Dore Crude Oil Loop Pipeline, McKenzie County

Pipeline Route Application

December 2014

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SERVICE & RELIABILITY SINCE 1998

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INTRODUCTION

Hiland Crude, LLC (Hiland), submits this Route Permit Application to the North Dakota Public Service Commission (Commission) for an approximately 13-mile-long, 12-inch crude oil pipeline in McKenzie County. The pipeline is known as the Dore Crude Oil Loop Pipeline (Project).

In accordance with Chapter 49-22 of the North Dakota Century Code, Section 69-06-08-02 of the North Dakota Administrative Code, and the Commission's Energy Conversion and Transmission Facility Siting Guidelines, Hiland provides the following information to support its request for a Route Permit for the Project.

SECTION A DESCRIPTION OF PROPOSED FACILITY

A.1 TYPE OF FACILITY

The Project consists of constructing and operating an underground approximately 13-mile-long, 12-inch crude oil pipeline in McKenzie County. The Project will parallel and interconnect with Hiland facilities on the Musket Lateral and/or the Dore Segment of the Market Center System from the Dore Junction to the Dore Terminal near Dore, North Dakota. The new section of pipeline will be operationally integrated into the existing operations of Hiland.

The pipeline will be installed within the existing 8-inch pipeline ROW utilized for the Market Center Pipeline and/or new ROW in McKenzie County in northwestern North Dakota. The pipeline will be buried underground. No new pumping facilities will be needed at this time within North Dakota. Also, no new surface facilities will be installed in the State of North Dakota, other than pipeline markers, rectifiers, and block valves. Some small fenced-in enclosures to house associated power and control systems may be installed to allow some valves to be operated remotely. Figure 3.A.1 shows the general location of the Project.

The total cost of the Project is estimated to be $10.5 million.

A.2 PRODUCT

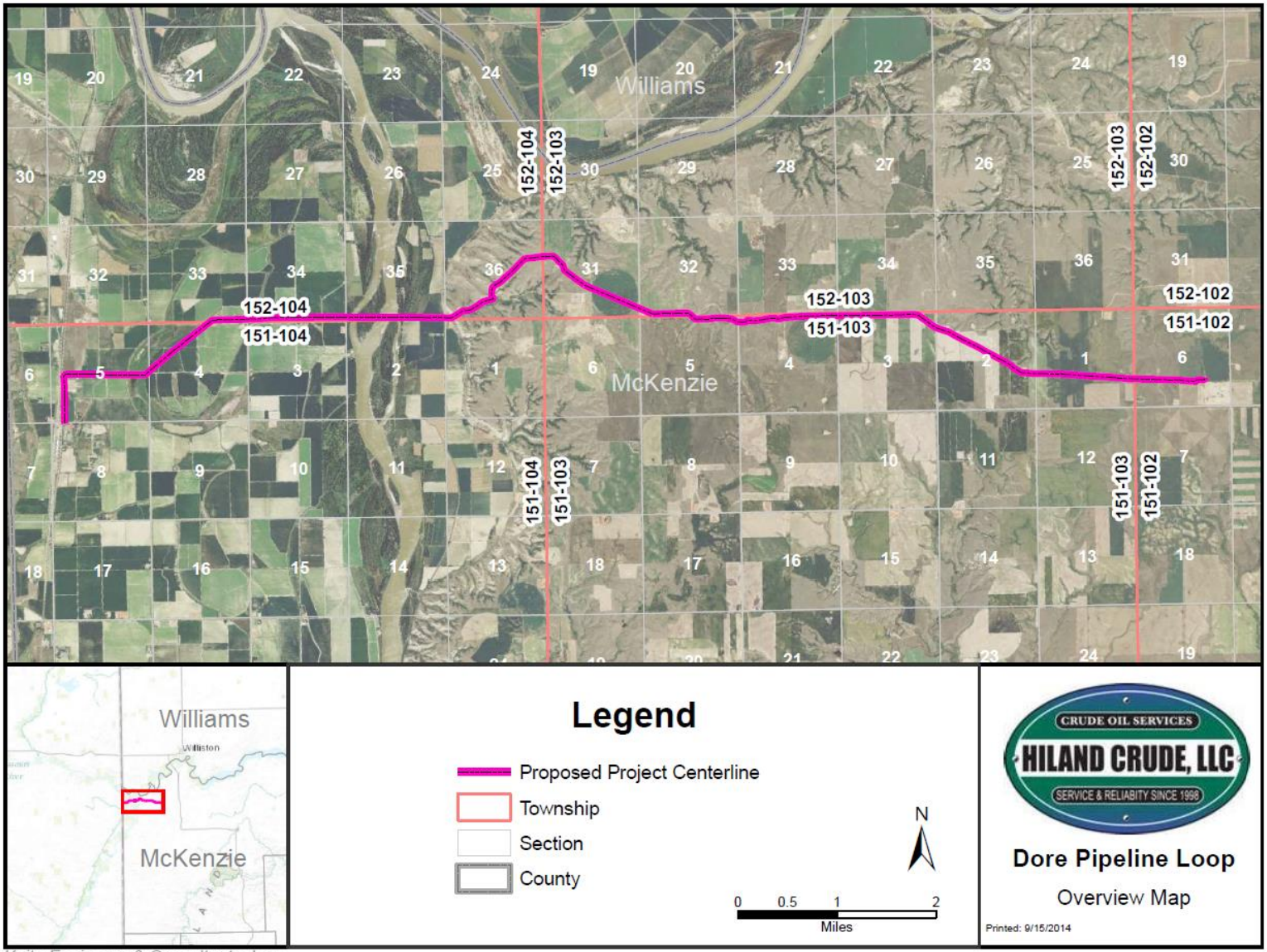
The Project provides pipeline transportation for produced crude oil.

Although Hiland does not explicitly specify the type of crude it will transport, historically Hiland has operated a light sweet common stream system and Hiland will continue to accept sweet crude oil into its common stream. This specification is consistent with the quality of crude oil produced from the Bakken formation, which is currently the largest exploration play in the region.

A.3 SIZE AND DESIGN

The Project involves the installation of 12-inch outside diameter steel pipe with a wall thickness of 0.219 inches. For crossings, 0.500 inch wall thickness fusion-bonded epoxy (FBE) coated pipe will be used. The maximum operating pressure (MOP) will be 1440 pounds of pressure per square inch gauge (psig). The maximum temperature of the crude will be 120°F, which is within design parameters. However, the Project will typically operate between 60°F to 120°F.

FIGURE 3.A.1 – General Project Location Map



Keltu Engineers & Consultants, Inc.

The valves to be installed will be 12-inch ANSI 600, flange end by flange end, full port, rising stem gate valves and similar ball valves. These valves will be manufactured in accordance with American Petroleum Institute (API) Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." The MOP of the valves will be 1440 psig.

The pipeline to be utilized for the Project will meet United States Department of Transportation (US DOT) regulations, specifically the design criteria outlined in 49 CFR Subpart 195(C). The Project will be constructed per 49 CFR Subpart 195(D), and will be operated and maintained per 49 CFR Subpart 195(F).

A.4 TIME SCHEDULE

Hiland proposes to develop the Project on the following time schedule:

A.4 (a) Certificate of Corridor Compatibility

The Certificate of Corridor Compatibility Application is being submitted in December 2014 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (b) Route Application

The Route Permit Application is being submitted in December 2014 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (c) Right-of-Way Acquisition Date

Hiland plans to have ROW acquisition completed by December 25, 2014.

A.4 (d) Issuance of Certificate of Corridor Compatibility and Route Permit

A Certificate of Corridor Compatibility and a Route Permit for the Project are expected to be issued on or before January 31, 2015.

A.4 (e) Construction Start Date

The proposed commencement date for construction is February 1, 2015.

A.4 (f) Construction Complete

Estimated construction completion date is on or before May 1, 2015.

A.4 (g) In-Service Date

All facilities are expected to be in-service on or before May 10, 2015.

SECTION B LOCATION

B.1 HILAND'S POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT.

Hiland works to protect the environment, home to its employees and customers. Protection of the environment is an integral element of Hiland's enterprises. Environmental protection efforts will span every phase of the Project, from planning through construction, restoration, and into full operation.

B.1 (a) Construction

The Project involves looping (i.e. laying a parallel section of pipeline) an existing 8-inch pipeline in existing or newly acquired ROW adjacent to the Musket Lateral and/or the Dore Segment of the Market Center pipeline in McKenzie County, North Dakota. Construction of the Project will result in temporary short-term impacts, but is not expected to result in significant long-term change to the environment.

The permanent ROW is 50 feet wide. During construction, an additional 25 feet of temporary workspace will be utilized for material staging and temporary access roads. Hiland will use existing public roads to access the 75-foot-wide construction ROW, and does not plan to modify roads or create new permanent access roads. Hiland has acquired 50-foot-wide permanent easements for the Project, as well as potential future pipeline(s).

Planning, design, construction, and restoration will incorporate the equipment and measures discussed in section B.6. Environmental monitoring, in the form of ongoing environmental inspection, will be conducted during and following construction. Environmental inspectors will monitor compliance with required environmental protection measures, permit conditions, and specifications, and provide ongoing oversight for day-to-day issues that may arise during construction. The environmental inspectors will be trained and well-versed in the implementation of environmental best management practices during construction. Contract specifications will incorporate environmental protection and mitigation measures, and contractors will be expected to implement these measures in the field. Contractor training and Project orientation will also be provided by Hiland.

The Project is located primarily on private land. Landowner concerns will be addressed during all phases of construction, including final restoration. Land agents assigned to the Project will work closely with landowners to the extent practicable, and will be responsive to issues that may arise during the course of the Project. Permission from all private land owners has already been obtained, with one exception.

Environmental data collected to date includes information on soils, land use, wetland and water body crossings, protected species, and cultural resources. Hiland will continue to work with appropriate regulatory agencies and will continue to gather comprehensive information during the permitting process.

B.1 (b) Ongoing Pipeline Operation

Hiland has a continuing commitment to conduct its operations in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, all of which reduce the impact of the Project

on the environment. Hiland supplements the support of its existing internal environmental staff with engineering and environmental consultants as necessary to ensure compliance with regulations and applicable company policy. Additional information regarding operations and safety is provided in Section B.9 (c).

B.1 (c) Energy Conservation Considerations

Installation of the Project will expand Hiland's service area while improving crude oil delivery destination options for system shippers.

The key energy economic impact will be the substitution of the most energy efficient mode of crude oil transportation, e.g., pipeline, for the least efficient mode of transportation, e.g., on-road transport via cargo tanker truck. This additional pipeline will increase the capacity of the system by 27,000 barrels per day and potentially in the future up to 100,000 barrels per day. This product will subsequently be delivered to major markets via Musket Rail using a loading station near Dore, North Dakota with a potential connection to Hiland's proposed Double H pipeline at this location.

Beyond the direct energy benefit of using an efficient mode of transportation (i.e., a pipeline), energy conservation is a major concern at Hiland. Energy/power costs represent the largest single recurring expense in pipeline operation. Attention is continually being directed toward energy conservation. Hiland's energy conservation goal is to minimize power/energy unit costs through the implementation of internal programs directed at continuous improvement of energy utilization efficiency.

Hiland control operators are trained in applied hydraulics and pipeline control. They are trained to operate the pipeline at a natural flow rate using efficient combinations of pump stations, thereby minimizing energy consumption. Operators have the capability to start and stop pumps and monitor pipeline operating conditions to assist in achieving an energy efficient operation.

B.2 DISCUSS THE FACTORS LISTED IN SECTION 49-22-09 OF THE NORTH DAKOTA CENTURY CODE TO AID THE COMMISSION IN ITS EVALUATION OF THE PROPOSED PROJECT ROUTE.

B.2 (a) Available Research and Investigations Relating to the Effects of the Location, Construction, and Operation of the Proposed Facility on Public Health and Welfare, Natural Resources, and the Environment

A discussion of the effects of the location, construction, and operation of the Project on public health and welfare, natural resources, and the environment is included in Section B.4 below.

Record and database research relating to these effects included (1) conducting a Class I Cultural Resource Inventory, (2) reviewing the Water Well Inventory maintained by the North Dakota State Water Commission, (3) utilizing the United States Fish and Wildlife Service's (USFWS) Wetlands Mapper, (4) reviewed Keitu Engineers & Consultants, Inc. (Keitu) previous study data from 2010, 2011, 2013, and (5) utilizing the North Dakota Game and Fish Department's (NDGFD) Wildlife Action Plan. In addition, site-specific information, such as the presence of occupied buildings, protected species and/or environmentally sensitive areas, was obtained during field studies conducted in September 2014. A Class III Cultural Resource

Inventory was conducted in the summer of 2013 for the parallel Musket Lateral, or Dore, Segment of the Market Center Pipeline.

B.2 (b) The Effects of New Energy Conversion and Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects

The Project does not include new energy conversion or transmission technologies. The Project design is consistent with existing pipeline technologies.

B.2 (c) The Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The Project does not involve new energy conversion facilities. No usable waste energy will result from the Project.

B.2 (d) Adverse Direct and Indirect Environmental Effects which Cannot be Avoided Should the Proposed Site or Route be Designated

Unavoidable adverse direct and indirect environmental effects may include temporary construction-related effects on vegetation, wildlife, agricultural operations, transportation, and noise levels, as described in Section B.4 below. However, since construction is scheduled to begin and be completed on an accelerated timeline, impacts to agricultural operations will be minimal and impacts to transportation will be short-term. Hiland will implement thorough mitigation measures to minimize these impacts as described in its Environmental Mitigation Plan (EMP) presented as Tab 5 and Tab 6 in this consolidated application.

B.2 (e) Alternatives to the Proposed Site, Corridor, or Route which are Developed During the Hearing Process to Minimize Adverse Effects

The pipeline corridor provides an established, direct route between Dore Junction and Dore Terminal near Dore, North Dakota with a potential connection to Hiland's proposed Double H pipeline at this location. This corridor was selected to avoid or minimize environmental and socioeconomic impacts and largely parallels the existing pipeline route. Use of this corridor takes advantage of Hiland's existing ROW, and in large part avoids the establishment of new permanent ROW and new severance on properties. No other corridor will offer these advantages over the pipeline route.

In addition, the Project route was selected based on voluntary landowner participation and landowner input regarding the specific location of the Project. The route is described in Section B.3 and depicted in diagrams presented in Tab 4.

B.2 (f) Irreversible and Irretrievable Commitments of Natural Resources Should the Proposed Site, Corridor, or Route be Designated

The Project requires minimal irreversible or irretrievable commitments of natural resources. Several oil field gathering systems and natural gas pipelines reside in the vicinity of the Project. Steel will be utilized for the pipeline, and petroleum fuel will be required for construction equipment.

B.2 (g) The Direct and Indirect Economic Impacts of the Proposed Facility

The Project presents an optimization of new and existing pipeline capacity to meet the need for additional liquid petroleum transportation to the region. Hiland's proposal represents an optimal use of new and existing pipelines on an existing route. Hiland's shippers support the proposal to be an appropriate economical response to the need for additional mid-stream pipeline transport capacity.

The application of horizontal drilling technology and steady and historically high crude oil prices have resulted in a resurgence of oil drilling activity in North Dakota. Unprecedented success has occurred in the Bakken oil formation, resulting in more than doubling of oil production in North Dakota in the last three years. A summary of annual crude oil production in the state is presented in Table 3.B.1, below.

Table 3.B.1 – Historical Oil Production North Dakota[1]

Year	Total Crude Oil Production, Barrels	% Gain over 2008
2009	79.7 million	26.9 %
2010	113.1 million	80.1 %
2011	153.0 million	143.6 %
2012	243.8 million	288.2 %
2013	313.9 million	399.8 %

The purpose of the Project is to provide "midstream" transportation alternatives for the expanding volumes of crude oil produced in North Dakota. This will help bring North Dakota sweet crude to more markets in the United States, therefore allowing for a more competitive price.

The Project will transport crude oil to major crude markets via Musket Rail using a loading station near Dore, North Dakota with a potential connection to Hiland's proposed Double H pipeline at this location.

The Project's proximity to other crude gathering systems in northwestern North Dakota will provide a pipeline alternative to trucking.

In addition to increasing the crude oil transmission capacity within North Dakota, the Project provides other benefits. For example, the Project has the potential to increase the tax base of McKenzie County. Construction workers will be hired from pipeline contractors, equipment contractors, suppliers, and regional testing firms. Forty to fifty percent of the labor force is expected to be hired from the regional labor pool. In addition, environmental consultants and safety, environmental, and construction inspectors will also be employed during the Project construction and restoration. North Dakota-based consulting firms will be selected to assist with the site selection and permitting process. Wages paid to non-local contractors and/or personnel

[1] U.S. Department of Energy, EIA webpage statistics, crude oil production by state, Retrieved October 10, 2014.

benefit the regional economy through expenditures for supplies, lodging, fuel and other services.

Materials for the expansion are all expected to be from U.S. and North American suppliers. Much of the materials and equipment needed for construction, including welding supplies, heavy equipment, electrical components, and building materials will be supplied from this region.

B.2 (h) Existing Plans of the State, Local Government, and Private Entities for Other Developments at or in the Vicinity of the Proposed Site, Corridor, or Route

Over the past several years, the North Dakota Pipeline Authority has been working with producers and regional pipeline companies to address issues surrounding the safe transportation of crude oil produced in the state. A report titled, "The Williston Basin: Greasing the Gears for Growth in North Dakota" prepared by Bentek Energy, LLC under funding from the North Dakota Pipeline Authority, provides an update regarding the State's current and forecasted production and projected infrastructure needs. The 129-page report released July 25, 2012 points out that oil production from the Williston Basin, which includes the Dakotas and Montana, soared more than 400% in the 5 years prior to 2012. North Dakota producers have continued to set volume records in 2013. Oil production from this basin is expected to continue to grow until 2025. Bentek Energy, LLC also speculated that planned refinery and pipeline projects will not be sufficient to keep up with the increased production. Producers will continue to use more expensive transportation options until additional pipeline capacity is available.[2] A report excerpt on crude oil alternatives is presented as Appendix 2.A in Tab 2.

A letter was sent to the McKenzie County Planning Director to gain information on planned developments within the vicinity of the Project. No response has been received to date. No developments conflicting with the Project have been discovered as of the date of this application.

Due to recent and continued crude oil volume expansion in the state, the Project and any proposed projects can be supported under current and foreseen economic conditions. Resolution to the current market imbalance at the Midcontinent crude hub at Cushing is expected to occur with the completion of TransCanada's Gulf Coast pipeline (i.e. south segment of Keystone XL). Crude oil prices in North Dakota are expected to rebound once the transportation bottleneck is eliminated.[3]

Hiland is not aware of any other existing plans by state, local government, or private entities with respect to any other planned development in the vicinity of the Project's corridor based on a review of publicly available documents. However, based on recent history, it is likely that expansion of crude oil and natural gas pipeline systems will continue to occur. No potential conflicts with any developments have been identified.

B.2 (i) The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites

Beaver Creek Archaeology, Inc. (Beaver Creek Archaeology) of Bismarck, North Dakota was engaged to review existing site file data maintained by the North Dakota State Historic

[2] Bentek Energy, LLC, "The Williston Basin: Greasing the Gears for Growth in North Dakota," July 25, 2012, pp. 35, 47.

[3] Berkshire Hathaway Inc., "Bakken Crude," *available at* http://seekingalpha.com/article/1042471-bakken-crude-buffetts-railroad-beats-oneoks-pipeline (accessed August 13, 2013).

Preservation Office (SHPO) to determine if any portion of the Project route was surveyed previously for cultural resources. The file search was performed in September 2014 using a 2-mile-wide study corridor for the entire route.

A Class III Cultural Resource Inventory was conducted on the proposed Project area between September and November 2014. A report was issued in November 2014. The majority of the cultural field study corridor will be 250 feet wide, for a total area of 560 acres inventoried for the proposed project. However, only 135 acres will be under review as part of this Application. The Class III Cultural Resources Inventory report prepared by Beaver Creek Archaeology is included in this application under Tab 4, Appendix 4.A.

During the cultural resource inventory, two sites were located inside an area of potential effect. The two sites are located within the area of potential effect for the Project and will be avoided by the narrowing of the construction ROW or by boring as recommended by Beaver Creek Archaeology. Site 32MZ1174 is the Lower Yellowstone Irrigation Project and will be avoided by boring. Site 32MZ2206 consists of one stone circle which maintains integrity and remains potentially eligible. A buffer of 50 feet is recommended between the site boundaries and proposed construction activities. Fencing along site buffer lines in conjunction with site monitoring during construction would minimize any adverse effect to the sites. The site will be either avoided by the narrowing of the construction corridor or by boring if necessary.

Beaver Creek Archaeology recommends that unevaluated sites within 100 feet of the construction ROW have temporary site buffer fencing and monitoring during future construction around these sites. No avoidance is necessary for ineligible sites.

Provided that the sites discussed above are avoided by following the recommendations of site buffer fencing and monitoring, Beaver Creek Archaeology recommends that the project proceed under a “No Adverse Effects”.

The cultural resource location details are not publicly available per request of the North Dakota State Historic Society, but Beaver Creek Archaeology has provided a redacted version of the report to be available for this application. General locations of cultural resource sites are included in Tab 4 Appendix 4.B.

The SHPO has been provided with a complete version of the Class III Cultural Resource Inventory report issued by Beaver Creek Archaeology. A concurrence letter from the SHPO has yet to be received with respect to the Project but will be filed with the Commission as soon as obtained.

B.2 (j) The Effect of the Proposed Route on Areas which Are Unique Because of Biological Wealth or Because They are Habitats for Rare and Endangered Species

The NDGFD, the USFWS, Lake Ilo National Wildlife Refuge, the North Dakota Parks and Recreation Department (NDPRD), and the US Army Corps of Engineers (USACE) were all contacted to assist in identifying species and ecologically significant habitats within the Project corridor and along the Project route. Possible areas of concern discussed with these agencies included federally-listed endangered, threatened, candidate, sensitive, or watch species, state-listed protected species, and critical habitats.

The USACE was sent an overview of the project and no comments have been received. USACE regulatory offices administer Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404). The Yellowstone River crossing is being proposed, but fill materials are not intended to be placed in jurisdictional waters. Hiland submitted a Nationwide 12 Permit on October 20, 2014 to the USACE for the Project. All river crossings will be horizontally directionally drilled (HDD).

The NDGFD was sent an overview of the Project and does not believe the Project will have any significant adverse effects on wildlife or wildlife habitat provided NDGF recommendations are followed.

The USFWS was sent an overview of the project and no comments have been received.

The Lake Ilo National Wildlife Refuge was sent an overview of the project and no comments have been received.

The NDPRD was sent an overview of the Project and recommends that the Project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats are not disturbed.

The North Dakota Natural Heritage Inventory System maintained by the NDPRD was reviewed for Species of Concern that will be identified by prior field studies within the one-mile-wide environmental study corridor. A map was provided to the NDPRD for the analysis of each location of concern. Keitu also supplemented field survey data with findings from previous surveys completed in 2010, 2011, and 2013 that extended into the survey corridor for the Project. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The following state-listed sensitive and US Forest Service (USFS) sensitive plant species were identified during the biological field survey conducted in the 500-foot wide study corridor in May 2011 and September of 2014: easter daisy (*Townsendia exscapa*), and Hooker's townsendia (*Townsendia hookeri*). No sensitive, threatened or endangered plant species were identified within the construction ROW. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The following animal state-listed Species of Conservation Priority, USFS Sensitive, and Bureau of Land Management (BLM) Sensitive Species were identified during the biological field survey conducted in the one-mile-wide environmental study corridor in May 2011, March and June 2013, and September of 2014: American white pelican (*Pelecanus erythrorhynchos*), bald eagle (*Haliaeetus* leucocephalus), bobolink (*Dolichonyx oryzivorus*), golden eagle (*Aquila chrysaetos*), lark bunting (*Calamospiza melanocorys*), marbled godwit (*Limosa fedoa*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), sharp-tailed grouse (*Tympanuchus phasianellus),* and short-horned lizard (*Phrynosoma hernandesi*).

The following animal state-listed Species of Conservation Priority were identified within the construction ROW: American white pelican (*Pelecanus erythrorhynchos*). Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The limited populations of sensitive plant species occurred well outside of the construction ROW. Although limited populations of sensitive animal species (but not unique habitat) were identified within the construction ROW, Hiland's environmental consultants have concluded that the Project will have no significant effect on unique areas of biological wealth or habitats for rare and endangered species.

B.2 (k) Problems Raised by Federal Agencies, Other State Agencies, and Local Entities

No problems or concerns have been raised by federal agencies, state agencies, or local entities.

B.3 IDENTIFY AND MAP CRITERIA LEADING TO PROPOSED PROJECT ROUTE LOCATION WITHIN CORRIDOR

The following criteria, which include but are not limited to the criteria required by Section 69-06-08-02 of the North Dakota Administrative Code, will be considered in evaluating the location of the Project route: Exclusion and Avoidance Areas, Selection and Policy Criteria, Design and Construction Limitations, Economic Considerations, Human Environment, Soils, Vegetation/Wildlife, Land Use, Water Resources, and Cultural Resources. Each criterion is discussed in detail, including descriptions, potential impacts, and mitigation measures where appropriate, in sections B.4, B.5, and B.6.

The Project route has been superimposed on both aerial photographic maps as well as USGS Quadrangle Topographic Maps that are presented in Tab 4 as Appendix 4.B, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

B.4 RELATIVE VALUE AND EFFECTS UPON EACH CRITERION INCLUDING LOCATION, CONSTRUCTION, AND OPERATION OF THE FACILITY

In accordance with Section 69-06-08-02 of the North Dakota Administrative Code, the proposed Project route was developed after consideration of its impact on humans and the environment. Alternative routes or options, which are discussed in Section C.2 of the Application for Certificate of Corridor Compatibility, are not optimum and may result in more significant impacts.

Underground pipeline installation minimizes potential impacts on human and animal welfare and aesthetics. Construction of the Project will result in temporary disruption to the environment, but will not result in long-term negative impacts to the environment. The following is a general analysis of the existing human and natural environment along the Project route and the impacts or potential impacts of ROW preparation, construction practices, and operation and maintenance procedures.

B.4 (a) Exclusion and Avoidance Areas (North Dakota Administrative Code Sections 69-06-08-02(1) and 69-06-08-02(2))

The Commission has identified certain sensitive or otherwise important environmental features that must be considered during the selection of a corridor and a route for transmission facilities. These features have been classified as either "Exclusion Areas" or "Avoidance Areas." As set forth in Section 69-06-08-02(1) of the North Dakota Administrative Code, Exclusion Areas are areas that are to be excluded from consideration for transmission facility routes, and may encompass only up to fifty percent of the width of transmission facility corridors unless there is

no reasonable alternative. As set forth in Section 69-06-08-02(2) of the North Dakota Administrative Code, Avoidance Areas are areas that are not to be considered in the routing of a transmission facility unless it is shown that, under the circumstances, there are no reasonable alternatives, and may encompass only up to fifty percent of the width of transmission facility corridors unless there is no reasonable alternative.

Appendix 4.B (see Tab 4) contains maps depicting Exclusion and Avoidance Areas within the one-mile-wide study corridor centered on the Project route. The Project route has been superimposed on both aerial photographic maps as well as USGS Quadrangle Topographic Maps.

B.4 (a)(1) Exclusion Areas

Two types of Exclusion Areas are located within the study corridor (see Table 3.B.2 below). However, no Exclusion Areas are crossed by the route, nor do any Exclusion Areas constitute more than 50% of the one-mile environmental study corridor width.

TABLE 3.B.2 – Exclusion Areas

Exclusion Area	Within Study Area	Crossed By Route	Description of Exclusion Area and Proposed Buffer
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.	None	None	
Designated or registered state: parks; historic sites; monuments; historical markers; archeological sites; and nature preserves.	None	None	
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.	None	None	
Areas critical to the life stages of threatened or endangered animal or plant species.	Yes	None	As noted in Section B.4.i, one raptor nest was identified within the 1-mile buffer zone recommended by the USFWS, however construction will only occur in those occupied areas outside of nesting season, and other recommendations offered by the USFWS will be followed.

Exclusion Area	Within Study Area	Crossed By Route	Description of Exclusion Area and Proposed Buffer
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	Yes	None	As noted in Section B.2.j, 12 sensitive species are within the study corridor, but well outside any area of disturbance by construction activities. Although one sensitive animal species was found within the construction ROW, Hiland's environmental consultants believe the species will not be irreversibly damaged.
Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	None	None	
Areas within thirty feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference.	None	None	

B.4 (a)(2) Avoidance Areas

Two types of Avoidance Areas were identified within the Project study corridor (see Table 3.B.3 below).

Significant archeological sites within the study corridor are summarized in Section B.2 (i) and discussed in detail in the report in Tab 4, Appendix 4.A.

Six rural residences and/or farmhouses were identified within 500 feet of the Project. The residences do not encompass more than fifty percent of the width of the corridor in any location. Hiland worked with owners of the affected residences to obtain waivers, pursuant to Section 49-22-05.1. Hiland previously obtained waivers for the Musket Lateral and/or the Dore Segment of the Market Center Pipeline that the Project will parallel. Waivers will be obtained for the Project.

TABLE 3.B.3 – Avoidance Areas

Avoidance Area	Within Study Area	Crossed By Route	Description of Avoidance Area and Proposed Buffer
Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	None	None	
Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands	None	None	

Avoidance Area	Within Study Area	Crossed By Route	Description of Avoidance Area and Proposed Buffer
Historical resources which are not specifically designated as exclusion or avoidance areas	Yes	None	Significant archeological sites within the study corridor are summarized in Section B.2 (i) and discussed in detail in the report in Tab 4 Appendix 4.A.
Areas that are geologically unstable	None	None	
Within five hundred feet [152.4 meters] of a residence, school, or place of business	Yes	None	Six residences are within 500 feet of the pipeline. Waivers will be obtained for the Project.
Reservoirs and municipal water supplies	None	None	
Water sources for organized rural water districts	None	None	
Irrigated land	N/A	N/A	Not applicable for underground transmission facilities.
Areas of recreational significance which are not designated as exclusion areas	None	None	

B.4 (b) Selection Criteria (North Dakota Administrative Code Section 69-06-08-02(3))

The North Dakota Administrative Code specifies several selection criteria to be considered in designating a transmission corridor or route. Specifically, the Commission considers whether adverse effects from the location, construction, and maintenance of the facility as they relate to the selection criteria will be at an acceptable minimum, and whether these effects will be managed and maintained at an acceptable minimum. Potential impacts, as they relate to each of the selection criteria, are discussed below. Measures Hiland has implemented, and will implement, to minimize these impacts are noted below and discussed in greater detail in Section B.6.

B.4 (b)(1) Agricultural Production

The pipeline will be installed within existing 8-inch pipeline ROW and/or new ROW in McKenzie County in northwestern North Dakota. The pipeline crosses agricultural and pasture lands where crop and livestock production are the primary economic activity. The primary crops cultivated in the area include barley, wheat, alfalfa, and sugar beets.

Project construction will result in temporary effects on agricultural land use. Hiland will institute appropriate management practices to restore all areas to pre-construction conditions, to the extent reasonably practicable.

Species that are considered noxious weeds under North Dakota state law are listed in Table 3.B.4. Noxious and invasive species that were recorded during field study and that are a concern on farm and pasture land are: Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula)*, and field bindweed (*Convolvulus arvensis*).

TABLE 3.B.4 – Noxious Weeds Listed Under North Dakota State Law

Common Name	Scientific Name	State Status	McKenzie County Status	Impact
Baby's Breath	*Gypsophila paniculata*	Invasive	Noxious	Displaces native vegetation. Reduces protein content of desirable grasses.
Halogeton	*Halogeton glomeratus*	Invasive	Noxious	Extremely difficult to control. The extensive root system and twine-like growth disrupts harvesting operations and replaces desirable vegetation.
Burdock: Common	*Arctium minus*	Invasive	Noxious	Displaces important plant communities. Taint milk products if heavily grazed.
Henbane: Black	*Hyoscyamus niger*	Invasive	Noxious	Toxic to humans and animals. Replaces desirable native species.
Houndstongue	*Cynoglossum officinale*	Invasive	Noxious	Displaces desirable plant communities, decreases grazing.
Common tansy	*Tanacetum vulgare*	Invasive		Aggressive plant that can form dense vegetative colonies, thus reducing rangeland productivity.
Knapweed: Diffuse	*Centaurea diffusa*	Noxious		May seriously reduce productive potential of infested rangelands.
Knapweed: Russian	*Acroptilon repens*	Noxious		Most distributed knapweed and most difficult to control. Inhibits growth in crop plants and other desirable plant species.
Knapweed: Spotted	*Centaurea maculosa*	Noxious		Reduces livestock and wildlife forage and increases surface water runoff, soil erosion, and stream sedimentation.
Loosestrife: Purple	*Lythrum salicaria*	Noxious		Quickly displaces native wetland vegetation and has the potential to cause a severe impact on wildlife. Roots of the plant can cause obstruction of water flow in ditches in canals.
Saltcedar	*Tamarix chinensis* *T. parviflora* *T. ramosissima*	Noxious		Displaces native vegetation by releasing salts to inhibit the growth of vegetation.
Spurge: Leafy	*Euphorbia esula*	Noxious		Contains milky latex which causes oral and digestive irritation in cattle. The plant also replaces desirable forage.
Thistle: Canada	*Cirsium arvense*	Noxious		Displaces desirable plant species and is unpalatable to livestock. Infestations decrease land value for crop production and grazing.
Thistle: Musk	*Carduus nutans*	Noxious		Corrupts pastures and reduces grazing in the vicinity.
Toadflax: Dalmatian	*Linaria genistifolia*	Noxious		Unpalatable to livestock and will flourish over native species.
Toadflax: Yellow	*Linaria vulgaris*	Noxious		Displaces existing plant communities and associated wildlife. Corrupts pasture lands and reduces grazing.

Common Name	Scientific Name	State Status	McKenzie County Status	Impact
Wormwood: Absinth	*Artemisia absinthium*	Noxious		Reported to contaminate the milk produced by cattle. Species inhibits growth of desirable forage.
Field Bindweed	*Convolvulus arvensis*	Noxious	Noxious	It has a deep root system that competes with crop plants for water and nutrients. Seeds viable over 60 years. Often confused with wild buckwheat.
Yellow Starthistle	*Centaurea solstitialis*	Noxious	Noxious	It is toxic to horses and causes "chewing disease."

Hiland will require that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the Project area. Hiland will implement, during facility construction, the following mitigation measures when undesirable species are found within the construction ROW:

- Hiland will make an effort to prevent the spread of noxious weed seeds during clearing and grading activities, and use straw mulch and seed mix that are free of noxious weed seed to re-vegetate the ROW. Contractors and construction inspectors will receive information to help them identify noxious weeds. Hiland will also provide training to its construction inspectors regarding identifying and preventing the spread of undesirable species.

- During pre-construction walkovers, Hiland's environmentally trained construction inspectors will flag and document areas containing noxious weeds. The construction crews will be informed of these areas. Hiland will instruct the contractors to minimize the amount of construction equipment and limit the number of passes by this equipment through infested areas. Construction mats will be used to minimize the transport of weed seed or plant material via construction equipment.

- Equipment and construction mats will be cleaned immediately after passing through infested areas. Cleaning will consist of removing large soil clods and/or plant parts from the equipment and construction mats using shovels and brooms and, when necessary, will wash the equipment with water or will clean using compressed air. Soil and water from cleaning activities will not be allowed to flow to non-infested areas.

- Final seeding will be initiated within 24 hours of final grading, so long as there are appropriate weather and soil conditions, to prevent the establishment of noxious weed seeds that may have been present in the existing seed bed.

The pipeline will be installed at a depth that exceeds the typical tillage depth. Following construction, agricultural lands will be returned to pre-construction conditions to the extent reasonably practicable. Therefore, the pipeline will not interfere with normal agricultural operations on cropland after construction. Construction operations will be conducted after the harvest season and prior to the growing season when feasible. Therefore, minimal disruption to agricultural production will occur.

Above-ground facilities on cropland are limited to line markers, cathodic protection rectifiers, and test stations which can be sited within fence lines. Therefore, the pipeline will result in

minimal long-term loss of farmland use. Hiland will consult with landowners to place above-ground appurtenances in areas that cause the least amount of disturbance to landowner operations. Landowners will be compensated by either long-term lease agreements or by the purchase of the land for these sites.

Approximately 0.3 percent (2.5 acres) of the Project route crosses prime farmlands, as classified by the Natural Resource Conservation Service (NRCS) (see Table 3.B.7). This total includes prime farmland and land that would be considered prime farmland if drained. Prime farmland is defined as land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Construction activities will not significantly affect the factors, such as soil quality, growing season, or moisture supply, that are considered in determining whether land is prime farmland.

B.4 (b)(2) Family Farms and Ranches

The Project will not alter the pattern of land ownership or create long-term disruptions of family farming operations. Easement payments will be beneficial to landowners within the route and no significant interference with farming operations is anticipated. Equipment will traverse only landowner-approved access routes to minimize disruption to soil, drainage, and crops. Hiland's crop loss compensation program will compensate landowners for any crop damage caused by construction. Hiland will also compensate landowners for crop damage that results from future pipeline maintenance and repairs.

Construction activity can cause short-term disruption of livestock operations and can inconvenience farm activities. Possible impacts include removal or damage of fences, gates, and private roads. Hiland will work to minimize construction interference. Temporary access across the ROW will be provided to allow for livestock and farm equipment movement, as needed. Temporary fences and gates will be constructed as necessary to prevent livestock from entering into the construction zone. The Project will be constructed in a timely matter and, upon completion, fences, gates, and roads will be restored to pre-construction conditions, to the extent reasonably practicable.

B.4 (b)(3) Lands Suitable for Irrigation

Pursuant to Section 69-06-08-02(2)(h) of the North Dakota Administrative Code, this criterion does not apply to underground transmission facilities such as the proposed pipeline. No above-ground facilities will be constructed on irrigated land.

B.4 (b)(4) Surface Drainage Patterns

Construction of the Project will not alter surface drainage patterns. Streams, swales, ditches, and other natural drains will be restored to pre-construction contours after construction is complete. The pipeline will be installed beneath drainage ditches in a manner that will not interfere with flow or future maintenance efforts by landowners or the drainage authority. Mitigation measures will include the installation of the pipe at a sufficient depth to avoid being encountered by drain cleaning equipment.

B.4 (b)(5) Groundwater Flow Patterns

Groundwater moves under the influence of gravity from areas of higher potential (recharge) to areas of lower potential (discharge). The rate of groundwater flow is indicated as only a few feet per year in the principal aquifers.[4,5]

Information concerning groundwater is generally available in or can be estimated from North Dakota county groundwater resource studies. The groundwater flow patterns from aquifer systems in the Project area that contain suitable water are summarized as follows:

The Charbonneau and Yellowstone Missouri Aquifers in McKenzie County are suitable for domestic and livestock supplies and some parts of the aquifers are suitable for municipal and industrial supplies and irrigation use. These aquifers generally flow north with the exception of the western part of the Charbonneau aquifer, which flows westward toward the Yellowstone-Missouri River System. [6]

Further aquifer details are provided in Section B.4 (k)(1) Water Resources-Groundwater.

Groundwater flow could potentially be altered by pipeline construction through blasting and trenching activities. However, no exposed bedrock or areas of shallow bedrock are expected to be encountered, therefore blasting is not anticipated. Trenching may temporarily disturb the level of groundwater and increase the sediment in the groundwater. However, given the shallow depth of construction activities and the relatively deep location of the area's aquifers, installation of the proposed pipeline should not have a significant effect on regional groundwater flow patterns.

Groundwater may be affected by accidental discharges of regulated materials, such as fuel, lubricants, and coolants used during construction. Hiland's Environmental Mitigation Plan (EMP) located in Tab 5 and supporting diagrams in Tab 6 outline precautions that Hiland takes to prevent sedimentation or other materials from entering the water supplies in the area. Project contractors must have a current oil spill prevention control and countermeasure (SPCC) plan and implement it fully if the facility contains an aggregate oil storage capacity above 1320 gallons, consistent with US Environmental Protection Agency requirements outlined in 40 CFR 112. Regardless of the total storage capacity, no bulk oil storage facilities will be sited within 100 feet of surface water.

B.4 (b)(6) Impact on Noise Sensitive Land Uses

Six residences are located within 500 feet of the Project. No other sensitive noise receptors, such as schools or hospitals, are located in the vicinity of the Project. During construction, residences in close proximity to the construction may experience short-term increases in construction-related noise. The heavy construction equipment needed to construct the Project generate short-term increases in ambient noise levels. Increases in ambient noise levels due to

[4] Croft, M.G., 1985, Ground Water Resources of McKenzie County, North Dakota: North Dakota Geological Survey Bulletin 90, part III, and North Dakota State Water Commission County Ground-Water Studies 37,part III, p. 57.

[5] Armstrong, C.A., 1971, Ground Water Resources of Burke and Mountrail Counties: North Dakota Geological Survey Bulletin 55, part III, and North Dakota State Water Conservation Commission County Ground Water Studies 14, part III, p. 86.

[6] Croft, M.G., 1985, Ground Water resources of McKenzie County, North Dakota: North Dakota Geological Survey Bulletin 90, part III, and North Dakota State Water Commission County Ground-Water Studies 37,part III, p. 57.

heavy equipment operation are limited to the period of construction, typically during daylight hours.

No additional significant noise is expected to be generated by the Project during normal operations.

B.4 (b)(7) Impact on Visual Effect on the Adjacent Area

Above-ground facilities that will be constructed as part of the Project include mainline valves, line markers, cathodic protection equipment, and test stations. Mainline valves will be sited at existing above-ground facility sites. Other than these permanent above ground facilities, the Project will result in only short-term visual effects related to construction activities.

B.4 (b)(8) Impact on Extractive and Storage Resources

No extractive or storage resources were identified that would be affected by the Project.

B.4 (b)(9) Impact on Wetlands and Water Bodies

Impacts to water bodies will be avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. Efforts will be made to restore all areas of disturbed wetland vegetation.

Waterbody crossings are described by legal description in Table 3.B.5 below.

TABLE 3.B.5 – Project Wetland and Waterbody Crossings

Name	Location
McKenzie County	
Canal Lateral	S5 T151N R104W NWSW
Briar Creek	S36 T152N R104W SESW
Drainage to Missouri River	S5 T151N R103W NWNE
Drainage to Missouri River	S4 T151N R103W NWNW
Drainage to Missouri River	S4 T151N R103W NWNE
Drainage to Missouri River	S5 T151N R103W NENE
Canal Lateral	S8 T151N R104W
Canal Lateral	S5 T151N R104W NWSE
Canal Lateral	S5 T151N R104W NESE
Wetland	S5 T151N R104W NESE
Canal Lateral	S34 T152N R104W SWSW

Name	Location
Canal Lateral	S34 T152N R104W SWSW
Canal Lateral	S34 T152N R104W SWSE
Yellowstone River	S35 T152N R104W SWSW
Drainage to Missouri River	S6 T151N R102W NWSE

Pipeline construction near water bodies will be conducted in accordance with applicable regulatory requirements. No water body will be permanently drained or filled as part of the Project, and effects on water bodies will be short-term and minor. Hiland will restore the area as close to its previous state and naturally functioning condition as possible.

In unsaturated wetlands, topsoil will be segregated from the trench line during construction to preserve natural sources of seed and rootstock. During trenching, water quality of inundated wetlands adjacent to the construction area may be temporarily affected due to the suspension of sediments and organic matter. Silt fence or straw bales will be installed as needed to minimize this effect. Although wetland vegetation will be cleared for pipeline construction, these areas will be re-vegetated to their pre-construction structure and function. After the trench is backfilled, the topsoil will be replaced to facilitate the natural re-vegetation process in unsaturated wetlands.

Unsaturated wetlands may be re-vegetated with a temporary cover crop if specified by permitting agencies. No fertilizer or soil amendments would be applied in wetlands. The long-term operation and maintenance of the pipeline will not have adverse effects on wetland function or value.

B.4 (b)(10) Impact on Woodlands and Wooded Areas

Tree rows and woody areas occur as isolated islands or rows throughout the Project area. The proposed Project route crosses through wooded areas on rangeland and in wetland areas. Impacts to trees will be avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. It may be necessary to clear some mature trees during construction; however, Hiland will work with the appropriate state agencies and private landowners to determine appropriate replacement measures following construction.

Hiland will satisfy the requirements of the Commission's tree and shrub mitigation specifications regarding replacement of trees and shrubs impacted by the Project.

B.4 (b)(11) Impact on Radio and Television Reception, and Other Communication of Electronic Control Facilities

No impacts on television or radio reception or communication or electronic control facilities are anticipated as a result of the Project.

B.4 (b)(12) Impact on Human Health and Human Safety

During construction, residences and businesses in close proximity to construction activities will be exposed to short-term increases in construction-related noise and dust. The construction

ROW and access roads near residential areas will be watered down to control dust during construction in instances of excessive dust. After construction is completed, measures to stabilize and re-vegetate the ROW will be taken promptly to prevent further dust emissions.

The heavy construction equipment needed to install the pipeline will generate unavoidable short-term increases in ambient noise levels. Increases in ambient noise levels due to equipment operation will be limited to the period of construction and will be generally limited to daylight hours. No noise will be generated by the pipeline during normal operations.

No residences or other occupied structures will be razed due to construction. Construction may temporarily restrict access to residences along the Project route. Where this potential exists, Hiland will either limit the time such restrictions are in place or will make arrangements to accommodate the landowner's access needs. Although developers will have to abide by state and/or local ordinances and easement restrictions, future residential developments will not be precluded by the Project.

Causes of and Prevention of Accidents on Pipelines

The major causes of pipeline leaks in the United States are corrosion (both internal and external), excavation damage, pipe or weld failure, incorrect operations, or natural causes (e.g., floods or outside force). To prevent these categories of failures, Hiland will construct and maintain the Project to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe utilized will meet US DOT Pipeline and Hazardous Material Safety Administration (PHMSA) federal regulations under 49 CFR Part 195 (referred to hereafter as PHMSA regulations), and construction methods will follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and API. As a safety measure, the pipeline is designed to withstand pressures over and above its normal operating pressures and will operate according to all applicable laws, rules, and regulations. All pipe will be inspected and integrity-tested at the factory and transported per the highest technical standards. All pipe will be manufactured with fusion-bonded epoxy (FBE) coating to protect against corrosion. The actual installation of the pipeline and all construction and testing records will be subject to inspection, including by PHMSA inspectors. Although PHMSA does not schedule field inspections on pipelines such as the Project pipeline under DOT 195, the pipeline complies with federal regulatory PHSMA requirements, including the integrity testing of the pipeline through the use of internal inspection devices.

Once installed, the pipeline will be subjected to careful testing to verify integrity and compliance with specifications. PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing such as checking coating integrity. Hiland will perform as near as possible to 100% X-ray inspections on girth-welded pipe. Only after adequate performance has been established based on statistically significant data, and each of the Project's welders has demonstrated proper weld material handling, will a reduction in the percentage of welds inspected be considered. However, the percentage of welds inspected will never fall below the requisite 10%.

Additional Project inspections may include internal inspection of the entire length of the pipeline using a tool known as a caliper pig, and hydrostatically testing the pipeline to determine the MOP. The Project will be placed into service only after inspection to verify compliance with all construction standards and requirements.

The Project will be maintained and inspected according to PHMSA regulations, industry codes, and prudent pipeline operating techniques. All of Hiland's pipelines are externally coated to resist corrosion, internally inspected at regular intervals using in-line inspection technology, and equipped with a cathodic-protection system to prevent external corrosion.

Hiland performs weekly aerial patrols on pipelines. The Hiland System rights-of-way that are designated Class 1 are patrolled via foot patrol annually. Road crossings are inspected via foot patrol semi-annually. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines.

Hiland also conducts extensive public education and outreach programs that exceed industry (API Recommended Practice 1162) and PHMSA (49 CFR § 195.440) requirements concerning public awareness of pipelines and pipeline safety. All Hiland pipelines are marked with signage and warnings, per federal regulations, at road and highway crossings, railroad crossings, navigable rivers, and other locations to alert the public to the presence of underground lines and to provide information, contact numbers, and emergency data.

Pipeline workers and contractors performing critical tasks are qualified under OSHA safety standards and PHMSA "operator qualification" rules and are subjected to federal drug and alcohol testing requirements. Hiland meets, and often exceeds, these requirements so that human error in construction and operation is avoided.

Hiland's Ten-Year Pipeline Accident Record

Based on a search of the U.S. Coast Guard's National Response Center incident database for the last ten years in North Dakota, Hiland Crude, LLC has had only three incidents on its pipeline systems in North Dakota.

On October 16, 2013, Hiland discovered a small leak while performing above-ground, routine maintenance on the right-of-way for its 4-inch, steel, underground crude oil gathering pipeline in Divide County, North Dakota. The affected section of the pipeline was immediately shut down, depressurized, and isolated.

Approximately 20 barrels of oil leaked in the immediate vicinity of the pipeline on company right-of-way land. Hiland identified the source to be a newly formed pinhole in the pipe, which was installed and commissioned in the first quarter of 2013. Hiland submitted the affected cross-section of the pipe to an independent laboratory to determine the cause of the pinhole.

Within an hour of learning of the leak, Hiland notified all appropriate regulatory agencies, completing a North Dakota spill report and filing a report with the National Response Center. Hiland also notified the Divide County Emergency Response Manager, the U.S. Fish and Wildlife Service, and the landowner the same day. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

On March 20, 2014, Hiland representatives discovered that approximately 800 barrels of crude oil were released from secondary containment resulting from a flange gasket failure on a pipeline in McKenzie County. Within hours, Hiland notified all appropriate regulatory agencies, completing a North Dakota spill report and filing a report with the National Response Center. Hiland also notified the landowners the same day. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

On November 2, 2014, Hiland discovered and reported a value failure on an above ground pipe, 8-inches in diameter, which resulted in the release of approximately 55 barrels of crude oil in Mountrail County. Once the leak was identified, the line was shut down and isolated. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

B.4 (b)(13) Impact on Animal Health and Safety

Construction activity within the Project area will have temporary impacts on domestic animals and wildlife. The clearing of vegetation will temporarily reduce cover, nesting, and foraging habitat for some species. However, species will generally move into adjacent habitats, away from the disturbance area. Once habitat alterations are reclaimed, wildlife will reestablish within the area.

Pipeline trenching activities and associated spoil piles may result in a short-term barrier restricting the movement of some wildlife species (typically two to four weeks at any one area). Except for short-term interruptions during construction, existing public roads, farm lanes, and livestock crossings will be kept open, providing crossing access for wildlife. During construction, Hiland will erect temporary fencing, as necessary, to keep livestock and wildlife away from the pipeline trench, and minimize the length of time the trench will be left open.

B.4 (b)(14) Impact on Plant Life

All areas where vegetation is removed will be re-vegetated in accordance with applicable county agency standards and landowner requests. Permanent impacts to vegetation are not anticipated. Special consideration will be taken for known occurrences of sensitive populations and habitat which could potentially establish new sensitive populations within the Project area.

B.4 (c) Policy Criteria (North Dakota Administrative Code Section 69-06-08-02(4))

The Commission may give preference to an applicant that will maximize benefits resulting from the adoption of policies and practices identified in Section 69-06-08-02(4) of the North Dakota Administrative Code. These policies, and the extent to which the Project aligns with or reinforces these policies, are discussed further below.

B.4 (c)(1) Location and Design

Hiland believes that the Project utilizes an optimal alignment. No designated Exclusion Areas will be crossed by the route.

Hiland engaged consultants before the construction of the gathering system pipeline segments to conduct environmental desktop studies and a Class I archeological study. The purpose of these studies is to avoid previously known plants, wildlife habitats, or cultural resources to avoid damage to these areas.

The Project will include the installation of 12-inch outside diameter steel pipe with a wall thickness of 0.219 inches. For crossings, 0.500 inch wall thickness FBE coating will be used. The MOP will be 1440 psig. The valves to be installed will be 12-inch ANSI 600, flange end by flange end, full port, rising stem gate valves. These valves will be manufactured in accordance

with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." The MOP of the valves will be 1440 psig.

The steel pipe installed will meet US DOT criteria outlined in 49 CFR § 195.100. The Project will be constructed per 49 CFR § 195.200, and operated and maintained per 49 CFR § 195.400.

The Project is designed and will be operated in a manner that meets or exceeds state and federal engineering, safety, and operational design standards.

B.4 (c)(2) Training and Utilization of Available Labor in this State for the General and Specialized Skills Required

During construction of the pipeline, skilled and unskilled labor, both local and non-local, will be employed by Hiland or by the general contractor(s) selected to construct the pipeline. Hiland has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by PHMSA under 49 CFR Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through reviews of job performance, periodic pipeline control system simulations, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

B.4 (c)(3) Economies of Construction and Operation

The Project is believed to be the most cost-effective and operationally sound means of meeting Hiland's delivery obligations. Please also refer to section B.2 (g) of this Application and section C.2 of the Application for a Certificate of Corridor Compatibility.

B.4 (c)(4) Use of Citizen Coordinating Committees

No Citizen Coordinating Committee is anticipated as a result of the Project. Hiland does not believe a Citizen Coordinating Committee is necessary for this type of project given that the pipeline will be installed in a ROW adjacent to an existing pipeline ROW. Further, the Project will be located in an area of the state where crude gathering and transmission pipelines already exist and, as such, the public is familiar with the permitting, construction, and operation of pipeline facilities.

B.4 (c)(5) Commitment of a Portion of the Transmitted Product for Use in this State

The Project is expected to receive deliveries of crude oil produced in northwestern North Dakota. This market flexibility is critical to assure the best overall value is obtained for North Dakota's crude oil production. Upon completion, the Project will provide needed capacity to transport increased production of crude oil from the Bakken and Three Forks formations.

B.4 (c)(6) Labor Relations

The Project is not anticipated to have any effect on labor relations within the State of North Dakota.

B.4 (c)(7) Coordination of Facilities

Existing Hiland crude pipelines and the Project's new 12-inch line, with their associated pumping, control and operating systems, will be used in conjunction with each other to optimize system capacity.

B.4 (c)(8) Monitoring of Impacts

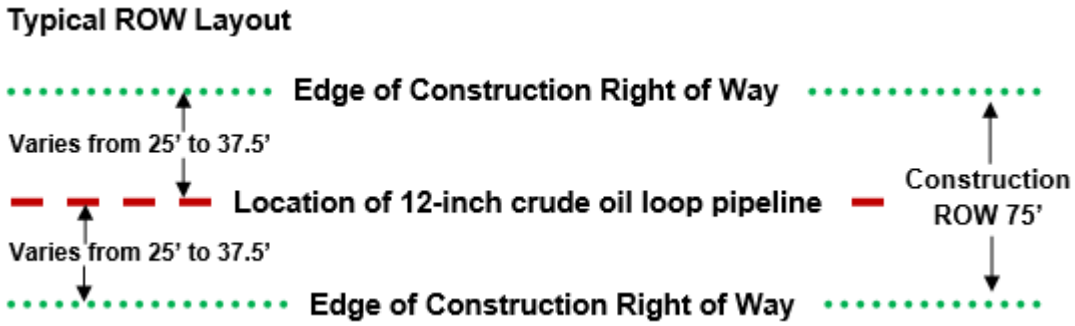
Any construction-related impacts of the Project will be mitigated through the use of best management practices, appropriate construction techniques, and environmental inspection during and following completion of construction. Following construction of the Project, a thorough inspection will be performed to ensure restoration efforts have been successful. Monitoring and treatment of noxious weeds and/or invasive species will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness. Ongoing environmental inspections will be conducted during and following construction.

B.4 (c)(9) Utilization of Existing and Proposed Rights-of-Way and Corridors

The Project will be constructed in a 75-foot wide temporary construction ROW. Hiland has acquired 50-foot permanent easements for the Project. Typical ROW configuration is shown in Figure 3.B.5. Part of the pipeline will be installed in the adjacent Market Center ROW.

Hiland acquired the right to utilize additional temporary workspace from the landowners, where necessary, during construction. The use of unauthorized workspace will be prohibited without the landowner's and Hiland's approval. In all cases, the amount of additional temporary workspace utilized will be kept to the minimum necessary to safely conduct work. Temporary workspace will be not restricted by or subject to permanent easement restrictions upon completion of construction.

FIGURE 3.B.2 – Typical Right-of-Way Configuration



B.4 (c)(10) Other Existing and Proposed Transmission Facilities

Crude oil produced in North Dakota when shipped by pipeline, is destined for one of three market hubs: (1) Tesoro's Mandan, North Dakota refinery; (2) the Guernsey, Wyoming interconnection hub; and/or (3) the Clearbrook, Minnesota interconnection hub.

Crude oil can also be transported by truck to Canada and by rail, directly to refineries or East, West, and Gulf Coast markets.

The "geographical market risk" of limited transportation options suffered by oil producers in the rapidly expanding crude oil production in northwestern North Dakota has caused millions of dollars per year in lost revenue. With constrained export capacity, local production lacks access to alternative markets, making it vulnerable to regional price swings.

Over the past several years, the North Dakota Pipeline Authority has been working with producers and regional pipeline companies to address the issues surrounding the safe transportation of this surge in crude oil volume.

Hiland is constructing an additional transmission pipeline in Montana connecting to the Project near Dore, North Dakota. The Double H pipeline will transport crude from Dore, North Dakota to Guernsey, Wyoming.

TransCanada's Keystone XL pipeline project is a proposed 1,179-mile 36-inch diameter crude oil pipeline. This pipeline would extend from Hardisty, Alberta to Steele City, Nebraska. Along with transporting crude oil from Canada, the Keystone XL Pipeline will also support the significant growth of crude oil production in the United States from producers in the Bakken region of Montana and North Dakota. The pipeline's reported capacity is 830,000 barrels of oil per day to Gulf Coast and Midwest refineries.[7] If Keystone XL is built, True Oil Company's Thunderbird pipeline, the BakkenLink pipeline, and Hiland's Double H pipeline are all expected to proceed with connections at Baker, Montana to ship crude to Gulf Coast refineries.

B.4 (d) Design and Construction Limitations

See Section A.3 of the Certificate of Corridor Compatibility Application (Tab 1).

B.4 (e) Economic Considerations

See Section B.2 (g) of this Route Permit Application and Section C of the Certificate of Corridor Compatibility Application (Tab 1).

B.4 (f) Human Environment

The Project area is sparsely populated and ranching and farming are the predominant economic activities. The pipeline route crosses land owned by 24 different landowners. The route does not pass through parks or recreational areas. The Project route does pass within 500 feet of six residences. Hiland previously obtained waivers for the Musket Lateral and/or the Dore Segment of the Market Center Pipeline that the Project will parallel. Waivers will be obtained for the Project.

The majority of the Project route is located on private land, and landowner concerns and routing preferences will be addressed during all phases of construction, including final restoration. Land agents assigned to the Project work closely with landowners and are responsive to issues that arise during the course of the Project to the extent practicable. Hiland has either obtained or is

[7] TransCanada. "Keystone XL Pipeline". Available at: http://keystone-xl.com/about/the-project/ (accessed on August 8, 2013).

in the process of finalizing easement agreements with all landowners along the proposed Project route.

No municipal water supplies or production water wells were identified within the survey corridor. While a domestic or stock water well does not meet the definition of a "municipal water supply" or a "water source for organized rural water districts," two domestic wells were identified within 500 feet of the route: 151-104-04 AAA, 152-104-34 CDC; and one stock well was identified within 500 feet of the route: 152-104-36-DBC. These wells were identified using information available through the North Dakota State Water Commission.

The Project will not transect any U.S. or North Dakota highways. The Project route will cross 18 gravel roads. Improved roads will be crossed via HDD. Through traffic will be not disrupted during the boring process. Eight vegetated trails will be open cut. The open cut trails will be temporarily disrupted during the Project. Hiland will work with landowners throughout the life of the Project regarding potential disruption to access for private driveways, access roads, and two track trails.

Road crossings for the route are summarized in Table 3.B.6.

All roads and section line crossings will be subject to review and approval by the County Engineer and County Commissions. Applications will be submitted and permits obtained for the road crossings prior to the start of construction.

TABLE 3.B.6 – Project Road Crossings

Legal Description	Coordinates	Road Name	Description of Road
McKenzie County			
S8 T151N R104W NWNW	47° 01' 56.5" N 103° 05' 46.76"W	35th Street NW	Gravel
S5 T151N R104W NWSW	47° 55' 31.3" N 104° 01' 49.34"W	Driveway	Gravel
S5 T151N 104W NESE	47° 55' 38.94" N 104° 1' 0.44"W	Un-Named Road	Two Track
Meridian 5 T151N R104W	47° 55' 40.37" N 104° 0' 43.10"W	No Road	Section Line
S4 T151N R104W NENW	47° 56' 1.05" N 104° 0' 4.68"W	Un-Named Road	Two Track
S33 T152N R104W SWSE	47° 56' 05.98" N 103° 59' 54.96"W	36th Street NW	Gravel
S33 T152N R104W SESE	47° 56' 07.29" N 103° 59' 44.76"W	Un-Named Road	Gravel
S33 T152N R104W SESE	47° 56' 07.51" N 103° 59' 25.54"W	159th Ave NW	Gravel
S34 T152N R104W SWSE	47°56'7.98"N 103°58'46.61"W	Un-Named Road	Gravel
S35 T152N R104W SWSW	47°56'7.85"N 103°58'7.99"W	158th Ave NW	Gravel
S35 T152N R104W SESE	47°56'7.07"N 103°57'9.15"W	Un-Named Road	Two Track
S36 T152N R104W SWSW	47° 56' 6.84" N 103° 56' 50.40"W	County Rte 7	Gravel

Legal Description	Coordinates	Road Name	Description of Road
S36 T152N R104W SESW	47° 56' 16.94" N 103° 56' 12.27"W	36 ½ Street	Gravel
Meridian 5 T152N R103W	47° 56' 38.30" N 103° 55' 33.13"W	No Road	Section Line
S31 T152N R103W NESW	47° 56' 22.34" N 103° 54' 58.18"W	Access Road	Gravel
S31 T152N R103W NWSE	47° 56' 21.31" N 103° 54' 54.79"W	Access Road	Gravel
S32 T152N R103W SWSW	47° 56' 10.28" N 103° 54' 17.45"W	155th Ave NW	Gravel
S32 T152N R103W SESW	47° 56' 7.40" N 103° 53' 47.15"W	Driveway	Gravel
S32 T152N R103W SWSE	47° 56' 6.10" N 103° 53' 36.88"W	36th Street	Gravel
S4 T151N R103W NWNW	47° 56' 2.39" N 103° 53' 0.03"W	154th Ave NW	Gravel
S4 T151N R103W NENW	47°56'4.45"N 103°52'23.63"W	Access Road	Gravel
S3 T151N R103W NWNW	47° 56' 4.95" N 103° 51' 42.66"W	153rd Ave NW	Gravel
S3 T151N R103W NENW	47° 56' 4.93" N 103° 51' 13.50"W	Access Road	Two Track
S3 T151N R103W NENE	47° 56' 2.62" N 103° 50' 34.88"W	Driveway	Two Track
S2 T151N R103W NWNW	47° 55' 57.78" N 103° 50' 25.09"W	152nd Ave NW	Gravel
S2 T151N R103W NESE	47° 55' 37.71" N 103° 49' 27.20"W	Un-Named Road	Two Track
S6 T151N R102W NWSW	47° 55' 29.26" N 103° 47' 50.12"W	150th Ave NW	Two Track
S6 T151N R102W NESW	47° 55' 28.70" N 103° 47' 30.55"W	Access Road	Two Track

B.4 (g) Terrain and Geology

The Project route is located in the glaciated Missouri Plateau section of the Great Plains Physiographic Province in western North Dakota. The Missouri Plateau (Coteau du Missouri) is characterized by low relief and gentle slopes interrupted by buttes and ridges. In the glaciated section, the drift is generally thin except for valley fill so the topography reflects the pre-glacial topography. Major drainages are the Missouri, Yellowstone, and Little Missouri Rivers. The Missouri River formed when glaciers blocked the northeastward flowing drainages and the diverted drainage flowing southeastward along the margin of the glacier was entrenched in that course after the ice melted. The Little Missouri River flowed northward in the valleys now occupied by Red Wing Creek and Tobacco Garden Creek prior to glaciations. Subsequently it was diverted eastward from Red Wing Creek. Similarly, the Yellowstone River flowed through the Charbonneau Creek-Timber Creek Valley prior to glaciations. The process of adjustment to the lowered base level of the Missouri River is developing a band of badlands along these drainages.

The pipeline route is located entirely in the Williston Basin, a large elliptical depression bounded by the Canadian Shield (northeast), Alberta Shelf (northwest), Black Hills (southeast), and Wisconsin Dome (southwest). The Williston Basin covers about 300,000 square miles. The Williston Basin is a structurally simple basin, deepest at its center (16,000 feet below the surface near Williston, North Dakota), becoming shallower and thinner towards its edges.

The Project area includes rocks of each of the geologic periods with the thickest accumulations of sedimentary rocks near the center of the Williston Basin. The pipeline route traverses various bedrock and surface geology including Coleharbor Formation, Sentinel Butte Formation, Bullion Creek Formation, and Oahe Formation. Bedrock is exposed along the major drainages and their tributaries in McKenzie County as far south as the limit of glaciations.[8]

In addition to bedrock, the Project area includes many surficial geological materials, including: Quaternary alluvium, colluviums, and glacial till (sand, gravel, clay). The near surface sediment is of Recent, Pleistocene, or Tertiary age. Recent sediment consists of alluvium or colluvium which is generally confined to lowland areas of current or Pleistocene drainage. Pleistocene sediments consist of till on the upland areas and water-sorted sediment in and along glacial drainages.

Surface elevations along the route range from approximately 1866 feet to 2265 feet above mean sea level.

B.4 (g)(1) Geologic Hazards

Potential geologic hazards along the proposed route include seismic hazards, landslides, subsidence, and flooding. Since the proposed route is located in relatively flat and stable terrain, opposed to active mountain belts or coastal areas, the potential for geologic hazards is reduced.

Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. A fault is a fracture along which the blocks of crust on either side have moved relative to one another parallel to the fracture. Rapid slippage of blocks of crust past each other can cause energy to be released, resulting in an earthquake. No active faults have been identified in the Project area, according to the U.S.G.S. Geologic Hazards Science Center.[9] An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years.

North Dakota historically contains little earthquake activity and is therefore not in an area of seismicity. No earthquakes of intensity V or above (Modified Mercalli Scale) have occurred within North Dakota during historical times. Furthermore, using the U.S Geological survey 2009 PSHA Model for predicting probabilities of earth quake occurrence and magnitude, there is less than a 2% chance of an earthquake occurring within the Project area within the next 50 years.

[8] Brostuen, Erlling A, 1977, Physical Data For Land-use Planning Divide, McKenzie, and Williams Counties, North Dakota, North Dakota Geological Survey Report of Investigation 62.
[9] U.S.G.S. Geologic Hazards Science Center, available at http://earthquake.usgs.gov/hazards/qfaults.

The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Project area is low. The hazard map uses estimated peak ground acceleration expressed as a percentage of the acceleration due to Earth's gravity. According to the ground motion hazard map there is a 2 percent probability of exceedance in 50 years; furthermore, the map predicts the most likely exceedance to be minor.[10]

Landslides

Landslides can be defined as gravity-caused mass movements of earth material. Included in this definition are rock falls, slumps, rock slides, mud slides, and debris flows. Landslide risks are highest in areas with steep slopes, and typically occur on steep terrain during conditions of partial or total soil saturation. In areas with landslide risk, anything impacting slope condition, such as seismic activity, construction, and increased soil moisture all aide in increasing mass movements. Landslide susceptibility is defined as the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. The Project route is entirely in areas that have moderate landslide susceptibility, yet historically low incidence.

Subsidence

Subsidence, a gradual settling or sudden sinking of earth's surface, is not a major concern along the proposed route. Subsidence is commonly caused by underground mining, drainage of organic soils, thawing permafrost, natural compactions, and depletion of aquifer systems. In the Project area, the only potential concern is underground mining. Because all mines (open and closed) within 15 miles of the Project route are open pit, the concern for subsidence is minimal.[11]

Flooding

In North Dakota, most flooding occurs in the spring, when the winter snow cover melts. While flooding is generally considered a geologic hazard, the potential for a flood to negatively impact the pipeline is minimal. The pipeline is waterproof and thus the only hazard that exists is scouring. For a flood event to affect the pipeline, 4 to 6 feet of the surface must be displaced. Risk of a flooding event large enough to scour 4 to 6 feet of the surface is minimal. However, control of erosion through periodic inspections and repair to soil cover if erosion occurs will further reduce the risk.

B.4 (h) Soils

Detailed soil characteristics along the pipeline route will be identified and assessed using the Soil Survey Geographic database (SSURGO; U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), 2003). The SSURGO database is a digital version of the original county soil surveys developed by the NRCS for use with geographic information systems (GIS). It provides the most detailed level of soils information for natural resource planning and management. The mapping scale in the Project area is 1:20,000, with a minimum delineation size of 4.0 acres. SSURGO is linked to an attribute database that gives the proportionate extent of the component soils and their properties for each map unit (USDA,

[10] U.S. Geological Survey (USGS). 2008, Geologic Hazards Science Center, available at https://geohazards.usgs.gov/hazards/apps/cmaps/ (accessed February 13, 2013).

[11] U.S. Geological Survey, Mineral Resource Data System (MRDS), 2012, Mineral Resource Data for North Dakota, available at http://tin.er.usgs.gov/mrds/.

NRCS 1995). The SSURGO database will be used to define soil characteristics along the pipeline route in McKenzie County. SSURGO attribute data consist of physical properties, chemical properties, and interpretive groupings. Attribute data apply to the whole soil (e.g., listed hydric, prime farmland soils, slope class) as well as to layer data for soil horizons (e.g., texture, permeability). The soil attribute data can be used in conjunction with spatial data to describe the soils in a particular area.
The Project area is in the Rolling Soft Shale Plain (Major Land Resource Area 54). This area belongs to the Northern Great Plains Spring Wheat Region.

The Project area lies within the McKenzie Upland Section of the Great Plains physiographic Province.

The soils in the Project area range from having clay loam to very gravelly course sand soils.

Wind erosion may be a hazard on most of the soils in the Project area. It is severe on the coarse textured and moderately coarse textured soils. These are primarily the Beisigl, Telfer, Wabek, Minnewaukan, Banks, Riverwash, Trembles, Ridgelawn, Velva, Seroco, Hummocky, Bowdle, Lehr soils. Certain soils have a relatively high content of lime. They are primarily the Cabba, Chama, Havrelon, Maschetah, Lambert, Trembles, Hoffmanville and Zahl soils. They are susceptible to wind erosion in the spring if they have been bare throughout the winter. Because of freezing and thawing, soil structure can break down, resulting in aggregates that are susceptible to movement. This can also cause fine textured soils such as Badland, Lambert, Temvik, Wilton, Zahl, Cabba, Chama and Lohler soils to have a severe wind erosion hazard. Nearly all soils can be damaged by wind erosion if they are not protected by residue.

Water erosion is a hazard on gently rolling and steeper soils, such as Badlands, Cabba, Maschetah, Chama, Havrelon and Zahl. The hazard is greatest when the surface is bare therefore the precautions outlined in the Environmental Mitigation Plan found in Tab 5 will be implemented to minimize impacts.

Tables 3.B.7 and 3.B.8 list the soil associations, the approximate acreage of each soil association, and provide a summary of soil limitations for the pipeline route. STATSGO MUIDs are geologically and geographically related soils which correspond to soil associations. Approximately .3 percent of the soils crossed by the pipeline route (2.5 acres of the 786.6 acres within the pipeline route) are NRCS-classified prime farmland, provided there is sufficient artificial drainage to remove excess surface water and sufficient irrigation.

TABLE 3.B.7 – Project Area Soil Characteristics

County	Total Project Acres	Prime Farmland	Hydric Soils	Highly Erodible	
				Water	Wind
Acres[a] (%)					
McKenzie	786.6	2.5 (0.3)	163.9 (21)	50 (6)	438 (56)

[a]Acreage is based on a 500-foot wide survey corridor and does not include access roads, temporary extra workspace, or areas of open water, and does not account for reduced right-of-way widths in wetlands and forested areas.
Prime Farmland includes areas that are prime if drained or irrigated

TABLE 3.B.8 – Project Area Topsoil Depths and Slope Classes

County	Total Project Acres	Topsoil Depth (Inches) *Depth to restrictive feature				Slope Class (%)				
		0-6	>6-12	>12-18	>18	0-6	>6-9	>9-15	>15-30	>30
		Acres[a] (%)								
McKenzie	786.6	3.5(.4)	00 (00)	31 (3.9)	752.1 (95.7)	546.5 (70)	75 (10)	32 (4)	0 (0)	120(15)

[a]Acreage is based on a 500-foot wide survey corridor and does not include access roads, temporary extra workspace, or areas of open water, and does not account for reduced right-of-way widths in wetlands and forested areas.

Potential temporary effects on soil resources include the loss of soil productivity due to erosion, soil mixing, or soil compaction. Soil disturbances associated with clearing, grading and trenching expose soils to water and wind and increase the potential for erosion. Analysis of STATSGO data indicates that soils in the Project area are susceptible to erosion by wind. Soil erosion by water is also common along the pipeline route. During construction, the effects of erosion by water on steep slopes will be mitigated by use of silt fence and other erosion control measures as described in Hiland's EMP (see Tab 5).

Soil productivity could potentially be affected if topsoil becomes mixed with subsoil during construction. To minimize this potential in agricultural land and other areas where soil productivity is an important concern, Hiland segregates topsoil during trench excavation. In cropland, topsoil will be removed to a maximum depth of 12 inches from the trench and soil storage area unless otherwise requested by the landowner. Topsoil will be stored separately from the trench soil and will be returned to its approximate original location after the trench is backfilled.

Project construction will cause temporary removal of vegetation and result in temporary exposure of soil. These actions may result in some minor temporary erosion. Re-vegetation of disturbed areas using native species will mitigate these concerns.

Heavy equipment used to construct the Project may cause soil compaction along the right-of-way. Soils will be tilled with a chisel plow or other deep-tillage equipment to loosen the soil to the reasonable satisfaction of the landowner. Because the soils of the Project area generally have a high shrink-swell potential, compaction will correct itself over time as the soil goes through wet-dry and freeze-thaw cycles.

B.4 (i) Vegetation and Wildlife

Investigations were conducted on potential impacts to wildlife and plant species. Information was gathered from a variety of sources to compile the existing conditions of plant, wildlife, and critical habitats within the proposed corridor. Sources included field surveys, literature reviews, and personal communications with the NDGFD, the USFWS, and the NDPRD (which provided information regarding the North Dakota National Heritage Inventory). Field surveys were conducted on foot and via utility terrain vehicle. Field data were collected with Trimble GeoXH 6000 Series Global Positioning System handhelds and photographs will be taken along the entire length of the route.

Analysis within the corridor included a complete inspection for species of concern, habitat components required to support species of concern, noxious weeds, and wetlands. The survey

area was expanded to encompass nearby areas that may be impacted by the Project. Species of concern, noxious weeds, plant species and wildlife species were identified in the field and mapped. Any unknown species were photographed and later identified using available up-to-date literature. Personal communications and knowledge of species and species habitat were used to make a determination regarding the potential effects of the Project.

B.4 (i)(1) Vegetation

Botany surveys were performed along the approximately 13-mile-long proposed Project route in McKenzie County during May 2011, June 2013, and September of 2014. The Project route crosses terrain mainly consisting of prairies, pasture land, cropland and wetlands. Grass species that were common in the project area are: blue grama (*Bouteloua gracilis*), crested wheatgrass (*Agropyron cristatum*), green foxtail (*Setaria viridis*), junegrass (*Koeleria macrantha*), Kentucky bluegrass (*Poa pratensis*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipedula*), and smooth brome (*Bromus inermis*). Common forbs within the project area include: alfalfa (*Medicago sativa*), broom snakeweed (*Gutierezzia serothrae*), common sunflower (*Helianthus annuus*), creeping juniper (*Juniper horizontalis*), dotted blazing star (*Liatris punctata)*, field sagewort (*Artemesia campestris*), fringed sagewort (*Artemesia frigid*), goatsbeard (*Tragopogon porrifolius*), goldenrods (*Solidago spp.*), hairy-golden aster (*Heterotheca villoa*), milkweeds (*Asclepias spp.*), plains pricklypear cactus (*Opuntia polyacantha*), prairie rose (*Rosa arkansana*), purple coneflower (*Echinacea angustifolia*), Russian thistle (*Salsola tragus*), soapweed yucca (*Yucca glauca*), and yellow sweetclover (*Melilotus indicus*).

The following state-listed species of concern and USFS sensitive plant species were identified during the biological field survey conducted in the study corridor in May 2011 and September of 2014: easter daisy (*Townsendia exscapa*) and Hooker's townsendia (*Townsendia hookeri*). No species were identified within the construction ROW. No federally threatened or endangered species were identified within the construction ROW. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The primary impact will be the removal of vegetation in the ROW during construction activity.

In areas that require re-vegetation, Hiland will specify appropriate seed mixes, application rates, and seeding dates, taking into account the requirements and recommendations of appropriate state and federal agencies, as well as preferences of landowners.

B.4 (i)(2) Wildlife

Wildlife surveys were performed along the 13-mile Project route in McKenzie County during May 2011, March and June 2013, and September of 2014. Keitu environmental field surveyors conducted a thorough inspection of private land consisting of prairies, cropland, rangeland, and wetland environment.

Common wildlife identified in the survey corridor included mule deer (*Odocoileus hemionus*), songbirds, migratory waterfowl, and raptors.

The following animal state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive Species were identified during the biological field survey conducted in the one-mile-wide environmental study corridor in May 2011, March and June 2013, and September of 2014:

American white pelican (*Pelecanus erythrorhynchos*), bald eagle (*Haliaeetus* leucocephalus), bobolink (*Dolichonyx oryzivorus*), golden eagle (*Aquila chrysaetos*), lark bunting (*Calamospiza melanocorys*), marbled godwit (*Limosa fedoa*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), sharp-tailed grouse (*Tympanuchus phasianellus),* short-horned lizard (*Phrynosoma hernandesi*), and Swainson's hawk (*Buteo swainsoni)*.

The following animal state-listed Species of Conservation Priority was identified within the construction ROW: American white pelican (*Pelecanus erythrorhynchos*). Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

Impacts from the Project during construction are not anticipated to have any significant effects on the State Sensitive Species for North Dakota. Based on the size of the Project and possible route location, any effect on habitat caused by the Project is not anticipated to alter a species population.

B.4 (i)(3) Raptors

An aerial raptor survey was conducted in the spring of 2013 to locate any raptors as well as suitable nests. The survey methods for the 2013 survey followed the USFWS technical guidance on inventory and monitoring protocols. Three surveyors (seated in rear-left, rear-right and front-left positions of the helicopter) thoroughly examined the area within the 2-mile-wide survey corridor along the ROW to locate currently active or inactive raptor nests. Complete coverage of the ROW was obtained by traversing the ROW centerline in a perpendicular manner while visually scanning all areas of potential nesting habitat, to provide complete coverage of the 2-mile corridor. A second pass was conducted in a similar manner in the opposite direction to get full field of view and line of sight in all possible raptor nest locations. When a possible nest was discovered, the helicopter would slow to a hover, at a distance great enough to prevent flushing and in the shortest amount of time needed to determine the condition, type of nest, contents, and obtain accurate GPS location coordinates. Cliffs and rocky outcrop areas were identified along the Project route that may be suitable future nesting sites for golden eagles (*Aquila chrysaetos*) and ferruginous hawks (*Buteo regalis*), among other cliff nesting species. Nesting habitat along the survey corridor included: shelterbelts, cliff edges, deciduous forests and riparian areas. Early spring timing of the survey facilitated locating nests in deciduous trees before "leaf out" occurred. Heavily wooded areas are within the survey area and multiple passes were taken when necessary. Only nests large enough to support raptors were recorded during the survey.

The North Dakota raptor species of concern detailed by the North Dakota Natural Heritage Inventory System (NHI) with potential to be located in McKenzie County include the following: golden eagle (*Aquila chrysaetos*), Swainson's hawk (*Buteo swainsoni*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), and the burrowing owl (*Athene cunicularia*).

The following state-listed Species of Conservation Priority, and BLM Sensitive species were identified in the study corridor during the aerial raptor survey conducted in the spring of 2013: bald eagle (*Haliaeetus leucocephalus)*, golden eagle (Aquila *chrysaetos*), Northern harrier (*Circus cyaneus*), and prairie falcon (*Falco mexicanus*).

Even though raptors of concern were spotted during the survey, due to the range of these raptors it is not uncommon for one to be seen at a distance greater than one mile from their

nests, making it quite probable that the raptor species of concern seen during the survey were in fact nesting outside the corridor. One unoccupied raptor nest was observed during the 2013 aerial survey. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

B.4 (j) Land Use

Specific to the Project area, agricultural production is the predominant land use. Approximately 54% is cropland or pasture, 35% is native rangeland, 7% is developed, and 3% is forest, shrub, or wetland. The Project is not located within any city limits or urban areas.

The primary crops cultivated in the area include wheat, grain, alfalfa, and sugar beets. The Project may result in temporary impacts to agricultural land use. Landowners will be compensated for crop loss or reduced yields caused by construction of the Project. Deep tillage will be implemented as necessary to mitigate effects of soil compaction.

Although developers will have to abide by state and/or local ordinances and easement restrictions, future residential developments will not be precluded by the Project. After installation of the pipeline, disturbed areas will be restored to pre-construction conditions to the extent reasonably practicable, and generally reverted to pre-construction uses. No long-term change in land use is anticipated.

B.4 (k) Water Resources

B.4 (k)(1) Water Resources-Groundwater

The project lies in the Missouri River Basin which is one of the five major hydrologic subdivisions in North Dakota. The Missouri River Basin is the largest in the state and drains approximately 48% of the state's total area. With respect to the ground water used in the basin, 69% is used for irrigation, 14% is used for livestock, 7% is used for industrial, 6% is used for municipal, 3% is used for rural domestic, and 1% is used for rural water systems/other.[12]

Groundwater in North Dakota occurs within bedrock or unconsolidated deposits. Bedrock aquifers underlie the glacial drift aquifers (aquifers in unconsolidated deposits). There is an Aquifer system within the Project area that contains suitable water. Water from rocks of Pre-Cretaceous Age and the Dakota Group of the Cretaceous System would not be suitable for most purposes.

The glacial drift aquifers within the project area includes the Yellowstone buried channel in McKenzie County.

The Yellowstone buried channel Aquifer in McKenzie County is suitable for domestic and livestock supplies and some parts of the aquifers are suitable for municipal and industrial supplies and irrigation use. The median dissolved solids concentration range around 900 milligrams per liter. The estimated yield from this aquifer is 500 gallons per minute. The Yellowstone buried channel Aquifer varies in quality with types ranging from sodium bicarbonate to calcium magnesium sulfate.

[12] 2005, A Reference Guide Water in North Dakota, Presented by North Dakota State Water Commission, available at http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryPDF/136/WaterRefGuide.pdf.

Most of the groundwater information came from County Ground Water Studies.[13] The following tables summarize Aquifer information.

TABLE 3.B.9 – Project Area Aquifer Information

Aquifer Name	Area (sq mi)	Depth (ft)	Re-Charge (In/Yr)	Estimated yield (gpm)	Topography (%Slpe)	Water Type	Conductivity (gpd/ft2)	Median dissolved solids (ppm)	Permitted Water Use (Ac Ft/Yr)
Yellowstone Buried Channel	200	120	0.7	500	8	$NaHCO_3$ or $Mg(HCO_3)_2$	1200	900	405.0

* North Dakota Department of Health —Ground Water-Aquifer Monitoring—Table B-7 North Dakota Geographic Targeting System Scoring All Aquifer Data Listed by Aquifer Name 09/05/96, available at http://www.ndhealth.gov/wq/gw/pubs/gwt.htm; County Ground Water Studies, available at http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryRecord/Reports%20and%20Publications/County%20Ground%20Water%20Studies.

TABLE 3.B.10 – Project Area Well Information

Aquifer	Number of wells by type in project area						
Glacial Drift Aquifers:	**Domestic**	**Stock**	**Municipal**	**Industrial**	**Irrig.**	**Prod.**	**Unknown**
Yellowstone Buried Chanel	6	2	0	1	0	0	0
Bedrock Aquifers:							

* North Dakota State Water Commission, Ground and Surface Water Date Query, available at http://www.swc.state.nd.us/4dlink2/4dcgi/wellsearchform/Map%20and%20Data%20Resousrce.

No sub-surface injection of water is expected for the Project. Any released water will be discharged to surface water, subject to the requirements of the general National Pollutant Discharge and Elimination System (NPDES) permit issued by the North Dakota Department of Health (DOH).

The Project is not expected to impact North Dakota ground water quality.

B.4 (k)(2) Surface Waters

Topographic maps and current aerial photos were reviewed to identify streams, rivers, and lakes crossed by the Project route (See Table 3.B.5).

Pipeline construction near surface waters will be conducted in accordance with applicable regulatory requirements. No creek will be permanently drained or filled as part of the Project, and effects on creeks will be short-term and minor. Hiland will restore the construction ROW as close to its previous state and naturally functioning condition as practicable.

B.4 (k)(3) Wetlands

Hiland, through its consultants, conducted a desktop survey using aerial photo-based alignment sheets and USGS topographic maps identifying USACE waters of concern within North Dakota

[13] Croft, M.G., 1985, Ground Water resources of McKenzie County, North Dakota: North Dakota Geological Survey Bulletin 90, part III, and North Dakota State Water Commission County Ground-Water Studies 37, part III, p. 57.

to identify wetlands along the Project route. Wetlands were identified within the Project's corridor and are listed by legal description in Table 3.B.5.
All wetland crossings identified along the route will be bored, which will eliminate the risk of wetland impact during construction and also eliminate the need for mitigation. No wetland impacts are expected during pipeline construction. Future construction of above-ground facilities including mid-route stations will not impact wetlands.

B.4 (k)(4) Water Use

The Project will not significantly affect water use patterns. Following construction, drains, swales, and flowages will be restored to pre-construction conditions to the extent practicable to minimize disruption of water resources.

The Project will require temporary appropriations of water for use in the hydrostatic testing of the newly installed pipeline. Additionally, some temporary trench dewatering may be required. No significant effect on existing or future water uses is anticipated to occur from pipeline installation or future construction of above-ground facilities.

Discharge of water used to hydrostatically test the new pipeline is not expected to have an impact on the environment or receiving waters. The discharge is regulated by the North Dakota Department of Health under a North Dakota Pollutant Discharge Elimination System (NDPDES) general permit issued specifically for temporary dewatering activities including hydrostatic testing and trench dewatering (Permit No. NDG-070000).

B.4 (k)(5) Water Runoff from Surfaces

Potential construction-related effects on surface waters are primarily related to sedimentation from uncontrolled erosion of disturbed areas. Much of the Project area is level or only gently sloping, which limits the potential for runoff effects. Because the ROW will be restored to pre-construction conditions, area runoff following construction will generally reflect surrounding land use.

Hiland will obtain authorization under a general permit for Storm Water Discharges Associated with Construction Activity from the North Dakota Department of Health, which implements a federal program under the Clean Water Act. Hiland's EMP describes best management practices. Hiland, it's General Contractor, and Project subcontractors will implement measures to minimize off-site erosion from site storm water runoff. These practices will protect surface water and soil resources within the Project area. Hiland's EMP will be included in the construction specifications for the Project and will be enforced by one or more environmentally trained construction inspectors during construction.

B.4 (k)(6) Discharges to Surface Waters

During construction, point source wastewater discharge may be generated from hydrostatically testing the new pipeline prior to placing it in service. Discharges will also occur as needed for trench dewatering during construction. The North Dakota Department of Public Health has developed a General Permit (Permit No. NDG-070000) which authorizes the discharge of waters related to temporary dewatering and hydrostatic testing. Hiland will obtain authorization for construction-related discharges and conducted trench dewatering and hydrotest water discharges in a manner consistent with the NPDES General Permit.

Testing and discharge is anticipated to be consistent with past practices and experience. Discharges of hydrostatic test water typically are controlled discharges directly to the ground surface or occasionally into Waters of the State. In most cases, water will be purchased from freshwater wells. The NPDES permit specifies that discharge water must be free from process and other wastewater discharge.

B.4 (k)(7) Protection from Fuel Spills

Motorized construction equipment to be utilized for the Project will be powered by gasoline- or diesel- fueled engines. Fuel for construction vehicles will be used and stored consistent with regulations of the US Environmental Protection Agency set forth in 49 CFR § 195.112 for areas with at least 1320 gallons of aggregate storage capacity and/or consistent with the National Fire Protection Association Code 395 for storage and handling of petroleum-based fuels in isolated and/or remote areas. If more than 1320 gallons of oil storage occurs at one area, the contractor is required to prepare and implement an oil spill prevention, control, and countermeasure (SPCC) plan in accordance with 49 CFR Section 195.112, including having the plan reviewed and certified as adequate by a registered professional engineer. The SPCC Plan outlines required secondary containment measures to be installed around bulk storage containers (i.e., tanks and drums) as well as other oil-handling areas such as unloading and dispensing areas. The Plan also describes response, containment, and cleanup measures. Training requirements of impacted employees are also outlined.

Contractors will be required to provide trained personnel, appropriate equipment, and materials to contain and clean up spills of fuel, lubricating oil or hydraulic fluid that result from equipment failure when working in or near wetlands or surface water bodies.

Storage of bulk fuels is prohibited within 100 feet of an open waterway or surface water during Project construction.

B.4 (l) Cultural Resources

See discussion in Sections B.2 (i) and B.4 (a)(1).

B.5 THE CRITERIA TO BE EVALUATED SHALL INCLUDE AT A MINIMUM ALL OF THE FOLLOWING, WHICH ARE WITHIN THE DESIGNATED CORRIDOR:

- Exclusion Areas;
- Avoidance Areas;
- selection criteria;
- policy criteria;
- design and construction limitations; and
- economic considerations

A discussion regarding potential impacts and mitigation measures relevant to these six criteria is provided in Section B.4, above. Below is a discussion of additional mitigation measures employed by Hiland.

B.6 MITIGATION MEASURES

B.6 (a) Measures to Preserve the Human Environment

Hiland requires its construction contractors to clean up personal litter, bottles and paper deposited by ROW preparation and construction crews on a daily basis. Waste and scrap produced during construction is always removed and properly disposed of in accordance with applicable regulations prior to the completion of construction.

To the maximum extent practicable, Hiland will minimize noise and dust resulting from construction near residences.

Prior to construction, Hiland will obtain any applicable permits for road crossings from McKenzie County. Hiland will also obtain permission from all owners of private roads, including oil lease roads, to cross said roads. Temporary signs will be posted at each crossing as appropriate to alert motorists of construction activity. Gravel roads will be bored, minimizing interference with traffic flow caused by construction activities.

B.6 (b) Measures to Protect Terrain and Geological Resources

Hiland will, to the extent reasonably practicable, restore the area affected by Project construction to pre-construction condition. Restoration will be compatible with the safe operation, maintenance, and inspection of the Project.

To the maximum extent practicable, the construction area will be restored to pre-construction contours. Measures such as slope breakers, erosion control blankets and re-vegetation may be employed to maintain the stability of slopes along the ROW. No crown of backfill material will be left over the trench in wetlands.

Fuel and all other hazardous materials will be stored in accordance with the requirements of the Project contractor's SPCC Plan, if applicable. The SPCC Plan describes response, containment, and cleanup measures. However, even for small quantities of oil-based liquids, containers and fueled equipment will not be stored within 100 feet of surface water.

B.6 (c) Measures to Protect Soils

Hiland will implement temporary and permanent erosion control measures as specified in the EMP (Tab 5 and Tab 6). The EMP will be included in contract documents and enforced throughout construction.

Temporary erosion and sedimentation control measures may include the installation of silt fence, straw bales, slope breakers, trench breakers, erosion control fabric, and mulch.

To minimize potential impacts on soil productivity, topsoil will be segregated during trench excavation in agricultural land, unsaturated wetlands, and other areas where soil productivity is an important consideration. Topsoil in cropland will be removed to the depth of cultivation or a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil. After the trench is backfilled, topsoil will be returned to its approximate original location. Compaction of agricultural soils will be minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of compaction occur in

agricultural lands, deep tillage equipment will be utilized to loosen the soil to the extent reasonably practicable.

Hiland will retain environmental experts to train Hiland's construction inspectors to monitor the contractor's compliance with applicable requirements to protect soil resources during construction of the Project.

B.6 (d) Measures to Protect Vegetation and Wildlife

Hiland will clear the ROW to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the Project.

Utilizing the measures discussed in Section B.4 (b)(1) above, Hiland and its contractors will effectively control or limit the spread of invasive plant species through control treatments and avoidance of existing populations where possible. Treatments will be initiated prior to pipeline construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

In areas that require permanent re-vegetation, Hiland will specify appropriate seed mixes, application rates, and seeding dates, taking into account recommendations of appropriate state and federal agencies and landowner requests. In non-agricultural areas, vegetation cleared from extra workspace will be allowed to re-vegetate after construction depending on arrangements with the landowner. Consequently, significant changes in cover types are not anticipated.

Hiland will take appropriate precautions to protect livestock and crops during construction. Operation of the Project is not anticipated to significantly affect terrestrial wildlife, fisheries resources, or other aquatic species. Shelter belts and trees will be protected and restored by Hiland to the extent practicable in a manner compatible with the safe operation, maintenance, and inspection of the Project, and in accordance with the Commission's tree and shrub mitigation specifications.

B.6 (e) Measures to Protect Land Use

Hiland will obtain and comply with applicable county permits regulating zoning and land use. These permits will include a Pipeline Utility Permit and a Road Crossing Permit. Hiland will retain one or more construction inspectors to monitor compliance with environmental conditions of county permits during any Project construction activities.

Hiland will repair surface drains disturbed during ROW preparation, construction, and maintenance activities. Hiland will repair private roads and farm lanes damaged when moving equipment or when obtaining access to the ROW. Hiland will repair or replace fences and gates removed or damaged as a result of ROW preparation, construction or maintenance activities.

The Project pipeline will be installed at a minimum depth of 48 inches from the surface contour to minimize the potential for environmental damage resulting from deep tillage activities, unless modified to accommodate special construction issues at a particular site.

Shelter belts and trees will be avoided by Hiland to the extent possible in a manner compatible with the safe operation, maintenance, and inspection of the Project.

B.6 (f) Measures to Protect Water Resources

Hiland's EMP describes best management practices that will be implemented to minimize off-site erosion from surface water runoff, and protect water and soil resources within the Project area.

No additives to discharge water will be permitted without written approval from Hiland, in accordance with the applicable permits. Construction inspectors with environmental training will monitor compliance with permits. Where appropriate, water will be discharged into an energy dissipation and/or filtering device to remove sediment and to reduce the erosive energy of the discharge.

B.6 (g) Measures to Protect Cultural Resources

Based on the results of the Class I and III cultural resource inventories, a finding of "No Adverse Effects" has been issued by Beaver Creek Archaeology, provided that the recommendations are followed as discussed in section B.2 (i). The findings of all inventory studies are presented in more detail on the route maps found in Tab 4, Figure 4.B.1b through Figure 4.B.6b.

An "Unanticipated Discovery Plan" has been developed should unexpected artifacts be uncovered during Project construction. The plan has been sent and approved by the SHPO.

Unanticipated Discovery Plan

In order to minimize the potential for the accidental discovery of cultural resources, Hiland conducted intensive pedestrian inventories along the entire proposed Project route. To ensure that Hiland maintains full and complete compliance with all Federal and State regulations concerning the protection of cultural resources, an Unanticipated Discovery Plan has been prepared for the Project. Construction may result in the discovery of unanticipated cultural resources, or of cultural resources in areas where they were not expected to occur.

All inspectors have the responsibility to monitor the construction of sites for potential archaeological remains throughout construction. If, during the course of construction, sites for potential cultural resources are identified, the inspector will immediately stop tasks in the vicinity of the potential find and make work stoppage recommendations to the Construction inspector. Should a work stoppage authority be deemed necessary, Hiland will notify the SHPO and will inform the archaeological consultant who will survey the site and provide an immediate verbal report to Hiland and the SHPO. Hiland will continue to consult with the SHPO as per the requirements of Section 106 of the National Historic Preservation Act (NHPA). The contact is:

Paul R Picha, Chief Archeologist
North Dakota State Historic Preservation Office
State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, North Dakota 58505-0830
(701) 328-3574

If the unanticipated discovery is determined to be not eligible for inclusion on the NRHP, Hiland will proceed with the Project following written concurrence from the SHPO. If the site is determined to be potentially eligible for inclusion on the NRHP, additional work such as a Determination of Eligibility of Data Recovery will be performed as required/approved by the SHPO. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other Federal and State regulations have been successfully completed.

If human remains and/or a burial are encountered, these remains, features and any associated artifacts shall be left undisturbed, work at the site of discovery shall cease immediately, and the site shall be secured from further trespass. Hiland shall immediately contact the SHPO and local law enforcement and shall not resume work at the site until further notice from the SHPO per North Dakota Century Code, Section 23-06-27 – Protection of human burial sites, human remains and burial goods, and North Dakota Administrative Code, Chapter 40-02-03 – Protection of Prehistoric and Historic Human Burial Sites, Human Remains, and Burial Goods.

Under no circumstances will human remains be removed from the site without completing all coordination processes with the local law enforcement agency, medical examiner, the SHPO and Native American representatives, as appropriate. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other related state and Federal regulations have been successfully completed.

B.7 QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

The qualifications of the personnel who contributed to the route application include:

(1) Jim Suttle, Senior Vice President – Hiland Crude, LLC

Degree: Bachelor of Art — Political Science, Wichita State University
Masters of Philosophy, Houston Baptist University

Experience: 33 years in petroleum industry, serving in multiple assignments including pipeline design, operation and construction. Senior Vice President of Hiland Crude, LLC since 2010.

(2) Kathleen Spilman, Managing Director – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science - Chemical Engineering, University of North Dakota
Masters in Management, University of Mary

Experience: 32 years' experience in petroleum refining and fuels transportation field as well as regulatory affairs and compliance.

Professional License:
Registered Professional Engineer: North Dakota, South Dakota, Montana

(3) Heather Patch, Staff Engineer (Chemical) – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science, Chemical Engineering, University of North Dakota

Experience: 3 years' experience in engineering, regulatory affairs and compliance.

Other Training: CHMM Test Preparatory Class, Natural Gas Plant Operators Class, US DOT-sponsored Hazardous Material Shipping Class

(4) Karine Becker, Specialist – Project Manager – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science, Natural Resource Management, University of Minnesota - Crookston

Experience: 5 years' experience in natural resource management.

Other Training: GIS, Listed and Candidate species in the Endangered Species Act compliance in North Dakota, Bald and Golden Eagle Protection Act, piping plover and least tern surveying, prairie restoration, Keitu In-Service Classes on North Dakota Plant and Animal Habitat Identification, Raptor Identification

(5) Dirk Churchill, Staff Consultant – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science Natural Resource Management, North Dakota State University

Experience: 5 years' experience in field technical services and regulatory affairs

Other Training: US Army Corps of Engineers Wetland Delineation Training, Keitu In-Service Class on North Dakota Plant and Animal Habitat Identification, Raptor Identification

B.8 MAPS

See Tab 4, Figure 4.B, for the Project Mapbook and Tab 7 for ESRI software "shapefiles."

B.9 OTHER MATTERS

The information provided below is in accordance with North Dakota Century Code Sections 49-22-08.1(1)(e), (1)(f), and (1)(g).

B.9 (a) Right-of-Way Preparation, Construction, and Reclamation Procedures

Critical safety aspects of pipeline installation are governed by US DOT regulations subject to the jurisdiction of PHMSA, which has tended to standardize installation techniques. The advance of technology has introduced significant improvements in the techniques and equipment available to install underground pipe lines, reducing both the time required and the size or "footprint" of impact.

Construction of the pipeline will follow standard techniques employed by other projects installed in North Dakota. Essentially an outdoor assembly line, the major steps of ROW preparation, pipeline construction, and reclamation using girth full penetration welds typically include: (1) survey and staking of the right-of-way; (2) clearing; (3) front-end grading; (4) right-of-way topsoil stripping; (5) pipeline route staking; (6) pipe stringing; (7) pipe bending; (8) pipe alignment and initial weld; (9) fill and cap with final weld; (10) as built footage; (11) x-ray inspection and weld

repair; (12) coating field welds and coating inspection; (13) trenching; (14) lowering pipe into trench; (15) as-built survey; (16) pad, backfill to rough grade; (17) hydrostatic testing and system tie-in; (18) clean-up; and (19) restoration and re-vegetation.

B.9 (a)(1) Survey and Staking

Before construction, Hiland crews will survey and stake the centerline and exterior boundaries of the construction ROW. The exterior boundary stakes will mark the limit of approved disturbance areas, which will be maintained throughout the construction period. The North Dakota One Call system will be utilized to identify and mark the locations of underground utilities in the construction corridor. During this period, equipment involved in Project construction will be moved onto the ROW using existing roads for access wherever practicable.

B.9 (a)(2) Clearing

Hiland will clear the 75-foot-wide ROW of shrubs and trees. The clearing crew will typically mow, chip, mulch and/or haul off all non-merchantable timber. Burning of non-merchantable wood may be allowed when the contractor has obtained the necessary permits and approvals. All merchantable timber will be property of Hiland unless other arrangements are made with the landowner.

B.9 (a)(3) Grading

Following clearing, the surface will be graded to provide a relatively smooth working surface and a safe working area

B.9 (a)(4) Topsoil Stripping

Topsoil will be stripped and segregated in agricultural areas, cropland, hayfields, pasture, residential areas, and other areas as requested by the landowner along the Project route in accordance with Hiland's EMP. In unsaturated wetlands, a maximum of 12 inches of surficial soils will also be stripped from the trench areas. Topsoil will be stripped to the depth of cultivation or a maximum depth of 12 inches in cultivated lands.

B.9 (a)(5) Pipeline Route Staking

Once the topsoil had been stripped and stockpiled, the route will be resurveyed and staked.

B.9 (a)(6) Pipe Stringing

Before excavating pipeline trenches, individual joints of pipe will be strung along the construction right-of-way and arranged to be accessible to construction personnel. This operation typically involves specially designed stringing trucks to deliver pipe from pipe yards to the ROW. Small portable cranes and/or side-boom tractors will be used to unload the stringing trucks and place pipe along the ROW.

B.9 (a)(7) Pipe Bending

A pipe-bending machine will bend individual joints of pipe to the desired angle to accommodate natural ground contours or pipeline alignment. In certain areas, prefabricated fittings will be used where field bending is not practicable.

B.9 (a)(8) Pipe Alignment and Initial Weld

After stringing and bending is completed, pipe sections will be aligned and placed on temporary supports located adjacent to the proposed trench locations. Pipe ends will be attached to each other using short welds or high pressure joining techniques.

B.9 (a)(9) Fill and Cap Segment Welds

Final welds will be completed around the entire circumference of the pipe joints in compliance with applicable industry standards and PHMSA requirements.

B.9 (a)(10) As-built Footage

Once welding is complete, Hiland will compare the as-built condition and length of the pipeline with construction drawings. Documents will be edited to reflect impacts of field decisions as well as final locations of lateral tie-in points, other pipeline apertures, and cathodic protection connections.

B.9 (a)(11) X-Ray Inspection and Weld Repair

PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing, such as checking coating integrity. Initially, Hiland will engage a third-party inspection service provider meeting PHMSA certification requirements to perform X-ray inspections of nearly 100% of the welds. Only after adequate performance has been established based on statistically significant data, and each of the Project's welders has demonstrated proper weld material handling, will a reduction in the percentage of welds inspected will be considered; however, the percentage of welds inspected will never fall below the requisite 10%. When welds are deemed inadequate, appropriate repairs will be made consistent with PHMSA regulations and re-inspected. Inspection records will be cross-referenced against the final "as-built" footage of the pipeline.

B.9 (a)(12) Coating and Coating Inspection of Field Welds

The pipe will be delivered with a factory coating of fusion-bonded epoxy or similar material to prevent corrosion. Hiland will apply coating at welded joints and will electronically inspect the pipeline coating before the pipe is lowered into the trench.

B.9 (a)(13) Trenching

Backhoes and/or ditching machines will be used to excavate trenches in accordance with PHMSA regulations, which require a minimum 30 inches of cover for normal excavations and 18 to 30 inches of cover in rocky areas. Hiland uses a minimum cover of 48 inches. The trench walls will generally be kept vertical to the extent practicable and the trenches will typically be 30 to 40 inches wide.

Where trench dewatering is needed, water will be discharged directly to the ground if there is adequate vegetation along the ROW to filter the water effectively. Where vegetation is sparse or absent, or in environmentally sensitive areas (e.g., adjacent to water bodies or wetlands), straw bale dewatering structures or suitable filtering alternatives will be used to minimize siltation in adjacent water bodies.

B.9 (a)(14) Lowering Pipe Into Trench

After welding and coating are completed and the trench is excavated, the pipe will be lowered into the trench by side-boom tractors.

B.9 (a)(15) As-built Survey

A survey of the final location of the pipeline will be made.

B.9 (a)(16) Pad and Backfill to Grade

Bladed equipment or a specially designed backfilling machine will be used to backfill the trench to the approximate ground surface elevation. This operation generally consists of replacing the material excavated from the trench. In areas where topsoil has been segregated, subsoil will be replaced first, and topsoil will be spread uniformly on top. Directly above the pipeline, an excess of soil or “crown” will be placed to allow for future settling, except in wetlands.

Construction debris, including wooden supports, welding rods, containers, brush, trees, or refuse of any kind, will not be permitted in the backfill. If an excessive amount of rocks are present in the backfill, the pipeline will be protected with rock shield or similar protective coating and/or backfilled with clean padding prior to backfilling with the rocky material.

B.9 (a)(17) Hydrostatic Testing

After backfilling, Hiland will test the pipe pneumatically in accordance with the PHMSA regulations to ensure that the system is capable of operating at the design pressure. The testing process will involve filling a segment of the pipeline with water and maintaining a prescribed pressure for a specified amount of time.

B.9 (a)(18) Cleanup

Cleanup may involve removing construction debris (including litter generated by construction crews and excess rock) and replacing fences removed during construction. In addition, extraneous material that would impede seed bed preparation will be removed from the ROW. Fences that were removed to install the pipeline will be reconstructed.

B.9 (a)(19) Restoration and Re-vegetation

Following installation and final cleanup of the Project construction area, original grade and contours will be restored to the extent practicable, and temporary and permanent erosion controls will be installed. Disturbed areas will be re-vegetated in accordance with permit requirements, agency input, and site-specific landowner requests. Monitoring will continue until 70% or higher vegetative cover has been established.

B.9 (b) Landowner Issues

B.9 (b)(1) Procedures for Landowner Relations

Hiland has either obtained or is in the process of finalizing easement agreements with all landowners along the proposed Project route. Construction will occur after the harvest and prior to the planting season when feasible, minimizing impacts to agriculture. Construction is expected to begin in February 2015.

A brief description of the Project will be mailed to affected landowners and known tenant farmers. Hiland is committed to giving landowners complete information about the Project and keeping them informed throughout the lifetime of the Project. Hiland personally contacted landowners to discuss methods of calculating damage settlements and tenant's rights, and to address any unique property concerns.

B.9 (b)(2) List of Landowners

By use of county records, a current list of landowners was generated and used to contact residents regarding the Project. In addition to landowners, all known tenant farmers in the construction area were notified. A list of landowners is provided in Tab 4, Appendix 4.C.

B.9 (c) Operations and Safety

B.9 (c)(1) Pipeline Operation and Control

Hiland's Control Center is monitored by pipeline operators 24 hours a day. The Control Center also serves as an emergency center to receive calls from employees, the public, or public officials reporting unusual conditions or pipeline failures.

The Project will also be designed to accommodate an instrumented internal inspection device to detect and record the type and location of corrosion or other defects for long-term monitoring of the pipeline integrity.

B.9 (c)(2) Communications Capabilities

Land-lines and satellite communications are used to exchange the necessary computerized data for pipeline monitoring and control. Hiland uses cellular phones as needed to facilitate personnel communications during operation, maintenance, or emergency activities.

B.9(c)(3) Protection of the Pipe from Damage

Hiland has an aggressive program to educate excavators and the public about the presence of the Project and prevent damage to the Project from excavating equipment. Hiland participates in and supports the North Dakota One-Call system.

The pipeline is protected from corrosion in a number of ways. The pipeline is covered with a protective coating. In addition, the pipeline is under a cathodic protection system, as required by PHMSA regulations.

B.9 (c)(4) Inspections

Hiland will conduct routine inspections of the Project to determine that the system is operating properly, in compliance with PHMSA regulations.

Each calendar year (not to exceed a 15-month interval), the cathodic protection system is monitored by taking pipe/structure-to-soil readings and, where possible, line current readings. Additionally, each rectifier and anode ground bed used to impose cathodic protection on the pipeline is inspected to ensure proper operation. Repairs and adjustments to the cathodic protection system are either made during the annual survey or during later maintenance activities. At least six times per year, each rectifier and critical cathodic protection interference bond to foreign structures is inspected and corrective measures are taken, if needed.

Hiland also periodically evaluates the effectiveness of its cathodic protection system by conducting supplemental close interval surveys (e.g., close interval pipe to soil, etc.) of the system.

Hiland conducts weekly aerial inspections. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines.

Isolating valves are checked at least twice per year to ensure proper operation. Other components of the Project, such as tanks and pump stations will also be routinely inspected.

Hiland periodically inspects the pipeline internally with a tool called a caliper pig. These devices travel through the inside of the pipeline and either mechanically, ultrasonically, or magnetically examine the condition of the pipe using on-board computers. Results of the inspection are analyzed, and the pipe is manually inspected to verify preliminary findings. Repairs are conducted where necessary.

All overpressure safety devices capable of limiting, regulating, controlling, and/or relieving operating pressures are inspected and tested to ensure the device is in good mechanical condition and functioning properly.

Periodically, government officials inspect compliance with applicable government regulations. Inspections of Hiland’s written procedures, records, and facilities are routinely conducted by PHMSA.

B.9 (c)(5) Maintenance

Many other maintenance activities will be performed on the Project. Hiland has a comprehensive preventative maintenance program that meets and, in many cases exceeds, minimum federal safety standards set forth in PHMSA regulations, including 49 CFR Part 195. When facilities are added or replaced, there are comprehensive standards for their design and installation in both Hiland procedure manuals and contract specifications. Repair pipe is pre-tested and other components used to repair the pipeline meet national standards and regulatory requirements. Other procedures, such as welding procedures, movement of the pipe, coating repair, corrosion control, and tank maintenance are all guided by written procedures which have been reviewed by the PHMSA inspectors.

B.9 (c)(6) Training of Personnel

Hiland has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by the PHMSA under 49 CFR Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through review of job performance, periodic pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

B.9 (c)(7) Public Awareness Program

Hiland conducts a public education program to ensure that the affected public (i.e., those who work and live near the Project), excavators, local public officials, and emergency responders can recognize and avoid or respond to a pipeline emergency. Hiland has also been active at the local, county, and state levels in emergency response planning and joint training to prepare all potential responders to deal with emergencies.

The Project route is marked at all public road and railway crossings (at a minimum) to increase the public's awareness of the underground pipeline. Additional markings are posted at valves, other pipeline facilities, and stations along the Project route.

B.9 (c)(8) Emergency Preparedness

Hiland's operating and maintenance practices are aimed at preventing emergencies. However, it is imperative that Hiland be prepared to respond to an emergency should one occur. In addition to preventative activities described above, Hiland's emergency response program includes pre-planning, equipment staging, notifications, emergency and leak containment procedures, and engaging the services of area contract spill responders. SPCC plans will be prepared for all North Dakota transportation and non-transportation related storage and use facilities with aggregate storage capacities in excess of 1320 gallons. The emergency response plan will be submitted and approved by PHMSA as required by 49 CFR Part 194.

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