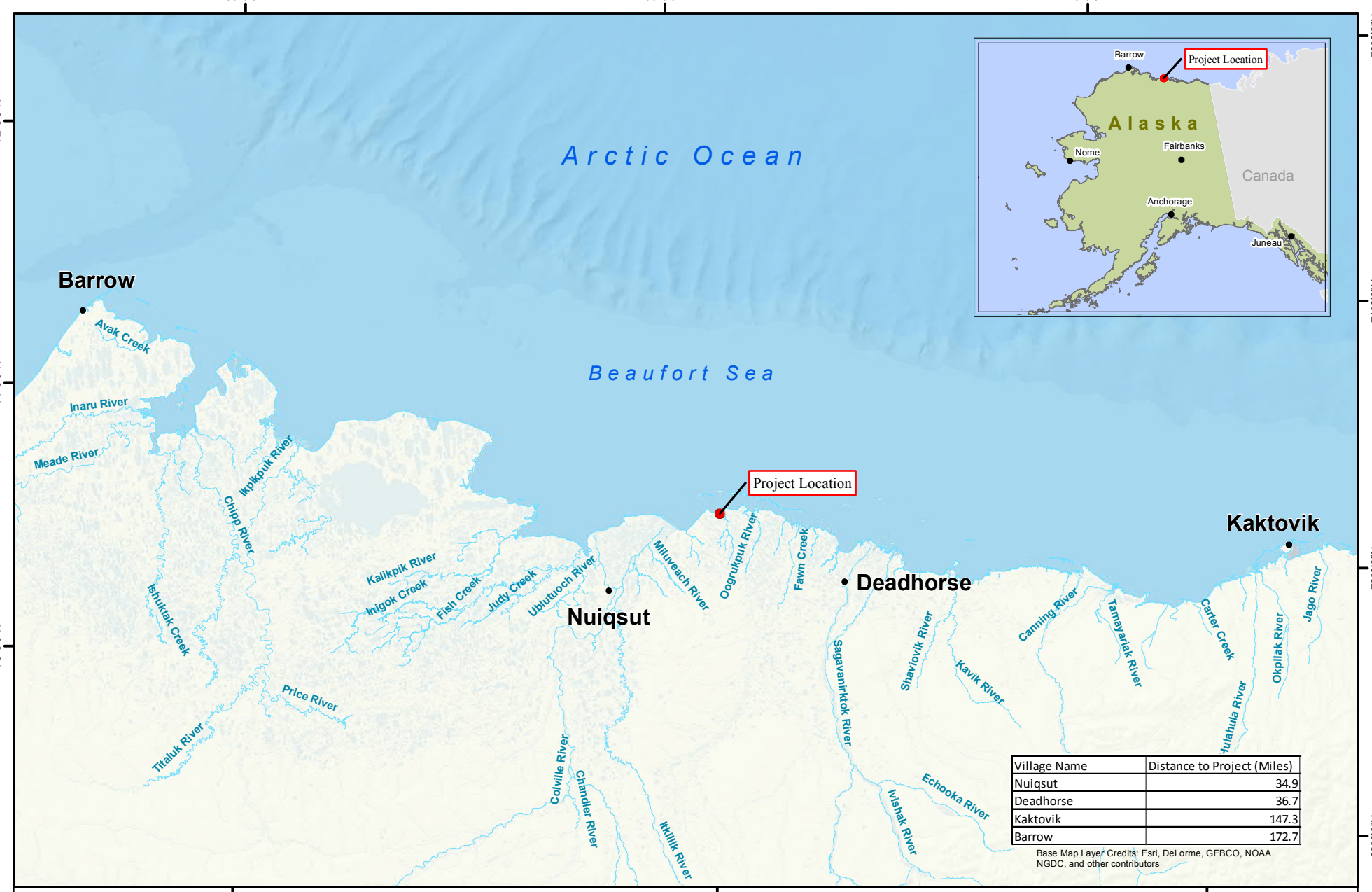
Hilcorp plans to submit the permit application package to agencies in August 2016. Following agency approval, ice road construction and mining operations are anticipated to begin December 15, 2016. Pad and access road construction would follow ice road construction and would begin approximately January 15, 2017. Pad and access road construction is anticipated to take approximately three months to complete. Following spring thaw, the pad surface and road bed will be excavated and re-compacted during the month of July 2017. Pad infrastructure will be in installed following pad completion.

5.0 AUTHORIZATIONS ANTICIPATED

Hilcorp will conduct the required environmental studies and obtain the appropriate approvals prior to beginning construction. The following authorizations are anticipated:

AGENCY	PERMIT	STATUS
USACE	Section 404	To be submitted
USEPA	SPCC Plan	To be revised
USFWS	Endangered Species Act Section 7 Consultation	To be submitted
	Letter of Authorization	Existing
ADNR Division of Oil and Gas	Unit/Lease Operations Approval	To be submitted
	Plan of Development	To be submitted
ADNR Division of Mining, Land, and Water	Material Sales Contract / Mining and Rehabilitation Plan	To be submitted / Existing
	Miscellaneous Land Use Permit	To be submitted
	Alaska Pollutant Discharge Elimination System (APDES) Permit	To be revised
	Temporary Water Use Permit / Water Rights	Existing
	Tundra Travel / Ice Road Construction General Permit	Existing
ADNR State Historical Preservation Office	Archaeological Clearance	To be submitted
ADFG	Title 16 Fish Habitat Permit	To be submitted
ADEC	Oil Discharge Prevention and Contingency Plan	To be revised
	Certificate of Reasonable Assurance	To be submitted
	Water Quality Certification- Concurrent with 404	To be submitted
NSB	Development Permit	To be submitted
	Ice Road Construction Permit	To be submitted
	Form 600	Existing
	Form 500	To be submitted

FIGURES



Village Name	Distance to Project (Miles)
Nuiqsut	34.9
Deadhorse	36.7
Kaktovik	147.3
Barrow	172.7

Base Map Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

Hilcorp Alaska, LLC

Map Date: 8/26/2016

North Slope Borough
Milne Point Unit
Proposed Moose Pad Location
Vicinity

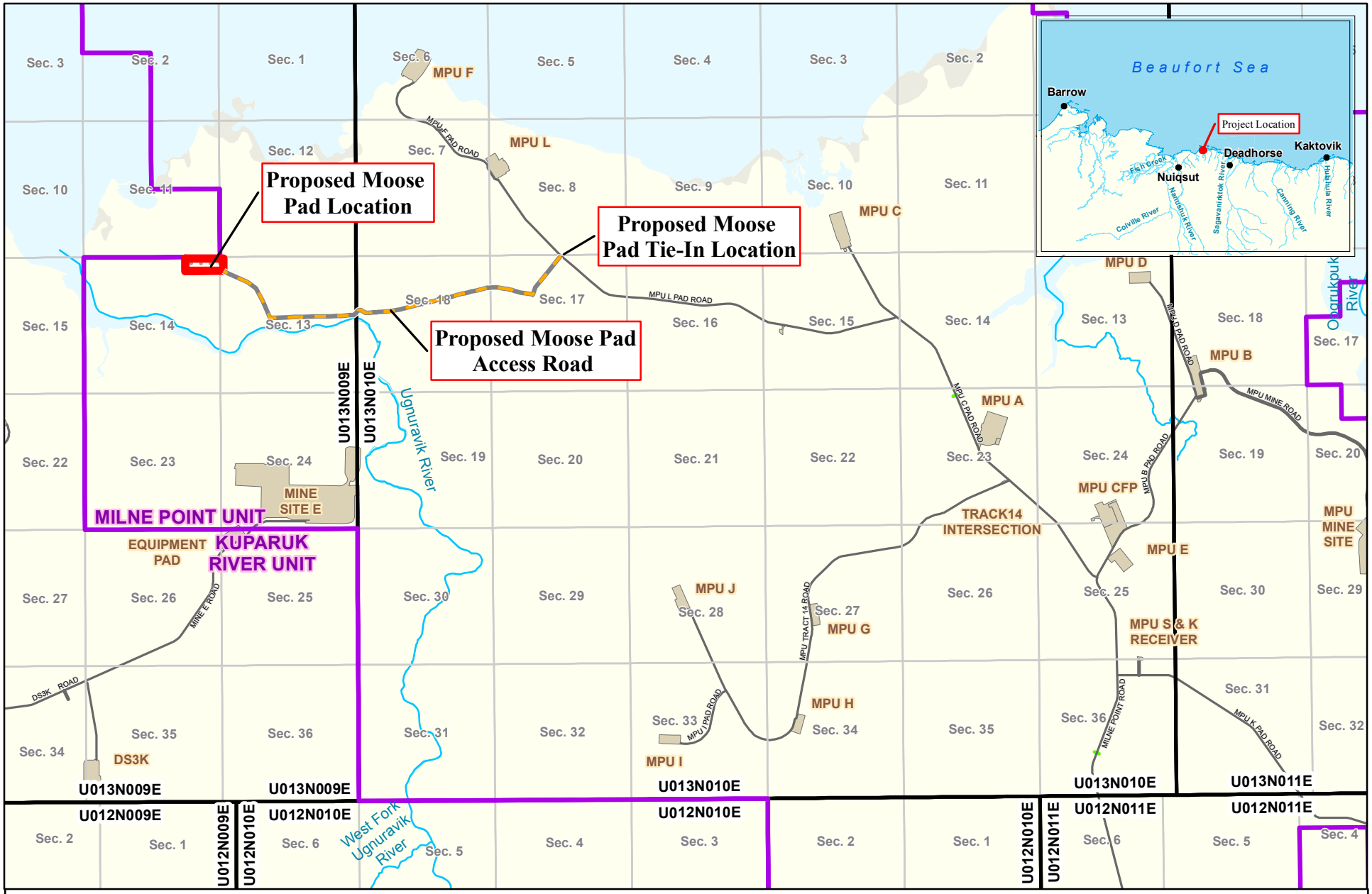
Legend

MPU Proposed Moose Pad Location

Alaska Albers Equal Area NAD 1983

0 10 20 30 40 50 Miles

Figure 1



Hilcorp Alaska, LLC

Map Date: 8/26/2016

North Slope Borough
Milne Point Unit
Proposed Moose Pad Location
Project Area

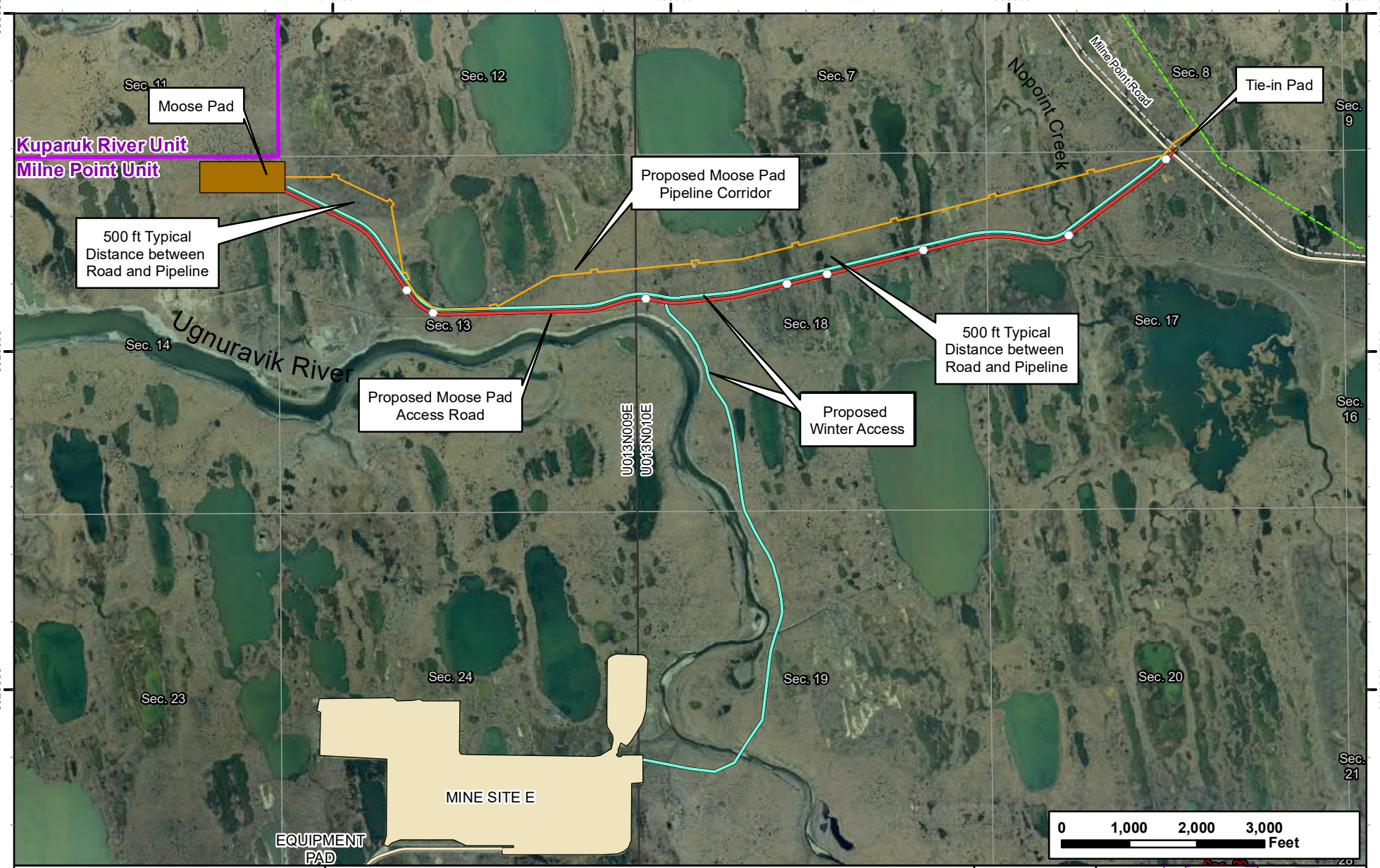
Proposed Access Road
MPU Proposed Moose Pad Location
Oil and Gas Unit Boundaries

Alaska StatePlane Zone 4 NAD 1983 (Feet)

0 2,500 5,000 7,500 10,000 Feet

N

Figure 2



HILCORP - Moose Pad
Proposed Infrastructure
Figure 3
Map and Engineering by RECON LLC
481 W. RECON Cir, Palmer AK 99645
NAD1983 Alaska SPCS Z4 (Feet)
Imagery/Existing Infra. from Hilcorp Alaska

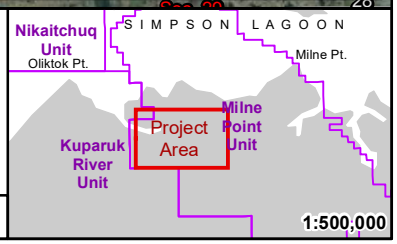
Legend

- Proposed Access Road
- Proposed Winter Access Road
- Proposed Pipeline
- Proposed Pad
- Proposed Culvert
- Existing Road
- Existing Pipeline (Above Ground)
- Existing Power Line
- Existing Facility
- Oil & Gas Unit Boundary

N

1:24,000

11/1/2016



MoosePad_8x11L_BlkB

APPENDIX A

ROAD AND PAD ENGINEERING DRAWINGS

MOOSE PAD PROJECT
ROAD AND PAD

SHEET LIST TABLE

SHEET TITLE	SHEET NO.
COVER SHEET	1
SHEET INDEX MAP	2
MOOSE PAD ACCESS TYPICALS	3
TIE-IN ROAD TYPICALS	4
GENERAL NOTES	5
MOOSE PAD ACCESS ROAD STA 00+00 TO 26+00	6
MOOSE PAD ACCESS ROAD STA 26+00 TO 52+00	7
MOOSE PAD ACCESS ROAD STA 52+00 TO 78+00	8
MOOSE PAD ACCESS ROAD STA 78+00 - 104+00	9
MOOSE PAD ACCESS ROAD STA 104+00 TO 130+00	10
MOOSE PAD ACCESS ROAD STA 104+00 TO EOP	11
TIE IN ROAD STA 00+00 TO EOP	12
MOOSE PAD	13

Hilcorp

COVER SHEET

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER

10/04/2016

RECON LLC

Rowland Engineering Consultants

24" x 36"

REVISIONS

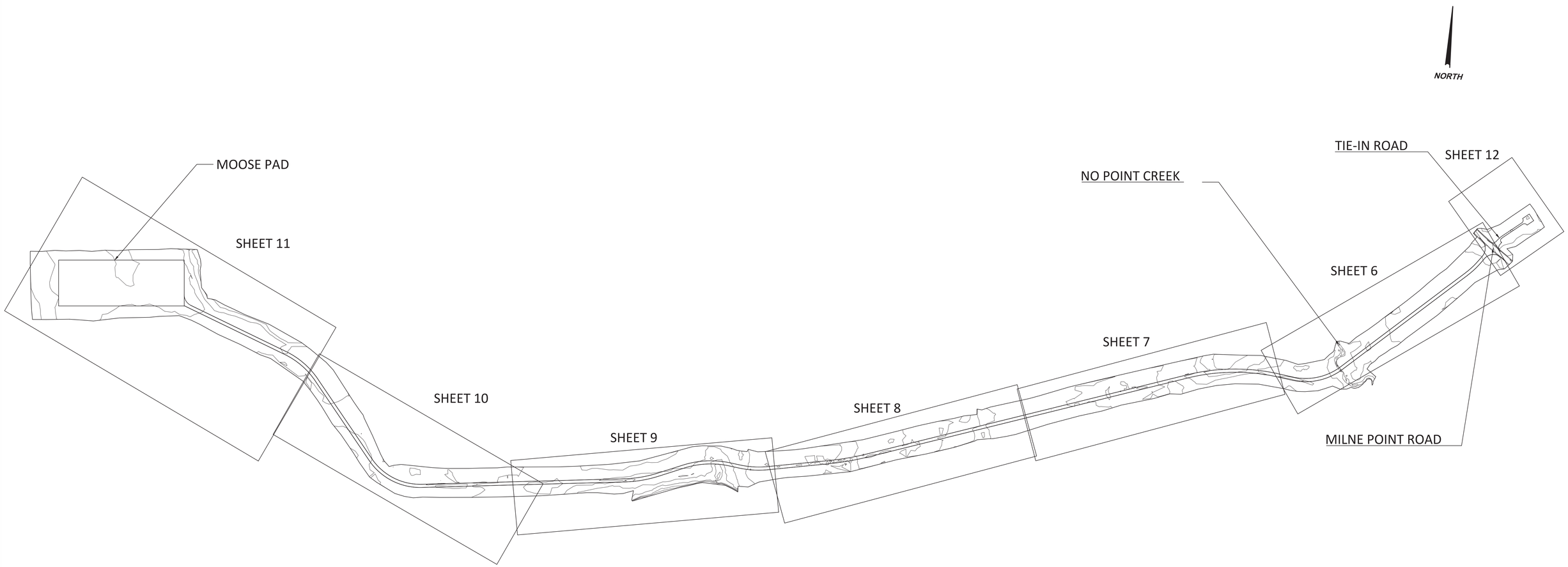
NO.	BY	DATE	DESCRIPTION

ADDRESS: RECON LLC, 481 W. RECON CIRCLE PALMER, AK 99674

ENGINEER: STEVE ROWLAND, PE

CONTACT: (907)355-3006, steve@reconllc.net

DRAWN BY: MARIA C. SANDERS



Hilcorp

SHEET INDEX MAP

STATE OF ALASKA
49TH
Steven R. Rowland
CE-7241
REGISTERED PROFESSIONAL ENGINEER

10/04/2016

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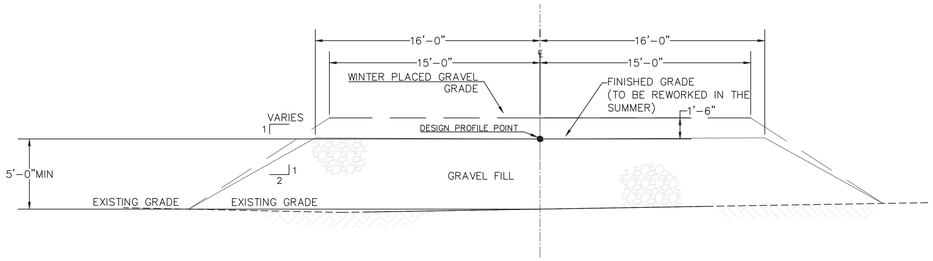
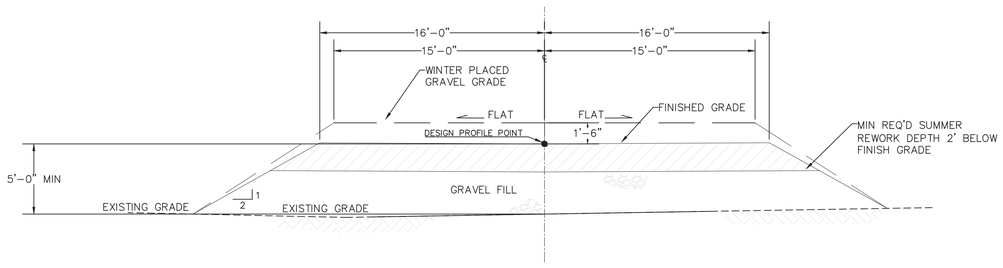
ROAD TYPICAL SECTION (WINTER CONSTRUCTION)



NOTES:

1. FILL TO CONSIST OF NON-FROST-SUSEPTIBLE GRAVEL FROM SOURCE APPROVED BY PROJECT ENGINEER.
2. NO DITCHING PERMITTED IN FILL AREAS EXCEPT AT THE DIRECTION OF THE PROJECT ENGINEER.
3. WINTER FILL PLACED 1.5' ABOVE FINISHED SUMMER GRADE.

ROAD TYPICAL SECTION (SUMMER CONSTRUCTION)



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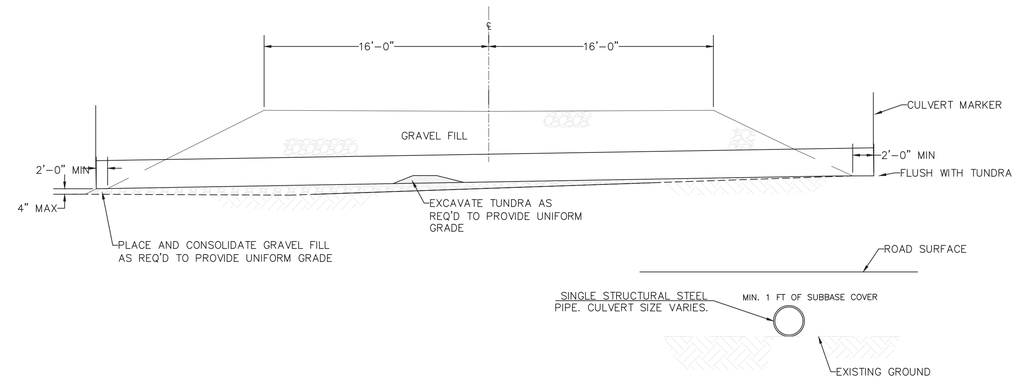
ROAD TYPICAL SECTION
CULVERT INSTALLATION



CULVERT NOTES:

1. CULVERTS PLACED AT LOCATIONS SPECIFIED BY ENGINEER.
2. STRUCTURAL STEEL PIPE CULVERTS SHALL BE PLACED ON EXISTING TUNDRA GRADE
3. CULVERT No. 2 INSTALLATION TO INCLUDE 4 PIPES TO BE INSTALLED FOR FISH PASSAGE. 2 PIPES AT INVERT ELEVATION SHOWN AND 2 PIPES AT INVERT 12.5
4. CULVERT SIZE AND NUMBER MAY VARY DEPENDING IN FINAL PERMITTED DESIGN. NO MORE THAN 4 PIPES TO BE INSTALLED AT CULVERT SITE NO. 2

CULVERT SUMMARY								
No.	North	East	Inlent Inv. Elev	Azimuth	Gradient	Length (ft)	Dia. (in)	thaw pipe
1	6027842.6	1687327.5	15.4 L	310.9	0.005	70	24	NO
2	6026715.2	1685883.2	10.2 L	321.0	0.005	80	(4) x 48	YES
3	6026490.7	1683736.1	12.5 L	346.1	0.005	75	36	YES
4	6026138.5	1682311.0	12.5 L	346.1	0.005	70	24	NO
5	6025991.2	1681715.7	13.5 L	346.1	0.005	70	36	YES
6	6025778.9	1679630.2	14.0 R	184.8	0.035	80	24	NO
7	6025569.1	1676486.8	13.0 R	228.0	0.005	80	24	NO
8	6025900.0	1676097.0	14.0 R	214.1	0.005	60	24	YES
9	6028132.9	1687646.2	12.3 L	303.7	0.005	50	24	NO

Hilcorp

MOOSE PAD ACCESS TYPICALS

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER

10/04/2016

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24" x 36"

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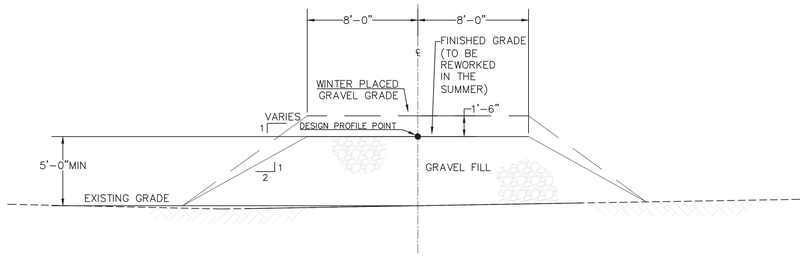
DRAWN BY: MARIA C. SANDERS

SHEET NO.

ROAD TYPICAL SECTION (WINTER CONSTRUCTION)



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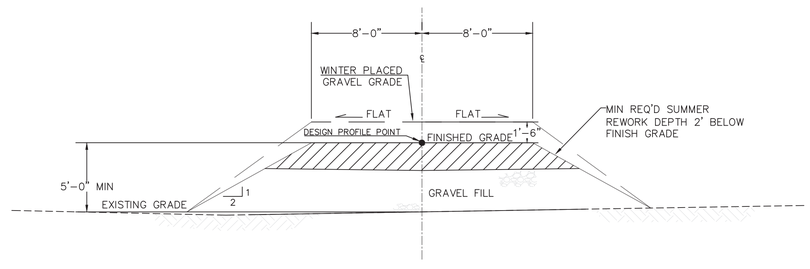
3. WINTER FILL PLACED 1.5' ABOVE FINISHED SUMMER GRADE.

ROAD TYPICAL SECTION (SUMMER CONSTRUCTION)



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Hilcorp

MOOSE PAD ACCESS TYPICALS

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DRAWN BY: MARIA C. SANDERS

SHEET NO.

4 OF 13

1 GENERAL PARAMETERS

1.1 SURVEY DATUM –
SURVEY INFORMATION PROVIDED BY RECON LLC. DATUM:
NAD83(2011)(2010.0000) OPUS PROJECTS DERIVED ALASKA STATE PLANE ZONE 4, NAVD88 (G12B) COORDINATES LISTED IN U.S. SURVEY FEET. NGS CORS ab33, ab45, ab46, atqk, brw1, and sg27 WERE FULLY CONSTRAINED TO DERIVE THE CONTROL COORDINATES FOR CP1 IN OPUS PROJECTS. CP2 COORDINATES WERE OBTAINED BY MULTI–SESSION RTK OBSERVATION WITH THE RTK BASE AT CP1.
COMBINED SCALE FACTOR IS 0.99990256, DERIVED IN OPUS PROJECTS AT POINT CP1.

1.2 DESIGN PARAMETERS –
ROAD GRADE – 2.0% MAXIMUM
VERTICAL CURVE LENGTH – MIN. OF 100 FEET PER EACH PERCENT (1%) GRADE CHANCE DESIGN SPEED – 35 MPH
MINIMUM FILL DEPTH – FIVE (5) FEET OVER EXISTING GROUND ELEVATIONS.
CULVERTS – 120PSI SURFACE PRESSURE WITH MINIMUM 3 FEET OF COVER.

IN THE EVENT THAT THERE IS A CONFLICT BETWEEN THE ABOVE REFERENCES AND THESE GENERAL NOTES, THE OWNER IS TO BE NOTIFIED OF ALL CONFLICTS AND THE FOLLOWING GENERAL PRIORITY SHALL BE FOLLOWED:
1. ALL PROJECT PERMIT REQUIREMENTS
2. THESE GENERAL NOTES
3. THE DESIGN DRAWINGS

1.3 PERMITS
THE OWNER WILL PROVIDE THE CONTRACTOR COPIES OF ALL PERMITS AND APPROVALS THAT ARE OBTAINED BY THE OWNER.

THE OWNER WILL TRANSMIT TO THE CONTRACTOR WRITTEN APPROVAL FOR THE COMMENCEMENT OF CONSTRUCTION.

2 MATERIALS

2.1 PIPE MATERIALS – CULVERT PIPE TO BE STEEL PIPE MEETING REQUIREMENTS OF API 5LX52. PIPE TO BE SUPPLIED BY HILCORP WITH THAW PIPES INSTALLED

2.2 SIGNAGE

2.2.1 SIGNS – PERMANENT SIGNS TO BE INSTALL BY HILCORP

2.3 GRAVEL FILL MATERIALS –
GRAVEL FILL MATERIAL SHALL CONSIST OF NON COHESIVE NATIVE GRAVELS TAKEN FROM THE OWNER SPECIFIED MATERIAL SOURCE. THE GRADATION CURVE OF THE GRAVEL FILL MATERIAL, AS DETERMINED BY SIEVE ANALYSIS, SHALL FALL WITHIN THE GRADATION ENVELOPE SPECIFIED BELOW.

THE FINE SOIL CONTENT (PERCENT PASSING THE NO. 200 SIEVE) OF THE GRAVEL FILL MATERIAL SHALL NOT EXCEED 15%.

OBSERVED DELETERIOUS MATERIALS MUST BE REMOVED FROM THE GRAVEL FILL MATERIAL PRIOR TO THE GRAVEL FILL MATERIAL LEAVING THE MATERIAL SOURCE. DELETERIOUS MATERIALS INCLUDE:

ICE AND SNOW OF SIGNIFICANT QUANTITY TO CAUSE SUBSTANTIAL SUBSIDENCE OF FILL UPON THAWING.
OVERBURDEN
ORGANIC MATERIAL
CLAY OR SILT

BEDDING MATERIAL IS DEFINED AS GRAVEL FILL MATERIAL WITH FINE SOIL (PERCENT PASSING NO. 200) CONTENT NOT EXCEEDING 10%.

3 INSTALLATION

3.1 GRAVEL PLACEMENT –

3.1.1 FILL LIMITS
GRAVEL FILL MATERIAL SHALL NOT BE PLACED OUTSIDE OF THE GRAVEL FILL FOOTPRINT SPECIFIED IN THE DESIGN DRAWINGS. GRAVEL FILL MATERIAL PLACED OUTSIDE OF THOSE LIMITS, INTENTIONALLY OR OTHERWISE, SHALL BE RECOVERED.

NO EQUIPMENT MAY TRAVEL OUTSIDE OF THE DESIGNATED ROUTES OR THE GRAVEL FILL FOOTPRINT SPECIFIED IN THE DESIGN DRAWINGS.
TRUCK TRAVEL ROUTES FROM THE MATERIAL SOURCE TO THE PROJECT SITE ARE AS SPECIFIED BY OWNER.

3.1.2 DELETERIOUS MATERIALS AT PLACEMENT –
DEPTHS OF ICE GREATER THAN FOUR (4) INCHES AND SNOW GREATER THAN FOUR (4) INCHES SHALL BE REMOVED PRIOR TO PLACING GRAVEL FILL. ANY DELETERIOUS MATERIALS OBSERVED IN PLACED GRAVEL FILL MUST BE REMOVED FROM THE GRAVEL FILL MATERIAL PRIOR TO PLACING SEQUENTIAL LIFTS.

DELETERIOUS AND WASTE MATERIALS SHALL BE DISPOSED OF AT AN OWNER APPROVED WASTE AREA.

LOCATIONS OF ICE DEPTHS GREATER THAN FOUR (4) INCHES, SHALL BE IDENTIFIED AND REMOVED. KNOWN PONDED WATER LOCATIONS OF SIGNIFICANT EXTENT OR DEPTH WERE IDENTIFIED DURING THE TOPOGRAPHIC SURVEY AND ARE SHOWN ON THE PLANS DESIGNATED FOR REMOVAL OF ICE.
FROZEN AGGREGATIONS OF GRAVEL FILL MATERIAL GREATER THAN 12–INCHES IN ANY DIMENSION SHALL BE BROKEN UP OR REMOVED FROM THE FILL PRIOR TO PLACING SEQUENTIAL LIFTS.

3.1.3 DEPTH OF LIFT –

3.1.3.1 WINTER PLACE MATERIAL –
THE FIRST LIFT OF GRAVEL FILL MATERIAL SHALL BE OF A DEPTH NO GREATER THAN TWENTY FOUR (24") INCHES PRIOR TO COMPACTION. ALL SEQUENTIAL LIFTS SHALL BE OF A DEPTH NO GREATER THAN TWELVE (12") INCHES PRIOR TO COMPACTION.

3.1.4 COMPACTION EFFORT –
3.1.4.1 WINTER COMPACTION EFFORT –
WINTER–PLACED GRAVEL FILL SHALL BE PLACED IN A WELL GRADED MASS, AS VOID FREE AS PRACTICABLE. FROZEN AGGREGATIONS OF GRAVEL FILL MATERIAL GREATER THAN 12–INCHES IN ANY DIMENSION SHALL BE BROKEN UP OR REMOVED FROM THE FILL PRIOR TO PLACING SEQUENTAIL LIFTS.

EQUIPMENT TRAFFIC SHALL BE DISTRIBUTED EVENLY ACROSS THE WIDTH OF ALL PLACED GRAVEL FILL LIFTS.

EACH LIFT OF WINTER PLACED GRAVEL FILL MATERIAL SHALL BE COMPACTED BY NO LESS THAN FIVE (5) PASSES OF A 10–TON ELLIOT GRID VIBRATORY COMPACTOR OVER THE ENTIRE LIFT SURFACE.

3.1.4.2 THAWED (SUMMER PLACED) MATERIAL COMPACTION EFFORT –
THAWED GRAVEL MATERIAL SHALL BE COMPACTED TO A DENSITY NOT LESS THAN 95% OPTIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.

3.1.5 PLACEMENT GRADES AND TOLERANCES –
GRAVEL FILL SHALL CONFORM TO THE ALIGNMENTS AND GRADES SHOWN ON THE DESIGN DRAWINGS. GRAVEL FILL SHALL BE FINISHED TO WITHIN A TOLERANCE OF MINUS 0.0FT/PLUS 0.25 FT.

THE FINAL LIFTS OF WINTER–PLACE GRAVEL FILL MATERIAL SHALL BE PLACED TO A WINTER PLACED GRADE ABOVE THE FINISHED GRADE PROFILE, AS INDICATED IN THE DRAWINGS, TO ALLOW FOR THAW CONSOLIDATION AND POST–THAW REWORKING OF THE FILL SURFACE.

3.1.6 PLACEMENT ACTIVITIES –
AN OWNER'S REPRESENTATIVE SHALL BE PRESENT FOR ALL PLACEMENT ACTIVITIES AND SHALL BE PROVIDED SAFE AND TIMELY ACCESS TO ALL PLACEMENT PROCESSES.

3.2 REQUIRED GRAVEL FILL MATERIALS TESTING –

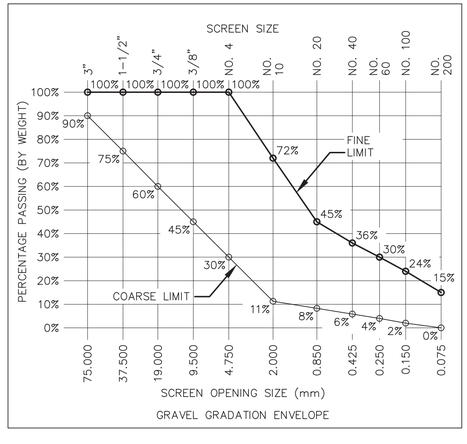
3.2.1 GRAVEL FILL MATERIALS SAMPLING AND TESTING –
ALL MATERIAL SAMPLING AND TESTING SHALL BE TAKEN IN ACCORDANCE WITH THE CURRENT EDITION OF THE ALASKA TEST METHODS MANUAL (ATM) AS PUBLISHED BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (AK DOT/PT) UNLESS OTHERWISE NOTED.

MATERIALS TESTING SHALL COMPLY WITH THE ASTM SPECIFICATIONS CITED BELOW:

C136 METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
D1557 STANDARD TEST METHODS FOR LABORATORY COMPACTION
D6938 STANDARD TEST METHODS FOR IN–PLACE DENSITY AND WATER CONTENT OF SOIL AND SOIL–AGGREGATE BY NUCLEAR METHODS (SHALLOW DEPTH)

3.2.2 QUALITY CONTROL TESTING PROVIDER –
MATERIAL TESTING SERVICES AND OTHER ASSOCIATED QUALITY CONTROL MEASURES SHALL BE PROVIDED BY THE OWNER BY A QUALIFIED AND OBJECTIVE THIRD PARTY AT THE CONTRACTOR'S EXPENSE.

THE QUALITY CONTROL TESTING PROVIDER SHALL PROVIDE DOCUMENTATION OF ALL APPROPRIATE INDUSTRY CERTIFICATIONS AND A RELEVANT WORK HISTORY PERTAINING TO THIS PROJECT.



GRAVEL GRADATION ENVELOPE

CONTROL TABLE				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	6028234	1687772.9	14.56	SET 2" BRASS CAP ON 5/8" REBAR
CP2	6025296.55	1674796.61	17.73	SET 2" BRASS CAP ON 5/8" REBAR

NOTES:
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Hilcorp

MOOSE PAD ACCESS TYPICALS

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER
10/04/2016

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24" x 36"

REVISIONS

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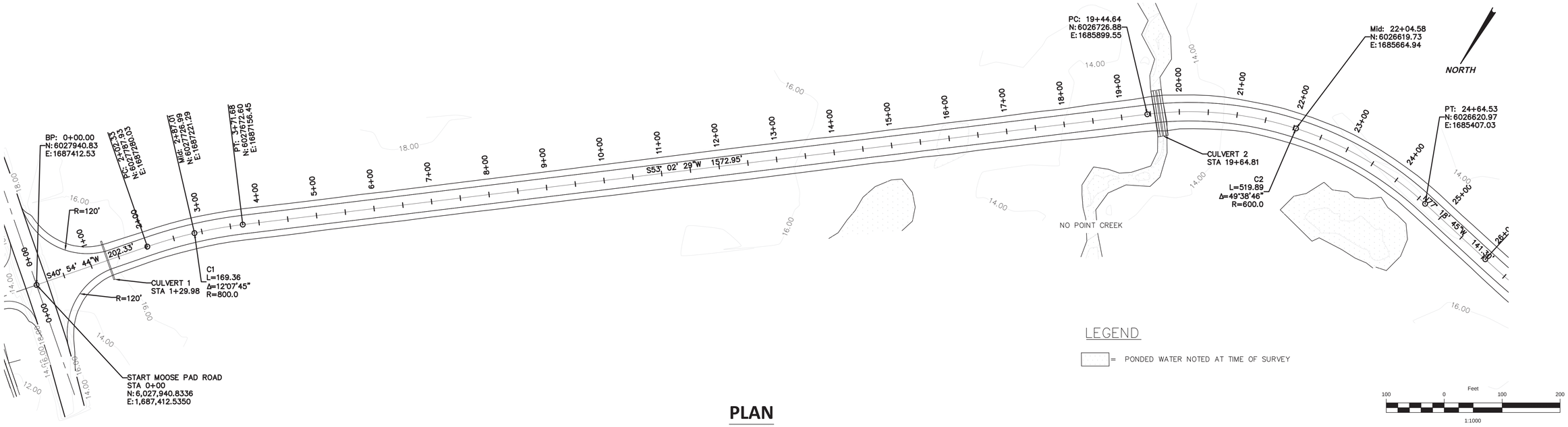
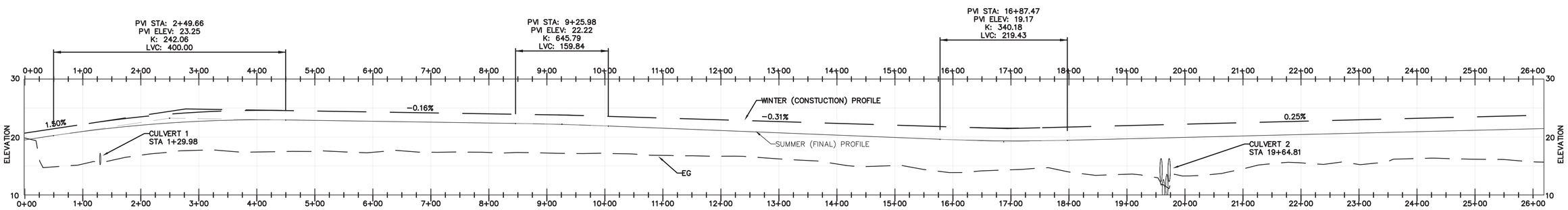
SHEET NO.
5 OF 13



PLAN

SCALE 1 : 1000



NOTE:
PROFILE GEOMETRY SHOWN IS FOR SUMMER PROFILE

PROFILE

SCALE 1:1000

Hilcorp

MOOSE PAD ACCESS ROAD
STA 0+00 TO 26+00

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER

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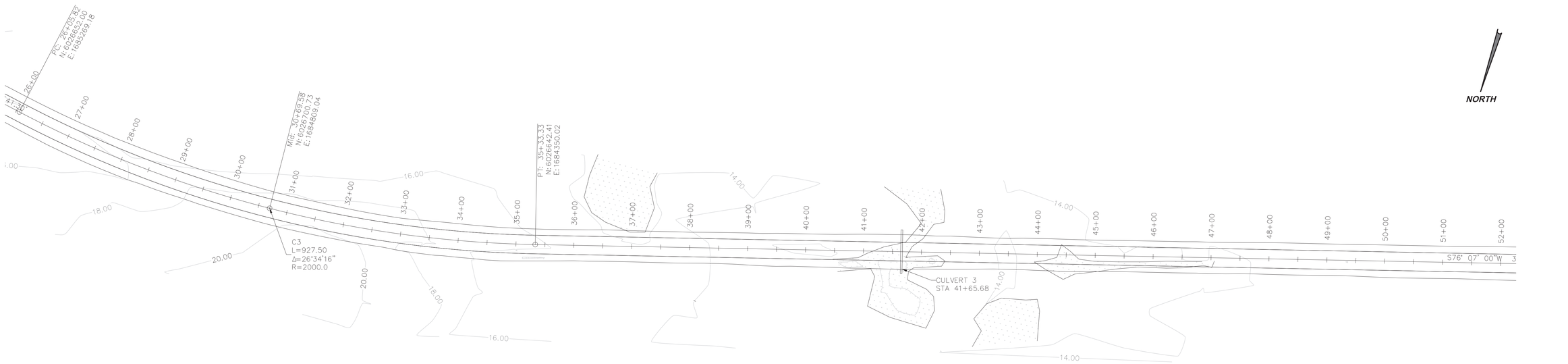
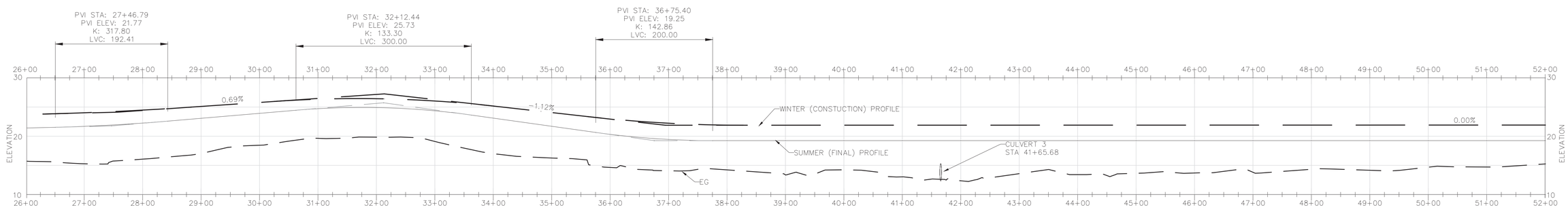
SHEET NO.

6 OF 13



PLAN

SCALE 1 : 1000



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PROFILE

SCALE 1:1000

Hilcorp

MOOSE PAD ACCESS ROAD
STA 26+00 TO 52+00

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER

10/04/2016

RECON LLC

Rowland Engineering Consultants

24" x 36"

REVISIONS

NO.	BY	DATE	DESCRIPTION

ADDRESS: RECON LLC, 481 W. RECON CIRCLE PALMER, AK 99674

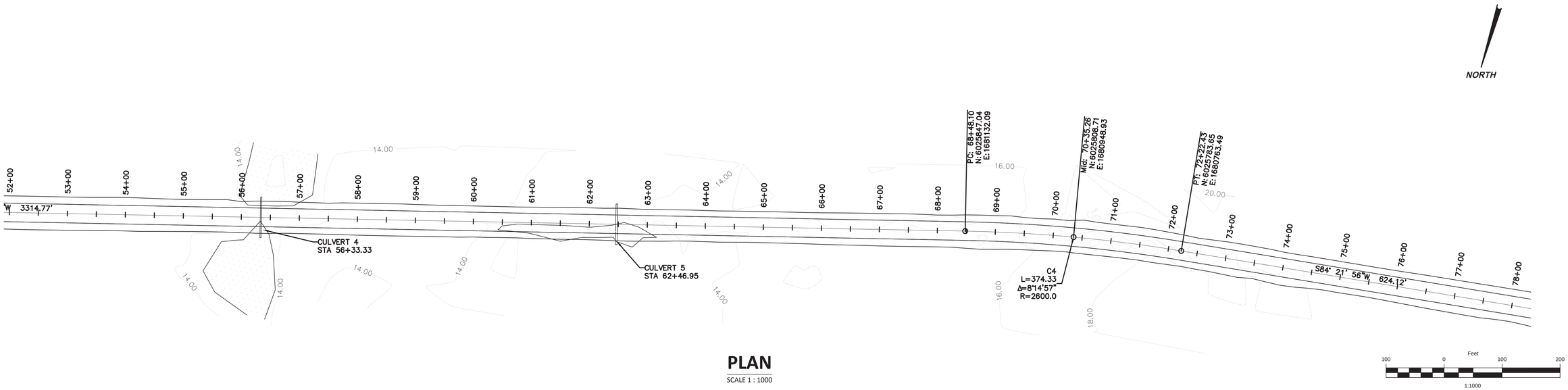
ENGINEER: STEVE ROWLAND, PE

CONTACT: (907)355-3006, steve@reconllc.net

DRAWN BY: MARIA C. SANDERS

SHEET NO.

7 OF 13



PLAN

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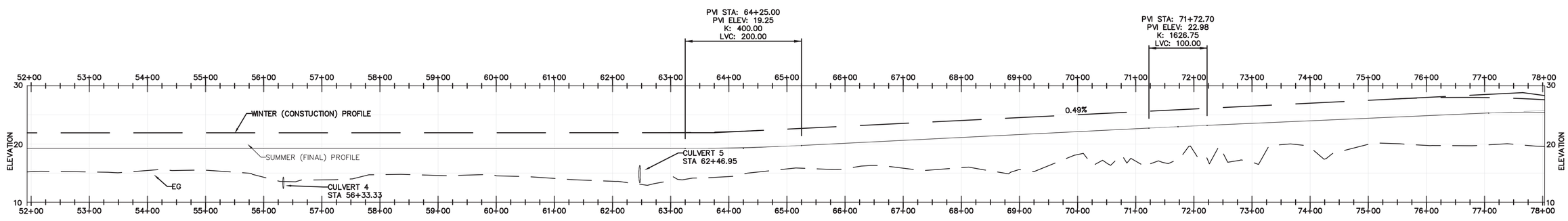

NOTE:
PROFILE GEOMETRY SHOWN IS FOR SUMMER PROFILE

PROFILE

SCALE 1:1000

Hilcorp

MOOSE PAD ACCESS ROAD
STA 52+00 TO 78+00

STATE OF ALASKA
49TH
Steven R. Rowland
CE-7241
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10/04/2016

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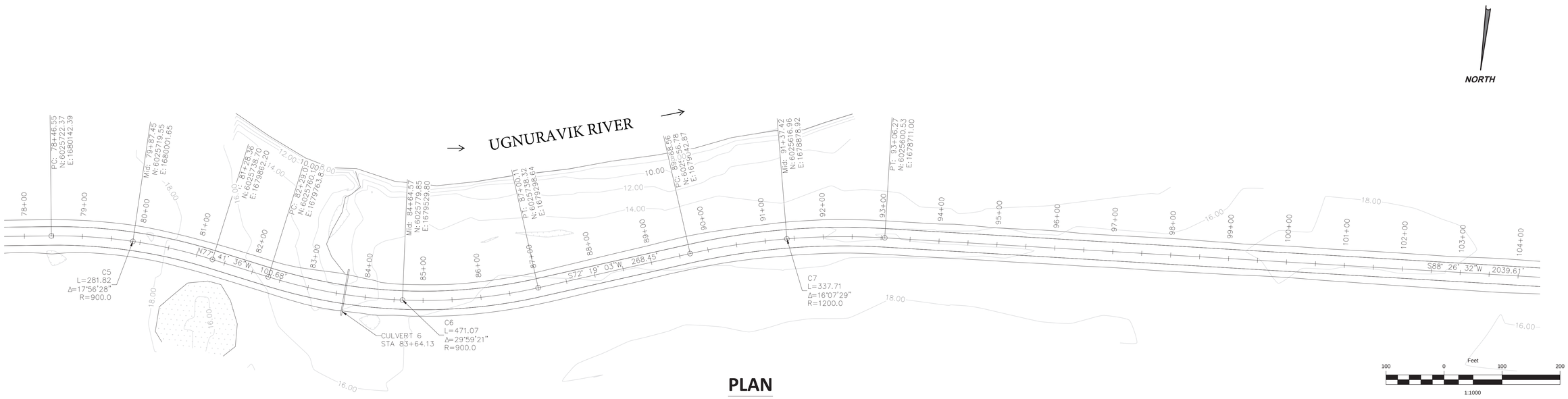
DRAWN BY: MARIA C. SANDERS

SHEET NO.
8 OF 13



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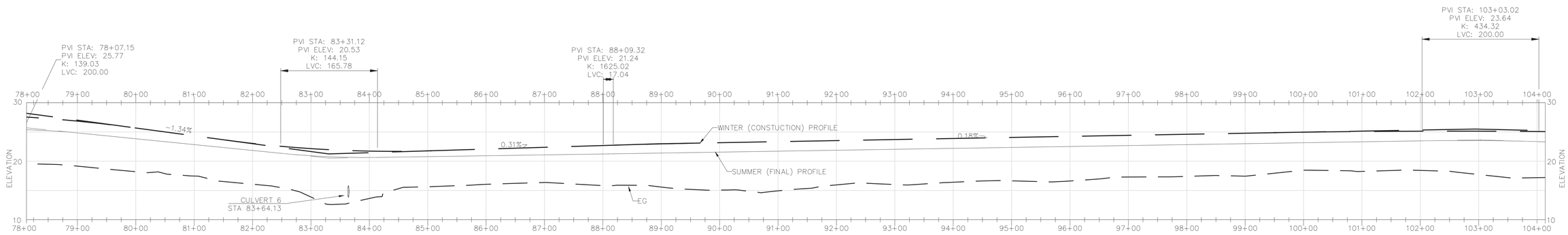

NOTE:
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PROFILE

SCALE 1:1000

Hilcorp

MOOSE PAD ACCESS ROAD
STA 78+00 TO 104+00

STATE OF ALASKA 49TH
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SHEET NO.

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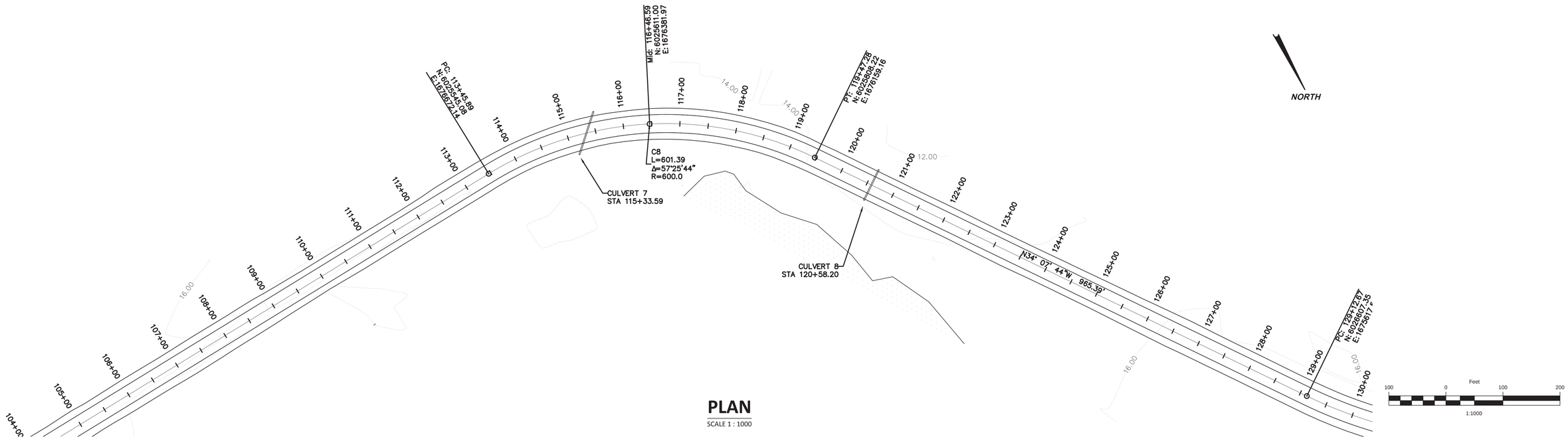

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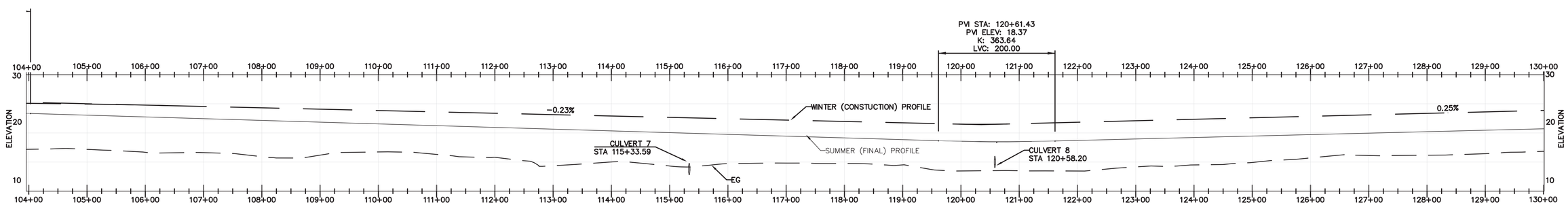

NOTE:
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PROFILE

SCALE 1:1000

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MOOSE PAD ACCESS ROAD
STA 104+00 TO 130+00

STATE OF ALASKA 49TH Steven R. Rowland CE-7241 REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY: MARIA C. SANDERS

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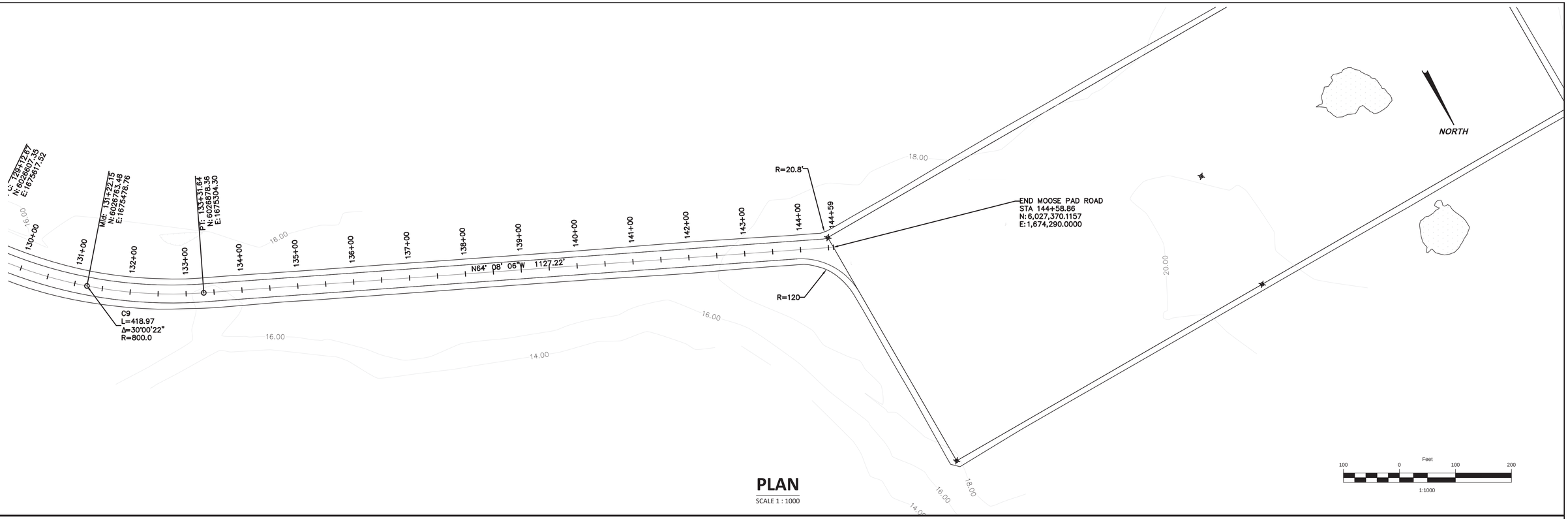
10 OF 13



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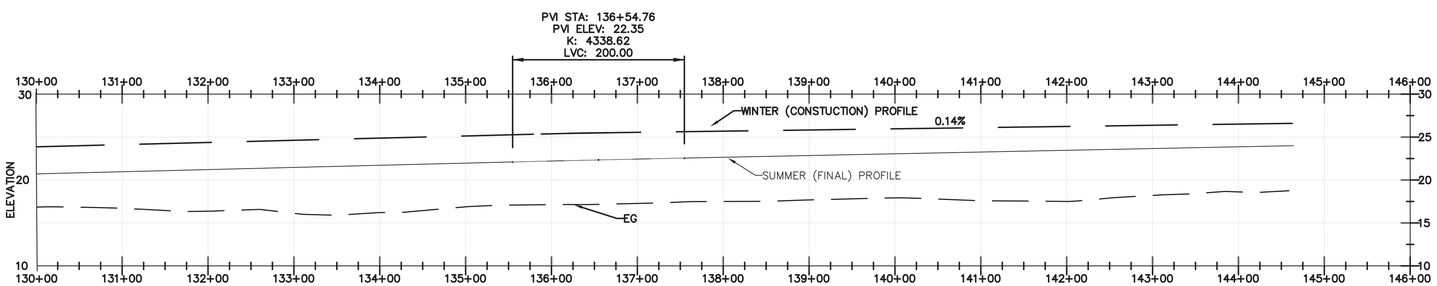

NOTE:
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PROFILE

SCALE 1:1000

Hilcorp

MOOSE PAD ACCESS ROAD
STA 104+00 TO EOP

STATE OF ALASKA
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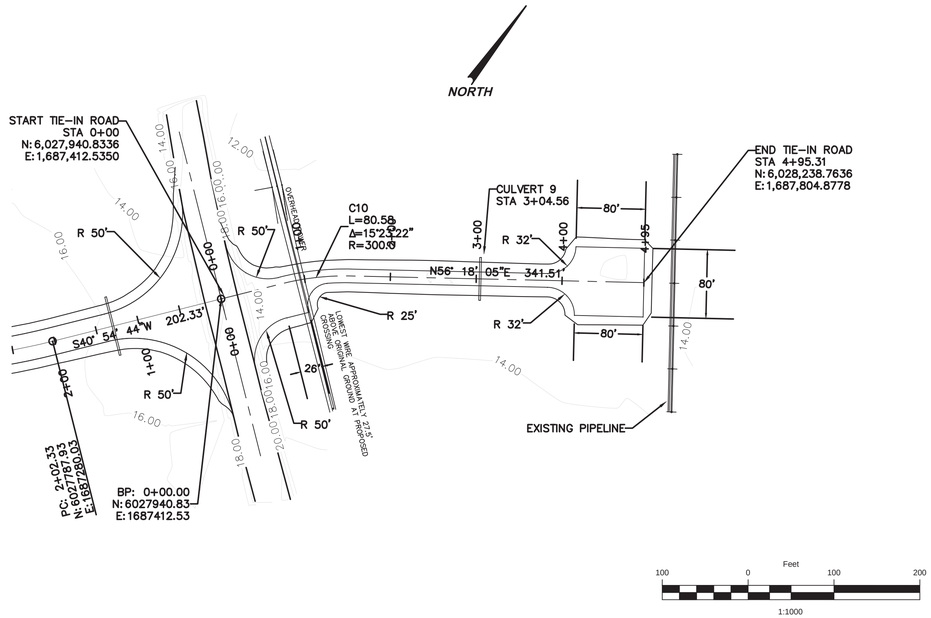
SHEET NO.
11 OF 13



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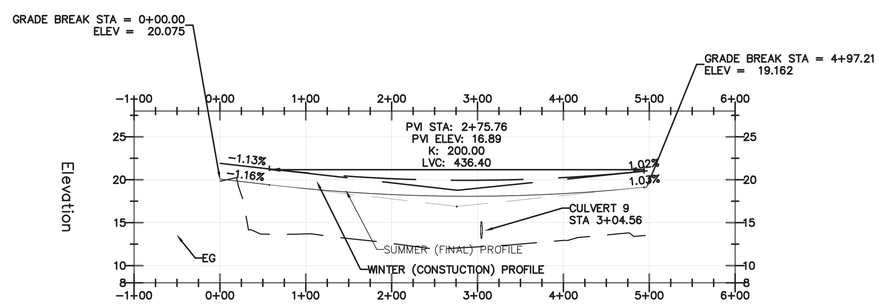

PROFILE

SCALE 1:1000

NOTE:
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Hilcorp

MOOSE PAD TIE-IN ROAD
STA 0+00 TO EOP

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SHEET NO.

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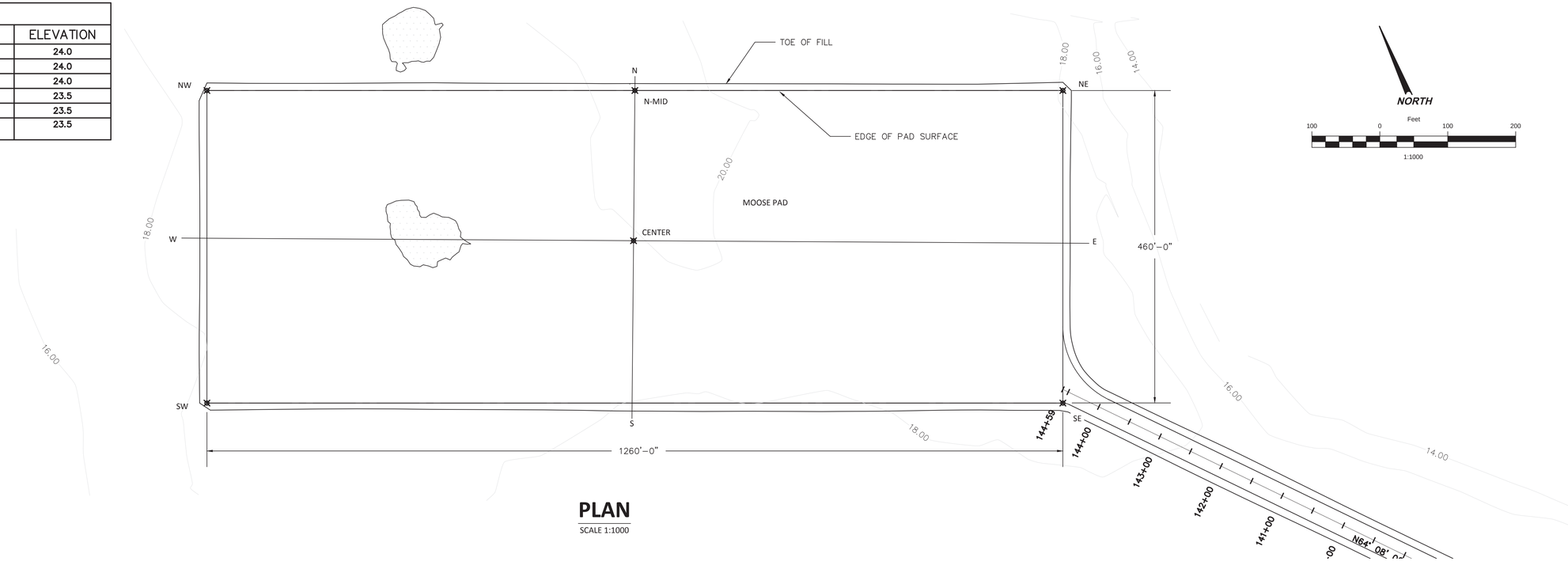
PAD COORDINATES			
	NORTHING	EASTING	ELEVATION
NE	6027810	1674290	24.0
NW	6027810	1673030	24.0
SE	6027350	1674290	24.0
SW	6027350	1673030	23.5
CENTER	6027580	1673660	23.5
MID–POINT OF NORTHERN EDGE	6027810	1673661	23.5

LEGEND

⊠ = PAD COORDINATES



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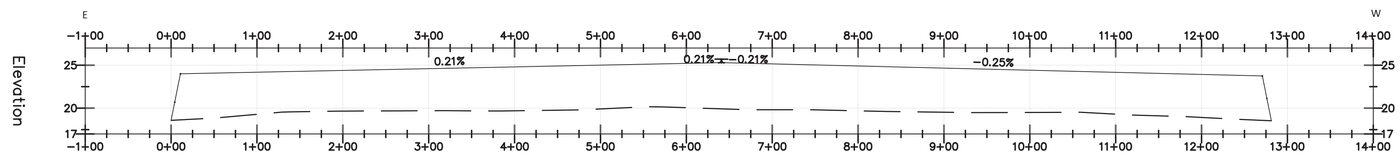

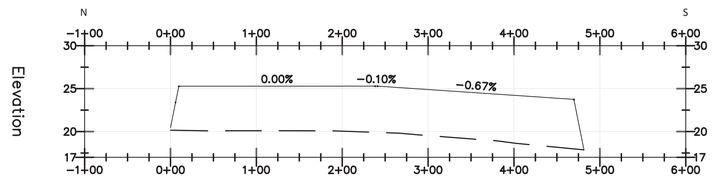

PROFILE

SCALE H 1:1000
V 1:250

Hilcorp

MOOSE PAD

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13 OF 13