ND PSC Case No. PU-13-136

Crude Oil Pipeline, McKenzie, Williams, Mountrail Counties

Pipeline Route Application

March 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 197-mile-long, 8-inch existing crude oil gathering pipeline system. The pipeline system spans three counties in North Dakota: Williams, McKenzie, and Mountrail and is known collectively as Market Center Pipeline (the Project). The existing pipeline system is currently the only system capable of gathering crude oil from lease sites in Williams, McKenzie, and Mountrail Counties, North Dakota and connecting to transmission pipelines that can transport the crude oil to the refineries located on the Gulf Coast, without ever utilizing truck or rail transport. Hiland proposes to add storage tanks and pumping facilities to the Project, which will convert the gathering pipeline system into a transmission pipeline system. The pipeline system has removed 481 trucks per day from western North Dakota roads, and with the planned storage tanks and pumping facilities, could remove an additional 364 trucks per day.

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 an existing underground gathering pipeline system, constructed over the past three years, that currently gathers crude oil. The Project consists of six segments of 8-inch steel pipeline. The 197-mile-long pipeline was constructed in six segments acting as crude oil gathering lines. Due to the increased volume of crude oil being gathered through the pipelines, it is necessary for Hiland to install storage tanks and pumping stations along the existing pipelines, converting the gathering lines into transmission lines. Future construction consists only of installation of storage tanks, pumping stations, and related above-ground facilities. No new underground pipeline will be installed.

After completion, the Project will act as a pipeline network that touches a significant number of major crude oil rail and pipeline network in northwestern North Dakota. Figure 3.A.1 shows the general location of the Project. The six segments are discussed individually, below.

Tioga Segment: This 23 mile segment originates approximately 14.5 miles northwest of Tioga, North Dakota at McGregor Station and terminates approximately 7.5 miles south of Tioga at Hiland's Tioga Terminal. An interconnection with Enbridge Pipeline's Beaver Lodge Crude Station and a 40,000 barrel tank exist at this site. Hiland proposes to install a 50,000-gallon storage tank at the McGregor Station with truck unloading facilities at the north end of this segment. Booster pumps will be installed at Tioga Terminal.

New Town Delivery Segment: This line originates five miles southwest of Ross, North Dakota at Hiland's White Earth Injection Station and runs 13 miles to the west, also terminating at Hiland's Tioga Terminal, approximately 7.5 miles south of Tioga. Again, an interconnection exists at this site with Enbridge Pipeline's Beaver Lodge Crude Station. Hiland proposes the addition of one storage tank at Hiland's White Earth Injection Station.

Epping to Tioga Segment: This segment moves crude from the Epping Injection Station approximately 2 miles southeast of Epping, North Dakota east to an interconnection with Enbridge Pipeline's Beaver Lodge. This segment is approximately 24 miles long. The addition of a storage tank is proposed at the Epping Injection Station.

Plains Delivery Segment: This 67 mile segment runs from the Epping Injection Station west to the proposed Bethel Injection Station located approximately 12 miles northwest of Williston, North Dakota and then south to the Dore Junction located approximately 8.5 miles northwest of Alexander, North Dakota. This segment interconnects with COLT Rail Terminal approximately one-half mile east of Epping and Savage Rail terminal approximately 3 miles south of Trenton. This segment also includes a lateral line originating approximately 5 miles northwest of Trenton, North Dakota and terminating with an interconnection with Plains' Bakken North Pipeline and Enbridge's pipeline approximately 5 miles northeast Trenton, North Dakota. This segment includes the Bainville Injection station located approximately 16 miles southeast of Bainville, Montana and approximately 1.7 miles west of Trenton, North Dakota. A total of three tanks are proposed to be added to this segment, one each at Trenton Station, Bainville Injection Station, and Bethel Injection Station. Truck unloading facilities are also proposed at each of these sites.

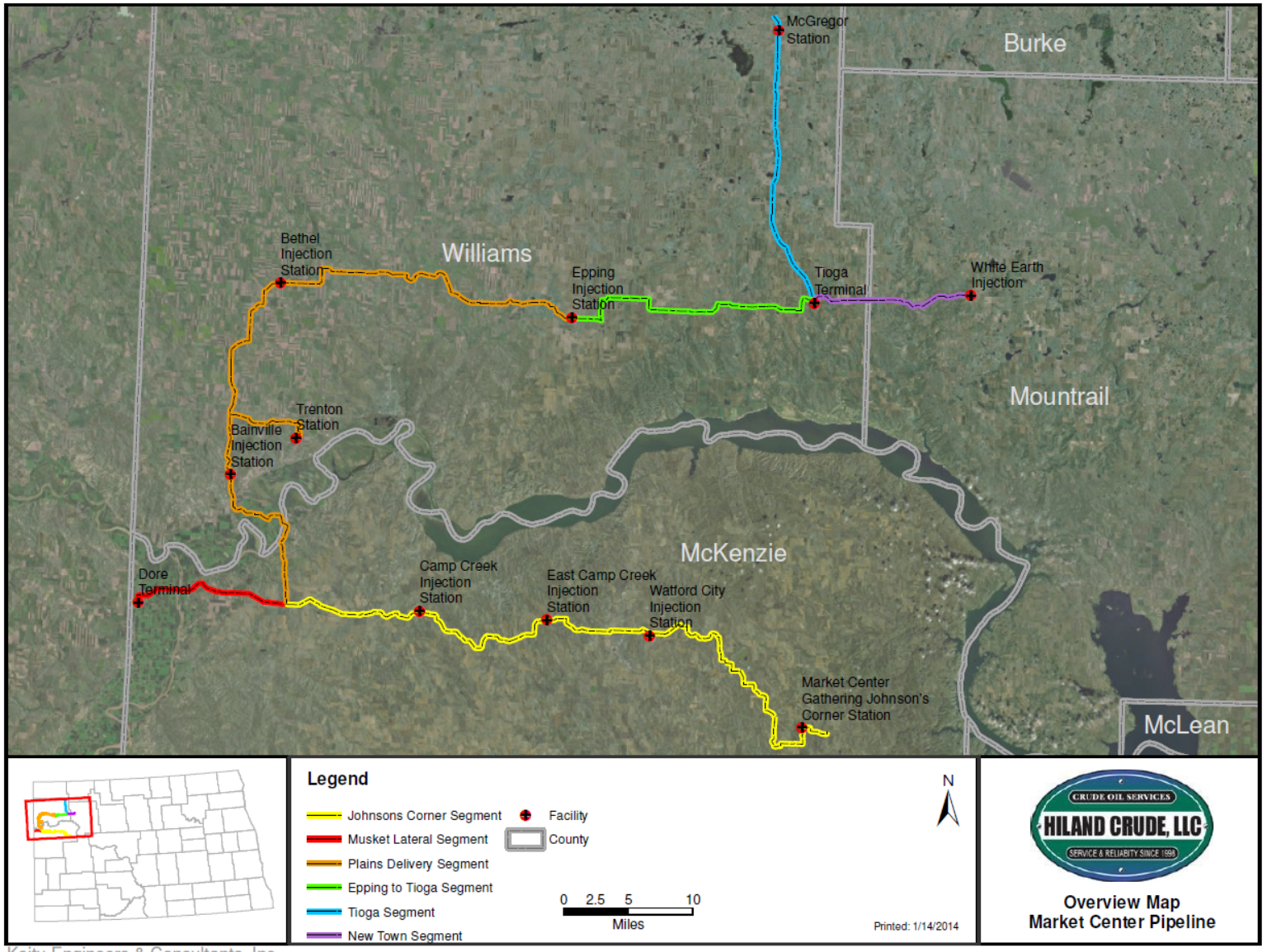
Musket Lateral Segment: This segment originates at the Dore Junction and terminates at Hiland's Dore Terminal near Dore, North Dakota. Their existing Dore Terminal supports both storage tanks as well as a crude oil rail loading facility. This segment is approximately 13 miles in length. The Dore Terminal will eventually become the origin of Hiland's Double H Pipeline.

Johnsons Corner Segment: This segment originates at the Dore Junction and terminates with an interconnection with Bridger Pipeline's Four Bears Pipeline near Johnson's Corner (approximately 17 miles east of Watford City, North Dakota). Hiland currently operates Johnson's Corner crude station here for delivery to Four Bears, consisting of storage tanks, pumps and truck unloading facilities. Capacity on this segment is proposed to be increased with the addition of storage tanks and new pumps at Camp Creek Injection Station (located approximately 6 miles northeast of Alexander, North Dakota), East Camp Creek Injection Station (located 8.5 miles northwest of Watford City, North Dakota), and Watford City Injection Station located 8.6 miles northeast of Watford City, North Dakota. Hiland is also looping a portion of this segment by installing approximately ten miles of gathering pipeline in the same right of way as the existing pipeline. The Johnson's Corner segment is approximately 58 miles in length.

The pipeline system was constructed to allow crude to flow in either direction. This feature allows for greater flexibility and access to more sales points depending on market conditions, and acts as a balancing point allowing the best price for North Dakota crude producers. The total length of the project is 197 miles. The Project is located in Williams, McKenzie, and Mountrail Counties, North Dakota.

The existing pipeline and any future pipeline segments will be buried underground. Storage tanks and pumping facilities will be installed as a part of this Project. Additional surface facilities will be limited to pipeline markers, rectifiers, "pig" launchers, receivers and block valves. Some small fenced-in enclosures to house associated power and control systems may be installed to allow valves to be operated remotely.

The purpose of the Project will be to transport crude oil from smaller crude gathering systems and truck facilities to existing rail and pipeline network destinations. The Project will enable the



Keitu Engineers & Consultants, Inc.

FIGURE 3.A.1 – General Project Location Map

transportation of crude oil produced in northwestern North Dakota to multiple shipping points for out of state sale.

The total cost of the Project is estimated to be $55.3 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 it is 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 involved the installation of 8-inch nominal diameter pipeline with a nominal wall thickness of 0.188 inches denoted as American Petroleum Institute (API) Code 5L specification X52 pipeline pipe. The maximum operating pressure (MOP) is 1440 pounds of pressure per square inch gauge (psig). The maximum temperature of the crude is 120°F which is within design parameters. However, the Project will typically operate between 60°F to 120°F.

The valves are 8-inch ANSI 600, flange end by flange end, full port, rising stem gate valves and similar ball valves. These valves were 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 is 1440 psig.

The steel pipeline utilized for the Project meets United States Department of Transportation (US DOT) regulations, specifically the design criteria outlined in 49 CFR Subpart 195(C). The Project was 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 March 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 March 2014 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

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

Right-of-Way (“ROW”) acquisition is complete.

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 May 1, 2014.

A.4 (e) Construction Start Date

Construction for the new tankage and booster pumps is expected to begin as soon as all necessary permits are acquired.

A.4 (f) Construction Complete

The addition of storage tanks, pumping stations and associated control features will be completed by May 30, 2014.

A.4 (g) Test Operations

Testing of all new facilities such as tanks and pumping stations will be performed prior to start of operation and is expected to be complete by June 31, 2014.

A.4 (h) In-Service Date

All facilities are expected to be in-service on or before July 1, 2014.

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 span every phase of the Project, from planning through construction, restoration, and into full operation.

B.1 (a) Construction

The Project involved laying an 8-inch steel pipeline in a newly acquired right-of-way (ROW) located in Williams, McKenzie, and Mountrail Counties, North Dakota. Construction of the Project resulted 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 was utilized for material staging and temporary access roads. Hiland used existing public roads to access the 75-foot-wide construction ROW, and did not 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 incorporated the equipment and measures discussed in Section B.6. Ongoing environmental inspection has been conducted during and following construction. Environmental training was provided to the construction manager, who,

in turn, trained construction inspectors to provide environmental inspections. Inspectors monitored for compliance with required environmental protection measures, and specifications, and provided ongoing oversight of day-to-day issues. Inspectors were well-versed in the implementation of environmental best management practices during construction. Contract specifications incorporated environmental protection and mitigation measures which were implemented in the field. Contractor training and project orientation was provided by Hiland.

The Project is located primarily on private land. Landowner concerns were addressed during all phases of construction, including final restoration. Land agents assigned to the Project worked closely with landowners and were responsive to issues that arose during the course of the Project.

Small parcels of North Dakota State lands were crossed by the pipeline, totaling less than 3 percent of its total length of the original gathering system. No new facilities are proposed at this point in time on State lands. However, if additional capacity is sought in the future, additional pipeline would be installed on one or more segments which may involve State lands.

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 expanded 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. Installing this new pumping and storage equipment will add 25,000 bpd of capacity to the system.

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) reviewing the 1978 Stream Evaluation Map of the State of North Dakota, (4) utilizing the United States Fish and Wildlife Service's (USFWS) Wetlands Mapper, 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 May, June, July, August, and September 2013. A Class III Cultural Resource Inventory was conducted in May, June, July, August, and September 2013.

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 involves the addition of several injection / booster pumps. The electric drivers on these items are relatively small. No usable waste energy will result from the Project.

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

Unavoidable adverse direct and indirect environmental effects included temporary construction-related effects on vegetation, wildlife, agricultural operations, transportation, and noise levels, as described in Section B.4 below.

For existing segments of pipe, construction was completed (1) outside of the prime growing season when feasible and (2) on an accelerated timeline. Impacts to agricultural operations were minimal and impacts to transportation were short-term. Impacts on vegetation and wildlife were also minimal. Vegetation was removed from the ROW prior to construction, and the area was restored and re-seeded following construction. Wildlife may have temporarily avoided the ROW during construction, but no long-term impacts are anticipated. Noise level increases were associated only with construction, and the Project does not generate noise while in operation. In addition, Hiland implemented thorough mitigation measures to minimize construction-related impacts as described in its Environmental Mitigation Plan (EMP) presented as Tab 5 and Tab 6 in this consolidated application.

The locations for the addition of new storage tanks and injection / booster pumps slated for installation in 2014 are adjacent to previously disturbed areas. No additional fragmentation of wildlife habitat will result from this Project.

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

Desktop studies for portions of the pipeline corridor and route, including a Class I archeology study and environmental databases retrieval, were conducted by a North Dakota-based environmental consulting firm prior to initial pipeline construction. The route was modified prior to initial construction to avoid or minimize environmental, cultural resource, and socioeconomic impacts.

The addition of storage tanks and injection/booster pumps will occur adjacent to previously disturbed areas and in location where no protected plant or animal habitat exist, nor do culturally relevant features exist.

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 required minimal irreversible or irretrievable commitments of natural resources. Several oil field gathering systems and natural gas pipeline pipelines reside in the vicinity of the Project. Steel was utilized for the pipeline, and petroleum fuel was 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 this region. The Project provides connection to both pipeline and rail facilities for the bulk crude oil transportation options. Hiland's shippers support the approved proportional tariff on this FERC-regulated Project as an economical response to the need for additional mid-stream pipeline transport capacity.

Application of horizontal drilling technology and steady and relatively 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
2008	62.8 million	---
2009	79.7 million	26.9 %
2010	113.1 million	80.1 %
2011	153.0 million	143.6 %
2012	242.5 million	286.1 %

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. Recent price data indicates an approximately $9.00 per barrel price discount for crude oil shipped into the Cushing, OK market.[2]

The Project will transport crude oil from Mountrail, McKenzie, and Williams counties to major crude markets via (1) Enbridge's pipeline using a connection at Beaver Lodge; (2) COLT Rail Hub using a connection near Epping, North Dakota; (3) Plains' origin at Trenton, Savage Rail Station, and Enbridge Trenton Station using connections near Trenton, North Dakota; (4) Musket Rail using a loading station near Dore, North Dakota with a potential connection to Hiland's proposed Double H pipeline at this location; and (5) Bridger's Four Bears pipeline using a connection near Johnson's Corner.

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 increased, and has the potential to further increase, the tax base of Williams, McKenzie, and Mountrail Counties. The Project offered job opportunities during construction, which were partially filled with local contractors and/or personnel. Over 50 construction workers were hired for the pipeline construction from pipeline contractors, equipment contractors, suppliers, and regional testing firms. Forty to fifty percent of the labor force was hired from the regional labor pool. Further job opportunities will be provided when the additional tanks and pumps are installed. Wages paid to non-local contractors and/or personnel benefit the regional economy through expenditures for supplies, lodging, fuel and other services.

Hiland currently employs more than 40 full-time operations positions and 12 full-time maintenance staff. In addition, environmental consultants and construction inspectors are and will continue to be employed during Project construction and restoration. North Dakota-based consulting firms were selected to assist with the site selection and permitting process. During

[1] U.S. Department of Energy, EIA webpage statistics, crude oil production by state, Retrieved July 23, 2013.
[2] N.D. Pipeline Authority, North Dakota Oil and Gas Research Council Presentation, Justin J. Kringstad, May 23, 2013

the months of preparation, construction, and testing, these workers have and will continue to have a significant positive economic impact (e.g., payroll tax, local expenditures, sales tax) on Williams, McKenzie, and Mountrail Counties.

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. "The Williston Basin: Greasing the Gears for Growth in North Dakota" was published by Bentek Energy, LLC under funding from the North Dakota Pipeline Authority, providing 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 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.[3] A report excerpt on crude oil alternatives is presented as Appendix A in Tab 2.

Letters were sent to County Auditors for McKenzie, Williams, and Mountrail Counties to gain information on planned developments within the vicinity of the Project. The Williams County Planning Director requested GIS Shapefiles of the Project, which were sent, but no comments have been received. An acknowledgement of the request was received by Mountrail County Auditor's office, but no further comments have been received. McKenzie County Planning and Zoning provided a list of permits throughout the county. No developments conflicting with the Project have been discovered as of the date of this application.

B.2 (h)(1) BakkenLink Pipeline (PSC Project PU-10-218)

BakkenLink Pipeline LLC has announced intentions and requested permission from the North Dakota PSC to construct and operate a pipeline from Beaver Lodge near Tioga, North Dakota to a rail terminal south of Fryburg, North Dakota as shown in Figure 3.B.1. This pipeline is currently under construction. BakkenLink has also announced its intent to construct a pipeline into Baker, Montana to tie into Keystone XL when and if Keystone XL is approved and constructed. This additional segment of BakkenLink is expected to have a capacity of 150,000 bpd. The timeline regarding this section is dependent upon the approval of Keystone XL.

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

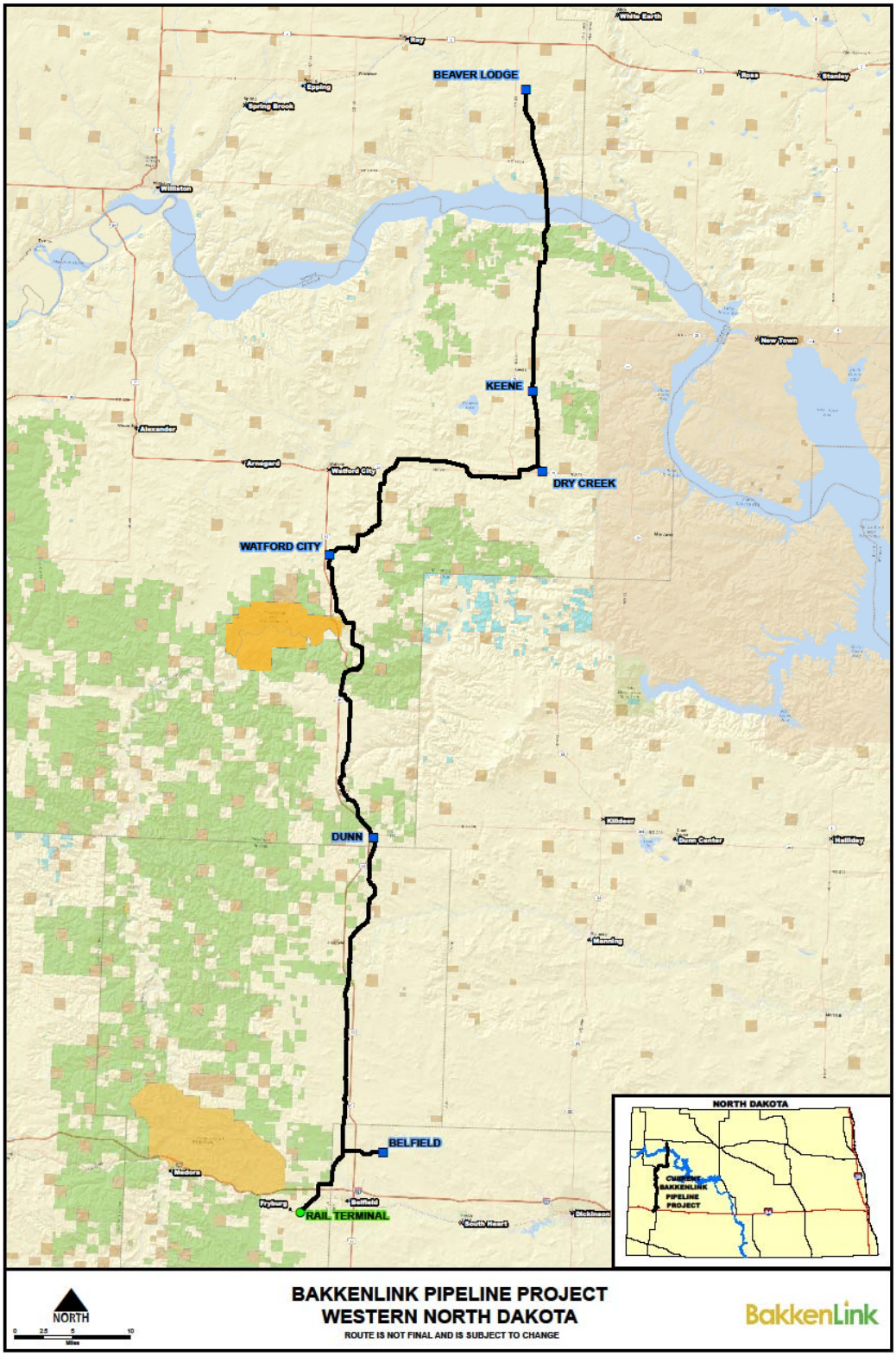


Figure 3.B.1 – BakkenLink Pipeline LLC Project Map[4]

B.2 (h)(2) Sandpiper Pipeline (PSC Project PU-13-187)

Enbridge Pipelines (North Dakota) LLC has announced its Sandpiper Pipeline crude oil project. This interstate crude oil pipeline, as currently proposed, would carry of Bakken crude oil from Beaver Lodge, North Dakota to an existing terminal in Superior, Wisconsin. This pipeline is expected to be completed in early 2016. Shown in Figure 3.B.2, the Sandpiper pipeline will generally follow Enbridge's existing pipelines and other utilities.

Current projections expect a 225,000 to 375,000 bpd capacity depending on shipper commitments. Final line diameter has not been announced. This project will provide capacity for both intrastate transports from Beaver Lodge south of Tioga to the eastern edge of the state, and ultimately export capacity to the Great Lake region refiners.

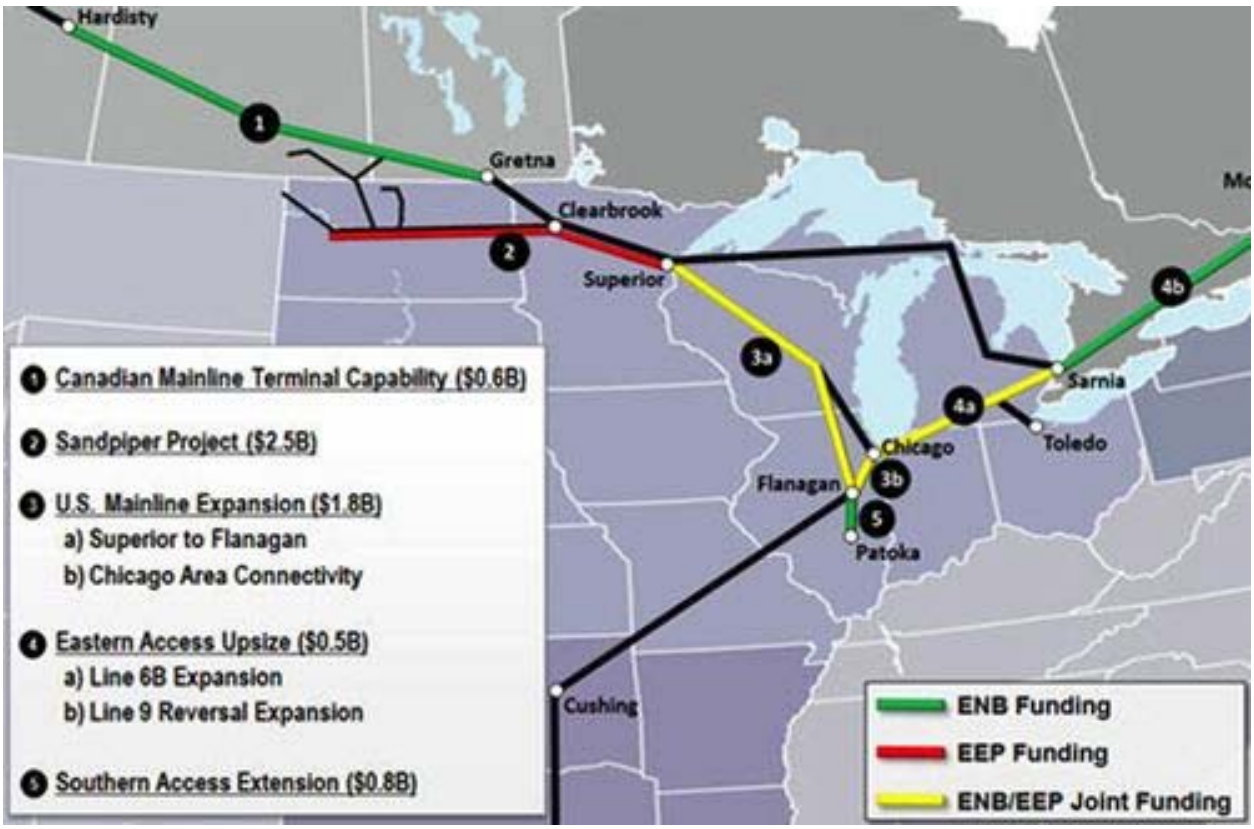


Figure 3.B.2 – Enbridge Sandpiper Pipeline Map[5]

[4] BakkenLink Pipeline LLC, "BakkenLink Project Map," available at: http://bakkenlink.whatisbold.com/data/upfiles/media/bakkenlink-project-map.pdf (accessed August 8, 2013).

[5] Bakken Shale, "Sandpiper Project Map – Enbridge," available at http://bakkenshale.com/wp-content/uploads/2012/12/Sandpiper-Project-Map-Enbridge.jpeg (accessed August 8, 2013).

B.2 (h)(3) Paradigm Midstream/Dakota Plains Holdings Pipeline

Paradigm Midstream and Dakota Plains Holdings, Inc. and joint-venture partner, Petroleum Transport Solutions, LLC have announced a pipeline project to export crude from McKenzie and Dunn counties. The proposed route runs from Johnson's Corner in McKenzie County and ties into Dakota Plain's Pioneer crude oil transloading facility at New Town. The pipeline will then run from the Pioneer facility to Enbridge's Stanley Station located in northern Mountrail County. Currently, no map of this project is publically available.

Connecting into Enbridge's Stanley Station offers connections to Enbridge's Berthold rail facility and additional pipeline export capacity downstream. This project is reliant upon Enbridge's Sandpiper project to support additional capacity brought into the Clearbrook, Minnesota market.

B.2 (h)(4) Sanish Pipeline (PSC Project PU-12-043)

Enbridge also has plans to construct the Sanish Pipeline. This project will consist of a new 12-inch mainline from Johnson's Corner in McKenzie County to Beaver Lodge Station near Tioga. They also propose to construct new 10-inch lateral pipelines to connect the Saddle Butte Facility and Arrow Pipeline Facility to the Sanish Pipeline. A tentative map of this pipeline is shown in Figure 3.B.3 Initial capacity is expected to be 67,000 bpd. This project is proposed to be in operation in early 2015 and would offer intrastate capacity in the same counties in North Dakota.

The Sanish pipeline project is synergistic with the Sandpiper project. These projects tie only into existing Enbridge connections. Enbridge is also now offering a rail option at the 80,000 bpd Berthold rail facility for this volume. Sandpiper would provide export access by pipeline to the Great Lake region refineries.

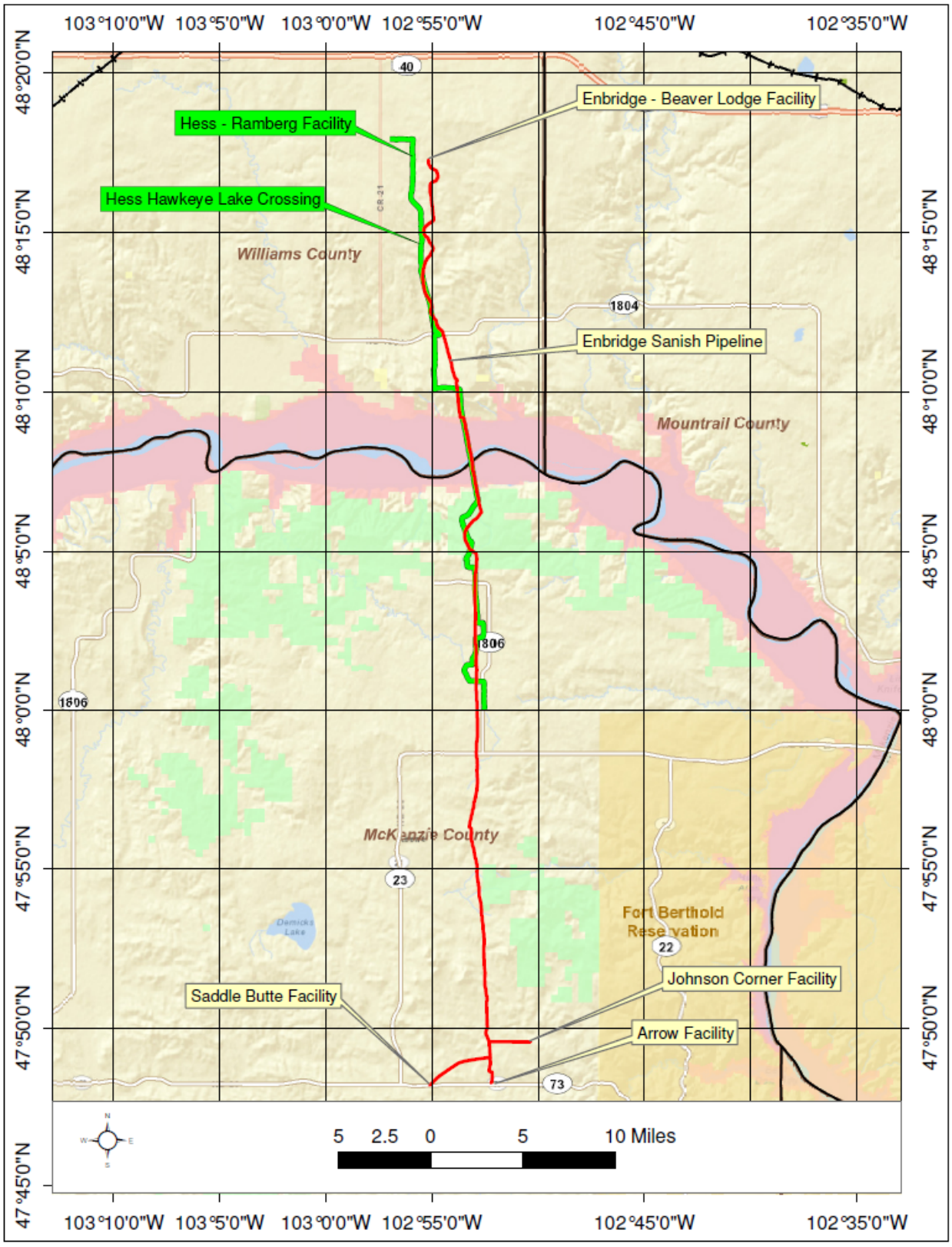
B.2 (h)(5) Hess Hawkeye Lake Crossing

Hess Corporation's Hawkeye Project is exploring repurposing an existing 8-inch high pressure gas pipeline under Lake Sakakawea to a crude oil pipeline for their proprietary use. Shown in Figure 3.B.3, this line will move crude produced south of the lake in McKenzie County to existing crude pipeline and rail export points north of the lake, including ties into the Enbridge system and/or rail shipment from Hess's Tioga rail system in Williams County. Operating up to 900 psig, estimated capacity of this line is 45,000 bpd. Start of operations is expected in mid-2014.

B.2 (h)(6) High Prairie Pipeline

Saddle Butte Pipeline, LLC, by and through its wholly-owned subsidiary High Prairie Pipeline, LLC, has capacity commitments from shippers to move crude oil by pipeline from Alexander, North Dakota east through the Thunder Buttes refinery at Makoti and on to the crude market hub in Clearbrook, Minnesota. A map of the proposed pipeline is shown in Figure 3.B.4. The pipeline would increase available capacity by 150,000 bpd.

High Prairie Pipeline's in-service date is undetermined at this time. Enbridge has refused an interconnection with the High Prairie Pipeline in Clearbrook, Minnesota. Legal action is in progress. The project timeline for this pipeline is uncertain.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47°45'0"N
Hess - Ramberg Facility
Hess Hawkeye Lake Crossing
Enbridge - Beaver Lodge Facility
Enbridge Sanish Pipeline
Williams County
Mountrail County
McKenzie County
Fort Berthold Reservation
Saddle Butte Facility
Johnson Corner Facility
Arrow Facility
40
1804
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23
22
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Figure 3.B.3 – Hess Hawkeye Lake Crossing and Enbridge Sanish Pipeline Map

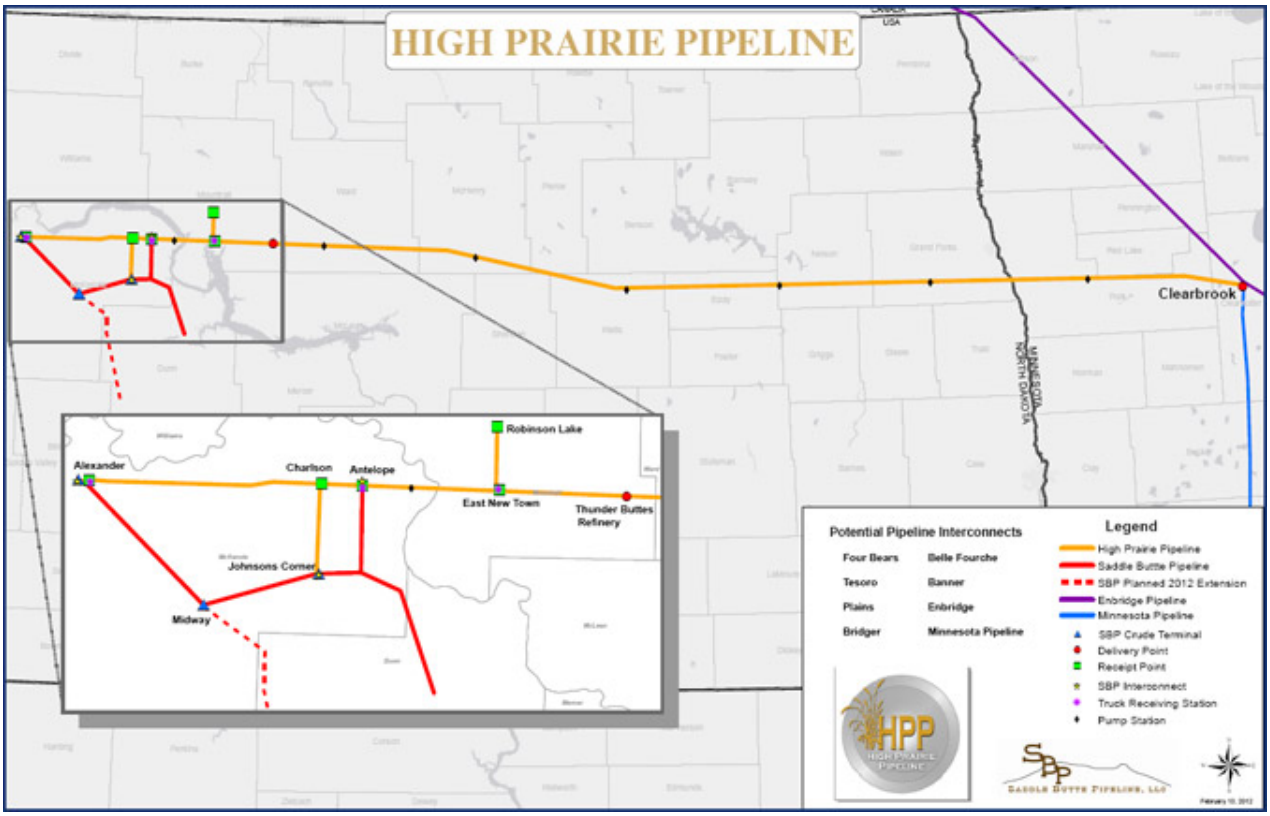


Figure 3.B.4 – High Prairie Pipeline Map[6]

Due to recent and continued crude oil volume expansion in the state, both the Project and the proposed projects by Enbridge Pipelines (North Dakota) LLC, BakkenLink Pipeline LLC, Hess Corporation, Paradigm Midstream and Dakota Plains Holdings, Inc., and Saddle Butte Pipeline, LLC 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.[7]

Hiland's proposed Market Center Pipeline varies from the above-mentioned proposed pipelines in the number of interconnects with different crude markets in the US. The above-mentioned markets primarily ship to the Clearbrook, Minnesota crude hub as well as rail-loading stations. Market Center has options to move crude to Clearbrook, Guernsey, Midcontinent/Cushing, and potentially and Gulf Coast markets should the Keystone XL Pipeline be constructed. Market Center also connects to multiple rail facilities for access to East, West and Gulf Coast markets.

[6] Saddle Butte Pipeline LLC, "High Prairie Pipeline," available at http://www.sbpipeline.com/images/map.jpg (accessed August 8, 2013).
[7] Berkshire Hathaway Inc., "Bakken Crude," available at http://seekingalpha.com/article/1042471-bakken-crude-buffetts-railroad-beats-oneoks-pipeline (accessed August 13, 2013).

Market Center can act as a balancing point for shippers to earn the best price for their North Dakota crude oil.

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 of Bismarck, North Dakota was engaged to review existing site file data maintained by the North Dakota State Historic Preservation Office (SHPO) to determine if any portion of the Project route was surveyed previously for cultural resources. The file search was performed in February 2013 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 May and September 2013. A report was issued in October 2013. The majority of the cultural field study corridor was 250 feet wide, for a total area of 7,441 acres inventoried for the proposed project; however, only 6,100 acres will be under review as a 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 A.

During the cultural resource inventory, 13 previously recorded sites, 54 newly recorded sites and three isolated finds were found during the field investigation. A total of 67 sites and three isolated finds are located in or near the 250-foot field study corridor. Eleven of these sites are inside an area of potential effect. There are 23 sites that Hiland completely avoided by a series of reroutes and as a result, they are no longer adjacent to or within an area of potential effect. The isolated finds are not eligible and no avoidance by the project is necessary.

Thirteen sites within the field study corridor were previously impacted by the original pipeline construction which did not require an archaeological inventory at the time of design and construction. Of these thirteen sites, two were previously recorded. The eastern side of site 32MZ1719 has been impacted by the existing pipeline. However, the site still retains integrity and is considered potentially eligible to the National Register of Historic Places (NRHP) and should be avoided in the future. Site 32WI104 is located in an agricultural field and was impacted by the construction of a well pad and is ineligible to the NRHP so no avoidance is necessary. The remaining 11 impacted sites identified and recorded during this project's cultural resource inventory were disturbed by the existing pipeline. For any future construction, they will be avoided by a series of reroutes, or by the narrowing of the construction ROW, and as a result will not be further impacted by the proposed project.

A buffer of 50 feet is recommended between the site boundaries and proposed construction activities. There are 20 sites where portions of the construction ROW narrow to a width of 50 feet to avoid sites. In areas where a site is near the already constructed pipeline portion, it is recommended that construction activities stay on the opposite side of the existing pipeline. In areas where there is pipeline disturbance through a site, it is recommended that future construction activities stay within the already disturbed corridor. Fencing along site buffer lines

in conjunction with site monitoring during construction would minimize any adverse effect to the sites.

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, Inc. 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 letter of concurrence with a finding of “no significant sites” was received from SHPO dated October 30, 2013.

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

The NDGFD, the USFWS, Crosby Wetland Management District, the North Dakota Parks and Recreation Department (NDPRD), and the US Army Corps of Engineers (USACE) were 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 provided a map of the route. USACE regulatory offices administer Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404). They requested applicable permits relating to Nationwide Permit 12, Section 10, or Section 404 be applied for and obtained from the USACE regulatory office for future construction. No new navigable river crossings are being proposed, nor any fill materials intended to be placed in jurisdictional waters. All other river crossings and wetlands were horizontally directionally drilled (HDD) and therefore USACE permits are not required.

The NDGFD does not believe the Project will have any significant adverse effects on wildlife or wildlife habitat, provided any wetland areas impacted by construction activities are mitigated and disturbed areas are reclaimed to pre-project conditions.

The USFWS was provided with an overview map of the route they reviewed. They responded that the agency does not provide comments on projects already complete. No further comments have been received.

The Crosby Wetland Management District was sent an overview of the project and no comments have been received.

The North Dakota Natural Heritage Inventory System maintained by the NDPRD was reviewed for Species of Concern that were 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. This information was incorporated into the field training and reference information used during the biological field survey conducted in May, June, July, August, and September of 2013. 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, June, July, August, and September of 2013: easter daisy (*Townsendia exscapa*). 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, June, July, August, and September of 2013: American bittern (*Botaurus* lentiginosus), American avocet (*Recurvirostra* Americana), bald eagle (*Haliaeetus* leucocephalus), black-tailed Prairie dog (*Cynomys ludovicianus*), black tern (*Chlidonias niger*), bobolink (*Dolichonyx oryzivorus*), canvasback (*Aythya valisineria*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk (*Buteo regalis*), golden eagle (Aquila *chrysaetos*), grasshopper sparrow (*Ammondramus savannarum*), great plains toad (*Bufo cognatus*), lark bunting (*Calamospiza melanocorys*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), northern leopard frog (*Rana pipiens*), northern pintail (*Anas acuta*), prairie falcon (*Falco mexicanus*), redhead (*Aythya americana*), sharp-tailed grouse (*Tympanuchus phasianellus),* short-eared owl (*Strix varia*), Swainson's hawk (*Buteo swainsoni*), upland sandpiper (*Bartramia longicauda*), and Wilson's phalarope (*Phalaropus tricolor*).

The following animal state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive were identified within the construction ROW: bobolink (*Dolichonyx oryzivorus*), grasshopper sparrow (*Ammondramus savannarum*), lark bunting (*Calamospiza melanocorys*), northern harrier (*Circus cyaneus*), northern leopard frog (*Rana pipiens*), northern pintail (*Anas acuta*), and sharp-tailed grouse (*Tympanuchus phasianellus*). 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 found within the construction ROW, Hiland's environmental consultants have concluded that the Project had 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, were 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 from June 2013 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 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. The addition of above ground facilities will occur adjacent to previously disturbed areas and in locations where no protected plant or animal habitats or culturally relevant features exist. Construction of the Project resulted 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 taken June 2013 as well as USGS Quadrangle Topographic Maps.

B.4 (a)(1) Exclusion Areas

Two types of Exclusion Area 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. The Minot Air Force Base was contacted twice in order to verify there was no interference with intercontinental ballistic missile (ICBM) launch or launch control facilities. Acknowledgements were received October 9, 2013, and January 9, 2013 from the base. No further comments have been received.

No Exclusion Areas will be impacted by the addition of mid-route stations.

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; 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, several raptor nests were identified within the 1-mile buffer zone suggested by the USFWS, however construction will only occur in those 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, one USFS Sensitive species is within the study corridor, but well outside any area of disturbance by construction activities. Although several sensitive animal species were found within the construction ROW, Hiland's environmental consultants believe these 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

Four types of Avoidance Areas were identified within the Project study corridor (see Table 3.B.3 below). Three Avoidance Areas were also crossed by the Project route. Two of these avoidance areas were unavoidable and measures taken to minimize impact are described further 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.

Twenty rural residences and/or farmhouses were identified within 500 feet of the Project including portions of the pipeline previously constructed. The residences do not encompass more than fifty percent of the width of the corridor in any location. Hiland worked with owners of the twenty affected residences to obtain waivers, pursuant to Section 49-22-05.1. Hiland was successful in obtaining waivers from all but five residences, neither of which is located within the construction ROW. The residences that did not provide waivers are located approximately 260 to 275 feet from the existing pipeline. Conversion of the existing pipeline from a gathering to a transmission pipeline will have no impact on operations near the five residences who failed to execute waivers.

No Avoidance Areas will be impacted by the addition of mid-route stations. The five above-mentioned residences are not located within 500 feet of new Project construction.

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	
Historical resources which are not specifically designated as exclusion or avoidance areas	Yes	Yes	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	19 residences are within 500 feet of the pipeline or its support structures. Waivers were obtained from all but two landowners.
Reservoirs and municipal water supplies	Yes	Yes	The Missouri River is the water source for multiple municipalities.
Water sources for organized rural water districts	Yes	Yes	The Missouri River is the water source for multiple municipalities.
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 was installed within a new ROW in Williams, McKenzie, and Mountrail Counties 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, and alfalfa.

Project construction did result in temporary effects on agricultural land use. Hiland instituted 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: common burdock (*Arctium minus*), houndstongue (*Cynoglossum officinale*), leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), absinth wormwood (*Artemisia absinthium*), and yellow toadflax (*Linaria vulgaris*).

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

Common Name	Scientific Name	State Status	Williams County Status	Mountrail County 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	Noxious	Displaces desirable plant communities, decreases grazing.
Common tansy	*Tanacetum vulgare*	Invasive		Noxious		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.

Common Name	Scientific Name	State Status	Williams County Status	Mountrail County Status	McKenzie County Status	Impact
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.
Wormwood: Absinth	*Artemisia absinthium*	Noxious				Reported to contaminate the milk produced by cattle. Species inhibits growth of desirable forage.

Hiland required that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the Project area. The addition of above-ground facilities will occur adjacent to previously disturbed areas. Hiland implemented, and will continue to implement during facility construction, the following mitigation measures when undesirable species were found within the construction ROW:

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

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

- Equipment and construction mats were cleaned immediately after passing through infested areas. Cleaning consisted of removing large soil clods and/or plant parts from the equipment and construction mats using shovels and brooms and, when necessary, washing the

equipment with water or cleaning using compressed air. Soil and water from cleaning activities were not allowed to flow to non-infested areas.

- Final seeding was initiated within 24 hours of final grading, so long as there were 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 was installed at a depth that exceeds the typical tillage depth. Following construction, agricultural lands were returned to pre-construction conditions to the extent reasonably practicable. Therefore, the pipeline did not interfere with normal agricultural operations on cropland after construction. Construction operations were conducted after the harvest season and prior to the growing season when feasible. Therefore, minimal disruption to agricultural production occurred.

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 resulted in minimal long-term loss of farmland use. Hiland consulted with landowners to place above-ground appurtenances in areas that cause the least amount of disturbance to landowner operations. The addition of mid-route station installation will cause a de minimus loss of farmland, as the new construction will be adjacent to previously disturbed areas. Landowners have been compensated by either long-term lease agreements or by the purchase of the land for these sites.

Approximately 3 percent (55 acres) of the 2078 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 did 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 does not alter the pattern of land ownership or create long-term disruptions of family farming operations. Easement payments are beneficial to landowners within the route and no significant interference with farming operations occurred. Equipment traversed only landowner-approved access routes to minimize disruption to soil, drainage, and crops. Hiland's crop loss compensation program compensated 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 worked to minimize construction interference. Temporary access across the ROW was provided to allow for livestock and farm equipment movement, as needed. Temporary fences and gates were constructed as necessary to prevent livestock from entering into the construction zone. The Project was constructed in a timely matter and, upon completion, fences, gates, and roads were restored to pre-construction conditions, to the extent reasonably practicable.

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

Pursuant to Section 69-06-08-012(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 did not alter surface drainage patterns. Streams, swales, ditches, and other natural drains were restored to pre-construction contours after construction was complete. The pipeline was installed beneath drainage ditches in a manner that will not interfere with flow or future maintenance efforts by landowners or the drainage authority. Drainage ditches were bored. Mitigation measures included the installation of the pipe at a sufficient depth to avoid being encountered by drain cleaning equipment. Existing and future above-ground facilities were and will be constructed in a manner that prevents alteration of surface drainage patterns.

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.[8,9]

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 groundwater of the Fox Hills and basal Hell Creek aquifer system, suitable for domestic, livestock, and industrial uses, generally moves northeastward and the gradient is about 3 ft/mi in McKenzie county.

The groundwater of the Ludlow Aquifer System, suitable for domestic and livestock uses, generally flows west to east in McKenzie County.

The Tongue River Aquifer system, which can be used for domestic and livestock, generally flows south to north in McKenzie County.

The Charbonneau, Tobacco Garden, 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. [10]

[8] 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, 57p.
[9] 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, p86.
[10] 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, 57p.

The Little Muddy, Ray, and Trenton Aquifers in Williams County vary in quality with types ranging from sodium bicarbonate to calcium magnesium sulfate. The Little Muddy and Ray aquifers generally flow southward in the Project area. The Trenton Aquifer generally flows northeast.[11]

The White Earth River Valley in Mountrail County has hard sodium sulfate and hard sodium bicarbonate. Recharge to the White Earth River Valley aquifer is generally from the undifferentiated Fort Union group and discharge is mainly by seepage into the White Earth River, which flows southward to the Missouri River.

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 have been encountered, therefore blasting has not been done, nor is it anticipated. Trenching may have temporarily disturbed the level of groundwater and increased 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 did 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

Nineteen 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 experienced short-term increases in construction-related noise. The heavy construction equipment needed to construct the Project generated short-term increases in ambient noise levels. Increases in ambient noise levels due to heavy equipment operation were 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. Mid-route stations are proposed to be added boost capacity. These mid-route stations may include a truck terminal, 50,000 gallon tank, and pump facility. Proposed station locations are McGregor Station, Tioga Terminal, White Earth Injection Station, Epping Injection Station, Bethel Injection Station, Trenton Station, Bainville Injection Station, Camp Creek Injection Station, Watford Injection Station, East Camp Creek Injection Station, and Johnsons Corner Station. Pump facilities are currently only planned at Tioga Terminal, Camp Creek

[11] Armstrong, C.A., 1969, Geology and Ground Water Resources Williams County, North Dakota: North Dakota Geological Survey Bulletin 48, Part III, and North Dakota State Water Conservation Commission County Ground Water Studies 9; 82p.

Injection Station, Watford Injection Station, East Camp Creek Injection Station, and Johnsons Corner Station.

Pumps will operate up to 3660 rpm and are electrically powered. No significant noise is expected.

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

Above-ground facilities that were constructed as part of the Project include mainline valves, line markers, cathodic protection equipment, and test stations. Mainline valves were sited at existing above-ground facility sites.

Mid-route stations will consist of truck terminal, 50,000 gallon tank, and/or pump facility. Other than these permanent above-ground facilities, the Project impacts to visual effects are limited to periods of 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. Efforts have been employed to avoid current or planned oil extraction facilities along the route.

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

Impacts to water bodies were avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. Efforts have been made and will continue to be made to restore all areas of disturbed wetland vegetation. No future above-ground facilities will be constructed in wetland areas.

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

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

Name	Length of Bore (ft)	Location	Trees Established
Williams County			
Drainage to White Earth Creek	300	S18 T159N R95W SENE	No
Drainage to Low Area Wetland	100	S32 T159N R95W SWNW	No
Drainage to Low Area Wetland	250	S32 T159N R95W SWSW	No
Drainage to Low Area Wetland	100	S5 T158N R95W SWNW	No
Drainage to Low Area Wetland	200	S5 T158N R95W NWSW	No
Drainage to Low Area Wetland	200	S17 T158N R95W NWNW	No
Low Area Wetland	700	S32 T158N R95W NWSW	No
Drainage to Paulson Creek	150	S11 T156N R96W SENE	No

Name	Length of Bore (ft)	Location	Trees Established
Drainage to Paulson Creek	100	S19 T156N R95W NWNW	No
Drainage to Dry Fork Creek	150	S29 T156N R95W NESW	No
Drainage to Dry Fork Creek	200	S32 T156N R95W SWNE	No
Drainage to Dry Fork Creek	100	S32 T156N R95W SESE	No
Drainage to Dry Fork Creek	100	S32 T156N R95W SESE	No
Drainage to Dry Fork Creek	200	S32 T156N R95W NESW	No
Drainage to Dry Fork Creek	250	S31 T156N R95W SESE	No
Beaver Creek	150	S5 T155N R96W SWNE	No
Drainage to Beaver Creek	300	S6 T155N R97W SENE	No
Drainage to Beaver Creek	150	S6 T155N R96W SENW	No
Drainage to Beaver Creek	250	S6 T155N R96W SWSW	No
Drainage to Nelson Creek	350	S2 T155N R97W SWSW	No
Stony Creek	350	S2 T155N R98W NWNW	Yes
Stony Creek	150	S3 T155N R98W NWNE	No
Un-Named Tributary to Stony Creek	100	S10 T155N R98W SWNW	No
Un-Named Tributary to Stony Creek	250	S8 T155N R98W SESE	No
Un-Named Tributary to Stony Creek	200	S8 T155N R98W SESE	No
Un-Named Tributary to Stony Creek	300	S8 T155N R98W SWSE	No
Un-Named Tributary to Stony Creek	200	S8 T155N R98W SESW	No
Un-Named Tributary to Stony Creek	300	S8 T155N R98W SWSW	No
Drainage to Stony Creek	400	S12 T155N R99W SWNE	No
Drainage to Stony Creek	100	S2 T155N R99W NWSE	No
Drainage to Epping Dam	300	S3 T155N R99W SWSW	No
Drainage to Stony Creek	200	S5 T155N R99W SWSE	No
Drainage to Stony Creek	500	S5 T155N R99W SWSE	No
Drainage to Stony Creek	200	S6 T155N R99W SESE	No
Drainage to Stony Creek	100	S6 T155N R99W SWSW	No
Un-Named Tributary to Stony Creek	100	S1 T155N R100W SWSW	No

Name	Length of Bore (ft)	Location	Trees Established
Un-Named Tributary to Little Muddy River	250	S2 T155N R100W NESW	No
Un-Named Tributary to Little Muddy River	250	S2 T155N R100W SWNW	No
Un-Named Tributary to Little Muddy River	150	S3 T155N R100W SENE	No
Un-Named Creek	150	S34 T156N R100W NESW	No
Drainage to Little Muddy River	200	S34 T156N R100W NWNW	No
Little Muddy River	350	S30 T156N R100W SESE	No
Drainage to Little Muddy River	500	S31 T156N R100W NWNE	No
Drainage to Cow Creek	200	S25 T156N R101W SWSW	No
Cow Creek	300	S27 T156N R101W SESW	No
Drainage to Cow Creek	200	S29 T156N R101W SWSE	No
Drainage to Cow Creek	200	S30 T156N R101W SESE	No
Un-Named Tributary to Cow Creek	250	S25 T156N R102W SWSE	No
Un-Named Tributary to Sand Creek	250	S35 T156N R102W SWSE	Yes
Un-Named Creek	200	S4 T155N R102W NENE	No
Sand Creek	200	S4 T155N R102W NENW	No
Drainage to Sand Creek	150	S4 T155N R102W NWNW	No
Un-Named Tributary to Painted Woods Creek	100	S5 T155N R102W NWSW	No
Un-Named Tributary to Painted Woods Creek	250	S7 T155N R102W NESE	No
Painted Woods Creek	300	S25 T155N R103W SWSW	No
Drainage to Painted Woods Creek	300	S11 T154N R103W SWSE	Yes
Painted Woods Creek	250	S27 T154N R102W SESE	No
Un-Named Tributary to Eight Mile Creek	150	S35 T154N R103W NWSE	No
Un-Named Tributary to Eight Mile Creek	100	S2 T153N R103W NENE	No
Un-Named Tributary to Eight Mile Creek	150	S2 T153N R103W SENE	No
Drainage to Eight Mile Creek	400	S31 T153N R102W NWSW	Yes
Drainage to Eight Mile Creek	350	S31 T153N R102W SESW	No
Drainage to Eight Mile Creek	250	S31 T153N R102W SESE	No
Drainage to Eight Mile Creek	200	S3 T152N R103W NENE	No

Name	Length of Bore (ft)	Location	Trees Established
Drainage to Eight Mile Creek	350	S2 T152N R103W NENE	No
Drainage to Missouri River	250	S1 T152N R103W NENE	No
Missouri River	2500	S6 T152N R102W	No
McKenzie County			
Un-Named Tributary to Missouri River	150	S18 T152N R102W SESW	Yes
Un-Named Tributary to Missouri River	500	S19 T125N R102W SESW	Yes
Yellowstone River	4000	S35 T152N R104W	Yes
Un-Named Tributary to Missouri River	350	S34 T152N R104W SWSW	Yes
Un-Named Tributary to Missouri River	200	S4 T151N R104W NWNE	No
Low Area Wetland	1500	S5 T151N R104W NESE	No
Four Mile Creek	200	S5 T151N R104W NWSE	No
Un-Named Tributary to Lonesome Creek	200	S4 T151N R102W SENW	No
Timber Creek	600	S9 T151N R101W NENE	No
Un-Named Tributary to Timber Creek	250	S1 T151N R101W SESW	Yes
Un-Named Tributary to Timber Creek	1000	S1 T151N R101W SESW	Yes
Un-Named Tributary to Timber Prong Creek	300	S11 T151N R99W NESE	No
Tobacco Garden Creek	100	S9 T151N R98W NESE	No
Tobacco Garden Creek	100	S10 T151N R98W NWSW	No
Un-Named Creek	1000	S10 T151N R97W NESE	No
Un-Named Tributary to NorthFork Creek	100	S16 T150N R96W SENE	No
Drainage to NorthFork Creek	400	S26 T150N R96W NENW	No
Drainage to NorthFork Creek	250	S26 T150N R96W NWNE	No
Drainage to NorthFork Creek	150	S26 T150N R96W NENE	No
Mountrail County			
Drainage to White Earth River	200	S33 T156N R94W NWSE	Yes
White Earth River	400	S34 T156N R94W SESE	No
Drainage to White Earth River	700	S36 T156N R94W NENE	No

Pipeline construction near water bodies was conducted in accordance with applicable regulatory requirements. No water body was permanently drained or filled as part of the Project, and

effects on water bodies were short-term and minor. Hiland restored the area as close to its previous state and naturally functioning condition as possible.

In unsaturated wetlands, topsoil was 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 have been temporarily affected due to the suspension of sediments and organic matter. Silt fence or straw bales were installed as needed to minimize this effect. Although wetland vegetation was cleared for pipeline construction, these areas were re-vegetated to their preconstruction structure and function. After the trench was backfilled, the topsoil was 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.

Future construction of above-ground facilities including mid-route stations will not impact wetlands.

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 pipeline crossed through wooded areas on rangeland and in wetland areas. Impacts to trees were avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. It may have been necessary to clear some mature trees during construction; however, Hiland did and will continue to work with the appropriate state agencies and private landowners to determine appropriate replacement measures following construction.

While a pre-construction tree count was not conducted, a North Dakota-based environmental consulting firm was engaged to estimate the number of trees likely impacted by the Project. In accordance with the Commission's Specifications, a desktop review of and field visits to the Project area were conducted in July, August and September 2013, to determine the number and species of tree in each potential area that was impacted. Only trees that are 1 inch in diameter at breast height or greater were inventoried.

Construction of mid-route facilities including storage tanks and/or pump facilities is not anticipated to require tree removal.

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 will occur 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 were exposed to short-term increases in construction-related noise and dust. The construction ROW and access roads near residential areas were watered down to control dust during construction in instances of excessive dust. After construction was completed, measures to stabilize and re-vegetate the ROW were taken promptly to prevent further dust emissions.

The heavy construction equipment needed to install the pipeline generated unavoidable short-term increases in ambient noise levels. Increases in ambient noise levels due to equipment operation were limited to the period of construction and were generally limited to daylight hours. No noise is generated by the pipeline during normal operations. Following installation, no additional significant noise is expected to be generated by the operation of mid-route stations during normal operations.

No residences or other occupied structures were or will be razed due to construction. Construction may have temporarily restricted access to residences along the pipeline route. When this was the case, Hiland either limited the time such restrictions were in place or made 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 are not 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 has constructed and will maintain the Project to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe utilized meets US DOT Pipeline and Hazardous Material Safety Administration (PHMSA) federal codes under 49 CFR Part 195 (referred to hereafter as PHMSA regulations), and construction methods followed 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 was inspected and integrity-tested at the factory and transported per the highest technical standards. All pipe was manufactured with fusion-bonded epoxy coating to protect against corrosion. The actual installation of the pipeline and all construction and testing records were subject to inspection. Although PHMSA does not conduct field inspections on rural, non-exempt 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.

The pipeline was 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 performed as near as possible to 100% X-ray inspections on girth-welded pipe. The percentage of welds inspected varied; however, the percentage of welds inspected never fell below the requisite 10%.

Over half of the pipeline's length was installed using Zap-Lok® connectors. The patented Zap-Lok® connection has been in continuous use for 30 years to join lengths of line pipe in the field on pipe from 2-inch nominal diameter up through 12-inch schedule 80, up to Grade X60 pipe.[12]

The Zap-Lok® process is a widely used alternative to field girth welding and is credited with offering pipe joints 140% specified minimum yield strength (SMYS) for pipe sizes at or below 10 inches in nominal diameter.[13] The Zap-Lok® connections involve a bell, or expanded area (what laymen would refer to as a socket) formed on one end of a stick of pipe and a groove formed on the opposite end. These end preparations are mechanically performed "cold" using hydraulically actuated equipment. Pipe sticks are joined together using a proprietary press, forcing a grooved end of one stick of pipe into the socket of the adjacent pipe using a thin coating of epoxy serving as a lubricant.

Additional inspections included 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 pipeline was placed into service only after inspection to verify compliance with all construction standards and requirements.

The pipeline is 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 the pipeline. 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, there have been 103 reported pipeline incidents, 44 involving crude oil on either gathering systems or transmission pipelines. During this time period, Hiland has had only one incident on its pipeline systems in North Dakota. On October 16, 2013, Hiland

[12] Alexander, C. et al, "Evaluating the Performance of the ZAP-LOK Connection System," Proceedings of IPC 2010 8th Int'l Pipeline Conference, IPC2010-31528, Sept. 2010.
[13] Zap-Lok® Website, available at http://zap-lok.businesscatalyst.com/overview.html (accessed November 8, 2013).

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.

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

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

Pipeline trenching activities and associated spoil piles resulted 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 were kept open, providing crossing access for wildlife. During construction, Hiland erected temporary fencing, as necessary, to keep livestock and wildlife away from the pipeline trench, and minimize the length of time the trench was left open.

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

All areas where vegetation was removed were re-vegetated in accordance with applicable county agency standards and landowner requests. There were no permanent impacts to vegetation. Special consideration was 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 were 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 was to avoid previously known plants, wildlife habitats, or cultural resources to avoid damage to these areas. All new facilities will be placed to avoid impact to identified sites.

The Project included the installation of an 8-inch nominal diameter pipeline with a nominal wall thickness of 0.188 inches denoted as API Code 5LX specification X52/X42 pipeline pipe. The MOP is 1440 pounds of pressure per square inch gauge (psig). The valves installed are 8-inch ANSI 600, flange end by flange end, full port, rising stem gate valves. These valves were manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." The MOP of the valve is 1440 psig.

The steel pipe installed meets US DOT criteria outlined in 49 CFR § 195.11. The Project was constructed per 49 CFR § 195.200, and is operated and maintained per 49 CFR § 195.400.

The Project is designed and 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, was 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 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 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. 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

Hiland does not believe that a Citizen Coordinating Committee is necessary for the Project, since the pipeline is 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 receives 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. The Project will provide the needed capacity to transport increased production of crude oil from the Bakken and Three Forks formations.

B.4 (c)(6) Labor Relations

The Project did not have any effect on labor relations within the State of North Dakota during construction of the original facilities. Several new large construction contractors have established operations in the state that will minimize adverse impacts to labor availability.

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

Existing Hiland crude pipelines and the new 8-inch line and their associated pumping, control and operating systems will be used in conjunction with each other to optimize system capacity. Shippers have already committed to using the new capacity, which will avoid potentially duplicating service.

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

Any construction-related impacts of the Project were 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 was performed to ensure restoration efforts were 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 inspection will continue to be conducted.

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

The Project was constructed in a new 75-foot wide temporary construction ROW. Hiland has acquired 50-foot permanent easements for the Project, as well as possible future pipeline installation. Typical ROW configuration is shown in Figure 3.B.5

Hiland has acquired either fee interests or easements for all sites for new tankage, loading and/or unloading areas and mid-route stations.

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

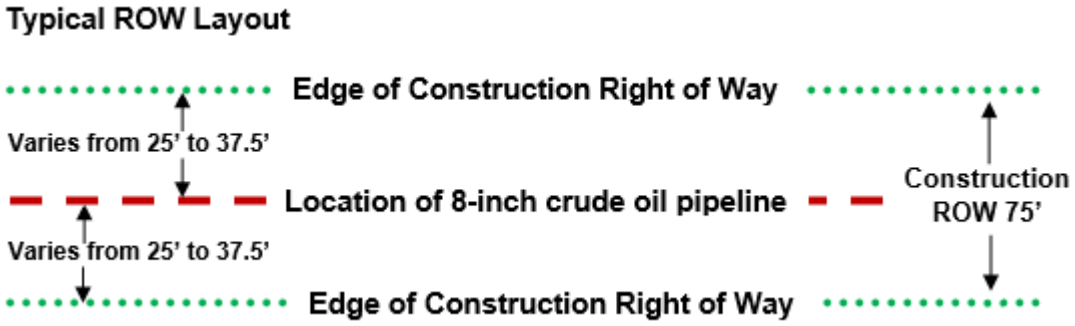


FIGURE 3.B.5 – Typical Right-of-Way Configuration

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 is expected to be operational by September 2014 and will transport crude from Dore, North Dakota to Guernsey, Wyoming.

Enbridge Pipelines' Sandpiper Pipeline crude oil project would carry Bakken crude oil from Beaver Lodge, North Dakota to an existing terminal in Superior, Wisconsin, with a mid-route connection to the Clearbrook, Minnesota crude hub. This pipeline is expected to be completed in early 2016. Current projections expect a 225,000 to 375,000 bpd capacity depending on shipper commitments. Final line diameter has not been announced. This project will provide capacity for both intrastate transports from Beaver Lodge south of Tioga to the eastern edge of the state, and ultimately export capacity to the Great Lake region refiners.

TransCanada's Keystone XL pipeline project is a proposed 1,179-mile 36-in 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. If an anticipated decision on the Presidential Permit occurs in 2013, the Keystone XL Pipeline would have a projected in-service date of 2015. The pipeline's

reported capacity is 830,000 barrels of oil per day to Gulf Coast and Midwest refineries.[14] 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 (see 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 (see 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 566 parcels of land owned by 251 different landowners. The route does not pass through parks or recreational areas. The Project route does pass within 500 feet of a nineteen residences. Hiland has obtained waivers from all but two residences, which are located approximately 260 to 275 feet from the existing pipeline.

The majority of the Project route is located on private land, and landowner concerns and routing preferences were 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 finalized easement agreements with all landowners along the route.

No municipal water supplies or production water wells were identified within the survey corridor. While a domestic water well does not meet the definition of a "municipal water supply" or a "water source for organized rural water districts," the following three domestic wells were identified within 500 feet of the route: 151-104-04 AAA; 152-104-24 CDC; 157-095-29 CCC.

Small portions of the Project are located on land under the jurisdiction of the State of North Dakota. However, no permanent population resides in this area.

The pipeline does transect two U.S. highways, US-2 and US-85, and two North Dakota highways, North Dakota-58 and North Dakota-23. Of the 32 county roads or highways crossed, all are improved county roads (i.e., gravel or asphalt). The pipeline crosses an additional 110 asphalt, gravel, or scoria roads. Improved roads were crossed via HDD. Through traffic was not disrupted during the boring process. Forty-two two-track vegetated trails were open cut. The open cut trails were temporarily disrupted during the Project.

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

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

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

TABLE 3.B.6 – Project Road Crossings

Legal Description	Coordinates	Road Name	Description of Road
Williams County			
South Section 7 T159N R95W	48° 36' 15.67" N 103° 00' 6.74" W	82nd St. NW	Two Track Vegetation
West Section 17 T159N R95W	48° 35' 52.69" N 102° 59' 41.57" W	County RD 21 (107th Ave NW)	Gravel Road
South Section 17 T159N R95W	48° 35' 23.69" N 102° 59' 39.37" W	81st St. NW	Asphalt Paved
South Section 29 T159N R95W	48° 33' 39.24" N 102° 59' 39.09" W	79th St. NW	Gravel Road
Section 5 T158N R95W NWNW	48° 32' 39.39" N 102° 59' 36.42" W	Un-Named Road	Scoria
West Section 5 T158N R95W	48° 31' 54.75" N 102° 59' 41.04" W	107th St. NW	Gravel Road
North Section 7 T158N R95W	48° 31' 54.75" N 102° 59' 41.04" W	77th St. NW	Gravel Road
Section 7 T158N R95W SENE	48° 31' 28.55" N 102° 59' 42.96" W	Un-Named Road	Scoria
West Section 8 T158N R95W	48° 31' 5.32" N 102° 59' 40.89" W	County Road 21	Gravel
South Section 8 T158N R95W	48° 31' 2.65" N 102° 59' 39.49" W	76th St. NW	Gravel
South Section 17 T158N R95W	48° 30' 10.48" N 102° 59' 39.51" W	County Road 12	Gravel
Section 20 T158N R95W NWNW	48° 30' 4.89" N 102° 59' 39.32" W	Private Road	Gravel
South Section 20 T158N R95W	48° 29' 18.26" N 102° 59' 39.07" W	74th St. NW	Gravel
Section 29 T158N R95W NWNW	48° 29' 14.79" N 102° 59' 39.04" W	Un-Named Road	Scoria
South Section 29 T158N R95W	48° 28' 26.24" N 102° 59' 30.86" W	73rd Ave. NW	Gravel
Section 32 T158N R95W	48° 28' 0.21" N 102° 59' 30.37" W	Un-Named Road	Two Track Vegetation
South Section 32 T158N R95W	48° 27' 34.06" N 102° 59' 20.51" W	72nd St. NW	Gravel
South Section 5 T157N R95W	48° 26' 41.86" N 102° 59' 13.80" W	71st St. NW	Gravel
South Section 8 T157N R95W	48° 25' 49.73" N 102° 59' 20.60" W	70th St. NW	Gravel
North Section 19 T157N R95W	48° 24' 57.57" N 102° 59' 39.91" W	69th St. NW	Gravel
West Section 17 T157N R95W	48° 24' 57.57" N 102° 59' 39.91" W	County Road 21	Gravel
South Section 19 T157N R95W	48° 24' 5.44" N 102° 59' 41.20" W	County Road 10	Gravel
Section 30 T157N R95W NENE	48° 23' 54.83" N 102° 59' 41.14" W	Un-Named Road	Scoria
Section 30 T157N R95W NENE	48° 23' 53.07" N 102° 59' 41.00" W	Railroad Crossing	No Road
South Section 30 T157N R95W	48° 23' 13.28" N 102° 59' 41.20" W	67th St. NW	Gravel

Legal Description	Coordinates	Road Name	Description of Road
Section 31 T157N R95W SESE	48° 22' 23.28" N 102° 59' 40.83" W	Un-Named Road	Scoria
Section 2 T156N R96W	48° 21' 49.47" N 102° 59' 23.73" W	Un-Named Road	Two Track Vegetation
South Section 2 T156N R96W	48° 21' 23.14" N 102° 59' 6.03" W	65th St. NW	Gravel
West Section 12 T156N R96W	48° 21' 0.53" N 102° 58' 44.11" W	106th Ave. NW	Gravel
South Section 12 T156N R96W	48° 20' 30.61' N 102° 58' 1.24" W	Highway 2 (64th St. NW)	Asphalt
East Section 13 T156 R96W	48° 19' 38.93" N 102° 57' 26.09" W	105th Ave NW	Asphalt
North Section 19 T156N R95W	48° 19' 39.93" N 102° 57' 26.09" W	63rd St. NW	Gravel
West Section 29 T156 R95W	48° 18' 46.87" N 102° 56' 11.91" W	104th Ave. NW	Gravel
South Section 19 T156N R95W	48° 18' 46.09" N 102° 56' 11.91" W	62nd St. NW	Gravel
South Section 29 T156 R95W	48° 17' 54.68" N 102° 55' 33.11" W	61st St. NW	Two Track Vegetation
Section 32 T156N R95W NESW	48° 17' 17.37" N 102° 55' 50.64" W	Un-Named Road	Scoria
West Section 32 T156 R95W	48° 17' 19.54' N 102° 56' 11.66" W	104th Ave. NW	Gravel
Section 31 T156N R95W SESE	48° 17' 13.59" N 102° 56' 19.38" W	Private Road	Two Track Vegetation
South Section 31 T156 R95W	48° 17' 2.72" N 102° 56' 23.95" W	County Road 8	Gravel
Section 6 T155N R95W	48° 16' 36.51" N 102° 56' 25.09" W	Un-Named Road	Two Track Vegetation
West Section 6 T155N R95W	48° 16' 30.75" N 102° 57' 26.56" W	105th Ave. NW	Gravel
West Section 1 T155N R96W	48° 16' 36.58' N 102° 58' 44.52" W	106th Ave. NW	Gravel
Section 2 T155N R96W SENE	48° 16' 43.10" N 102° 59' 0.49" W	Un-Named Road	Scoria
West Section 4 T155N R96W	48° 16' 38.89" N 103° 02' 38.11" W	County Highway 19	Gravel
West Section 6 T155N R96W	48° 16' 16.18" N 103° 05' 14.38" W	111th Ave. NW	No Road
West Section 1 T155N R97W	48° 16' 12.19" N 103° 06' 32.13" W	112th Ave. NW	Gravel
South Section 2 T155N R97W	48° 16' 11.28' N 103° 6' 47.20" W	County Road 17	Gravel
North Section 11 T155N R97W	48° 16' 11.33' N 103° 7' 31.43" W	County Road 17	Gravel
West Section 3 T155N R97W	48° 16' 12.32" N 103° 9' 8.26" W	114th Ave. NW	Gravel
West Section 5 T155N R97W	48° 16' 17.77" N 103° 11' 44.17" W	116th Ave. NW	Gravel
West Section 6 T155N R97W	48° 16' 58.26" N 103° 12' 59.23" W	117th Ave. NW	Gravel
West Section 1 T155N R98W	48° 16' 56.59" N 103° 14' 17.20" W	118th Ave. NW	Gravel
West Section 2 T155N R98W	48° 16' 56.77 N 103° 15' 35.25" W	County Road 15	Gravel

Legal Description	Coordinates	Road Name	Description of Road
South Section 3 T155N R98W	48° 16' 12.43" N 103° 16' 34.54" W	59th St. NW	Two Track Vegetation
West Section 10 T155N R98W	48° 15' 27.85" N 103° 16' 53.28" W	120th Ave. NW	Gravel
Section 12 T155N R99W	48° 16' 10.92" N 103° 21' 21.65" W	County Highway 42	Asphalt
Section 4 T155N R99W NWSW	48° 16' 30.98" N 103° 25' 40.03" W	Railroad Crossing	No Road
Section 5 T155N R99W SESE	48° 16' 18.83 N 103° 26' 4.81" W	127th Ave. NW	Two Track Vegetation
West Section 5 T155N R99W	48° 16' 14.63" N 103° 27' 12.56" W	128th Ave. NW	Two Track Vegetation
West Section 6 T155N R99W	48° 16' 14.85" N 103° 28' 28.89" W	Country Road 11	Gravel
North Section 3 T155N R100W	48° 17' 4.47" N 103° 31' 46.41" W	County Road 8	Gravel
Section 28 T156N R100W	48° 18' 8.47" N 103° 32' 32.97" W	61st St. NW	Two Track Vegetation
West Section 33 T156N R100W	48° 17' 15.46" N 103° 33' 41.22" W	County Highway 9	Gravel
Section 29 T156N R100W SWSW	48° 18' 5.27" N 103° 34' 46.99" W	61st St. NW	Two Track Vegetation
Section 31 T156N R100W SWNE	48° 17' 42.55" N 103° 36' 11.09" W	Un-Named Road	Two Track Vegetation
West Section 30 T156N R100W	48° 17' 57.24" N 103° 36' 14.56" W	135th Ave. NW	Two Track Vegetation
West Section 36 T156N R101W	48° 17' 55.58" N 103° 37' 31.83" W	Highway 2	Asphalt
Section 27 T156N R101W SESE	48° 18' 5.01" N 103° 38' 53.36" W	137th Ave. NW	Two Track Vegetation
Section 28 T156N R101W SWSE	48° 17' 57.90" N 103° 40' 37.39" W	Private Road	Gravel
Section 29 T156N R101W SESW	48° 17' 57.75" N 103° 42' 14.33" W	140th Ave. NW	Gravel
West Section 30 T156N R101W	48° 18' 8.94" N 103° 44' .62" W	County Road 7	Gravel
South Section 25 T156N R102W	48° 17' 57.37" N 103° 44' 47.22" W	County Highway 68	Gravel
West Section 36 T156N R102W	48° 17' 5.89" N 103° 45' 18.81" W	142nd Ave. NW	Two Track Vegetation
Section 35 T156N R102W SESE	48° 17' 5.94" N 103° 45' 34.89" W	60th St. NW	Two Track Vegetation
Section 35 T156N R102W SWSE	48° 17' 5.99" N 103° 45' 38.49" W	60th St. NW	Two Track Vegetation
South Section 35 T156N R102W	48° 17' 5.34" N 103° 46' 4.53" W	60th St. NW	Two Track Vegetation
West Section 2 T155N R 102W	48° 17' 4.10" N 103° 46' 37.04" W	143rd Ave. NW	Two Track Vegetation
West Section 4 T155N R 102W	48° 16' 59.4" N 103° 49' 13.25" W	County Highway 1	Gravel
West Section 5 T155N R 102W	48° 16' 29.71" N 103° 50' 30.97" W	146th Ave. NW	Two Track Vegetation
South Section 6 T155N R 102W	48° 16' 12.80" N 103° 50' 33.11" W	59th St. NW	Gravel
South Section 7 T155N R 102W	48° 15' 20.74" N 103° 51' 15.90" W	58th St. NW	Gravel

Legal Description	Coordinates	Road Name	Description of Road
South Section 24 T155N R 103W	48° 13' 36.50" N 103° 51' 49.40" W	County Highway 6	Gravel
West Section 25 T155N R103W	48° 12' 45.37" N 103° 53' 5.80" W	County Highway 1A	Gravel
South Section 26 T155N R103W	48° 12' 45.37" N 103° 53' 5.80" W	55th St. NW	Two Track Vegetation
South Section 35 T155N R103W	48° 11' 53.09" N 103° 53' 34.7" W	54th St. NW	Gravel
South Section 2 T154N R103W	48° 11' 0.77" N 103° 53' 30.64" W	53rd St. NW	Two Track Vegetation
South Section 11 T154N R103W	48° 10' 8.77" N 103° 53' 23.61" W	52nd St. NW	Gravel
East Section 14 T154N R103W	48° 09' 43.01" N 103° 53' 4.76" W	County Highway 1A	Gravel
Section 13 T154N R103W SWSW	48° 09' 16.71" N 103° 53' 4.77" W	County Highway 1A and 51st St. NW	Gravel
Section 23 T154N R103W NESE	48° 8' 43.30" N 103° 53' 10.72" W	Un-Named Road	Two Track Vegetation
South Section 23 T154M R103W	48° 08' 25.22" N 103° 53' 24.52" W	Highway 2	Asphalt
East Section 26 T154M R103W	48° 08' 3.71" N 103° 53' 4.67" W	148th Ave. NW	Gravel
Section 30 T154N R102W NESW	48° 07' 52.95" N 103° 51' 27.78" W	Un-Named Road	Gravel
East Section 29 T154M R102W	48° 07' 45.63" N 103° 49' 11.46" W	145th Ave. NW	Scoria
East Section 27 T154M R102W	48° 07' 43.14" N 103° 46' 36.66" W	143rd Ave. NW	Asphalt
South Section 26 T154M R102W	48° 07' 32.43' N 103° 46' 20.66" W	49th St. NW	Gravel
South Section 24 T153N R103W	48° 03' 12.51" N 103° 53' 3.19" W	County Highway 2	Gravel
Section 25 T153N R103W SESW	48° 02' 26.17" N 103° 52' 43.78" W	143rd Ave. NW	Asphalt
Section 25 T153N R103WSESW	48° 02' 24.50" N 103° 52' 43.32" W	Railroad Tracks	No Road
East Section 36 T153N R103W	48° 01' 41.98" N 103° 51' 46.88" W	147th Ave. NW	Gravel
Section 31 T153N R102W SESW	48° 01' 30.02" N 103° 51' 21.85" W	Un-Named Road	Gravel
Section 31 T153N R102W SWSE	48° 01' 29.92' N 103° 50' 56.46" W	Private Road	Gravel
South Section 31 T153N R102W	48° 01' 28.08" N 103° 50' 31.45" W	42nd St. NW	Gravel
Section 2 T152N R103W NWNW	48° 01' 26.33" N 103° 50' 13.52" W	Un-Named Road	Two Track Vegetation
East Section 2 T152N R103W	48° 01' 7.62" N 103° 49' 7.33" W	145th Ave. NW	Gravel
Section 1 T152N R103W NENE	48° 01' 26.57" N 103° 48' 3.59" W	144th Ave. NW	Gravel
Section 6 T152N R102W NWNW	48° 01' 17.40" N 103° 47' 48.79" W	Un-Named Road	Scoria
Section 32 T156N R95W NESE	48° 17' 22" N 102° 54' 54" W	103rd Ave. NW	Gravel
Section 33 T156N R95W NESE	48° 17' 17" N 102° 53' 36" W	County Highway 23	Gravel

Legal Description	Coordinates	Road Name	Description of Road
Section 34 T156N R95W SESE	48° 17’ 15” N 102° 52’ 18” W	102B Ave. NW	Gravel
Section 35 T156N R95W NESE	48° 17’ 19” N 102° 50’ 60” W	102A Ave. NW	Gravel
Section 36 T156N R95W NESE	48° 17’ 21” N 102° 49’ 42” W	102nd Ave. NW	Gravel
McKenzie County			
Section 19 T152N R102W NENW	47° 58’ 32.79” N 103° 47’ 26.62” W	Un-Named Road	Two Track Vegetation
Section 30 T152N R102W NWSE	47° 57’ 15.77” N 103° 47’ 12.44” W	Un-Named Road	Gravel
Section 31 T152N R102W SWSE	47° 56’ 6.43” N 103° 47’ 2.67” W	36th St. NW	Scoria
Section 6 T151N R102W NESW	47° 55’ 29.10” N 103° 47’ 30.48” W	Un-Named Road	Two Track Vegetation
West Section 6 T151N R102W	47° 55’ 29.54” N 103° 47’ 50.04” W	Un-Named Road	Two Track Vegetation
Section 2 T151N R103W	47° 55’ 37.55” N 103° 49’ 27.15” W	Un-Named Road	Two Track Vegetation
West Section 2 T151N R103W	47° 55’ 57.88” N 103° 50’ 25.12” W	152nd Ave. NW	Gravel
Section 3 T151N R103W NENE	47° 56’ 2.70” N 103° 50’ 34.84” W	Private Road	Scoria
Section 3 T151N R103W NENW	47° 56’ 5.03” N 103° 51’ 13.43” W	Private Road	Two Track Vegetation
West Section 3 T151N R103W	47° 56’ 5.23” N 103° 51’ 42.44” W	153rd Ave. NW	Gravel
Section 4 T151N R103W NENW	47° 56’ 4.88” N 103° 52’ 23.58” W	Private Road	Gravel
West Section 4 T151N R103W	47° 56’ 2.49” N 103° 53’ 0.05” W	154th Ave. NW	Gravel
North Section 5 T151N R103W	47° 56’ 6.12” N 103° 53’ 36.91” W	36th St. NW	Gravel
West Section 32 T152N R103W	47° 56’ 10.18” N 103° 54’ 17.40” W	155th Ave. NW	Gravel
Section 31 T152N R103W NWSE	47° 56’ 20.13” N 103° 54’ 54.75” W	Un-Named Road	Gravel
Section 36 T152N R104W SESW	47° 56’ 16.98” N 103° 56’ 12.39” W	Un-Named Road	Gravel
West Section 36 T152N R104W	47° 56’ 6.89” N 103° 56’ 50.29” W	County Road 7 and 157th Ave. NW	Gravel
West Section 35 T152N R104W	47° 56’ 7.54” N 103° 58’ 7.94” W	Un-Named Road	Gravel
Section 34 T152N R104W	47° 56’ 7.87” N 103° 58’ 46.65” W	Un-Named Road	Gravel
Section 34 T152N R104W SESW	47° 56’ 7.15” N 103° 59’ 3.30” W	Private Road	Gravel
West Section 34 T152N R104W	47° 56’ 7.31” N 103° 59’ 25.47” W	Un-Named Road	Scoria
Section 33 T152N R104W	47° 56’ 7.29” N 103° 59’ 44.75” W	Un-Named Road	Two Track Vegetation
South Section 33 T152N R104W	47° 56’ 6.10” N 103° 59’ 54.44” W	Un-Named Road	Gravel
Section 4 T151N R104W	47° 56’ 0.89” N 104° 0’ 4.61” W	Un-Named Road	Two Track Vegetation
Section 4 T151N R104W	47° 55’ 53” N 104° 0’ 20.28” W	Un-Named Road	Gravel

Legal Description	Coordinates	Road Name	Description of Road
Section 4 T151N R104W SWNW	47° 55' 45.52" N 104°0' 33.49" W	Un-Named Road	Gravel
Section 5 T151N R104W NESE	47° 55' 38.89" N 104° 01' 0.30" W	Un-Named Road	Two Track Vegetation
Section 5 T151N R104W NWSE	47° 55' 39.31" N 104° 01' 17.10" W	Un-Named Road	Two Track Vegetation
Section 5 T151N R104W NESW	47° 55' 38.33" N 104° 01' 34.45" W	Un-Named Road	Two Track Vegetation
Section 5 T151N R104N NWSW	47° 55' 38.00" N 104° 01' 48.37" W	Un-Named Road	Two Track Vegetation
South Section 5 T151N R104W	47° 55' 14.26" N 104° 01' 48.49" W	Un-Named Road	Gravel
Section 8 T151N R104W NWNW	47° 55' 9.82" N 104° 01' 51.86" W	Highway 58	Asphalt
East Section 6 T151N R102W	47° 55' 28.29" N 103° 46' 35.41" W	149th Ave. NW	Scoria
East Section 5 T151N R102W	47° 55' 37.96" N 103° 45' 17.84" W	148th Ave. NW	Asphalt
East Section 4 T151N R102W	47° 55' 40.45" N 103° 44' 0.27" W	147th Ave. NW	Gravel
East Section 3 T151N R102W	47° 55' 18.45" N 103° 42' 42.77" W	146th Ave. NW	Gravel
East Section 12 T151N R102W	47° 54' 58.12" N 103° 40' 7.78" W	144th Ave. NW	Gravel
East Section 7 T151N R101W	47° 55' 2.00" N 103° 38' 53.08" W	Highway 85	Asphalt
East Section 8 T151N R101W	47° 55' 13.30" N 103° 37' 35.50" W	Un-Named Road	Two Track Vegetation
North Section 11 T151N R101W	47° 55' 14.57" N 103° 33' 48.23" W	35th St. NW	Gravel
East Section 11 T151N R101W	47° 55' 15.53" N 103° 33' 43.02" W	139th Ave. NW	Gravel
Section 1 T151N R101W SESW	47° 55' 15.09" N 103° 33' 12.98" W	Private Road	Two Track Vegetation
South Section 1 T151N R101W	47° 55' 14.60" N 103° 32' 40.89" W	35th St. NW	Scoria
East Section 7 T151N R100W	47° 54' 21.90" N 103° 31' 10.47" W	137th Ave. NW	Gravel
Section 17 T151N R100W SENW	47° 54' 2.28" N 103° 30' 33.05" W	Un-Named Road	Two Track Vegetation
Section 17 T151N R100W SWNE	47° 54' 6.15" N 103° 29' 53.00" W	Un-Named Road	Scoria
Section 16 T151N R100W SWNW	47° 54' 1.28" N 103° 29' 45.72" W	Un-Named Road	Scoria
South Section 15 T151N R100W	47° 53' 29.82" N 103° 28' 26.41" W	County Road 29	Gravel
East Section 14 T151N R100W	47° 53' 51.67" N 103° 26' 0.68" W	133rd Ave. NW	Two Track Vegetation
East Section 13 T151N R100W	47° 53' 36.30" N 103° 24' 43.28" W	132nd Ave. NW	Scoria
East Section 18 T151N R99W	47° 53' 54.07" N 103° 23' 26.80" W	131st Ave. NW	Gravel
East Section 9 T151N R99W	47° 55' 6.70" N 103° 20' 51.89" W	129th Ave. NW	Gravel
Section 7 T151N R98W SESE	47° 54' 28.19" N 103° 15' 52.71" W	County Road 36	Gravel

Legal Description	Coordinates	Road Name	Description of Road
East Section 8 T151N R98W	47° 54' 34.67" N 103° 14' 27.32" W	Un-Named Road	Two Track Vegetation
East Section 10 T151N R98W	47° 54' 33.92" N 103° 11' 52.43" W	1806	Gravel
East Section 11 T151N R98W	47° 54' 20.38" N 103° 10' 34.82" W	34th St. NW and 121st Ave. NW	Gravel
Section 12 T151N R98W	47° 54' 27.34" N 103° 09' 36.87" W	Un-Named Road	Gravel
Section 7 T151N R97W	47° 54' 32.99" N 103° 08' 40.30" W	Private Road	Two Track Vegetation
Section 8 T151N R97W SWNW	47° 54' 56.04" N 103° 07' 55.56" W	Un-Named Road	Gravel
North Section 15 T151N R97W	47° 54' 19.43" N 103° 04' 29.72" W	Un-Named Road	Scoria
South Section 11 T151N R97W	47° 54' 19.56" N 103° 03' 33.00" W	County Road 12	Gravel
East Section 23 T151N R97W	47° 52' 48.60" N 103° 02' 52.17" W	115th Ave. NW	Gravel
South Section 24 T151N R97W	47° 52' 34.85" N 103° 02' 12.58" W	Un-Named Road	Scoria
South Section 30 T151N R96W	47° 51' 43.25" N 103° 01' 0.67" W	31st St. NW	No Road
East Section 31 T151N R96W	47° 51' 16.15" N 103° 0' 21.19" W	113th Ave. NW	Gravel
South Section 32 T151N R96W	47° 50' 50.77" N 102° 59' 47.18" W	Un-Named Road	Two Track Vegetation
South Section 9 T150N R96W	47° 49' 6.90" N 102° 57' 47.50" W	28th St. NW	Gravel
Section 16 T150N R96W SESE	47° 48' 19.59" N 102° 57' 49.35" W	Un-Named Road	Scoria
South Section 16 T150N R96W	47° 48' 14.87" N 102° 57' 49.33" W	Highway 23	Asphalt
Section 21 T150N R96W	47° 48' 1.34" N 102° 57' 48.31" W	Un-Named Road	Scoria
Section 21 T150N R96W SESE	47° 47' 30.12" N 102° 58' 0.22" W	Un-Named Road	Scoria
East Section 27 T150N R96W	47° 47' 21.36" N 102° 56' 29.16" W	110th Ave. NW	Asphalt
Mountrail County			
Section 31 T156N R94W NESE	48° 17' 22" N 102° 48' 26" W	101St Ave. NW	Gravel
Section 32 T156N R94W NESE	48° 17' 24" N 102° 47' 08" W	Un-Named Road	Scoria
Section 33 T156N R94W NESE	48° 17' 18" N 102° 45' 50" W	Un-Named Road	Scoria
Section 3 T155N R94W NENW	48° 16' 59" N 102° 45' 10" W	Un-Named Road	Scoria
Section 31 T156N R93W NENW	48° 17' 44" N 102° 41' 18" W	Private Road	Gravel

B.4 (g) Terrain and Geology

The pipeline route is 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 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 geology including Coleharbor Formation, Tongue River Formation, Sentinel Butte Formation, Bullion Creek Formation, and Golden Valley Formation. Bedrock is exposed along the major drainages and their tributaries in Williams and McKenzie Counties as far south as the limit of glaciations.[15]

South of this limit, bedrock forms the surface material. Only the formations above the Cannonball Formation are exposed at the surface in Mountrail County.[16] 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 of 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 1900 feet to 2400 feet.

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

[15] 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.
[16] Clayton, Lee, 1972, Geology of Mountrail County North Dakota, North Dakota Geological Survey Bulletin 55-IV, North Dakota State Water Commission County Ground Water Study 14-IV.

identified in the Project area, according to the U.S.G.S. Geologic Hazards Science Center.[17] 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.

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.[18]

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 majority of the Project area is located in low landslide risk terrain. However, the Project route crosses areas that have moderate landslide susceptibility, yet historically low incidence. A small segment along the Williams Mountrail border is located in moderate susceptibility and low incidence and another relatively small segment has low landslide incidence. Potentially unstable soils and/or geologic formations with higher landslide susceptibility is present at the Missouri River crossing and along the western edge of Mountrail County. Figure 3.B.6 shows the landslide risk of the Project.

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 of the mines (open and closed) within 15 miles of the Project route are open pit, the concern for subsidence is minimal. [19]

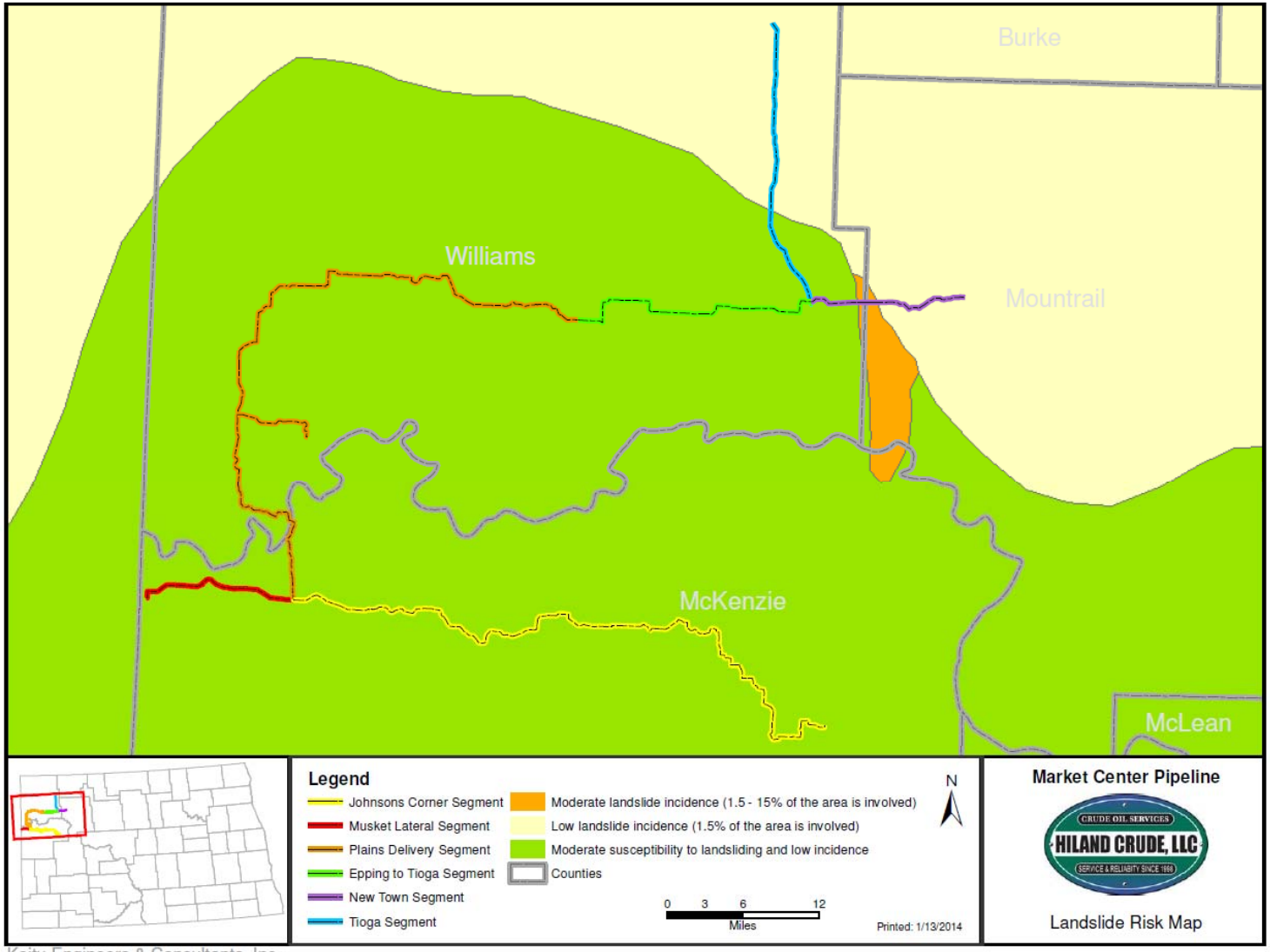
Flooding

[17] U.S.G.S. Geologic Hazards Science Center, available at http://earthquake.usgs.gov/hazards/qfaults.

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

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

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 very minimal. However, control of erosion through periodic inspections and repair to soil cover if erosion occurs will further reduce the risk.



Keitu Engineers & Consultants, Inc.

FIGURE 3.B.6 – Project Landslide Risk[20]

[20] U.S. Geological Survey Professional Paper 1183. "USA Landslide Susceptibility". U.S. Geological Survey. Accessed via ArcGIS Online.

B.4 (h) Soils

Detailed soil characteristics along the pipeline route were 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, NRCS 1995). The SSURGO database was used to define soil characteristics along the pipeline route in Williams, McKenzie, and Mountrail Counties. 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 Central Dark Brown Glaciated Plains (Major Land Resource Area 53B), Rolling Soft Shale Plain (Major Land Resource Area 54), and the Northern Rolling High Plains, Northeastern Part (Major Land Resource Area 58C). All of these belong to the Northern Great Plains Spring Wheat Region.

The Project area lies within the Glaciated Missouri Plateau Section of the Great Plains physiographic Province.

The soils in the Project area range from having course to fine loamy and fine silty 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 Appam, Banks, Beisigl, Dooley, Flasher, Glendive, Lihen, Livona, Manning, Parshall, Tally, Telfer, Trembles, Vebar, Velva, and Wabek soils. Certain soils have a relatively high content of lime. They are primarily the Cabba, Chama, Cherry, Havrelon, Korchea, Lonna, Maschetah, 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 Grano, Heil, Hoffmanville, Lallie, Lawther, Lohler, Moreau, Nutley, Scorio, Wayden, and Wildrose 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 Beisigl, Cabba, Cabbart, Chama, Cherry, Dogtooth, Flasher, Janesburg, Lonna, Vebar, Williams, 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 (55 acres of the 2078 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	685	2 (0.3)	140 (20)	179 (26)	517 (76)
Williams	1007	53 (5)	661 (66)	94 (9)	212 (21)
Mountrail	77	0 (--)	0.2 (0)	61.7 (80)	55.8 (72)
Total Project Acres	1769	55 (3)	801.2 (45)	334.7 (19)	784.8 (44)

[a]Acreage is based on a 75-foot wide construction right-of-way 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	685	95 (14)	71 (10)	23 (3)	475 (69)	345 (50)	121 (18)	110 (16)	53 (8)	69 (10)
Williams	1007	18 (2)	2 (0.2)	0 (--)	987 (98)	716 (71)	188 (19)	64 (6)	17 (2)	20 (2)
Mountrail	77	0(--)	0(--)	0(--)	77 (100)	43.7 (57)	18.9 (25)	2.4 (3)	1.6 (2)	10.4 (14)
Total Project Acres	1769	113 (6)	73(4)	23(1)	1539 (87)	1104.7 (62)	327.9 (19)	176.4 (10)	71.6 (4)	99.4 (6)

[a]Acreage is based on a 75-foot wide construction right-of-way 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 was 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 were to become 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 was removed to a maximum depth of 12 inches from the trench and spoil storage area unless otherwise requested by the landowner. Topsoil was stored separately from the trench spoil and will be returned to its approximate original location after the trench is backfilled.

Project construction caused temporary removal of vegetation and resulted in temporary exposure of soil. These actions may have resulted in some minor temporary erosion. Re-vegetation of disturbed areas, with native species, mitigates these concerns.

Heavy equipment used to construct the pipeline may have caused soil compaction along the right-of-way. Soils are 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, 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 was collected with Trimble Juno 5B and GeoXH 2008 and 6000 Series Global Positioning System handhelds and photographs were 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 have been 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 197-mile-long Project route in McKenzie, Mountrail, and Williams Counties during May, June, July, August, and September of 2013. 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*), Japanese brome (*Bromus japonicas*), Kentucky bluegrass (*Poa pratensis*), little bluestem (*Schizachyrium scoparium*), needle-and-thread (*Hesperostipa comate*), sideoats grama (*Bouteloua curtipedula*), smooth brome (*Bromus inermis*), threadleaf sedge (*Carex filifolia*) and western wheatgrass (*Pascopyrum smithii*) were primarily found in the project area habitats. Common forbs within the project area include alfalfa (*Medicago sativa*), American licorice (*Glycyrrhiza lepidota*), blue

lettuce (*Lactuca tatarica*), common dandelion (*Taraxacum officinale*), common sunflower (*Helianthus annuus*), common yarrow (*Achillea millefolium*), curlycup gumweed (*Grindelia squarrosa*), field sagewort (*Artemesia campestris*), fringed sagewort (*Artemesia frigid*), goatsbeard (*Tragopogon porrifolius*), goldenrods (*Solidago spp.*), hairy-golden aster (*Heterotheca villoa*), Indian breadroot (*Pediomelum aromaticum*), milkweeds (*Asclepias spp.*), moss phlox (*Phlox subulata*), plains pricklypear cactus (*Opuntia polyacantha*), prairie crocus (*Anemone patens*), prairie rose (*Rosa arkansana*), purple coneflower (*Echinacea angustifolia*), Russian thistle (*Salsola tragus*), silver sagebrush (*Artemisia cana*), silverleaf scurfpea (*Psorlea argophylla*), and yellow sweetclover (*Melilotus indicus*).

Plant communities established in wetlands include common cattail (*Typha latifolia*), creeping spikerush (*Eleocharis fallax*), curly dock (*Rumex crispus*), scouring rush (*Equisetum hyemale*), prairie cordgrass (*Spartina pectinata*), and reed canarygrass (*Phalaris arundinacea*).

The following state-listed species of concern were identified during the biological field survey conducted in the study corridor in May, June, July, August, and September of 2013: easter daisy (*Townsendia exscapa*). 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 was the removal of vegetation in the ROW during construction activity.

In areas that required re-vegetation, Hiland specified 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 197-mile Project route in McKenzie, Mountrail, and Williams Counties during May, June, July, August, and September of 2013. 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 13-lined ground squirrel (*Spermophilus tridecemlineatus*), coyote (*Canis latrans*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), porcupine (*Erethizon dorsatum*), white-tailed deer (*Odocoileus virginianus*), white-tailed jackrabbits (*Lepus townsendii*), songbirds, migratory waterfowl, and raptors.

The following state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive species were identified during the biological field survey conducted in the study corridor in May, June, July, August, and September of 2013: American bittern (*Botaurus* lentiginosus), American avocet (*Recurvirostra* Americana), bald eagle (*Haliaeetus* leucocephalus), black-tailed prairie dog (*Cynomys ludovicianus*), black tern (*Chlidonias niger*), canvasback (*Aythya valisineria*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk (*Buteo regalis*), golden eagle (Aquila *chrysaetos*), great plains toad (*Bufo cognatus*), loggerhead shrike (*Lanius ludovicianus*), northern pintail (*Anas acuta*), prairie falcon (*Falco mexicanus*), redhead (*Aythya americana*), short-eared owl (*Strix varia*), smooth green snake (*Liochlorophis vernalis*), Sprague's pipit (*Anthus spragueii*), Swainson's hawk (*Buteo swainsoni*), upland sandpiper (*Bartramia*

longicauda), and Wilson's phalarope (*Phalaropus tricolor*). The following state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive were identified within the construction ROW; American white pelican (*Pelecanus erythrohynchos*), bobolink (*Dolichonyx oryzivorus*), grasshopper sparrow (*Ammondramus savannarum*), lark bunting (*Calamospiza melanocorys*), marbled godwit (*Limosa fedoa*), northern harrier (*Circus cyaneus*), northern leopard frog (*Rana pipiens*), Richardson's ground squirrel (*Spermophilus richardsonii*), sharp-tailed grouse (*Tympanuchus phasianellus*), and willet (*Catoptrophorus semipalmatus*). 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 Project has had no significant effects on the State Sensitive Species for North Dakota. Based on the size of the Project, and route locations, the Project's effect on habitat 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, Mountrail, and Williams Counties 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, USFS Sensitive, 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), ferruginous hawk (*Buteo regalis*), golden eagle (Aquila *chrysaetos*), Northern harrier (*Circus cyaneus*), and Swainson's hawk (*Buteo swainsoni*).

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. A total of forty-four raptor nests were observed during the aerial survey, comprised of thirty-eight potential (i.e., empty) raptor nests, four occupied great horned owl (*Bubo virginianus*) nests, and two occupied red-tailed hawk (*Buteo jamaicensis*) nests. Two Northern harrier (*Circus cyaneus*) ground nests were observed during the summer ground surveys, one of which contained four eggs. While it is impossible to say with certainty that eagles will not occupy the recorded empty nests, based on the size of the discovered unoccupied nests it would be improbable. 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, and alfalfa. The Project resulted in temporary impacts to agricultural land use. Landowners were compensated for crop loss or reduced yields caused by construction of the Project. No permanent crop loss occurred. Deep tillage was implemented as necessary to mitigate effects of soil compaction.

The Project route runs in the vicinity of, and sometimes adjacent to, existing oil well sites. 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 were 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-Ground Water

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 percent of the state's total area. With respect to the ground water used in the basin, 69 percent is used for irrigation, 14 percent is used for livestock, 7 percent is used for industrial, 6 percent is used for municipal, 3 percent is used for rural domestic, and 1 percent is used for rural water systems/other.[21]

Groundwater in North Dakota occurs within bedrock or unconsolidated deposits. Bedrock aquifers underlie the glacial drift aquifers (aquifers in unconsolidated deposits). There are 10 Aquifer systems within the Project area that contain 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 aquifer of the Late Cretaceous Age is Fox Hills and basal Hell Creek aquifer system (bedrock aquifer) and its suitable uses include domestic, livestock, and industrial. The

[21] 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.

McKenzie County groundwater resource study found it generally 1100 to 1800 feet below land surface with a transmissivity from 200 to 300 feet squared per day. The median dissolved solids concentration is about 1325 milligrams per liter. Estimated yield from this aquifer system is 100 gallons per minute and the water type is Sodium bicarbonate. The Mountrail County ground water study found the top of the aquifer ranging from about 1450 to 2100 feet below land surface. The Fox Hills-Hell Creek aquifer would yield small quantities of water to wells in most of Burke and Mountrail Counties and data is not sufficient to determine transmissivity in the counties.

The aquifers of Tertiary Age include the Ludlow Aquifer System and Tongue River Aquifer System (bedrock aquifers). The Ludlow Aquifer System can be used for domestic and livestock. It underlies all of McKenzie County at depths of more than 500 feet and depths between 822 and 990 feet in Mountrail County. The Ludlow Formation does not crop out in Williams County and was not been identified as a separate unit in the county's study. The median dissolved solids concentration is about 1750 milligrams per liter. Estimated yield from this aquifer system is 25 gallons per minute and the water type is Sodium bicarbonate.

The Tongue River aquifer system underlies all of McKenzie County at a depth between 140 to 500 feet in most areas. Williams and Mountrail County studies do not differentiate between Tongue River and Sentinel Butte Formations. This aquifer is used for domestic and livestock. The median dissolved solids concentration is about 1830 milligrams per liter. The estimated yield from this aquifer is 25 gallons per minute and the water type is Sodium Bicarbonate. The Mountrail County study does note that Tongue River and Sentinel Butte Formations vary greatly in thickness. Most sand beds are less than 10 feet thick, but thicknesses exceeding 100 feet do occur. Sand units that are as thick as 100 feet may have transmissivities as high as 5,000 gpd per foot. Most sand lenses are thin and the transmissivity is low indicating that the aquifer transmissivity is less than 700 gpd per foot.

The glacial drift aquifers within the project area of the Quaternary age include the Charbonneau, Tobacco Garden, and Yellowstone Missouri Aquifers in McKenzie County and the Little Muddy, Ray, and Trenton Aquifers in Williams County and the New Town and White Earth River valley aquifers in Mountrail County.

The Charbonneau, Tobacco Garden, 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. The median dissolved solids concentration range from about 947 to 1100 milligrams per liter. Estimated yield from these aquifers ranges from 100 gallons per minute in the Charbonneau Aquifer to 500 gallons per minute in the Tobacco Garden and Yellowstone Missouri Aquifers. The water types in these aquifers are Sodium bicarbonate.

The Little Muddy, Ray, and Trenton Aquifers in Williams County vary in quality with types ranging from sodium bicarbonate to calcium magnesium sulfate. The dissolved solids range from 900 ppm in the very hard sodium or magnesium bicarbonate type of the Little Muddy Aquifer to over 3000 ppm in the sodium sulfate type of the Trenton Aquifer. Estimated yields from these aquifers range from 50 to more than 500 gallons per minute.

Most of the groundwater information came from County Ground Water Studies. [22,23,24] 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)
Charbonneau	24	33	1.4	100	11	$NaHCO_3$	288	1100	315.0
Little Muddy (Yellowstone Buried Channel)	200	120	0.7	500	8	$NaHCO_3$ or $Mg(HCO_3)_2$	1200	900	405.0
Ray	100	125	0.7	1000	4	Ca $MgSO_4$	2000	Generally exceed 1350	1273.0
Tobacco Garden	23	44	1.5	500	15	$NaHCO_3$	3740	947	1056.5
Trenton	41	50	2.2	500	3	Varies from Na_2SO_4 to Ca $NaHCO_3$	1700	Over 3000	167.9
White Earth River Valley	20	14	2.3	350	20	Na_2SO_4	2200	2870	0.0
Yellowstone-Missouri	55	20	2.8	500	1	$NaHCO_3$	1496	1100	0.0
Fox Hills and basal Hell Creek		1100 - 2100		100		$NaHCO_3$		1325 – 1530 (mg/L)	
Ludlow		500 - 990		25		$NaHCO_3$		1750 (mg/L)	
Tongue River		140 - 800		25 – 50		$NaHCO_3$		1830 (mg/L)	

* 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.

[22] 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, 57p.
[23] Armstrong, C.A., 1969, Geology and Ground Water Resources Williams County, North Dakota: North Dakota Geological Survey Bulletin 48, Part III, and North Dakota State Water Conservation Commission County Ground Water Studies 9; 82p.
[24] 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; p86.

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**
Charbonneau	6	2	0	2	12	0	0
Little Muddy	27	11	1	10	54	0	16
Yellowstone Buried Chanel	25	1	0	0	5	0	16
Ray	22	9	6	2	3	0	4
Tobacco Garden Creek	16	5	4	3	4	0	2
Trenton	31	4	1	9	0	4	4
White Earth River Valley	(no data)						
Yellowstone-Missouri	0	0	0	3	1	0	0
Bedrock Aquifers:							
McKenzie, Williams, and Mountrail total Counties combined:							
Fox Hills	38	61	0	6	0	4	15
Hell Creek	0	3	0	0	0	0	0
Tongue River	7	11	0	3	0	0	6
Sentinel Butte-Tongue River	132	78	3	14	0	0	9
Dakota Group	0	0	0	0	0	0	1
Fort Union	61	22	5	2	3	4	19

* 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 was conducted in accordance with applicable regulatory requirements. No creek was permanently drained or filled as part of the Project, and effects on creeks were short-term and minor. Hiland restored 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 US Corps of Engineers waters of concern within North Dakota 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 were bored, which eliminated the risk of wetland impact during construction and also eliminated the need for mitigation. No wetland impacts occurred 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 does not significantly affect water use patterns. Following construction, drains, swales, and flowages were restored to pre-construction conditions to the extent practicable to minimize disruption of water resources.

The Project required temporary appropriations of water for use in the hydrostatic testing of the newly installed pipeline. The majority of the water used for hydrostatic testing is purchased from freshwater wells and transported to testing sites. Additionally, some temporary trench dewatering may have been 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 had 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

Construction-related effects on surface waters were 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 was restored to pre-construction conditions, area runoff following construction generally reflects surrounding land use.

Hiland obtained 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 implemented measures to minimize off-site erosion from site storm water runoff. These practices protected surface water and soil resources within the Project area. Hiland's EMP was included in the construction specifications for the Project and enforced by one or more environmentally trained construction inspectors during construction. Similar measures will be taken during future construction of above-ground facilities where appropriate.

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

During construction, point source wastewater discharge was generated from hydrostatically testing the new pipeline prior to placing it in service. Discharges also occurred 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 obtained 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 was 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 was purchased from freshwater wells. The NPDES permit specifies that discharge water must be free from process and other wastewater discharge.

No discharges to surface waters are anticipated to occur during future construction.

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

Motorized construction equipment utilized for the Project is powered by gasoline- or diesel-fueled engines. Fuel for construction vehicles was and 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 were and will continue to 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 prior or future 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.

Hiland minimizes noise and dust resulting from construction near residences to the maximum extent practicable.

Hiland obtained applicable permits for road crossings from Williams, McKenzie and Mountrail Counties. Hiland also obtained permission from all owners of private roads, including oil lease roads, to cross said roads. Temporary signs were posted at each crossing as appropriate to alert motorists of construction activity. Gravel roads were bored, minimizing interference with traffic flow caused by construction activities. No road crossings will occur with respect to the above-ground facilities to be installed in the future.

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

Hiland restored the area affected by pipeline construction to pre-construction condition. Restoration was compatible with the safe operation, maintenance, and inspection of the Project.

The construction area was restored to pre-construction contours. Measures such as slope breakers, erosion control blankets and re-vegetation were employed to maintain the stability of slopes along the ROW. No crown of backfill material was left over the trench in wetlands.

Fuel and all other hazardous materials were, and will continue to 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 were not, and will not be, stored within 100 feet of surface water.

B.6 (c) Measures to Protect Soils

Hiland implemented temporary and permanent erosion control measures as specified in the EMP (Tab 5 and Tab 6). The EMP was included in contract documents and enforced throughout construction. These measures will continue to be taken during all future Project construction activities.

Temporary erosion and sedimentation control measures 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 was segregated during trench excavation in agricultural land, unsaturated wetlands, and other areas where soil productivity is an important consideration. Topsoil in cropland was 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 was backfilled, topsoil was returned to its approximate original

location. Compaction of agricultural soils was minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of compaction could have occurred in agricultural lands, deep tillage equipment was utilized to loosen the soil to the extent reasonably practicable.

Hiland retained 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 cleared 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 effectively controlled or limited the spread of invasive plant species through control treatments and avoidance of existing populations where possible. Treatments were initiated prior to pipeline construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment are conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

In areas that required permanent re-vegetation, Hiland specified 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 was allowed to re-vegetate after construction depending on arrangements with the landowner.

Over the next three years, Hiland will continue to work to re-establish vegetation consistent with prior cover types in each area. Hiland will similarly re-vegetate any areas affected by future construction.

Hiland took appropriate precautions to protect livestock and crops during construction. These same measures are expected to be implemented during any future Project construction activities. Operation of the Project, including the pipeline and associated mid-route stations, has not and is not anticipated to, significantly affect terrestrial wildlife, fisheries resources, or other aquatic species. Shelter belts and trees were protected and restored by Hiland to the extent practicable in a manner compatible with the safe operation, maintenance, and inspection of the Project.

B.6 (e) Measures to Protect Land Use

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

Hiland repaired surface drains disturbed during ROW preparation, construction, and maintenance activities. Hiland repaired private roads and farm lanes damaged when moving equipment or when obtaining access to the ROW. Hiland repaired or replaced fences and gates

removed or damaged as a result of ROW preparation, construction or maintenance activities. Hiland will similarly repair any such items removed or damaged during future construction.

The Project pipeline was 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 were and will be avoided by Hiland to the extent possible in a manner compatible with the safe operation, maintenance, and inspection of the Project. Construction of mid-route facilities including storage tanks and/or pump facilities is not anticipated to require tree removal.

B.6 (f) Measures to Protect Water Resources

Hiland's EMP describes best management practices that were 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 were permitted without written approval from Hiland, in accordance with the applicable permits. Construction inspectors with environmental training monitored compliance with permits. Where appropriate, water was discharged into an energy dissipation and/or filtering device to remove sediment and to reduce the erosive energy of the discharge.

Future construction is not anticipated to affect water resources.

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.1a through Figure 4.B.61a.

An "Unanticipated Discovery Plan" has been developed should unexpected artifacts be uncovered during future Project construction. The plan has been sent and approved by the SHPO. Beaver Creek Archaeology recommends that the "Unanticipated Discovery Plan" approved by the SHPO be used during any future construction phase of the project.

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 regulation 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: 1.5 years' experience in engineering, regulatory affairs and compliance.

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

(4) Karine Becker, Specialist – Biology & GIS – Keitu Engineers & Consultants, Inc.

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

Experience: 4 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) Michael Pederson, Staff Consultant – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science Natural Resource Mgmt Minor: Zoology/Range Science
North Dakota State University

Experience: 8 years' experience in field technical services and regulatory affairs

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

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

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

Experience: 1.5 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

(7) Josh Swann, Field Technician – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Arts Ecology and Evolutionary Biology
University of Colorado - Boulder

Experience: 1 year experience in field technical services and regulatory affairs

Other Training: GIS, Groundwater Monitoring and Sampling, 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 the 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 followed 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.

Most of the line is Zap-Lok® pipe hydraulically coupled and hydrostatically tested according to PHMSA guidelines.

In areas where Zap-Lok® connections are used, the major steps of ROW preparation, pipeline construction are almost identical, with the changes associated with steps 8 & 9 and the elimination of step 11 x-ray inspection and weld repair. The installation process typically consists of: (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; (9) hydraulically coupling the bell end of one stick of pipe to the pin-end of the adjacent pipe; (10) as built footage; (11) coating pipe connections and coating inspection; (12) trenching; (13) lowering pipe into trench; (14) as-built survey; (15) pad, backfill to rough grade; (16) hydrostatic testing and system tie-in; (17) clean-up; and (18) restoration and re-vegetation.

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

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

B.9 (a)(2) Clearing

Hiland cleared the 75-foot-wide ROW of shrubs and trees. The clearing crew typically mowed, chipped, mulched and/or hauled off all non-merchantable timber. Burning of non-merchantable wood was allowed when the contractor had obtained the necessary permits and approvals. No merchantable timber was cleared from ROW.

B.9 (a)(3) Grading

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

B.9 (a)(4) Topsoil Stripping

Topsoil was 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 was also stripped from the trench areas. Topsoil was stripped to the depth of cultivation or a depth of 12 inches, whichever was greater.

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

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

B.9 (a)(6) Pipe Stringing

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

B.9 (a)(7) Pipe Bending

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

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

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

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

Final welds were 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 was complete, Hiland compared the as-built condition and length of the pipeline with construction drawings. Documents were 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. Hiland engaged a third-party inspection service provider meeting PHMSA certification requirements to perform X-ray inspections of nearly 100% of the welds. After adequate performance had been established based on statistically significant data, and each of the Project's welders had demonstrated proper weld material handling, a reduction in the percentage of welds inspected was considered; however, the percentage of welds inspected never fell below the requisite 10%. When welds were deemed inadequate, appropriate repairs were made consistent with PHMSA regulations and re-inspected. Inspection records were cross-referenced against the final "as-built" footage of the pipeline.

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

The pipe was delivered with a factory coating of fusion-bonded epoxy or similar material to prevent corrosion. Hiland applied coating at welded joints and electronically inspected the pipeline coating before the pipe was lowered into the trench.

B.9 (a)(13) Trenching

Backhoes and/or ditching machines were 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 were generally kept vertical to the extent practicable and the trenches were typically 30 to 40 inches wide.

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

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

After welding and coating were completed and the trench was excavated, the pipe was lowered into the trench by side-boom tractors.

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

A survey of the final location of the pipeline was made.

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

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

Construction debris, including wooden supports, welding rods, containers, brush, trees, or refuse of any kind, was not permitted in the backfill. If an excessive amount of rocks was present in the backfill, the pipeline was 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 tested the pipe pneumatically in accordance with the PHMSA regulations to ensure that the system was capable of operating at the design pressure. The testing process involved 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 involved 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 was removed from the ROW. Fences that were removed to install the pipeline were reconstructed.

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

Following installation and final cleanup of the Project construction area, original grade and contours were restored to the extent practicable and temporary and permanent erosion controls were installed. Disturbed areas are in the process of being 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 finalized easement agreements with all landowners along the Project route. Construction occurred after the harvest and prior to the planting season when feasible, minimizing impacts to agriculture.

A brief description of the pipeline was mailed to affected landowners and known tenant farmers. Hiland is committed to giving landowners complete information about the pipeline 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. In addition to landowners, all known tenant farmers in the construction area were notified prior to pipeline construction. A list of landowners and tenants is provided in Tab 4, Appendix 4.C.

B.9 (c) Operations and Safety

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

Although not required by regulation Hiland maintains remote monitoring and control of the system. 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 of the pipeline or associated storage or pumping equipment and/or pipeline failures.

The Project was also 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 conducts 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.

Storage tanks are periodically removed from service, cleaned and internally inspected for evidence of unexpected corrosion or damage. Repairs are performed as 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. The PHMSA routinely inspects written procedures, records, and facilities. The majority of the pipeline system is rural and exempt. To date, there have been no PHSMA inspections on non-exempt portions. In addition, inspection by weekly aerial line flights are used by Hiland as a BMP.

B.9 (c)(5) Maintenance

Many other maintenance activities are and will continue to 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, and emergency and leak containment procedures and engaging the services of area contract spill responders. SPCC plans were 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 was submitted and approved by PHMSA as required by 49 CFR Part 194.