Hawkeye Pipeline System Project
Draft Environmental Assessment

Cooperating Agencies:

U.S. Forest Service **U.S. Army Corps of Engineers** **U.S. Fish and Wildlife Service**

US Army Corps of Engineers ®
Geotechnical and Structures Laboratory

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BLM

Bureau of Land Management, North Dakota Field Office, Dickinson, North Dakota

BLM Mission Statement

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific, and cultural values.

Abbreviations and Acronyms

$\mu g/m^3$	micrograms per cubic meter
AAQS	Ambient Air Quality Standards
ACHP	Advisory Council on Historic Preservation
AD	Anno Domino
AIRFA	American Indian Religious Freedom Act of 1978
AIS	Aquatic Invasive Species
amsl	above mean sea level
APE	area of potential effects
API	American Petroleum Institute
AQI	Air Quality Index
ARPA	Archaeological Resources Protection Act
ATWS	additional temporary work space
BEA	Bureau of Economic Analysis
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
blpd	barrels liquid per day
BMP	best management practices
BOR	Bureau of Reclamation
BP	Before Present
bpd	barrels per day
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CESA	cumulative effects study area
CFR	Code of Federal Regulations
CH_4	methane

CMRP	Construction, Mitigation, and Reclamation Plan
CMS	Cultural Material Scatter
CO	carbon monoxide
CO_2	carbon dioxide
CO2e	carbon dioxide equivalent
CP	cathodic protection
CPM	Computational Pipeline Monitoring
CWA	Clean Water Act
dB	decibel
dBA	decibels on the A-weighted scale
DR	Decision Record
EA	environmental assessment
EIS	environmental impact statement
EO	Executive Order
ERP	Emergency Response Plan
ESA	Endangered Species Act
ESD	emergency shutdown
FBE	fusion bond epoxy
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GPD	gross domestic profit
GPS	global positioning system
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HCA	high consequence area

HDD	horizontal directional drill
Hess	Hess North Dakota Pipelines LLC
HUC	Hydrologic Unit Code
HUD	Housing and Urban Development
IM	Instruction Memorandum
IMP	Integrity Management Plan
IPCC	Intergovernmental Panel on Climate Change
LMNG	Little Missouri National Grassland
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
mcf	million cubic feet
MHA Nation	Mandan, Hidatsa, and Arikara Nation
MIS	Management Indicator Species
MLA	Mineral Leasing Act of 1920
MLRA	Major Land Resource Area
MLV	mainline valve
mmscfd	million standard cubic feet per day
MOP	maximum operating pressure
MOU	Memorandum of Understanding
MP	milepost
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Grave Protection and Repatriation Act of 1990
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIC	North Dakota Industrial Commission
NDGFD	North Dakota Game and Fish Department

NDGS	North Dakota Geological Survey
NDNHI	North Dakota Natural Heritage Inventory
NEPA	National Environmental Policy Act of 1969
NGL	natural gas liquids
NGO	non-governmental organization
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
O_3	ozone
OCC	Operations Control Center
OD	outside diameter
OSHA	Occupational Safety and Health Administration
PEM	Palustrine Emergent Wetland
PFYC	Potential Fossil Yield Classification
PHMSA	Pipeline and Hazardous Materials Safety Administration
P.L.	Public Law
PLOTS	Private Land Open to Sportsman
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 microns or less
POD	Plan of Development
ppb	parts per billion

ppm	parts per million
Project	Hawkeye Pipeline System Project
PRPA	Paleontological Resources Preservation Act
PSC	Public Service Commission
psig	pounds-force per square inch gauge
PUP	Pesticide Use Proposal
RCRA	Resource Conservation and Recovery Act
RFFAs	reasonably foreseeable future actions
ROW	right-of-way
RV	recreational vehicle
SASR	Sakakawea Area Spill Response
SARA	Superfund Amendments and Reauthorization Act
SCADA	supervisory control and data acquisition
SF	Standard Form
SH	State Highway
SHPO	State Historic Preservation Office
SIO	scenic integrity objectives
SIP	State Implementation Plan
SIS	safety instrument system
SMS	Scenery Management System
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SSURGO	Soil Survey Geographic Database
SWCA	SWCA Environmental Consultants
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
tpy	tons per year

TRNP	Theodore Roosevelt National Park
TSS	total suspended sediment
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound
VQO	Visual Quality Objective
WT	wall thickness
WUS	waters of the U.S.

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1.0 Introduction

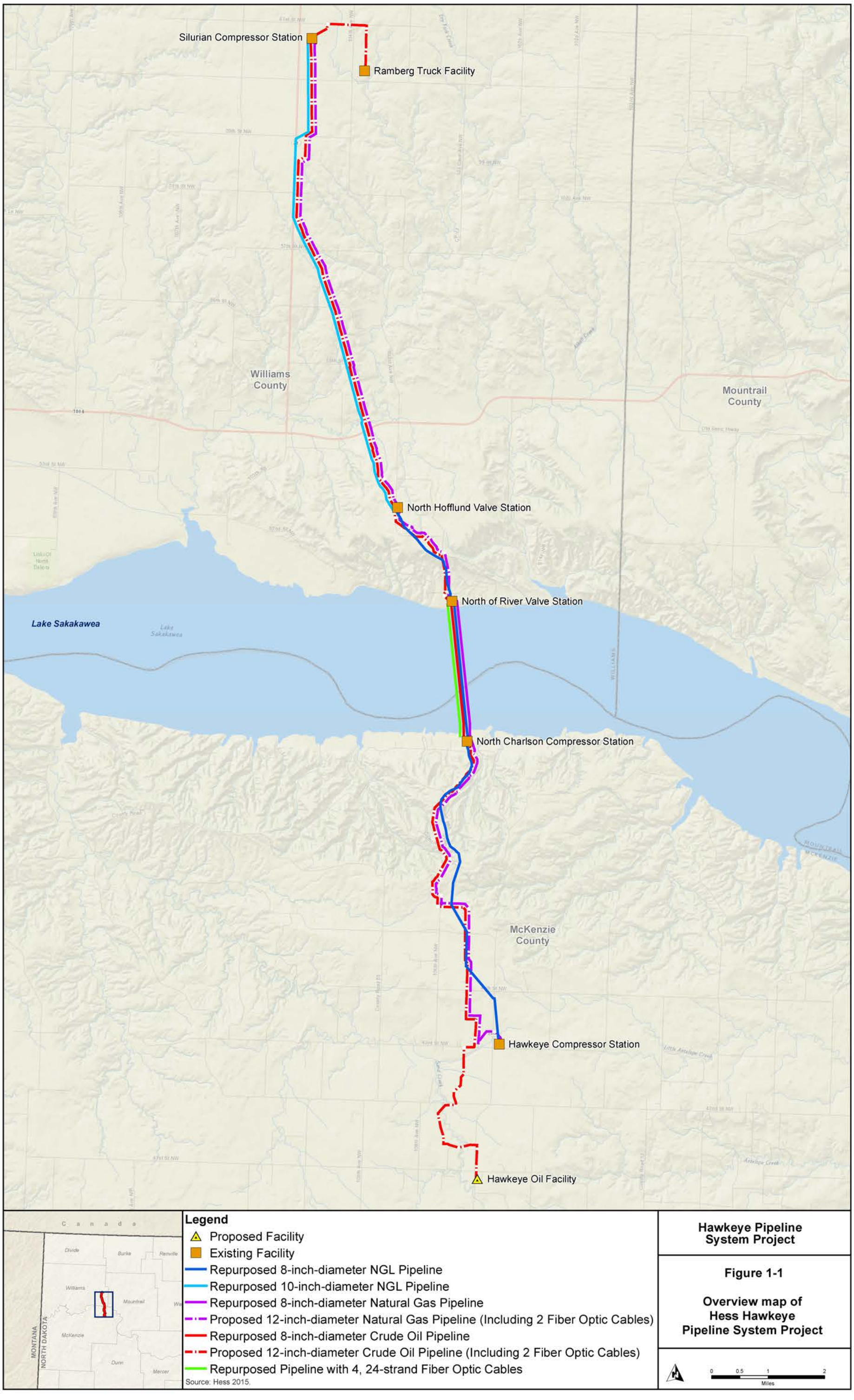
1.1 Introduction

Hess North Dakota Pipelines LLC (Hess) has filed a Right-of-Way (ROW) Grant application with the Bureau of Land Management (BLM) to construct, operate, and maintain the proposed Hawkeye Pipeline System Project (Project) in McKenzie and Williams counties, North Dakota, as shown in **Figure 1-1**.

Hess is proposing to construct an approximately 26-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The Project would transport crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, and natural gas and natural gas liquids (NGL) from the existing Hawkeye Compressor Station near Charlson, North Dakota, to the existing Ramberg Truck Facility (crude oil) and existing Silurian Compressor Station (natural gas and NGL) near Tioga, North Dakota (**Figure 1-1**). The Project would include:

- Construction of 22.9 miles of new 12-inch-diameter crude oil pipeline, which would initiate at the Hawkeye Oil Facility, tie-in to 2.4 miles of existing 8-inch diameter pipeline to cross Lake Sakakawea, and terminate at the Ramberg Truck Facility north of Lake Sakakawea.
- Construction of 18.3 miles of new 12-inch-diameter natural gas pipeline, which would initiate at the Hawkeye Compressor Station, tie-in to 2.4 miles of existing 8-inch-diameter pipeline to cross Lake Sakakawea, and terminate at the Silurian Compressor Station.
- Repurposing of 16.8 miles of existing 8-inch-diameter and 10-inch-diameter pipeline to a NGL pipeline, which would initiate at the Hawkeye Compressor Station, tie-in to 2.4 miles of existing pipeline to cross Lake Sakakawea, and terminate at the Silurian Compressor Station.
- Construction of 24-strand fiber optic lines. The fiber optic lines would be encased in an existing pipeline across Lake Sakakawea, but placed in the trench alongside the new crude oil and natural gas pipelines outside of the lake crossing. From the Hawkeye Oil Facility to the Hawkeye Compressor Station, there would be one 24-strand fiber optic line; from the Hawkeye Compressor Station to the Ramberg Truck Facility, there would be two 24-strand fiber optic lines; and from the Ramberg Truck Facility to the Silurian Compressor Station, there would be one 24-strand fiber optic line. The fiber optic lines would be used for communications for monitoring and controlling the pipelines.
- Construction of eight pig launchers (three for crude oil, three for natural gas, and two for NGL). All eight pig launchers would be constructed within existing Hess-owned facilities.
- Construction of eight pig receivers (three for crude oil, three for natural gas, and two for NGL). All eight pig receivers would be constructed within existing Hess-owned facilities.
- Construction of the Hawkeye Oil Facility, including permanent surface disturbance of approximately 79.7 acres.
- Placement, setting, and construction of 4 mainline valves (MLVs) and 12 emergency shutdown (ESD) valves would be constructed within existing Hess-owned facilities.

The Project would cross approximately 2.6 miles of United States (U.S) Department of Agriculture (USDA) Forest Service (USFS) land, 2.9 miles of U.S. Army Corps of Engineers (USACE) land, 1.2 miles of North Dakota state-owned property, and 19.2 miles of private land. The two new proposed pipelines would be buried (in the same trench where feasible) and collocated within existing Hess pipeline easements to the extent practicable and would utilize existing pipeline infrastructure at the Lake Sakakawea crossing (four 8-inch-diameter pipelines that currently cross the lake; one each for the NGL,


Silurian Compressor Station
Ramberg Truck Facility
Williams County
Mountrail County
North Hofflund Valve Station
North of River Valve Station
Lake Sakakawea
North Charlson Compressor Station
McKenzie County
Hawkeye Compressor Station
Hawkeye Oil Facility
Canada
Divide
Burke
Renville
Williams
Mountrail
McKenzie
Dunn
Mercer
MONTANA
NORTH DAKOTA
Legend
Proposed Facility
Existing Facility
Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Repurposed 8-inch-diameter Natural Gas Pipeline
Proposed 12-inch-diameter Natural Gas Pipeline (Including 2 Fiber Optic Cables)
Repurposed 8-inch-diameter Crude Oil Pipeline
Proposed 12-inch-diameter Crude Oil Pipeline (Including 2 Fiber Optic Cables)
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Source: Hess 2015.
Hawkeye Pipeline System Project
Figure 1-1
Overview map of Hess Hawkeye Pipeline System Project
0 0.5 1 2
Miles

natural gas, crude oil, and fiber optic cables [both of which would be strung through one of the 8-inch-diameter pipes]). All aboveground facilities (pipeline inspection gauge [pig] launchers and receivers and block valves) would be located within existing Hess facilities.

The Environmental Assessment (EA) for the Project is being prepared under the direction of the BLM, serving as the lead federal agency in compliance with the National Environmental Policy Act of 1969 (NEPA) per the Mineral Leasing Act of 1920 (MLA), as amended. The USFS, USACE, U.S. Fish and Wildlife Service (USFWS), and State of North Dakota are serving as cooperating agencies on the Project. This document follows the guidelines promulgated by the Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508, BLM's NEPA Handbook [H-1790-1], and the USACE regulation ER 200-2-2 [33 CFR 230]). Additionally, CFR 1506.3(a) allows the cooperating agencies (USFS, USACE, USFWS, and State of North Dakota) to adopt a NEPA document prepared by the lead federal agency (BLM). The USACE and USFS would independently evaluate and verify the information and analysis undertaken in the EA and would take full responsibility for the scope and content contained herein, even though, per the MLA, the BLM would issue the ROW Grant for all federal lands crossed.

The Project would be designed, constructed, and operated in accordance with the U.S. Department of Transportation (USDOT) regulations in 49 CFR 195, Transportation of Hazardous Liquids by Pipeline; 49 CFR 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards; and other applicable federal and state regulations. The federal regulations are administered by USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA).

This chapter presents Hess' interests and objectives for the Project as well as the BLM's purpose and need for the action. In addition, it also describes the Project location and identifies other authorizing actions necessary for the Project to be constructed. A complete description of the Applicant's Project is provided in Chapter 2.0.

The sources of the crude oil, natural gas, and NGL that would be transported by the Project are the middle Bakken and upper Three Forks formations (Bakken) of the Williston Basin. The base flow rate for the crude oil pipeline is expected to be 60,000 barrels per day (bpd); the pipeline is designed to carry up to 76,000 bpd. The base flow rate for the natural gas pipeline is expected to be 70 million standard cubic feet per day (mmscfd); the pipeline is designed to carry 100 mmscfd. The base flow rate for the NGL is expected to be up to 13,000 barrels liquid per day (blpd); the pipeline is designed to carry up to 30,000 blpd.

The new pipelines would be buried with a minimum of 5 feet of cover except for locations/conditions that would warrant deeper burial depths. Other surface facilities would be limited to pipeline markers, pig launchers and receivers, ESD valves, and block valves. No pumping or compressor stations would be built as part of the Project.

1.2 Hess's Interests and Objectives

Hess submitted a Standard Form (SF) 299 application to the BLM North Dakota Field Office on May 25, 2012, requesting a new ROW Grant to cross USACE and USFS lands in North Dakota. Hess proposes to construct, operate, and maintain the Project that would transport crude oil, natural gas, and NGL from the middle Bakken and upper Three Forks formations (Bakken) of the Williston Basin, to existing export infrastructure north of Lake Sakakawea. Hess contends that the Project would help to address anticipated regional pipeline and outlet constraints north of Lake Sakakawea as development of the Bakken Formation increases and that the pipeline is needed to relieve the large truck traffic congestion on the western North Dakota road system.

1.3 BLM's Proposed Action

The Proposed Action under consideration in this analysis is the BLM's authorization of a 50- to 100-foot-wide construction ROW across 2.6 miles of USFS land and 2.9 miles of USACE land for the construction and operation of the Project. During operation of the pipeline, the ROW would permanently accommodate two 12-inch-diameter pipelines within a 20-foot-wide permanent easement across federal lands.

1.4 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to consider granting Hess a ROW across federal lands to meet their interests and objectives for the Project. The need for the Proposed Action is the requirement to consider granting approval for the construction, operation, maintenance, and termination of a pipeline system for the purpose of transporting crude oil, natural gas, and NGL on public lands administered by the USFS, McKenzie Ranger District, and USACE, Omaha District, under the authority of the MLA, as amended and supplemented, (30 United States Code [U.S.C.] 181 et seq.), and prescribed in 43 CFR 2880 and 3160. The Department of Interior's Energy Policy Act of 2005 encourages the development of energy-related facilities upon review and analysis.

1.5 Decisions to be Made

The BLM is the lead agency for this EA and would decide whether or not to approve Hess's application for a ROW and, if so, under what terms and conditions. The cooperating agencies will have their own terms and conditions for portions of the pipeline and/or any facilities that would be installed on their property. BLM would make a decision regarding whether or not to issue a ROW Grant, and under what conditions, after consultation with the cooperating agencies.

1.6 Location of Project

The Project would be located in two North Dakota counties (McKenzie and Williams) and traverse private, state, USFS, and USACE-administered lands. The Project route would not traverse BLM-administered lands. A map showing the location of the Project is provided on **Figure 1-1**.

1.7 Authorizing Actions

The Project would require federal, state, and local authorizations for many aspects of construction, operation, maintenance, and abandonment. It is the Applicant's responsibility to fulfill all requirements of any applicable statutes, regulations, and policies. **Table 1-1** lists permits, approvals, and reviews necessary for implementation of the Project.

Table 1-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
Federal Permits, Approvals, and Reviews		
U.S. Department of the Interior, BLM	Grant ROWs and issue temporary use permits for federal lands following NEPA review.	Section 28 of the MLA, as amended.
	Government-to-Government consultation.	U.S. Constitution and Federal Treaties, Statues, and Orders, including NEPA, National Historic Preservation Act (NHPA), Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), Executive Orders (EOs) 13007 and 13175, Secretarial Order 3317, and Presidential Memorandums.

Table 1-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
U.S. Department of the Interior, BLM (Continued)	State Historic Preservation Office (SHPO) Consultation.	36 CFR 800.2(a)(4).
	Management of Paleontological Resources.	Paleontological Resources Preservation Act (PRPA) (Public Law [P.L.] 111-011); Federal Land Policy and Management Act (FLPMA) (P.L. 94-579).
USFS	Review proposal for consistency with Land and Resource Management Plan. Provide BLM with reasonable and necessary measures to minimize impacts to Little Missouri National Grassland (LMNG) resources.	Section 28 of the MLA, as amended.
	Issue cultural resource permit to excavate or remove cultural resources on federal lands.	Archaeological Resources Protection Act of 1979 (ARPA), 16 U.S.C. Section 470aa-47011; 43 CFR 3.
USACE	Review, provide stipulations, and concur with BLM's decision for issuance of a ROW and Special Use Permits across USACE lands.	40 CFR 1506.3(a).
	Issue Section 404 permit for placement of dredged or filled material in Waters of the U.S. (WUS).	Section 404 of the Clean Water Act (CWA) of 1972 (40 CFR 122-123); 33 U.S.C. Section 1344; 33 CFR 323, 325.
	Engineering Circular – proposed alterations to USACE Civil Works Projects.	Pursuant to 33 U.S.C. 408 (CEDW-CP Circular No. 1165-2-216) 31 July 2014.
	Issue cultural resource permit to excavate or remove cultural resources on federal lands.	ARPA, 16 U.S.C. Section 470aa-47011; 43 CFR 3.
USFWS	Section 7 Consultation process for endangered or threatened species.	Endangered Species Act (ESA) of 1973; 16 U.S.C. 1531 et seq. Migratory Bird Treaty Act (MBTA) of 1918, as amended; EO 13186; EO 11990; Bald and Golden Eagle Protection Act (BGEPA) of 1940; NEPA.
USDOT – PHMSA	Review and approve Integrity Management Plan for High Consequence Areas (HCAs).	49 CFR 195.
	Review and approve Emergency Response Plan (ERP).	49 CFR 194.
State of North Dakota		
North Dakota State Historical Society	Review and comment on activities potentially affecting cultural resources.	Consultation under Section 106, NHPA.
	Issue cultural resource permit to identify, evaluate, or mitigate adverse effects to cultural resources on state or private land.	North Dakota Century Code (NDCC) 55-03-01.1.

Table 1-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
North Dakota Department of Health (NDDH), Division of Water Quality	Permit for stream and wetland crossings/consultation for USACE Section 404 process.	Section 401 CWA, Water Quality Certification.
	Permit regulating hydrostatic test water discharge and construction dewatering and storm water to waters of the state.	National Pollutant Discharge Elimination System (NPDES) Temporary Dewatering/ Hydrostatic Testing Permit (NDG07000), Storm Water Discharge Permit NDR10- 0000.
NDDH, Division of Air Quality	Permit to construct.	Clean Air Act (CAA).
Public Service Commission	Permit for construction of a pipeline within an approved corridor and along an approved route.	Energy Conversion and Transmission Facility Siting Act Corridor Certificate and Route Permit.
North Dakota Game and Fish Department (NDGFD)	Consultation and review.	Assess potential effects to fish and wildlife.
North Dakota State Water Commission	Section 401 CWA Certification.	CWA.
	Water Use.	Temporary Water Use Permit SWC Form 247.
North Dakota State Land Department	Easement.	North Dakota Department of Trust Lands.
North Dakota Department of Transportation	Utility Occupancy Permit.	ROW occupancy permit for state roadway crossings.
Counties	Conditional Use/Pipeline Permit/Road Crossing Permits.	Required for pipeline construction.

1.7.1 ROW Acquisition Process on Public Lands

Several steps must be taken to obtain a ROW Grant from federal land management agencies or easements across private land. For federally administered lands, an applicant must submit a ROW application to the appropriate federal agency along with a fee to cover the costs of processing the application and granting and administering the ROW. The agency then prepares an environmental document (such as this EA) as required under NEPA to determine potential impacts on all lands (regardless of ownership) that may occur as a result of implementing the Proposed Action. CFR 1506.3(a) allows the cooperating agencies (USACE and USFS) to adopt a NEPA document prepared by the lead federal agency (BLM) if needed for any independent decisions those agencies may require.

Protective measures to avoid and minimize adverse impacts are proposed by the Applicant and referenced throughout this document as environmental protection measures. In addition to these commitments, the agencies require standard protective measures on federal lands.

After the EA is prepared with input and participation from the cooperating agencies, reviewing agencies, tribal governments, and the public, the BLM prepares a Decision Record (DR). The DR documents and provides the legal record for BLM decisions made regarding the requested ROW on federal lands. If it is determined that no significant impacts would be incurred after application of mitigation measures, the BLM would issue a Finding of No Significant Impact (FONSI) along with its DR. If it is determined that significant impacts would be incurred as a result of construction and/or operation of the Project, an environmental impact statement (EIS) would have to be prepared to further evaluate the Project under NEPA.

Before the ROW can be granted, Hess must prepare a Plan of Development (POD) detailing construction of all Project facilities. The POD must be submitted to the authorizing agencies for approval. The POD would be amended to include reasonable and necessary mitigation as described in the EA. POD approval is concurrent with the ROW approval. The POD contains Project information and site-specific procedures for the following:

- Fire protection;
- Erosion control, revegetation, and reclamation;
- Water resources protection;
- Transportation;
- Communications;
- Cultural resources protection;
- Threatened or endangered species protection;
- Wildlife protection;
- Blasting;
- Dust control;
- Weed control;
- Health and safety;
- Construction schedule;
- Construction facilities and housing;
- Pipeline testing;
- Construction monitoring;
- Operations and maintenance plans; and
- Abandonment.

For the NEPA analysis, the Applicant has been required to conduct site-specific surveys on the Project ROW; additional temporary work space (ATWS); access roads; and ancillary facility locations for sensitive habitats, plants, animals, and other resources, including federally listed, proposed, and candidate species; raptor species protected under the MBTA and BGEPA; USFS sensitive species; jurisdictional WUS; cultural, historical, and paleontological resources; and noxious weeds. Data obtained from these surveys have been used in this document to apply stipulations and mitigation measures, where necessary, to protect site-specific resources. All reasonable and necessary stipulations and mitigation measures must be incorporated into the POD prior to issuance of a DR or FONSI.

1.7.2 Easement Acquisition Process on Private Lands

The process used by pipeline companies to obtain easements across private lands is different from that used for state or federal lands. The company's ROW agent contacts the landowner for permission to determine the proposed pipeline's centerline across the owner's property. At the same time, the ROW agent seeks the landowner's permission to conduct the cultural and biological surveys required to obtain permits to cross private lands.

A plat is prepared after the surveyor obtains the necessary data for locating the pipeline. This plat shows the relationship of the planned pipeline to the property boundaries. The ROW agent meets with the landowner to initiate negotiations for an easement across the property.

Across federal, state, and private lands, Hess has requested a temporary construction ROW of 100 feet (USFS will allow only a 50-foot-wide construction ROW on their lands). ATWS would be required at certain locations (e.g., road and river crossings and in rugged terrain). The temporary construction ROW may be reduced in some areas as necessary to avoid impacts to environmentally sensitive areas. Hess requests a permanent easement of 20 feet (USFS will allow only 20-foot-wide permanent easements on their lands). However, the location of the pipeline within the permanent easement may vary depending on terrain, the presence of other existing facilities, and landowner concerns. Construction techniques and reclamation procedures would be the same on private and public lands, or as specified by the landowner.

1.8 Conformance with Land Use Plans

This Project would traverse private, state, USFS, and USACE-administered lands; BLM-administered lands are not crossed by the Project. However, the BLM is responsible for issuing the ROW grant across federal lands under the authority of the MLA. The USFS and USACE, as cooperating agencies, are reviewing the Project to assure conformance with their land use plans (Land and Resource Management Plan for the Dakota Prairie Grasslands [USFS 2001] and Garrison Dam/Lake Sakakawea Master Plan [USACE 2007], respectively). The State of North Dakota and affected counties also are reviewing the Project to assure conformance with any state- and county-level land use plans. The Project is consistent with federal, state, and local land use plans.

1.9 North Dakota Public Service Commission Coordination

In accordance with the laws of North Dakota and prior to undertaking the construction and operation of a crude oil pipeline, Hess is required to apply for, and obtain from the North Dakota Public Service Commission (PSC), a Certificate of Corridor Compatibility and a Route Permit, confirming the construction and operation of the pipeline: 1) would result in minimal adverse effects to the environment and on the welfare of the citizens of North Dakota; 2) are compatible with environmental protection and the efficient use of resources: 3) would minimize adverse human and environmental impact while ensuring continuing system reliability and integrity, and ensuring that energy needs are met and fulfilled in an orderly and timely fashion; and 4) are of such design and location that it would produce minimal adverse effect.

1.10 Agency and Public Scoping and Issues

Both formal and informal agency scoping for the Project has been ongoing since March 11, 2013. Hess engineers, lands specialists, and consultants have contacted regulatory agencies and potentially affected landowners to develop a preferred route and construction techniques to avoid or minimize impacts to the environment. In accordance with NEPA Sections 101 and 102, federal regulations, and BLM guidelines, the BLM has solicited the public's involvement in the EA process through public notification and scoping.

As lead federal agency, the BLM determined that no formal public scoping meeting was needed as part of the NEPA process for the Hawkeye Pipeline System Project; however, the public was notified about the Project by direct mail notifications to affected landowners, tribal governments, governmental agencies, and other potentially interested parties, and publication of public notices in local newspapers.

1.10.1 Agency Involvement

In addition to ongoing informal agency consultation, mail notifications, and press releases, interested agencies were invited to a formal agency scoping meeting held in Minot, North Dakota, on April 23, 2013. The purpose of the meeting was to present the Project and obtain feedback on agency issues and concerns. Eight agency personnel participated in the agency scoping meeting, representing the BLM, USFS, and USACE. An additional formal agency scoping meeting was held at the USFWS North Dakota Ecological Services Field Office on January 15, 2014.

1.10.1.1 Agency Issues and Concerns

A majority of the comments received from the agencies were related to project development and potential impacts to biological and cultural resources, wetlands, reclamation/restoration practices, and operations and safety measures to minimize impacts from a potential product spill. The following is a general list of issues or concerns noted in the comments:

- Alternatives analysis that includes avoidance of the Lake Sakakawea crossing;
- Direct, indirect, and cumulative impacts to:
  - Wildlife;
  - Special status species (federal listed, proposed, candidate, and USFS sensitive species);
  - Protected raptors and migratory birds;
  - Cultural resources and tribal traditional cultural properties;
  - Vegetation from noxious weed invasion; and
  - Wetlands.
- Reclamation/restoration of disturbance areas with native species; and
- Noxious weed management and control.

1.10.2 Public Involvement

The BLM initiated the scoping comment period by notifying the public about the Project. A scoping notice, describing the Project was distributed to 119 interested parties and 32 landowners on March 11, 2013. The scoping notice also included BLM contact information for providing comments. The BLM issued press releases containing the same project and contact information for publication in seven regional newspapers: *Associated Press*, *Billings County Pioneer*, *Dickinson Press*, *Dunn County Herald*, *Minot Daily News*, *Bismarck Tribune*, and the *Williston Daily Herald*. The 30-day public scoping period ended on April 22, 2013.

1.10.2.1 Public Issues and Concerns

By the conclusion of the official scoping period, BLM received a total of seven comment letters/submittals (e.g., formal letters or e-mails) from two federal agencies (Natural Resources Conservation Service [NRCS] and USFWS), four North Dakota state agencies (Geologic Survey, Forest Service, Parks and Recreation, and Water Commission), and one tribe (Standing Rock Sioux). No comments were received from individuals, landowners, or non-governmental organizations (NGOs). The comments received were compiled and reviewed to identify key issues and concerns to be addressed in the EA.

The following is a general list of concerns noted in the comments:

- Concerns about impacts to cultural resources of significance to the Tribe (Standing Rock Sioux);
- Request that pedestrian surveys be conducted by tribal representatives;
- Construction activities that disturb wetlands should follow NRCS guidelines for wetlands;
- Concerns about landslide hazards in the Project area;
- Forested areas should be avoided and any trees or shrubs removed from Project construction should be replaced;
- Permit requirements: A Sovereign Land Permit will be required from the State Engineer;
- Waste material must be properly disposed;

- Concerns about adverse impacts to significant ecological communities adjacent to the Project area (Jointed-spike sedge, bur Oak Upland Woodland, Western Little Bluestem Prairie);
- USFWS requested an invitation to be a cooperating agency on the Project;
- Alternatives analysis should include the evaluation of an alternative that avoids the Lake Sakakawea crossing;
- Project restoration plan should include grasslands and impacted wetlands; recommendation of native seed mix; and use of broadcast seeding; and
- Concerns about invasive and weedy species with recommendations for weed monitoring.

1.10.3 Native American Consultation

The BLM initiated government-to-government consultation with 17 tribes as part of the scoping process through mail notification posted on March 7, 2013 (**Table 1-2**). Of the 17 tribes, only the Standing Rock Sioux and Flandreau Santee Sioux Tribe responded to the mail notification. To date, tribal consultation for the Project has included over 50 telephone conversations and 25 emails with the Tribal Historic Preservation Officers (THPOs) and other tribal representatives, several formal letters, and two face-to-face meetings (Section 3.21, Tribal Treaty Rights and Interests).

Table 1-2 Tribes Contacted by the BLM

Cheyenne River Sioux Tribe	Crow Creek Sioux Tribe	Flandreau Santee Sioux Tribe
Fort Belknap Gros Ventre and Assiniboine Tribes	Fort Peck Assiniboine and Sioux Tribes	Lower Brule Sioux Tribe
Lower Sioux Indian Community	Northern Cheyenne Tribe	Oglala Sioux Tribe
Rosebud Sioux Tribe	Santee Sioux Tribe of Nebraska	Sisseton-Wahpeton Oyate Tribe
Spirit Lake Tribe	Standing Rock Sioux Tribe	Yankton Sioux Tribe
Three Affiliated Tribes: Mandan, Hidatsa, and Arikara	Turtle Mountain Band of Chippewa	

2.0 Description of the Proposed Action and Alternatives

2.1 Introduction

Hess is proposing to construct an approximately 26-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The Project would transport crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, and natural gas and NGL from the existing Hawkeye Compressor Station near Charlson, North Dakota, to the existing Ramberg Truck Facility (crude oil) and existing Silurian Compressor Station (natural gas and NGL) near Tioga, North Dakota (**Figure 1-1**).

Construction of the Project would require approximately 333.8 acres, of which 254.1 acres would be reclaimed following construction. With the exception of the proposed Hawkeye Oil Facility, aboveground facilities to be installed as part of the Project would be located within existing fenced Hess facilities. Hess would construct a total of 3 new access roads. Pipe storage yards would be located within existing Hess facilities. **Table 2-1** provides information regarding temporary and permanent acreage requirements for development of the Project. All disturbances, with the exception of the proposed Hawkeye Oil Facility, would be temporary in nature and reclaimed following construction.

Table 2-1 Temporary and Permanent Disturbance Required for Project Development

Project Component	Existing Facility Footprint (Acres)	New Temporary Disturbance (Acres)[1]	New Permanent Disturbance (Acres)
Aboveground Facilities			
Hawkeye Oil Facility	0	0	79.7
Hawkeye Compressor Station	39.7	0	0
North Charlson Compressor Station	4.2	0	0
North of River Valve Station	0.5	0	0
North Hofflund Valve Station	0.2	0	0
Silurian Compressor Station	4.0	0	0
Ramberg Truck Facility	20.0	0	0
Aboveground Facilities Subtotal	68.6	0	79.7
Pipeline Facilities[2]			
New Pipeline Facilities	N/A	238.3	0
Additional Temporary Workspaces	N/A	14.9	0
New Access Roads (3)	N/A	0.9	0
Pipeline Facilities Subtotal	N/A	254.1	0
Project Total	68.6	254.1	79.7

[1] Typical temporary construction ROW width would be 100 feet, with the exception of USFS and USACE land, where it would be limited to 50 feet. Additional locations, such as wooded areas and wetlands, would be narrowed to 50 feet to minimize surface disturbance and impacts. Surface disturbance may be slightly wider on side hill locations and narrower on flat terrain.

[2] Pig launchers/receivers, mainline valves, and emergency shutdown valves would be located within proposed (i.e., Hawkeye Oil Facility) and existing Hess facilities; therefore, disturbance associated with construction of these pipeline facilities already is included under each aboveground facility.

N/A = Not applicable

2.2 Proposed Action

The Project includes approximately 26 miles of new pipeline construction and repurposing of existing pipelines to connect the Bakken production field south of Lake Sakakawea to infrastructure north of the lake. New pipeline construction would tie into the existing pipeline infrastructure to cross Lake Sakakawea. Repurpose is defined as changing the product transported in an existing pipeline to another product. The new and repurposed pipeline system would transport crude oil, natural gas, and NGL.

In addition, a system of two new 24-strand fiber optic cables would be constructed. The fiber optic cables would originate from the proposed Hawkeye Oil Facility (crude oil) and existing Hawkeye Compressor Station (natural gas) south of Lake Sakakawea in McKenzie County. One fiber optic cable would extend to the existing Ramberg Truck Facility (crude oil) in Williams County and the other fiber optic cable would extend to the existing Silurian Compressor Station (natural gas) in Williams County. For the lake crossing, an existing gas line across the lake would be taken out of service and repurposed to string the fiber optic cables. The fiber optic lines would be used for communications for monitoring and controlling the pipelines.

2.2.1 Description of Facilities

The Project would be designed, constructed, and operated in compliance with applicable portions of the USDOT regulations as set forth in 49 CFR 195, Transportation of Hazardous Liquids by Pipeline. These regulations encompass general requirements, accident reporting and safety-related condition reporting, design requirements, construction, pressure testing, operation and maintenance, qualification of pipeline personnel, and corrosion control. Relevant industry standards are incorporated into these regulations by reference, including those of the American Petroleum Institute (API), American Society of Mechanical Engineers, the American Standard for Testing and Materials, and others.

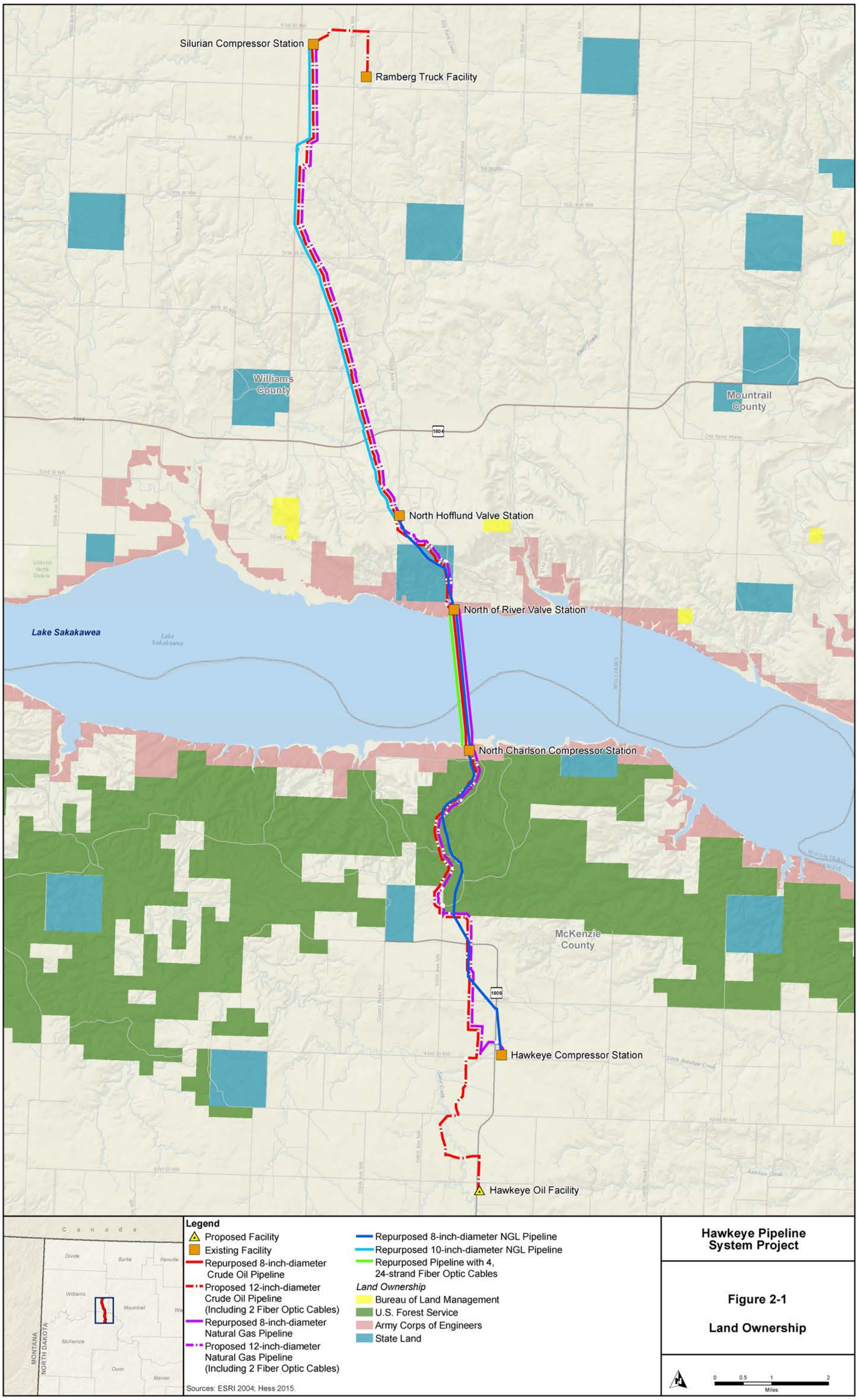
The Project route would traverse private, state, and federal lands. Approximately 19.2 miles (74 percent) of the Project route would be on private land, 1.2 miles (5 percent) on state land, and 5.5 miles (21 percent) on federal land (2.6 miles [10 percent] on USFS land and 2.9 miles [11 percent] on/across USACE lands and water). Land ownership along the Project route is illustrated on **Figure 2-1**. Major components of the Project are discussed in further detail below.

2.2.1.1 Crude Oil Pipeline

Hess proposes to install 22.9 miles of new pipeline and repurpose 2.4 miles of an existing pipeline that crosses Lake Sakakawea. South of Lake Sakakawea, the Project consists of approximately 10.1 miles of new 12-inch-diameter crude oil pipeline and 2 associated 24-strand fiber optic cables in a single trench from the proposed Hawkeye Oil Facility (**Figure 2-2**) to the existing North Charlson Compressor Station. From the existing North Charlson Compressor Station to the existing North of River Valve Station, Hess proposes to repurpose approximately 2.4 miles of an existing 8-inch-diameter pipeline across Lake Sakakawea to crude oil service. North of Lake Sakakawea, from the existing North of River Valve Station to the existing Ramberg Truck Facility, Hess proposes to install approximately 12.8 miles of new 12-inch-diameter crude oil pipeline and 2 associated 24-strand fiber optic cables in a single trench (**Figure 2-3**).

All pipeline components must meet federal pipeline safety standards (49 CFR 195). The existing pipeline proposed for crude oil service was constructed in 1992 and the serviceability was confirmed in 2013 by hydrostatic testing per pipeline safety requirements (49 CFR 192, Subpart J, Test Requirement) and through use of in-line inspection tools. New pipe and pipeline components also must be tested prior to service to demonstrate the pipeline is fit for service per 49 CFR 195, Subpart E.

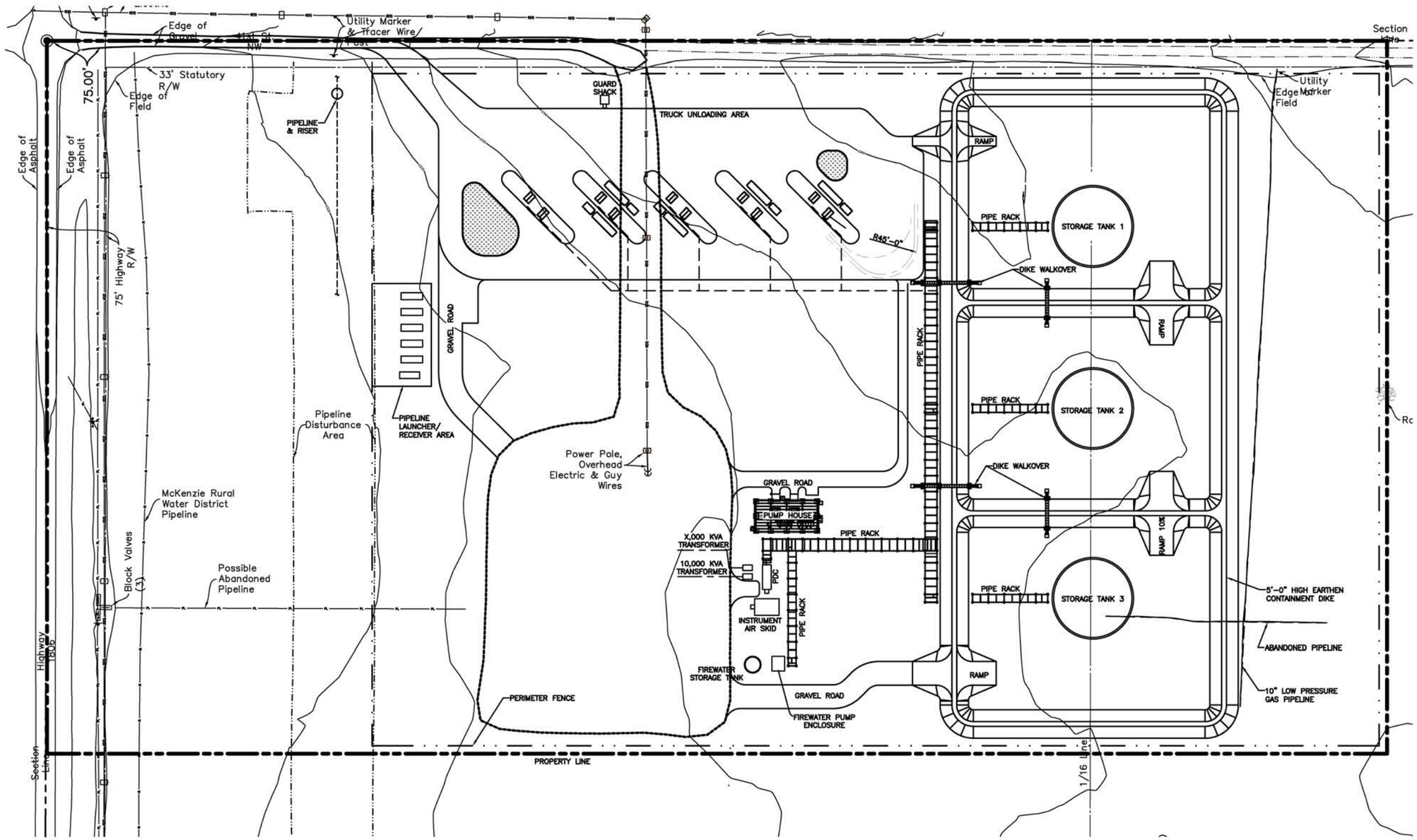
The crude oil pipeline is designed for an initial flow rate of 60,000 bpd and a maximum design flow rate of the crude oil pipeline is 76,000 bpd. The crude oil pipeline would be buried a minimum of 5 feet underground, a depth that exceeds federal pipeline safety requirements (49 CFR 195.248). This additional depth would help protect the pipeline from outside force damage, such as excavation damage and stream scour. Since excavation damage is a major cause of pipeline releases, this additional depth of cover is a supplemental mitigation measure Hess is employing to reduce the probability of pipeline incidents. The pipe is designed for a maximum allowable operating pressure (MAOP) of 1,000 pounds force per square inch gauge (psig). The crude oil pipeline would consist of API 5L–X52 steel pipe with a 12-inch outside diameter (OD) and a 0.375-inch wall thickness (WT), for the majority of the Project route except for at boring locations that would be 0.500-inch WT, and at the Lake Sakakawea crossing where the existing pipe consists of API 5L Grade B, 8-inch OD pipe with a 0.500-inch WT. Proposed aboveground Project components (e.g., pig launcher/receivers, MLVs, ESD valves) associated with the proposed crude oil pipeline are presented in **Table 2-2**.



Hawkeye Pipeline System Project

Figure 2-1

Land Ownership



Location
McKenzie Co., ND

Project Information
Project Number: 212205020
Last Modified: November 18, 2014

Note: Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-2

Hawkeye Oil Facility

Legend

- Proposed Facility
- Existing Facility
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline (Including 2 Fiber Optic Cables)
- Repurposed Pipeline with 4, 24-strand Fiber Optic Cables

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-3

Crude Oil Pipeline

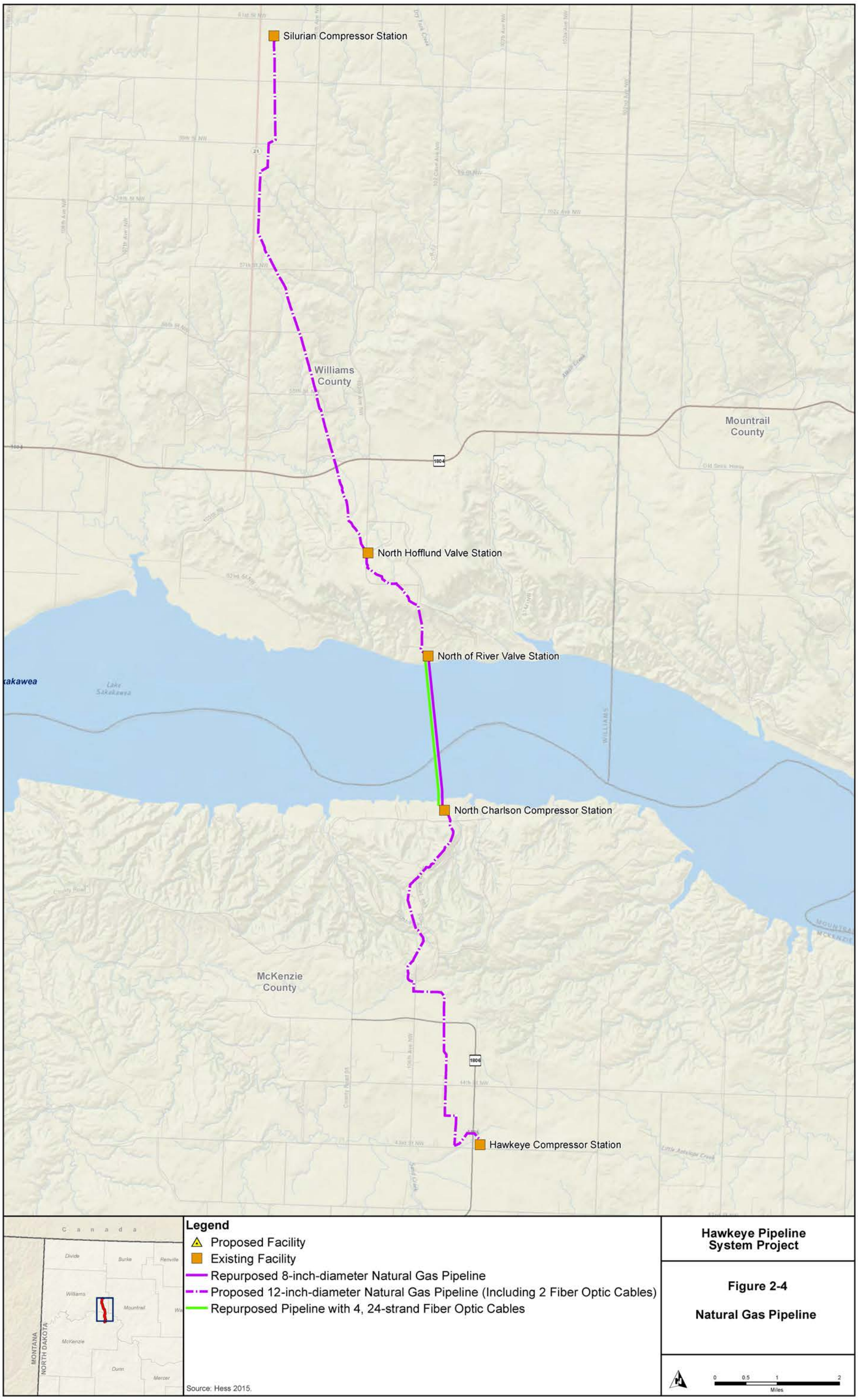
0 0.5 1 2 Miles

Table 2-2 Receipt Facility, Mainline Valve, Pig Launcher/Receiver, and Emergency Shutdown Valve Locations by Milepost

Facility	Component	Approximate Milepost (MP)
Hawkeye Oil Facility	12-inch Pig Launcher – Crude Oil 12-inch ESD Valve – Crude Oil	MP – 0
Hawkeye Compressor Station	12-inch Pig Launcher – Natural Gas 8-inch Pig Launcher – NGL 12-inch ESD Valve – Natural Gas 8-inch ESD Valve – NGL	MP – 0 of Natural Gas Pipeline
North Charlson Compressor Station	12-inch Pig Receiver – Crude Oil 12-inch Pig Receiver – Natural Gas 8-inch Pig Launcher – Crude Oil 8-inch Pig Launcher – Natural Gas 12-inch MLV – Crude Oil 12-inch MLV – Natural Gas 8-inch ESD Valve – Crude Oil 8-inch ESD Valve – Natural Gas 8-inch ESD Valve – NGL	MP – 10.5
North of River Valve Station	8-inch Pig Receiver – Crude Oil 8-inch Pig Receiver – Natural Gas 12-inch Pig Launcher – Crude Oil 12-inch Pig Launcher – Natural Gas 12-inch MLV – Crude Oil 12-inch MLV – Natural Gas 8-inch ESD Valve – Crude Oil 8-inch ESD Valve – Natural Gas 8-inch ESD Valve – NGL	MP – 12.5
North Hofflund Valve Station	8” Pig Receiver – NGL 10” Pig Launcher – NGL	MP – 14.7
Silurian Compressor Station	10-inch Pig Receiver – NGL 12-inch Pig Receiver – Natural Gas 12-inch ESD Valve – Natural Gas 10-inch ESD Valve – NGL	MP – 23.4
Ramberg Truck Facility	12-inch Pig Receiver – Crude Oil 12-inch ESD Valve – Crude Oil	MP – 25.3

2.2.1.2 Natural Gas Pipeline

Hess proposes to install 18.2 miles of new pipeline and repurpose 2.4 miles of an existing pipeline that crosses Lake Sakakawea. South of Lake Sakakawea, from the existing Hawkeye Compressor Station to the existing North Charlson Compressor Station, Hess proposes to install approximately 7.2 miles of new 12-inch-diameter natural gas pipeline and two associated fiber optic cables in the same trench with the proposed crude oil pipeline. Between the existing North Charlson Compressor Station and existing North of River Valve Station, Hess proposes to repurpose approximately 2.4 miles of an existing 8-inch-diameter residue line to natural gas service. North of Lake Sakakawea, from the existing North of River Valve Station to the existing Silurian Compressor Station, Hess proposes to install approximately 11.0 miles of new 12-inch-diameter natural gas pipeline and two associated 24-strand fiber optic cables in the same trench as the proposed crude oil pipeline (**Figure 2-4**).


Silurian Compressor Station
Williams County
Mountrail County
North Hofflund Valve Station
North of River Valve Station
Lake Sakakawea
North Charlson Compressor Station
McKenzie County
Hawkeye Compressor Station
Legend
Proposed Facility
Existing Facility
Repurposed 8-inch-diameter Natural Gas Pipeline
Proposed 12-inch-diameter Natural Gas Pipeline (Including 2 Fiber Optic Cables)
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Source: Hess 2015.
Hawkeye Pipeline System Project
Figure 2-4
Natural Gas Pipeline
0 0.5 1 2
Miles

All pipeline components must meet federal pipeline safety standards (49 CFR 192). The existing pipeline was constructed in 1956. Serviceability of the existing pipe was confirmed in 2013 by hydrostatic testing per pipeline safety requirements (49 CFR 192 Subpart J Test Requirements) and through use of in-line inspection tools. New pipe and pipeline components also must be tested prior to service to demonstrate the pipeline is fit for service.

The natural gas pipeline is designed for an initial flow rate of 70 mmscfd and a maximum design flow rate of 100 mmscfd. The natural gas pipeline would be buried a minimum of 5 feet underground, exceeding depth of cover requirements and thus providing supplemental mitigation to reduce the risk of outside force damage as described in Section 2.2.1.1. The pipe is designed for a MAOP of 1,250 psig. Typically, the natural gas pipeline would consist of API 5L –X52 steel pipe with a 12-inch OD and 0.375-inch WT except at boring locations that would be 0.500-inch WT, and at the Lake Sakakawea crossing where the existing pipe consists of API 5L Grade B 8-inch OD pipe with 0.500-inch WT. Proposed aboveground Project components (e.g., pig launcher/receivers, MLVs, ESD valves) associated with the proposed natural gas pipeline are presented in **Table 2-2**.

2.2.1.3 Natural Gas Liquids Pipeline

Hess proposes to repurpose 19.2 miles of existing natural gas pipelines to NGL service. Between the existing Hawkeye Compressor Station south of Lake Sakakawea and existing North Hofflund Valve Station north of Lake Sakakawea, approximately 10.5 miles of an existing 8-inch-diameter natural gas pipeline would be repurposed to NGL service. North of Lake Sakakawea, from the existing North Hofflund Valve Station to the existing Silurian Compressor Station, approximately 8.7 miles of an existing 10-inch natural gas pipeline would be repurposed to NGL service (**Figure 2-5**).

The 8- and 10-inch existing pipelines proposed for NGL service were both constructed in 1978 with the river crossing constructed in 1992. Serviceability of these pipelines was confirmed in 2013 by hydrostatic testing per pipeline safety requirements (49 CFR 195 Subpart E Pressure Testing) and through use of in-line inspection tools. New pipe and pipeline components also must be tested prior to service to demonstrate the pipeline is fit for service.

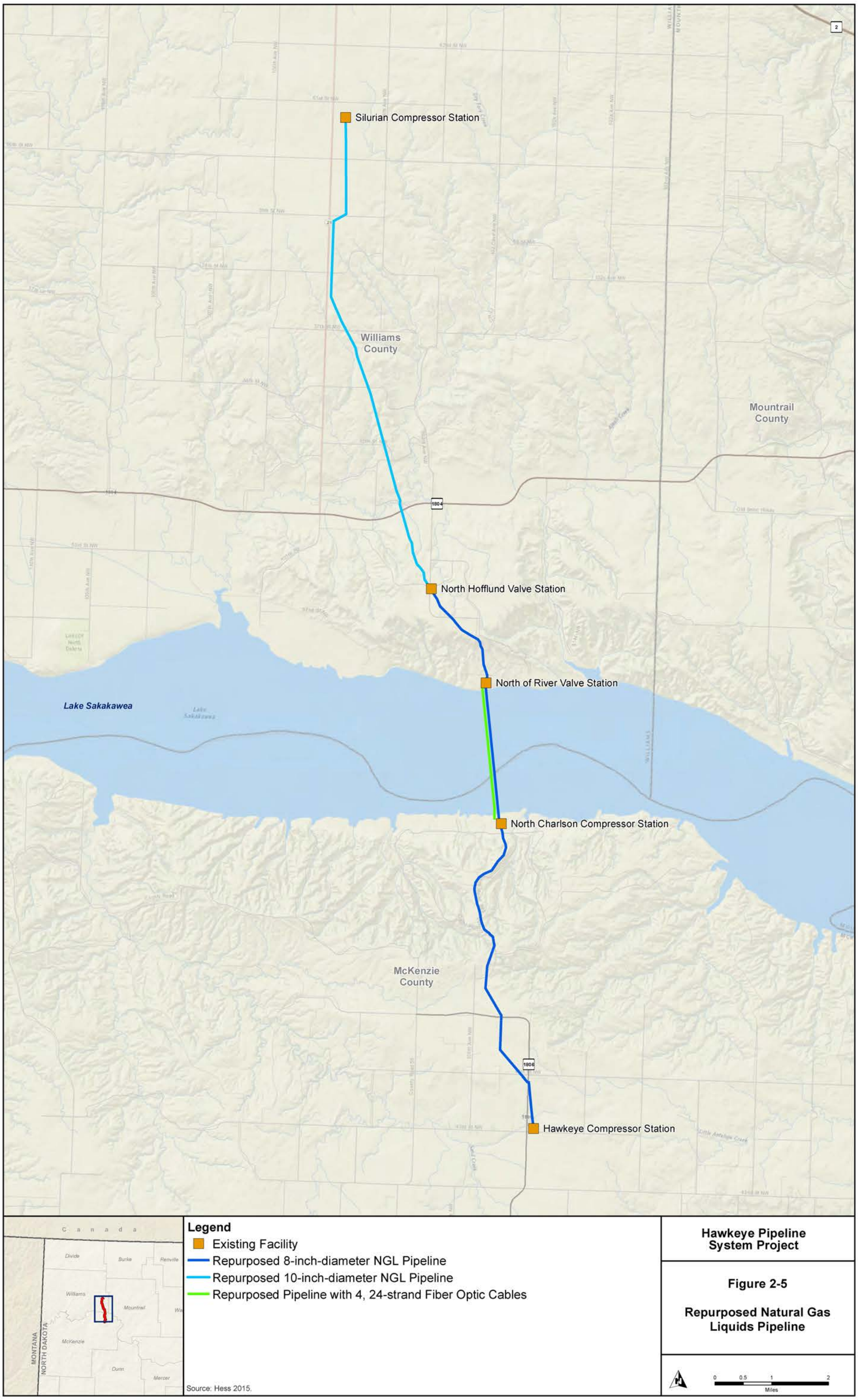
The NGL pipeline is designed for an initial flow rate of 13,000 bpd. The maximum design flow rate of the NGL pipeline is 30,000 bpd. The NGL pipeline would maintain a minimum burial depth of 5 feet underground, exceeding depth of cover requirements and thus providing supplemental mitigation to reduce the risk of outside force damage as described in Section 2.2.1.1. The pipe is designed for a MAOP of 1,250 psig. The NGL pipeline would utilize existing API 5L Grade B steel pipe with an 8-inch OD and 0.250-inch WT or 10-inch OD with 0.279-inch WT, except at the Lake Sakakawea crossing where the existing pipe consists of API 5L Grade B 8-inch OD pipe and a 0.500-inch WT. Proposed aboveground Project components (e.g., pig launcher/receivers, ESD valves) associated with the proposed repurposing of an existing natural gas pipeline to NGL service are presented in **Table 2-2**.

2.2.1.4 Receipt Facilities

Seven receipt facilities would be associated with the Project, six of which are existing Hess facilities (i.e., Hawkeye Compressor Station, North Charlson Compressor Station, North of River Valve Station, North Hofflund Valve Station, Silurian Compressor Station, and Ramberg Truck Facility) (**Figure 1-1**). The proposed Hawkeye Oil Facility would be the only receipt facility constructed as part of the Project. A typical drawing of the proposed Hawkeye Oil Facility is provided in **Figure 2-3**. Pig launcher and receivers are used as in-line tool insertion sites to clean and inspect the pipeline during operations. **Table 2-2** summarizes the milepost (MP) locations for the receipt facilities, MLVs, pig launchers/receivers, and ESD valve locations.

2.2.1.5 Other Aboveground Facilities

In order to meet or exceed the valve siting requirements (natural gas: 49 CFR 192.179; crude oil and NGL: 49 CFR 195.260), 5 MLVs would be spaced along the Project. For liquid pipelines, Hess has


Silurian Compressor Station
Williams County
Mountrail County
North Hofflund Valve Station
North of River Valve Station
Lake Sakakawea
North Charlson Compressor Station
McKenzie County
Hawkeye Compressor Station
Legend
Existing Facility
Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Source: Hess 2015.
Hawkeye Pipeline System Project
Figure 2-5
Repurposed Natural Gas Liquids Pipeline
Miles

conducted an analysis to identify locations of HCAs (HCAs; Section 2.2.2) near the Project, to refine appropriate placement of the MLVs and minimize potential environmental impacts in the event of a rupture or leak. As a supplemental protection measure, Hess would install communications equipment (Section 2.2.1.7) that would allow all valves to be operated remotely to minimize potential impacts of a spill. Hess would install remotely controlled MLVs on both sides of Lake Sakakawea at the North Charlson Compressor Station and North of River Valve Station. Compared to manual valves that require deployment of personnel to physically shut a valve, the use of remotely operated valves substantially enhances Hess's ability to quickly isolate a pipeline segment in the event of an emergency, thus limiting the volume released. At Lake Sakakawea, remotely operated valves also would have pressure sensors that are capable of detecting leaks with slow release rates and pressure detectors equipped with acoustic detection capabilities, capable of identifying the location of a release within 6 feet of its actual location, thereby reducing environmental disturbance in the unlikely event of a leak. Plan and profile views of a typical MLV for an oil pipeline and natural gas pipeline are shown in **Figures 2-6** and **2-7**. MLV locations by MP are provided in **Table 2-2**.

Additional aboveground facilities would be limited to pipeline markers. Pipeline markers are important tools to increase public awareness, help prevent outside force damage, and provide emergency contact information. Pipeline markers would be installed at line-of-sight intervals and at crossings of roads and other key points (as required by 49 CFR 195) to show the location of the pipeline. Markers would identify the owner of the pipeline and provide emergency contact information. Because pipelines are normally buried underground, markers are used to show the approximate, not exact, location of the pipeline.

2.2.1.6 Storage, Staging, and Access

Hess plans to use clearly identified and approved additional temporary workspaces where necessary. Hess has planned the Project to minimize the use of temporary workspaces during the construction phase, and where they are used, would restore the sites in accordance with the applicable regulations, standards, and specifications.

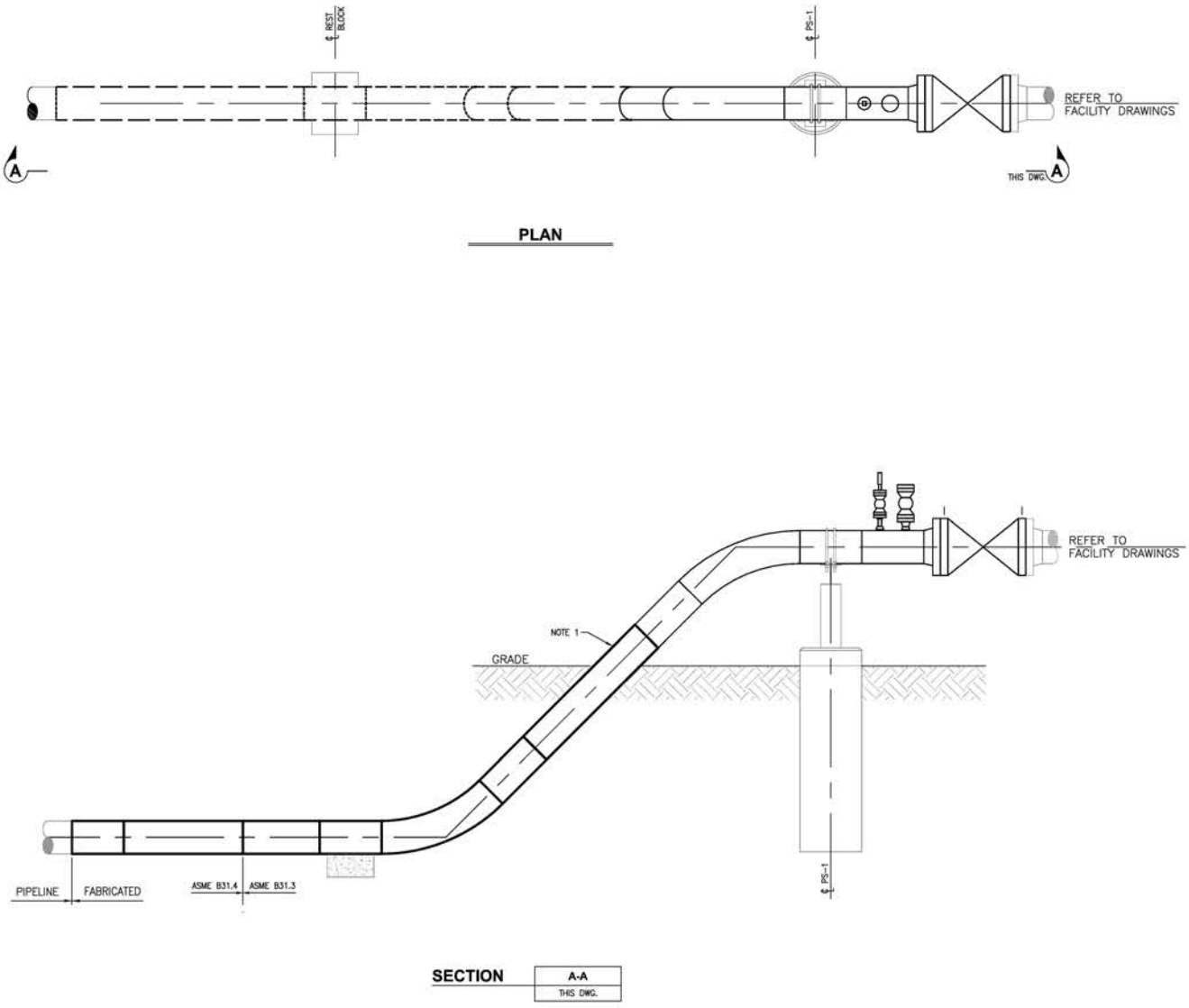
Hess plans to use existing pipe storage/staging yards based in New Town, North Dakota. Any additional pipe storage, equipment staging, or contractor offices would be located at existing Hess facilities.

Hess has indicated that all construction vehicles and equipment traffic would be confined to roads and trails open for public travel, private roads acquired for Project use, and the construction ROW. The majority of the Project would be constructed using existing roads to access the ROW (see POD Appendix A, Access Road Report). However, Hess has identified a total of 3 new access roads that would be needed to access the ROW (**Table 2-3**). There would be no improvements made to any USFS roads.

Table 2-3 New Access Roads

Road ID	Milepost	Length (feet)	Improvement	Land Ownership	County
001	MP 1.9	278	Blade, Gravel	Private	McKenzie
002	MP 15.1	165	Blade, Gravel	Private	Williams
003	MP 17.2	375	Blade, Gravel	Private	Williams

Hess also may request access to the ROW via other roads or highways that are crossed, if permitted by the road/highway authority. All construction-related access roads to the ROW would be marked with signs. Any private roads not to be used during construction also would be marked to prevent unintended use. Hess would offer landowners or land managing agencies the installation and maintenance of access deterrent features to control unauthorized vehicle access to the construction ROW, where appropriate.



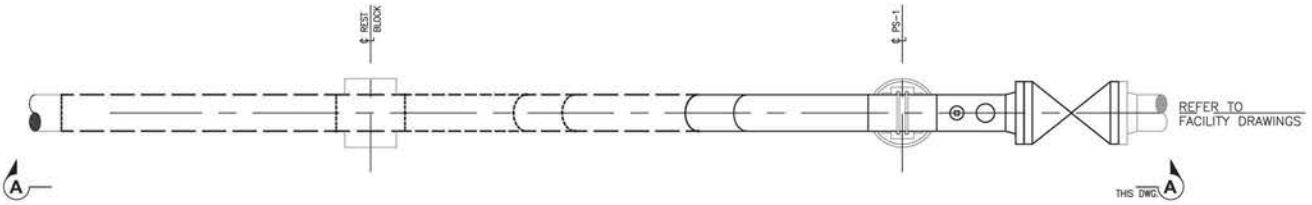
Not to Scale

Source: Hess 2015.

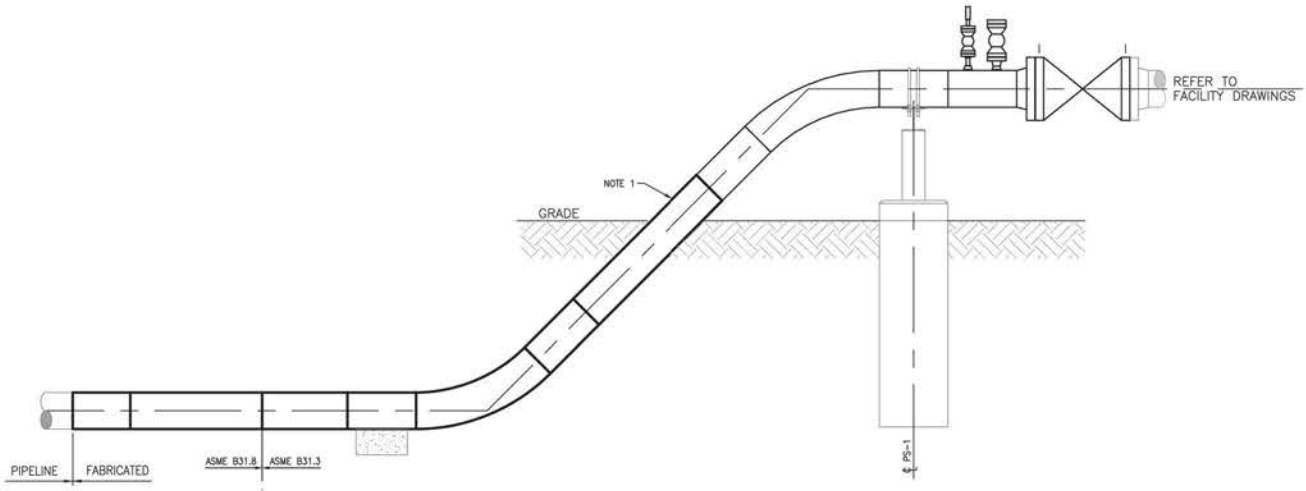
Hawkeye Pipeline System Project

Figure 2-6

Mainline Valve Site Plan - Oil Pipeline



PLAN
SCALE: 1/2" = 1'-0"



SECTION A-A
SCALE : 1/2"=1'-0" THIS DWG.

Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-7

Mainline Valve Site Plan - Natural Gas Pipeline

On federal lands, all travel management would be in accordance with applicable travel management plans. Access deterrent features may include the following, unless otherwise approved or directed by Hess and relevant government authority based on site-specific conditions or circumstances:

- Signs;
- Fences with locking gates; and
- Slash and timber barriers, pipe barriers, or boulders lined across the construction ROW.

Upon completion of Project construction, access roads would be restored to pre-construction conditions, unless otherwise specified by the landowner.

2.2.1.7 Fiber Optic Control System

An existing gas line across the lake would be taken out of service and repurposed to string four, 24-strand fiber optic cables (2 associated with the proposed crude oil pipeline and 2 associated with the proposed natural gas pipeline). Because the existing pipe would be used strictly as a conduit for the fiber optic lines and would not transport petroleum hydrocarbons, hydrostatic testing of the pipe is not necessary. These fiber optic cables would continuously transmit operating data for the Supervisory Control and Data Acquisition (SCADA) system, which monitors operating conditions of each of the pipelines (crude oil, natural gas, and NGL pipelines). Pressure, temperature, flow rate, pressure alarms, and status alarms for the transmission pipelines would be transmitted by fiber optic cables to a central location and monitored 24 hours a day, 7 days a week. Pipeline operators would transmit signals back through the fiber optic system to remotely operate pumps and valves. In the event of an emergency, operators could remotely shutdown the pipeline system via the fiber optic control system. Data from the SCADA system represents one of a multi-tiered leak detection system (see Section 2.2.6 for additional information).

2.2.1.8 Corrosion Protection

The external coating system for the Project is a high performance fusion bond epoxy (FBE) coating for below ground pipeline and high performance epoxy/urethane for aboveground piping. All welded joints would have field joint coating applied with a heat shrinkable sleeves coating protection system. All of the pipe and joint coating/sleeves are “defect detected” prior to lowering the pipe to verify coating integrity. These high performance coatings significantly reduce the potential for external corrosion and stress corrosion cracking.

Additional external corrosion protection is provided by a cathodic protection (CP) system. The Project would be cathodically protected in accordance with B31.4 section 461.2.4 and National Association of Corrosion Engineers Recommended Practice 0169-2007. An impressed current CP system would be installed on the Project and maximum interference voltage with other structures would not exceed 20 millivolt. The impressed current CP would be utilized on the pipeline system including CP test points installed at a maximum interval of 1.25 miles including significance locations at road crossings, pipeline crossings, and Hess facilities. A close interval survey that assesses the effectiveness of the CP system by providing a pipeline potential measurement every 3 feet initially would be carried out and occur thereafter every 7 years, or more frequently in critical areas identified in the Integrity Management Plan (IMP). While the Project life is expected to be 30 years, the lifespan of a steel pipeline that is properly protected from corrosion is many decades longer.

2.2.2 Environmental Protection Measures

Hess has committed to specific environmental protection measures as part of the Project to minimize potential impacts during construction and operation. **Table 2-4** summarizes these protection measures by resource. The construction ROWs would be 100 feet wide on private and state lands, but would be reduced to a width of 50 feet wide with numerous neckdowns (ROW width reductions to confine the work areas) to further minimize impacts on lands managed by the USFS and USACE.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Air Quality	Water or chemical soil binders would be used to control dust along the ROW and access roads during construction in accordance with federal, state, and local requirements.
	Construction would be performed using methods and equipment to minimize the discharge of smoke, dust, or other contaminants to the atmosphere in accordance with federal, state, and local requirements.
Geology and Minerals	The horizontal directional drill (HDD) construction method would be used to avoid impacts to landslide areas associated with the bluffs on the north and south sides of Lake Sakakawea. Where needed, geotechnical investigations would be used to ensure protection from underground coal mines during construction of the pipeline ROW.
Soils	Soil erosion would be minimized by implementing procedures described in the Storm Water Pollution Prevention Plan (SWPPP) (POD, Appendix I), and Construction, Mitigation, and Reclamation Plan (CMRP) (POD, Appendix C).
	For storm water events during construction, vehicle traffic and equipment would be restricted to prevent rutting in areas where topsoil is intact (excluding areas where topsoil has been removed/segregated).
	Use of temporary roads across agricultural lands may result in some compaction and seasonal loss of crops. When necessary, compacted soils would be disked following Project completion and landowners would be compensated for crop loss per their easement agreement.
	During construction, topsoil and subsoil would be segregated. Topsoil would be stripped and stored separately from the subsoil, which would be replaced with minimum handling. In rocky areas, an assessment of the soil handling requirements would be made by Hess.
	On agricultural land, subsoil would be chisel-plowed, rock-picked, and leveled prior to the replacement of topsoil.
Water Resources and Wetlands	The SWPPP and best management practices (BMPs) would be implemented to minimize storm water transport of sediment from disturbed areas to streams and wetlands. All Project-related storm water discharges would be in compliance with a NPDES permit.
	Wetland and riparian areas would be identified and signs posted at the edges of the wetland/waterbody features prior to construction to indicate to crews the limits of these areas so that specific BMPs and work practices are adhered to.
	No aboveground facilities or staging areas would be constructed within wetlands, riparian areas, or other waters of the U.S.
	ATWS would be located a minimum of 50 feet outside wetland boundaries. Protection measures (including installation of erosion control devices) would be utilized at wetland and waterbody crossings to minimize sedimentation. For areas where additional setbacks are deemed necessary to protect the resource, the applicability of the appropriate setback would be determined in consultation with agencies on a site-specific basis.
	No refueling or lubricating would occur within 100 feet of wetlands and/or perennial/ intermittent/ephemeral waterbodies. Hazardous materials, chemicals, fuels, etc., would not be stored within 100 feet of wetlands or perennial/intermittent waterbodies.
	Hydraulic, fuel, and lubricating systems on operating equipment would be kept in good repair to avoid leakage of petroleum products into watercourses.
	No debris would be placed or left where it would enter a river or stream. Earthen material would not be dumped into rivers or waterways.
	Depositing harmful substances in or adjacent to wetlands or waterbodies is prohibited.
	Application of herbicides or pesticides within the vicinity of wetlands and waterbodies would follow pesticide use protocol and restrictions outlined in the Noxious Weed Management Plan.
	Where crossings of riparian or wetland areas cannot be reasonably avoided, HDD methodology would be utilized for the crossings.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Water Resources and Wetlands (Continued)	To control Aquatic Invasive Species (AIS), equipment would be washed to remove all vegetation matter and AIS prior to arrival at the construction site and after constructing through stream water, where water is evident within the channel.
	To minimize surface disturbance, temporary drainage alteration would take place for the shortest time possible, and streams and ditches would be reclaimed to the extent practicable.
	The HDD/bore crossing method would be used at a total of 45 locations to avoid sensitive areas such as waterbodies (14), steep topography (3), county roads (23), two combined cultural features/steep terrain and construction constraints, and three combined roads/waterbodies.
	Water used for hydrostatic testing, dust control during construction, etc., would be obtained from a licensed contractor. The installation or abandonment of wells is not anticipated. Surface water or groundwater appropriation is not anticipated. All water that needs to be discharged would be handled in accordance with an NPDES permit.
	Based on coordination with the USACE, a Section 404 permit is not required. However, if a Section 404 permit is obtained and mitigation is required, mitigation areas would be monitored for a minimum of 5 years. Annual reports would be submitted to the North Dakota Corps of Engineers regulatory office. Successful performance criteria would be developed in a Mitigation and Monitoring Plan that would be submitted with the 404 permit application.
Vegetation	The USFS agency-approved revegetation seed mixes for native prairie would be applied on federal lands. The USFS-approved seed mix will be applied on state and private lands unless state and private landowners request a different seed mix. The CMRP would outline the procedures to be followed for returning the land to pre-existing vegetative cover and land uses.
	Trees and shrubs would be replaced in accordance with the *Tree and Shrub Sampling Plan* (POD, Appendix O). Hess would coordinate with the appropriate agencies to identify efficient restoration and mitigation measures following construction.
	Reclamation monitoring would be conducted for 3 to 5 years after the first growing season, depending on land ownership, to determine the success of revegetation focusing on vegetative cover and noxious weeds and invasive species cover. On private lands, if, after the third growing season, revegetation is successful, no additional monitoring will be conducted. On USFS, state, and USACE managed lands, if, after the fifth growing season, revegetation is successful, no additional monitoring will be conducted. Areas which have not been successfully re-established will be revegetated by Hess or by compensation of the landowner to reseed the area. Reclamation success would be based on the revegetation to at least 70 percent of the background cover as stipulated in the SWPPP and the applicable permits obtained.
	In grasslands identified as high and medium quality Dakota Skipper habitat, post-construction monitoring inspections would be conducted for 5 years following the first growing season to determine the success of revegetation focusing on vegetative cover and noxious weeds and invasive species establishment. The monitoring period may be shortened to 3 years upon request if located on private land. If 2 consecutive years of successful revegetation is not documented, additional mitigation measures (e.g. reseeding) and extended monitoring may be required. Additional mitigation measures will be determined by discussions between the appropriate entity involved (BLM, landowner/manager, or USFWS). Reclamation success would be based on the revegetation to at least 70 percent of the background cover, with no more than 30 percent of the total vegetative cover as non-native species, as stipulated in the SWPPP and the applicable permits obtained.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Noxious Weeds	The *Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan* (POD, Appendix F) would be implemented to minimize the spread of noxious weeds. A Pesticide Use Proposal (PUP) would be included in the Plan in the event pesticides are used.
	Reclamation monitoring for noxious weeds post-construction would be conducted in conjunction with ROW monitoring of reclamation success.
Wildlife and Fisheries	No firearms, dogs, or pets would be brought onto the ROW by anyone involved with the project and no harassment or depredation of any wildlife species or livestock would take place.
	Hess would construct escape ramps every 0.5 mile to reduce the potential for livestock and wildlife becoming trapped in the pipeline trench.
	If construction occurs during bird breeding season (February 1 to July 15), Hess would either: 1) mow and maintain vegetation within the Project disturbance area prior to and during the breeding season to deter migratory birds from nesting in the Project area until construction is underway; or 2) conduct a breeding bird survey within 5 days of construction activities. If evidence of breeding is identified, Hess would coordinate with the BLM and applicable federal agencies to determine appropriate actions to protect breeding birds.
	Any open posts (1.5-inch-diameter or greater), which may be utilized in pipeline construction or operation (such as markers, signs, stacks, etc.), would be permanently covered or filled with sand or gravel. This is necessary to prevent wildlife mortalities by entrapment.
	To avoid/minimize impacts to nesting bald eagles from construction activities, Hess would: 1) maintain a minimum 0.5-mile buffer between the activity and any bald eagle nest if no landscape buffer exists; 2) maintain a minimum 660-foot buffer and landscape buffer or natural area between the activity and around the nest tree; and 3) avoid activities during the bald eagle nesting season (February 1 to July 15).
	To avoid/minimize impacts to golden eagles, Hess would conduct surveys prior to any on-the-ground activities to determine the extent of any golden eagle breeding territories in the area that may be impacted by the Project. Hess would conduct an aerial nest survey (preferably by helicopter) within 1 mile of the Project ROW to identify any occupied and unoccupied golden eagle nest sites in proximity to the Project area. Aerial surveys would be conducted between March 1 and May 15, before leaf-out, so that nests are visible and their status (active or inactive) can be determined. A nesting territory or inventoried habitat would be designated as unoccupied by golden eagles only after at least two complete aerial surveys in a single breeding season. Aerial surveys would include the following: 1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed-wing aircraft, although small aircraft also may be used. Hess would report any golden eagle nests, as well as other nests of any other raptors found during the survey. Where possible, Hess would utilize two observers to conduct the surveys. 2. Hess would record any observations of golden eagle nest sites using a global positioning system (GPS). The date, location, nest condition, activity status, and habitat would be recorded for each sighting. 3. Hess would share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the USFWS.
	Alternatively, Hess may conduct ground surveys to identify golden eagle nests within 1 mile of the Project ROW between March 1 and May 15. However, ground surveys are much less reliable than aerial surveys, even during leaf-off conditions, and 75 percent of golden eagle nests present may be missed. Hess would conduct at least 2 ground observation periods lasting at least 4 hours or more per linear mile to designate inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and monitored. If a golden eagle nest is observed, Hess would contact the USFWS for further consultation to determine appropriate protection measures and possible “take” permit implications.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Special Status Species	Prior to the initiation of construction, applicable biological surveys would be conducted through areas of suitable habitat for specific species during the appropriate season, as determined by the jurisdictional agencies (e.g., BLM and USFWS) and survey results reported in compliance with Section 7 of the ESA.
	If threatened, endangered, candidate, or sensitive plant species are identified in proposed disturbance areas prior to construction, appropriate protection measures would be determined in consultation with agencies.
	Surface use is prohibited from March 1 through June 15 within 1 mile (line of sight) of a sharp-tailed grouse display ground.
	If construction were to occur during the interior least tern or piping plover breeding season (April 1 through August 31), Hess would conduct surveys in suitable habitat within 0.5 mile of the Lake Sakakawea crossing location. Surveys would be conducted by a qualified wildlife biologist who is able to identify these species and would occur daily, before and after construction activities. Surveys would last for at least 2 hours prior to the start of construction each day and continue for at least 1 hour after construction has finished each day. If interior least terns or piping plovers are observed within line-of-sight of the Project area, no work would begin or continue and the BLM and USFWS would be contacted within 24 hours. Appropriate protection measures, such as seasonal constraints and the establishment of a spatial buffer area, may be implemented on a site-specific basis in coordination with the USFWS. Similar constraints and/or mitigation measures may apply to pipeline maintenance activities if conducted within 0.5 mile of suitable habitat.
	If construction occurs during spring (March to May) or fall (September to November) migration, Hess would provide whooping crane monitors in suitable habitat along the ROW. If a whooping crane is sighted within 1 mile of a pipeline or associated facilities during construction, all work would cease within 1 mile of the area and the USFWS would be contacted immediately. In coordination with the USFWS, work would resume after the bird(s) leave the area.
	In order to reduce impacts to the Dakota skipper, Ottoe skipper, regal fritillary, and tawny crescent, disturbance to native prairie would be reclaimed to its original condition using the USFS-approved native seed mix. The objective is for no net loss of native prairie habitat to occur. In addition, the following protection measures would be implemented to minimize impacts to the special status butterfly species: • Restrict workspaces where the ROW crosses native prairie habitat; • Salvage and segregate topsoil in native prairie to maintain the native seed sources for re-vegetation of the ROW in native prairie; • Control noxious and invasive plant species as addressed in the *Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan* (POD, Appendix F); and • Prohibit herbicide and pesticide use where special status butterfly species are found.
	The loss of special status plant species individuals or populations may occur as a result of adjacent noxious weed-related herbicide application treatments. To effectively mitigate this impact, consultation between the special status plant species jurisdictional agency and the weed control specialists would be completed prior to treatments. The location of known special status plant species and noxious weed species individuals and populations would be confirmed prior to treatments. In addition, techniques for special status plant species avoidance via direct and indirect applications would be developed.
	To prevent the spread of aquatic nuisance species during construction and operation, Hess would remove aquatic plants and animals from equipment prior to entering and before leaving any waterbody. Project staff would spray/wash equipment with high pressure hot water when leaving a wetland/waterbody, or would dry equipment for at least 5 days before use at a different wetland/waterbody.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Special Status Species (Continued)	The revegetation plan would include a commitment to reseed disturbed native prairie with a comparable native grass/forb seed mixture and planting a diverse mixture of native cool- and warm-season grasses and forbs. The approved USFS-approved seed mix to be used for reclamation meets these commitments.
	Hess would obtain a seed source that is as local as possible to ensure the particular cultivars are well adapted to the local climate.
Land Use	Any range improvements such as fences, gates, cattle guards, and developed water sources that are damaged during construction and are located within the Project's disturbance area or access roads would be repaired to the satisfaction of the agency or private landowner.
	If construction disturbs or destroys a natural barrier used for livestock control, the opening would be temporarily closed during construction and permanently closed following construction, as required by the agency or private landowner.
	Hess would coordinate with landowners to minimize impacts to their lands. Lands would be restored to original use following the construction phase of the Project.
	Construction personnel would be directed to stay within the approved ROW or would follow designated access roads to prevent disturbance beyond the ROW and approved access routes.
Recreation and Visual Resources	Measures would be implemented to minimize the visual effects of construction on high value road, river, and trail crossings as identified by the BLM, USFS, or USACE.
	To prevent unauthorized use of the ROW by off-road vehicles and subsequent potential impacts to soil, vegetation, and wildlife resources, access would be blocked at locations specified by agencies and /or private landowners.
Transportation	All major highway crossings would be bored to limit traffic interruptions.
	All roads, including unpaved roads, would be bored subject to approval of local road authorities.
	Temporary access areas would avoid sensitive features such as wetlands. Areas used for temporary roads or staging areas during construction would be restored to their original condition to the extent practicable.
Cultural and Paleontological Resources	Prior to Project construction, cultural and paleontological resource inventories would be conducted on all proposed disturbance areas not previously inventoried. All cultural resources recorded during the inventories would be evaluated for eligibility to the National Register of Historic Places (NRHP). Avoidance is recommended for cultural resources listed on the NRHP, evaluated as eligible for listing on the NRHP, or unevaluated. If avoidance is not possible, a treatment plan would be developed by the BLM in consultation with the North Dakota SHPO, USFS/USACE (if on their lands), and interested tribes. The treatment plan would be implemented prior to Project construction.
	If cultural resources, including human remains, are discovered during Project construction, all work would stop in the area of the discovery and the procedures outlined in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K) would be followed. BLM written permission stating that work in this area no longer presents a hazard to cultural resources would be required before work can resume in the area of the discovery. If paleontological resources are discovered during Project-related construction activities, all construction activity would cease within 100 feet of the discovery and would be reported to the construction supervisor and a qualified BLM-permitted paleontologist for assessment and recommended actions. The discovery would be handled as stipulated in the Unanticipated Discoveries Plan for Paleontological Resources (POD, Appendix L). Construction activities would not resume until the BLM Project Manager has issued a Notice to Proceed.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Cultural and Paleontological Resources (Continued)	To reduce potential visual effects to a historic property in which site setting contributes to its NRHP eligibility, aboveground structures would be painted with BLM-approved environmental colors to minimize contrasts with surrounding landscapes
	To minimize indirect impacts to cultural and paleontological resources, Project-related personnel would be educated as to the sensitive nature of the resources, and a strict policy of prohibiting collection of these resources would be implemented.
Noise	Construction would be restricted to the hours from 7:00 a.m. to 7:00 p.m. within 1,000 feet of an occupied residence. Construction would not occur within 1,000 feet of the Trinity Lutheran Church on Sundays. Based on these assumptions, noise levels would comply with the 65 decibels (dB) on the A-weighted scale (dBA) Housing and Urban Development (HUD) standard and noise effects on sensitive receptors would be minimized.
Public Safety and Environmental Protection	The Project would be located a minimum distance of 300 feet from residences to minimize hazards to human health and safety. Also, isolation valves would be installed along the pipeline in accordance with federal regulations to isolate the pipeline during a potential leak to minimize the release. At Lake Sakakawea, isolation valves would: 1) be remotely operated to reduce potential spill volume; 2) have pressure sensors that are capable of detecting leaks with slow release rates; and 3) have pressure detectors equipped with acoustic detection capabilities, capable of identifying the location of a release within 6 feet of its actual location, thereby reducing environmental disturbance.
	A Spill Risk Assessment (**Appendix A**) has been completed to identify HCAs and potential impacts as a result of an accidental release of crude oil, NGL, and natural gas during pipeline operation.
	Equipment would be maintained on-site to contain, capture, and clean up any accidental release of harmful chemicals, pollutants, or other materials into the environment. Spills would be cleaned up immediately. Spills on water that cause a sheen on the water require notification to the U.S. Environmental Protection Agency (USEPA) and would be removed by the appropriate containment and cleanup technologies. Spills would be cleaned up using an absorbent material, vacuum trucks, and other equipment, and the contaminated material either drummed in marked 55-gallon drums or hauled to an authorized disposal area.
	The use of hazardous materials would be carefully controlled. Such materials would be clearly labeled and used only by authorized personnel trained in the transportation, handling, use, and storage of the specific hazardous materials. Storage sites for fuels and hazardous materials would be located a minimum distance of 500 yards from wetlands and waterbodies and would be selected to ensure that risk of contamination of waterbodies or other sensitive environments resulting from an accidental spill at the site is reduced, and that leakage would be readily detected and contained.
	Storage sites of fuels or chemicals designed to hold in excess of 300 barrels would be surrounded by an impermeable berm, which would be of sufficient capacity to contain 150 percent of the volume of liquid stored. All hazardous chemicals, regardless of volume (including pesticides) would be stored on or in a secondary containment vessel capable of containing 150 percent of the volume of liquid stored.
	Hess would be responsible (or have contracts with companies with equipment and capabilities) for maintaining a sufficient supply of spill containment and clean-up equipment, including suitable commercial absorbent material on the work site with the responsibility to adequately respond to a loss of containment event.
	Hess would implement fire prevention and control measures including, but not limited to: 1) ensuring that sufficient suppression equipment and qualified personnel are present during hot work jobs; 2) requiring construction crews to carry fire extinguishers in their vehicles and/or equipment; 3) training construction crews in the proper use of fire extinguishers; and 4) coordinating with the local fire district to provide fire response services.

Table 2-4 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
USFS Specific Mitigation Measures	Keep disturbance to a minimum to reduce impacts to suitable sensitive species habitat and native vegetation communities in general, and also to reduce spread of invasive species.
	Where the disturbance area would intersect noxious weeds or patches of invasive species, treat the noxious weeds or invasive species at least 2 weeks prior to construction, or salvage and stockpile the topsoil from these sites separately to isolate the vegetative propagules and seed. These areas should be identified to ensure they are monitored after reclamation.
	Use a USFS-approved native seed mix for reclamation; monitor to ensure proper establishment. Monitor annually for 5 years following reclamation to ensure reclamation success and to identify noxious weeds and invasive species establishment. If, at any time during the 5-year monitoring period, revegetation is deemed successful by the USFS, no additional monitoring would be conducted.
	If invasive species are found on reclaimed sites that are in areas mostly dominated by native species, treat the invasive species sites and reseed if necessary.
	If noxious weeds are found on reclaimed sites, treat the weeds and reseed if necessary.
	Clean vehicles and equipment used for construction at approved water or air wash stations (monitored by an Environmental Inspector) prior to entering the LMNG to remove all seeds and plant propagules (seeds and vegetative parts that may sprout) in order to prevent the potential spread of noxious weeds and invasive species. Approved wash stations would include commercial car washes and on-site locations. This mitigation would be applied when moving equipment from an area containing invasive species to an area that does not contain invasive species.
	Clearly mark (stake/fence/flag) sensitive plant populations within or very near the ROW prior to construction and note them on alignment sheets to ensure that they are avoided. Ensure that such marking is still visible prior to reclamation activities.
	Any discovery of sensitive or watch plants within the Project area should be reported to the McKenzie Ranger District Office. Sensitive plant populations discovered after Project approval should be protected; therefore, last-minute alterations of the Project design or access route may be requested in order to avoid negative impacts to such populations.

A spill risk assessment has been completed to identify potential impacts as a result of an accidental release of crude oil, natural gas, and NGL during pipeline operation (**Appendix A**). The risk assessment presents the results of a pipeline incident frequency analysis based on the Project's design and operations criteria and applies the resulting risk probabilities to an environmental consequence analysis that incorporate Project-specific environmental data. Specifically, the risk assessment evaluates the risk of product releases during pipeline operations, including probable spill volumes and contribution of natural hazards to spill risk and the subsequent potential effects on humans and other sensitive resources, particularly in areas of high environmental sensitivity, including federally designated HCAs (e.g., certain populated areas, designated zones around public drinking water intakes, and/or ecologically sensitive areas).

Isolation valves are key design features to reduce the risk of impacts from potential accidental release from the pipeline. In the event of a release, isolation flow restriction devices can be used to isolate an affected pipeline segment and thereby substantially reduce spill volumes. Federal regulations require valves on either side of major water crossings, at pump stations, and sites that are particularly sensitive to a pipeline release. Additionally, Hess has evaluated the location of HCAs to confirm the appropriate placement of valves during final design. HCAs are PHMSA-defined locations where the potential impacts resulting from a spill have the potential to be greater than in other locations. For natural gas, HCAs are limited to populated areas, since the greatest threat from a natural gas release is fire and explosion. In contrast, HCAs for liquid pipelines include populated areas, unusually sensitive areas (municipal drinking water intakes and

ecologically sensitive areas), and commercially navigable waterways (49 CFR 195.450) due to the different hazards posed by these hydrocarbon products.

Federal pipeline regulations mandate a higher degree of protection for HCAs. While no HCAs were identified for the natural gas pipeline, there is approximately 2.4 miles where the liquid pipelines would have the potential to affect a HCA. These pipeline segments would be subject to a greater level of inspection and higher repair criteria to prevent a release within a HCA. The location of HCAs is considered by PHMSA to be highly sensitive information and public distribution of HCA data is not permitted due to Homeland Security concerns. Consequently, the location of the HCAs is not identified in this document. However, these data are available to regulatory agencies to ensure they can make informed decisions.

As required by 49 CFR 195.452(i) and enforced by the PHMSA, Hess would create a detailed engineering risk assessment and IMP if the Project is approved and constructed. Throughout the life of the Project, federal regulations would require Hess to continue to evaluate and monitor the integrity of its pipelines. PHMSA would routinely audit the Project to ensure Hess's compliance with 49 CFR 195.452(i) regulations, including the Integrity Management Rule, and would review the technical basis for the risk assessment's assumptions during integrity management inspections.

2.2.3 Construction

Hess facilities would be designed, constructed, tested, operated, and maintained in accordance with applicable requirements of the USDOT regulations in 49 CFR 195, Transportation of Hazardous Liquids by Pipeline, and 49 CFR 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards; United States Department of Labor regulations; Occupational Safety and Health Administration requirements; and other applicable federal and state regulations, such as PHMSA regulations. These regulations are intended to ensure adequate protection for the public and to prevent pipeline accidents and failures. Among other design standards, 49 CFR 195 and 49 CFR 192 specify pipeline material selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and qualification procedures for welding and operations personnel.

Construction methods, mitigation measures, and reclamation plans for the Project are described in detail in the Project's CMRP (see POD, Appendix C). The following subsections provide a summary of the measures included in this plan.

2.2.3.1 Safety Requirements and Environmental Inspection

Hess and its contractors would undergo prevention, response, and safety training. The program would be designed to improve awareness of safety requirements, pollution control laws and procedures, and proper operation and maintenance of equipment.

As part of the construction mobilization activities, Hess would hold a pre-construction safety coordination meeting at each spread or project work location. Designated Hess Project Management personnel would attend these sessions with the contractor superintendent, foremen, and safety representatives. The meeting would address any specific contractor and/or Hess concerns and expectations; safety initiatives; and facilitate review of the safety compliance program, incident reporting, and established protocols for determining, correcting, and documenting safety non-compliance incidents.

Following the pre-mobilization safety and environmental orientation, the Contractor would conduct safety and environmental orientation for all personnel and site visitors prior to granting access to any portion of the construction ROW. The Contractor would keep a log of all personnel receiving safety and environmental orientation. All work would be conducted in accordance with the terms and conditions of the approved ROW permit.

The Contractor and subcontractors would ensure that persons engaged in Project construction are informed of the construction and environmental requirements and would attend and receive training about the

requirements, laws, rules, and regulations applicable to the work. All Project personnel would be trained on environmental permit requirements and specifications, fuel handling and storage, cultural resources protection, stream and wetland crossing requirements, and sensitive species protection measures.

The Contractor would provide, at a minimum, one qualified and experienced safety representative and three personnel trained in emergency management for each construction spread. Hess would provide at least one Environmental Inspector per spread to ensure construction activities are compliant with the permit-approved environmental mitigation and reclamation requirements.

Construction activities would be carried out during daylight hours unless otherwise approved by Hess. Burning along the ROW would be controlled in accordance with local permits and requirements. Spill prevention measures would be taken to maintain the safety of the construction personnel and to protect the environment. Access to the ROW would be controlled to allow only authorized vehicles and to maintain the safety of the public and construction crews.

Multiple spreads may be constructed at the same time. The construction process would be coordinated in such a manner as to minimize the total time an individual tract of land is disturbed, exposed to erosion, or temporarily precluded from its normal use. A typical pipeline construction sequence is shown in **Figure 2-8**.

2.2.3.2 Survey and Staking

The first step of construction would involve marking the limits of the approved work area (the construction ROW and ATWSs), the pipeline centerline, access roads, existing utility lines, and other special areas. Sensitive areas such as wetland boundaries and cultural resources sites would be marked and flagged. Hess would notify landowners in advance of construction activities that could affect their property, business, or operations.

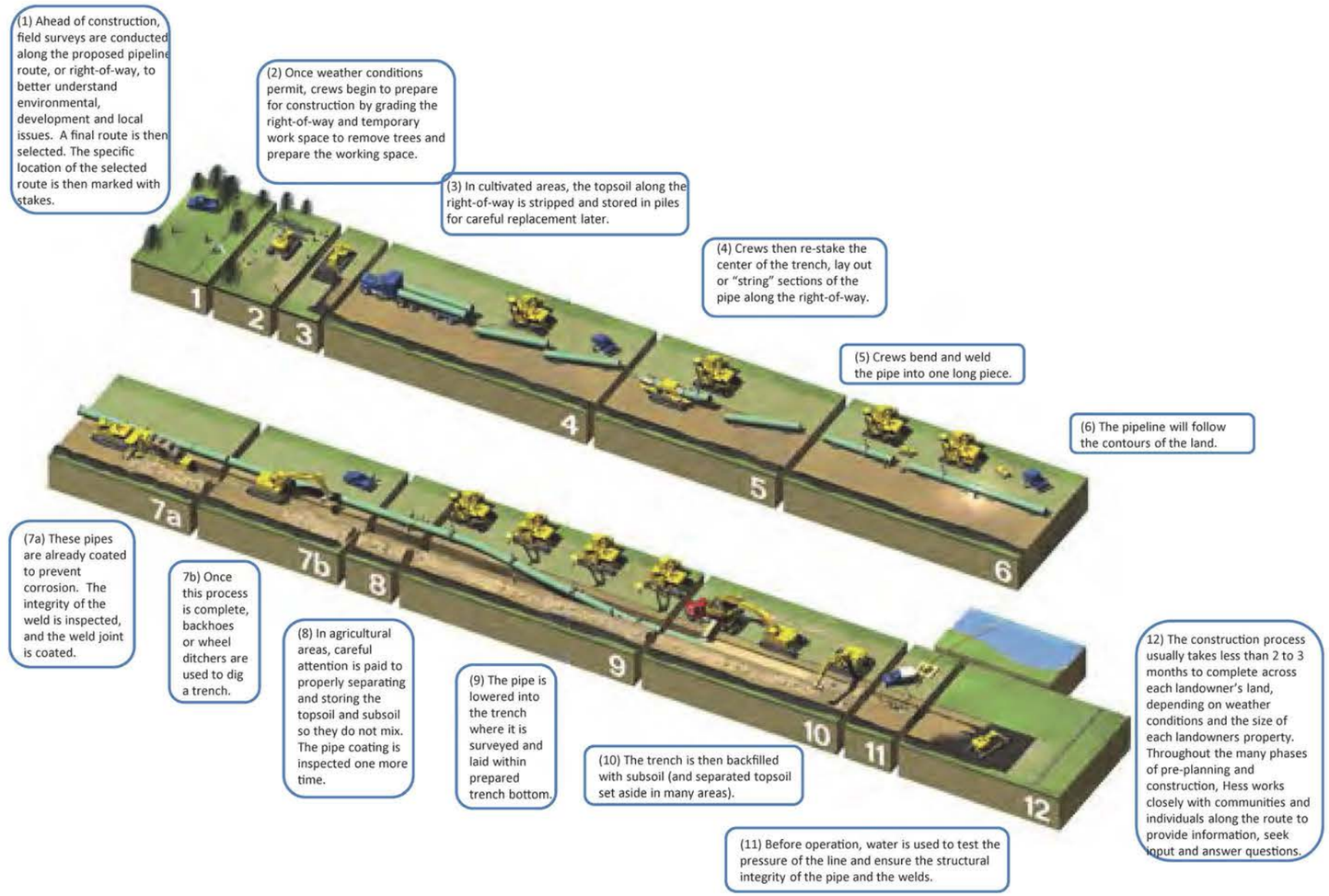
2.2.3.3 Clearing and Grading

The construction ROW would be cleared and graded (where necessary) to provide a relatively level surface for construction equipment, a sufficiently wide workspace for the passage of heavy construction equipment, and safety for the pipeline workers.

To avoid soil mixing, topsoil would be salvaged for future reclamation efforts by removal and segregation from the underlying subsoil for the entire width of the Project ROW for the length of the pipeline. Typically, stripped topsoil would be stored within the temporary construction ROW on the spoil side of the trench. After pipeline installation is complete, the subsoil would then be replaced in the pipeline trench and adjacent areas to restore the land's natural contours. Only then would the topsoil be replaced in the locations from where it was initially removed. However, special, site-warranted cases (e.g., rugged terrain) may require the storage of topsoil on the working side of the trench (e.g., construction on an upward facing side slope). Typical construction ROW cross-sections depicting topsoil and subsoil storage locations are provided in **Figures 2-9** through **2-11**.

The depth of topsoil stripping would vary according to the ROW landscape position. Construction activities would be suspended during abnormally wet conditions to prevent excessive rutting or mixing of topsoil and subsurface soils. The suspension of construction activities would depend on the depth of topsoil rutting with work halting when ruts reach an average depth of 3 to 4 inches.

Fences and gates would be constructed during the clearing and grading operations to allow continuous use of pastures and livestock facilities. Temporary erosion controls would be installed after initial disturbance of soils, where necessary, to minimize erosion. Erosion controls would be maintained throughout construction.



Location
McKenzie Co., ND

Project Information
Project Number: 212205020
Last Modified: November 18, 2014

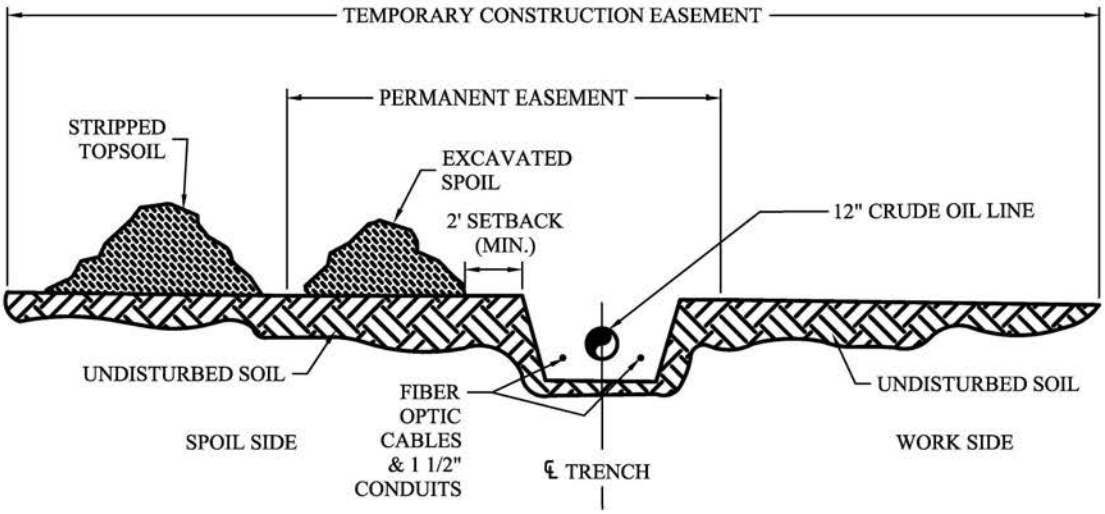
Note: Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-8

Typical Construction Sequence



NOTES:

1. EASEMENT WIDTHS ARE:
   PRIVATE PROPERTY:
   100' TEMPORARY
   50' PERMANENT

   STATE PROPERTY:
   100' TEMPORARY
   33' PERMANENT

   FEDERAL PROPERTY:
   50' TEMPORARY
   20' PERMANENT

2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.

3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.

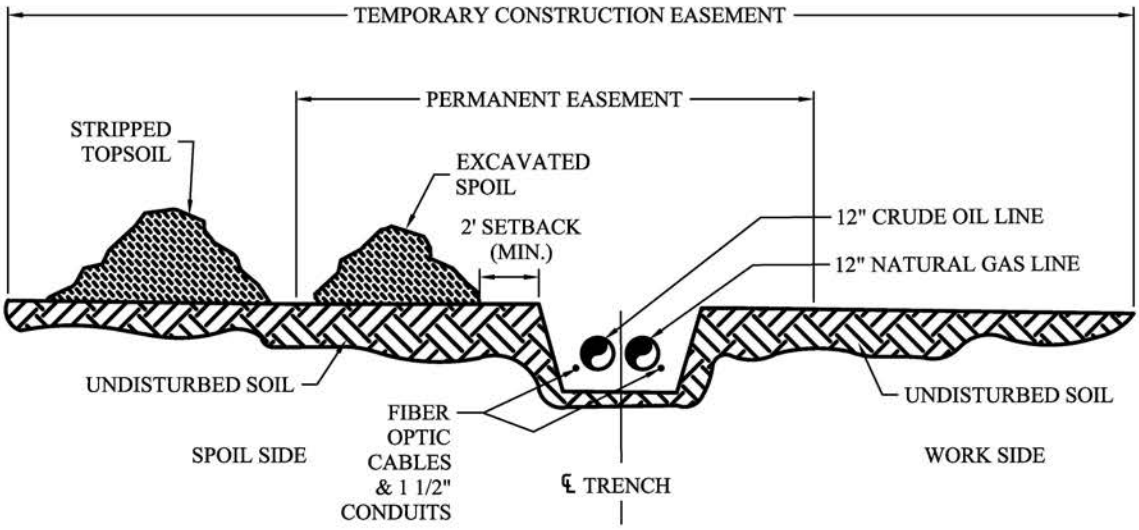
Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-9

Construction ROW - Crude Oil



NOTES:

1. EASEMENT WIDTHS ARE:
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   20' PERMANENT

2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.

3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.

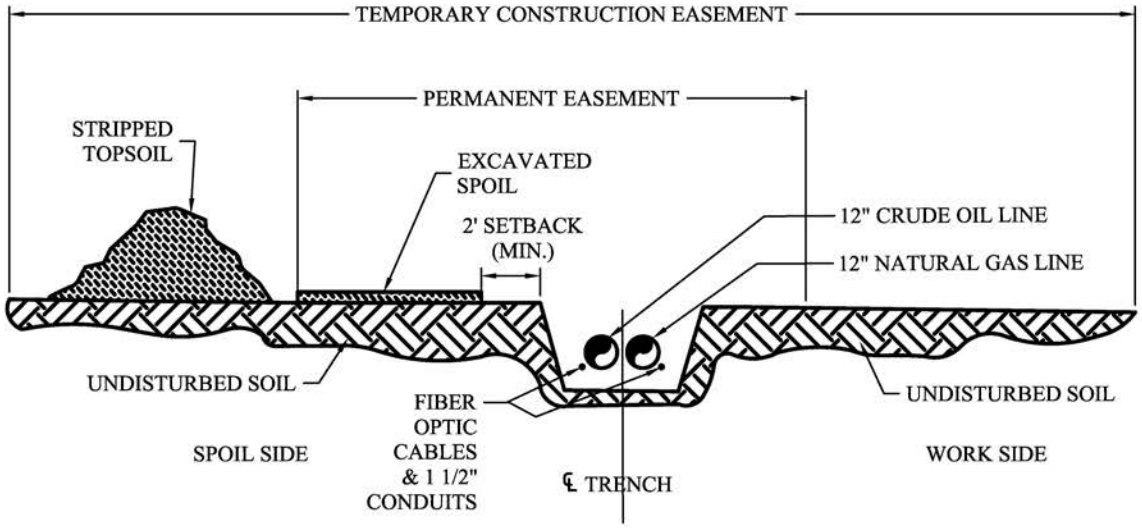
Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-10

Construction ROW - Crude Oil and Natural Gas



NOTES:

1. EASEMENT WIDTHS ARE:
   USFS PROPERTY:
   50' TEMPORARY,
   20' PERMANENT
2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.
3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.
4. DECOMPACTION WILL BE PROVIDED ON THE WORKING SIDE OF THE TRENCH.

Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-11

Construction ROW - Crude Oil and Natural Gas on USFS Land

2.2.3.4 Trenching

Trenches would be excavated using a backhoe and/or excavator. Special excavation equipment or techniques may be used if large quantities of solid rock are encountered. Trenches would be excavated to a minimum depth of 6 feet, which would ensure a 5-foot depth of cover from the top of the pipe. USDOT specifies a minimum cover of 3 feet from natural ground to the top of the pipe, except in rock, where a minimum depth of cover of 30 inches is required. By exceeding federal pipeline standards, the additional depth allows for various farm activities without impacting the installed pipelines.

The amount of open trench permitted at any time during the Project would be governed by the stability of the trench and the prevailing weather conditions. The open trench would be restricted so as not to extend more than 3 miles ahead of the welding and x-ray crew unless approved by Hess. When the trench is excavated through lands where livestock is confined or through cultivated fields where it is desirable for the landowner to have a passageway across the trench, temporary fences, gates, and/or bridges would be installed to provide appropriate restriction or safe access across the open trench. It is envisioned that the trenching activities would be carried out after completion of welding and follow up scope to minimize any impact on landowners. Trench ramps or other safe means of egress would be provided in all trenches that are 4 feet deep or more. Hess would position these means of egress within 25 lateral feet of workers. Structural ramps used in place of steps must have a non-slip surface. The use of earthen ramps as a means of egress is permitted only if a worker can walk on them in an upright position, and only if they have been evaluated by a qualified individual. Structural ramps that are used solely for access or egress from excavations would be designed in line with industry standards.

2.2.3.5 Pipe Stringing, Bending, and Welding

The Contractor would string along the ROW, side by side. Hess plans to use typical pipe lengths of 40 feet. A stringing crew using special trailers would move the pipe along the ROW.

A pipe-bending machine would be used to make necessary side bends and over bends in the pipe to account for changes in the pipeline route and to conform to the topography. The bending machine uses a series of clamps and hydraulic pressure to make a smooth, controlled bend in the pipe. All bending is performed in strict accordance with federally prescribed standards to ensure integrity of the bend. The pipe would be bent at the mill using high-frequency technique when necessary to achieve 5-inch-diameter radius for bends. The pipe would be pre-coated at the mill with FBE external coating (or other coating technique) to provide corrosion protection.

A welding process would be used to join the sections of both sets of pipe into two continuous lengths, simultaneously, side by side. Each welder would be required to pass an approved qualification test to work on particular aspects of the pipelines. The qualification tests would be conducted using project-specific weld procedures that would be developed in accordance with federally adopted welding standards.

Welds would be nondestructively tested to ensure structural integrity and compliance with the applicable USDOT regulations. Those welds not meeting established specifications would be repaired or removed. Once the welds are approved, the welded joints would be externally coated and both entire pipelines would be visually and electronically inspected for coating defects, scratches, or other damage. Any damage or defects would be repaired before lowering the pipe into the trench. Both pipes would be lowered into the trench, sequentially, side by side, while maintaining the required 12-inch minimum spacing between pipes.

2.2.3.6 Lowering-in, Padding, and Backfilling

A series of side-boom tractors would simultaneously lift welded sections of the pipe and carefully lower the sections into the trench. The fiber optic armored cables would be continuously unrolled alongside the pipes after completion of lowering and stringing the pipe. Non-metallic slings protect the pipe and coating as it is raised and moved into position. In rocky areas, the Contractor may place sandbags at the bottom of the trench prior to lowering-in to protect the pipe and coating and fiber optic cables from damage. Trench

breakers or water stops would be installed, as necessary, adjacent to wetlands and stream crossings to preclude groundwater migration along the trench.

The trench would be dewatered, as necessary, prior to lowering in. Dewatering effluent would pass through sediment filters (hay bale structures and/or filter bags) to ensure compliance with applicable water quality standards.

The trench would be backfilled after the pipes and fiber optic cables have been installed. Soil would be returned to the trench in the reverse order of excavation. Subsoil would be backfilled first, followed by topsoil. The trench line (subsoil) would be compacted with a wheeled-roller or other suitable construction equipment. A crown would be left over the trench line to allow for natural subsidence in locations that are not cultivated. If the excavated material (rock) can damage the pipe and/or coating and/or the fiber optic cables, they would be protected with a rock shield and/or covered with select padding fill obtained from commercial borrow areas, or by separating suitable material from nearby trench spoil. Topsoil would not be used for padding.

2.2.3.7 Hydrostatic Testing

The entire length of the three product pipelines would be hydrostatically tested per USDOT regulations at 49 CFR 195 and 49 CFR 192 before being placed into service. The existing pipes to be used to convey crude oil, natural gas, and NGL across Lake Sakakawea were hydrostatically tested in June 2013. All three pipe sections under Lake Sakakawea passed the requisite tests required by federal pipeline regulations. For new build sections, Hess plans for the construction contractors to obtain hydrostatic test water and/or alternatively antifreeze might be added to the water during winter testing from an approved location or municipality to hydrostatically test the pipelines. No surface water sources would be utilized for hydrostatic testing of the pipeline. Each pipe section would be filled with water and pressurized to a level higher than the operating pressure. Hess would require a minimum hydrostatic test pressure of 125 percent of design pressure for a minimum of 4 hours to confirm that it meets the design strength requirements and whether any leaks are present. The pipeline test section breakdowns are provided in **Table 2-5**.

Table 2-5 Hydrostatic Test Segments and Estimated Water Volumes

Pipeline	Break Locations	Approximate MP		Length	Water Volume	Source[1]	Proposed Discharge Locations (Approximate MP)
Crude Oil and Crude Oil/Natural Gas	Hawkeye Oil Facility to North Charlson Compressor Station	0.0	10.5	91,213	535,893.36	TBD	3.5
Crude Oil/Natural Gas	North Charlson Compressor Station to North of River Valve Station	10.5	12.5	25,554	60,617.46	TBD	12.5
Crude Oil/Natural Gas	North of River Valve Station to Silurian Compressor Station	12.5	23.4	115,670	679,582.79	TBD	23.4
Crude Oil	Silurian Compressor Station to Ramberg Truck Facility	23.4	25.3	9,822	57,706.08	TBD	23.4
Repurposed 8.625-inch Diameter NGL Conversion	Hawkeye Compressor Station to North Hofflund Valve Station	0.0	14.7	55,598	144,489.24	TBD	14.7
Repurposed 10.750-inch Diameter NGL	North Hofflund Valve Station to Silurian Compressor Station	14.7	23.4	46,028	188,543.72	TBD	14.7
	Total			**111,448**	**1,666,832.66**		

[1] Local municipal/private wells to be determined.

Hess plans to dispose of all hydrostatic test water via a contracted trucking company, which would haul the water to a wastewater treatment facility for treatment prior to being discharged. Hess's Hydrostatic Test Plan is provided in Appendix E of the POD.

2.2.3.8 Cleanup

The final step in the construction process is restoring the ROW as closely as possible to its original condition. Depending on the Project requirements, this typically involves decompacting construction work areas, replacing topsoil, and seeding non-cultivated land. Final grading is anticipated to occur within 20 days of backfilling the trench. Measures to protect the pipeline and mitigate against the loss of cover include, but are not limited to, trench plugs, permanent slop breakers, erosion control, matting, and rip rap.

Pipeline markers and/or warning signs would be placed along the pipeline centerlines at line-of-sight intervals and at crossings of roads, railroads, and other key points as required by 49 CFR 195 and 49 CFR 192 to show the location of the pipelines. Access roads would be restored to pre-construction conditions, unless otherwise specified by the landowner. Public and private property (fences, gates, driveways, roads, etc.) that were disturbed by construction would be restored to their original or better condition, consistent with agreements with landowners, federal agencies, counties, and/or townships. Rocks greater than 6 inches across would not be placed within 1 foot of the surface on tilled land. Rocks would be collected and disposed of off the ROW or at a location designated by the landowner.

2.2.3.9 Restoration

The construction Contractor would limit ground disturbance wherever practical and use appropriate erosion and sediment control measures. Prior to the completion of construction activities, Hess would ensure that the BLM Project Manager has access to review and inspect vegetation and restoration activities along the ROWs on federal lands. Hess and its contractors would be responsible for the removal of temporary construction facilities, structures or surface materials, reclamation of the original grade contours, and restoration of disturbed areas to a state similar to pre-construction conditions, to the extent practicable. Post-construction reclamation activities include removing and disposing of debris, dismantling temporary facilities, leveling or filling tire ruts, soil decompaction, and reseeding non-cultivated areas.

<u>Reclamation</u>

The objectives of reclamation and revegetation are to return the disturbed areas to approximately pre-construction use and capability. This involves the treatment of soil as necessary to preserve approximate pre-construction capability and the stabilization of the work surface in a manner consistent with the initial land use.

Post-construction reclamation activities would include soil decompaction, the removal of construction debris, topsoil replacement as feasible, restoring original contours with no crown over the trench, reseeding, establishment of permanent erosion control measures, and post-construction monitoring. Temporary erosion control measures would be applied as necessary. Seeding would follow cleanup and topsoil replacement as closely as possible.

The USFS -approved revegetation seed mixes for native prairie would be applied on federal lands. The USFS-approved seed mix will be applied on state and private lands unless state and private landowners request a different seed mix. Certificates of seed analysis by the State of North Dakota, or the state in which the seed originated, are required for all seed mixes to limit the introduction of noxious weeds. The seed mix would consist of native species. Any adjustments to the seed mix due to site characteristics and/or lack of available seed for some species would need to be conducted with prior approval by the USFWS, USFS, and the BLM. Temporary cover crops of naturalized species may be used until final reclamation can occur. Weather conditions, construction ROW constraints, site access, and soil type would influence the seeding method to be used (i.e., drill seeding versus broadcast seeding).

The Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan (POD, Appendix F) would be implemented to minimize the spread of noxious weeds. Herbicide would be applied to noxious weed infestation areas after grass species are established. Treatment methods other than herbicide application, such as mowing and biological methods, would be considered during the post-reclamation process. Monitoring of noxious weeds would be conducted as part of on-going operations and maintenance inspections.

Post-construction monitoring inspections would be conducted for 3 to 5 years after the first growing season depending on land ownership, to determine the success of revegetation focusing on vegetative cover and noxious weeds and invasive species cover. Areas which have not been successfully re-established would be revegetated by Hess or through compensation to the landowner to reseed the area. On private lands, if after the third growing season, revegetation is successful, no additional monitoring would be conducted. On U.S. Forest Service (USFS), State, and USACE managed lands, if revegetation is successful after the fifth growing season, no additional monitoring will be conducted.

In grasslands identified as high and medium quality Dakota Skipper habitat, post-construction monitoring inspections would be conducted for 5 years following the first growing season to determine the success of revegetation focusing on vegetative cover and noxious weeds and invasive species establishment. The monitoring period may be shortened to 3 years upon request if located on private land. If 2 consecutive years of successful revegetation is not documented, additional mitigation measures (e.g. reseeding) and extended monitoring may be required. Additional mitigation measures will be determined in consultation with the BLM, landowner/manager, and the USFWS.

In general, revegetation would be considered successful if, upon visual survey, the density and cover of native vegetation is 70 percent of the density and cover in adjacent undisturbed lands, or of the pre-construction vegetation mix. In grasslands identified as high and medium quality Dakota Skipper habitat, no more than 30 percent of the total vegetative cover can be non-native species. Restoration would be considered successful if the surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the landowner or land managing agency), revegetation is successful, and drainage has been restored. More detail on reclamation activities is provided in the CMRP (POD, Appendix C).

2.2.4 Special Construction Techniques

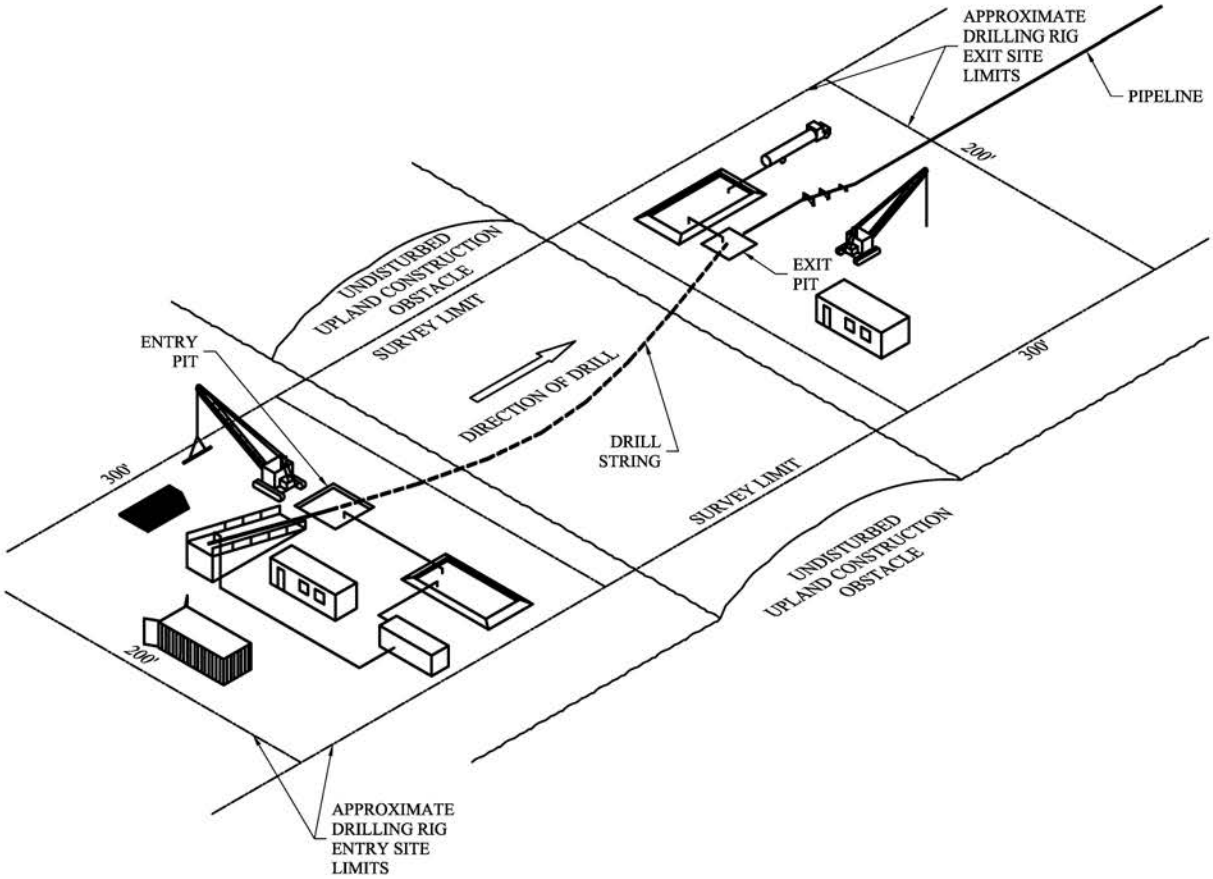
2.2.4.1 Open Cut Construction

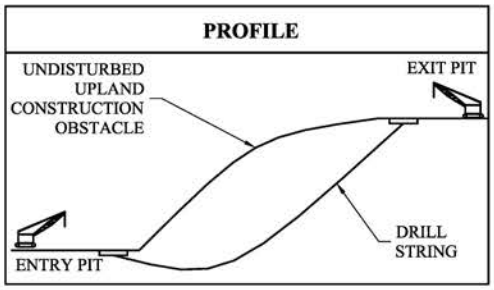
The open-cut crossing method involves excavating the trench across the drainage, installing a section of pipe, and backfilling. Excess debris, piling, and other obstructions during crossing construction would be removed to allow potential water flow. To reduce the potential risk of stockpiled soil and debris, construction of crossings would be scheduled during a time when there is little rainfall, if possible. Following grading, banks would be stabilized, potentially riprapped, and seeded to prevent erosion. Banks would be restored to as near their original contours and elevations as practicable.

2.2.4.2 Horizontal Directional Drilling

HDD is a construction technique for installing pipelines beneath ground surface to avoid impacting sensitive areas (e.g., wetlands, steep topography, cultural resources, and roads). **Figure 2-12** provides an illustration of a typical HDD for a landslide area. Entry and exit holes are constructed at either end of the predetermined length to control and guide the pipe installation, and are set back a sufficient distance from the avoidance area. While the holes are being drilled and before the pipe is pulled through the hole, the pipe is welded and hydrostatically tested along the construction ROW. Once the hole is prepared and stable, the welded pipe (or drill string) is strung through the hole. The pilot hole generally is 1.5 to 2 times the size of the pipe diameter to ensure enough space to pull the pipe through. Circulating drilling fluid, primarily consisting of bentonite, is released from equipment on ground level through the drill pipe to a downhole bit and then back

DIRECTIONAL DRILLING SITE TO SITE





Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-12

Typical Construction HDD - Upland Obstacle

to the surface between the pipe and the wall of the hole. Bentonite keeps the equipment lubricated and serves to remove large cuttings. The drilling fluid would be under a great amount of pressure and follows the path of least resistance. Pockets of substrate material could be encountered that cannot be penetrated or contains fissures, thus causing fluids to rise to the surface. Hess has prepared a contingency plan prior to HDD construction to manage unintended returns of drilling fluids (POD, Appendix G, Inadvertent Returns Contingency Plan).

Upon completion of the directionally drilled crossing and installation of the carrier pipe, the drilled cuttings and residual drilling fluid are removed from site to an approved dump site.

The major advantage of the HDD technique is the minimal effects on environmentally sensitive surface areas, roads, and temporary surface impacts during construction activities. Hess proposes to use the HDD method (**Figure 2-12**) to construct 45 HDD and bore segments for the Project (**Table 2-6**) (**Figure 2-13**), with the vast majority of the HDD segments being constructed to avoid impacts to wetlands/streams and roads.

Table 2-6 Horizontal Direction Drill and Bore Locations

Segment Number	Enter Milepost	Exit Milepost	Feature Avoided[1]	Length (Feet)
001	0.12	0.14	Road	80
002	0.63	0.68	Road	280
003	0.76	0.94	Waterbody	939
004	1.86	1.91	Waterbody	244
005	2.00	2.05	Waterbody	240
006	2.16	2.17	Road	80
007	3.03	3.06	Road/Waterbody	187
008	3.40	3.43	Road	160
009	3.61	3.69	Waterbody	418
010	4.59	4.60	Road	80
011	5.60	5.63	Road	161
012	6.52	6.55	Waterbody	182
013	7.00	7.02	Road	83
014	7.14	7.50	Sensitive Area/Steep Terrain	1921
015	7.59	7.61	Waterbody	119
016	7.78	7.79	Road	80
017	8.23	8.40	Steep Terrain	894
018	8.59	8.63	Road	200
019	8.83	8.84	Road	52
020	9.43	9.59	Steep Terrain	860
021	9.81	9.82	Road	80
022	12.69	12.71	Road	87
023	13.03	13.38	Steep Terrain	1836
024	13.85	13.89	Waterbody	245
025	13.94	14.02	Waterbody	417
026	14.29	14.32	Waterbody	171
027	14.73	14.75	Road	122
028	14.96	14.98	Waterbody	134
029	15.53	15.57	Waterbody	211
030	16.21	16.46	Road/Waterbody	1302
031	16.74	16.75	Waterbody	80
032	17.42	17.44	Road	80
033	19.12	19.17	Waterbody	285

Table 2-6 Horizontal Direction Drill and Bore Locations

Segment Number	Enter Milepost	Exit Milepost	Feature Avoided[1]	Length (Feet)
034	19.45	19.51	Sensitive Area/Construction Constraints	351
035	19.56	19.57	Road	81
036	20.13	20.14	Road	80
037	20.63	20.64	Road	80
038	21.15	21.17	Road	109
039	21.70	21.71	Road	80
040	22.76	22.78	Road	137
041	23.94	23.96	Road	80
042	24.34	24.36	Road/Waterbody	120
043	25.25	25.27	Road	114
Natural Gas Pipeline Lateral Extension to Hawkeye Compressor Station				
044	0.05	0.07	Waterbody	109
045	0.37	0.39	Road	122

[1] Waterbodies include wetlands and streams identified during field delineation surveys. Multiple wetlands are often crossed by one bore or HDD and as such the total crossings do not match the total count of wetlands and streams identified in the Natural Resources Report (POD, Appendix H).

2.2.5 Special Construction Areas

2.2.5.1 Highway, Road, and Railroad Line Crossings

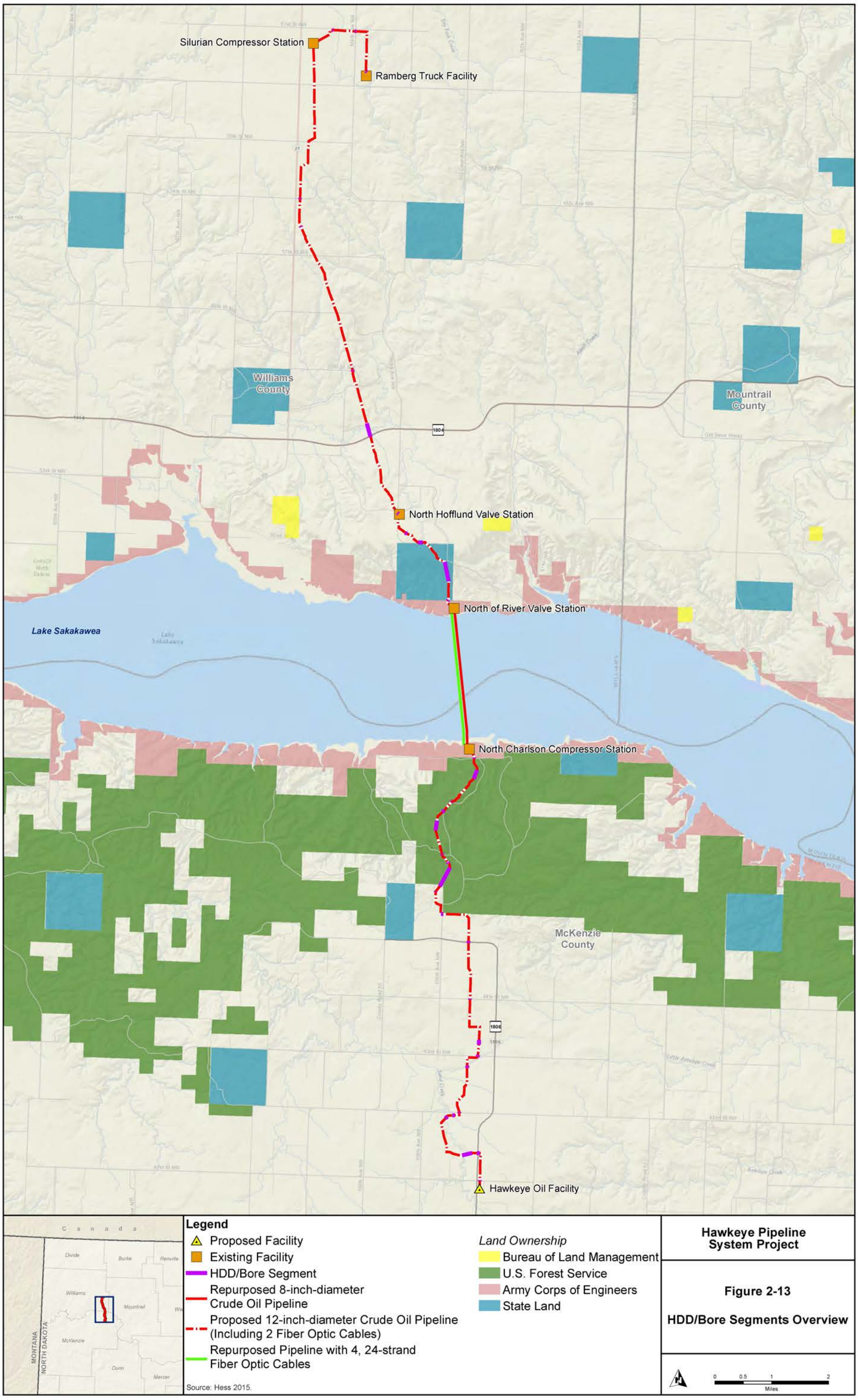
Construction across paved roads, highways, and railroads would be in accordance with the requirements of the road and railroad crossing permits and approvals obtained by Hess. In general, all major paved roads, all primary gravel roads, highways, and railroads would be crossed by boring beneath the road or railroad. Boring requires the excavation of a pit on each side of the feature, the placement of boring equipment in the pit, and boring a hole under the road at least equal to the diameter of the pipe. Once the hole is bored, a prefabricated pipe section would be pulled through the borehole. For long crossings, sections can be welded onto the pipe string just before being pulled through the borehole. Boring would result in minimal or no disruption to traffic at road or railroad crossings. Each boring would be expected to take 1 to 2 days for most roads and railroads and up to 10 days for long crossings such as interstate or four-lane highways.

Unimproved roads generally are minor roads with minimal traffic. They normally are identified as small roadways, trails, or two-tracks with no embankment or adjacent ditches and constructed/situated in natural earth material. The surface may have a light sprinkling of granular material. Unimproved roads would be crossed using the bore method as well.

2.2.5.2 Waterbody Crossings

Hess proposes to use the HDD method for 17 waterbodies crossed by the Project. Hess's CMRP, Spill Prevention, Control, and Countermeasures Plan (SPCC Plan), and SWPPP would specify measures that would address erosion control, equipment refueling, timing, construction methods, and restoration. Temporary workspaces typically are required on each side of a waterbody crossing to stage construction, fabricate the pipeline, and store materials. Temporary workspaces would be located in upland areas a minimum of 50 feet from the waterbody edge. Trench spoil would be stored at least 10 feet from the waterbody banks. Spoils from the trench would be placed in an upland area with requisite sediment and erosion control ditching. No foreign material would be added to the channel during backfilling the trench and the channel would be recontoured as close as possible to original condition.

An Environmental Inspector would be present prior to and during water crossing construction to ensure protection measures are implemented and functioning as intended.



Hawkeye Pipeline System Project

Figure 2-13

HDD/Bore Segments Overview

Lake Sakakawea Approach

In order to avoid steep terrain and constructing in landslide-prone areas on either side of Lake Sakakawea, Hess would HDD these areas and tie into the existing pipelines at existing Hess facilities. **Figure 2-14** shows the proposed HDD of the bluff approaching the south side of Lake Sakakawea and the tie-ins to the existing pipelines. **Figure 2-15** shows the proposed HDD of the bluff approaching the north side of Lake Sakakawea and the tie-ins to the existing pipelines.

2.2.5.3 Wetland Crossings

All wetlands would be crossed using HDD/boring techniques. Boundaries of all wetlands within the construction ROW would be marked with tape or pin flags no more than 5 days prior to construction.

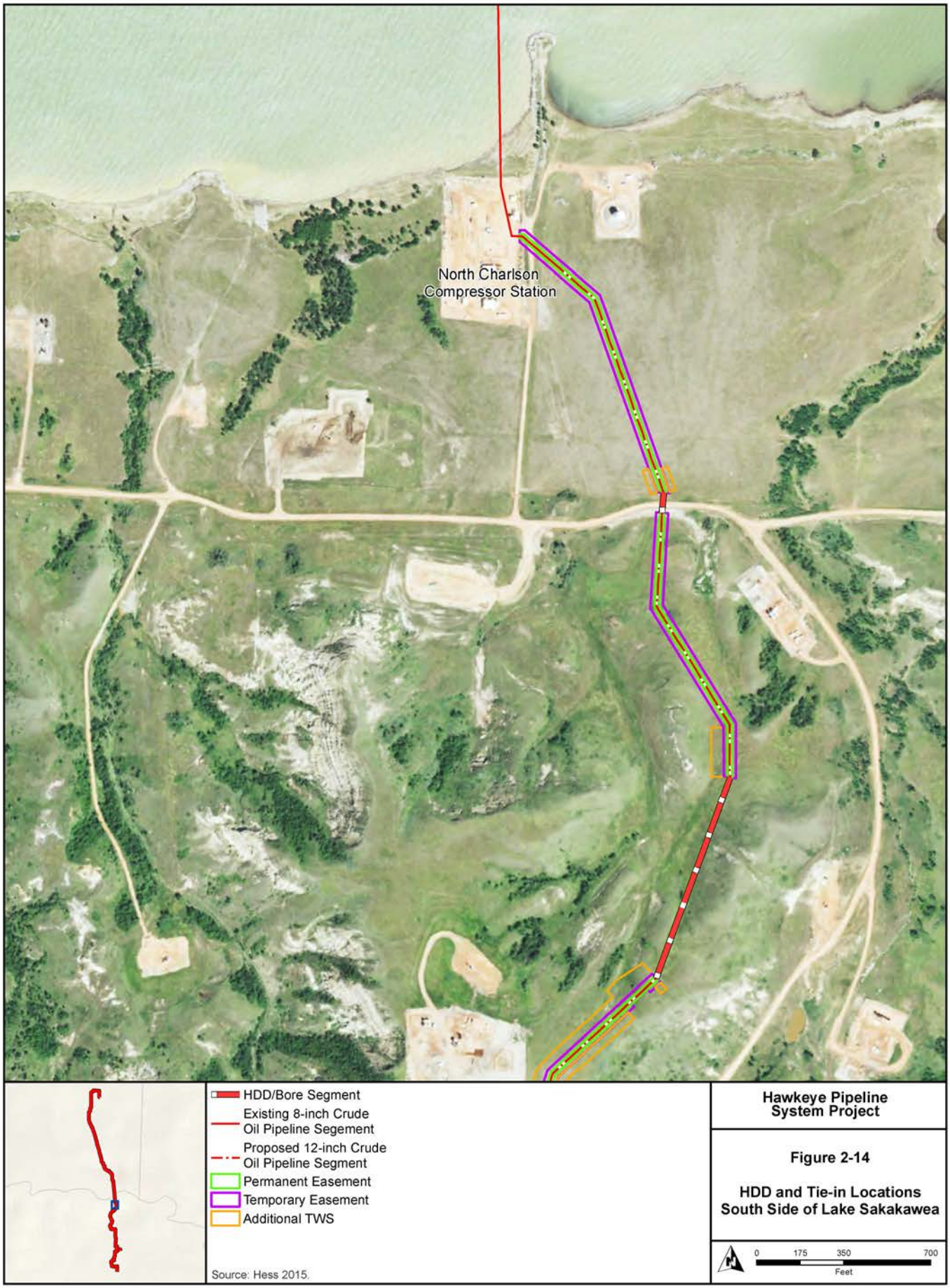
2.2.5.4 Rugged Terrain

Certain locations along the Project route may require special construction methods used for steep slopes. Some of the steep slope segments may be located across the LMNG and Hess would need to obtain USFS approval to exceed a 50-foot-wide construction ROW at these locations. In these areas, Hess may employ side slope construction techniques. **Figures 2-16** through **2-19** depict the side slope construction technique both within a 100-foot-wide construction ROW and a 50-foot-wide construction ROW, respectively. In both cases, topsoil would be segregated from the full ROW, and the spoil from the cut area and trench would remain on the approved construction ROW. In some cases, it may be necessary to place some of the spoil from the cut areas onto the working side of the trench, and allow the construction equipment to work from the spoil. In particularly steep areas, safety precautions would be implemented to ensure public and worker safety. It may be necessary to anchor equipment and pipe with cables to secured equipment or “dead men” to prevent the equipment or pipe from sliding down steep slopes. Some equipment also may need mechanical assistance to traverse steep slopes. Such equipment would be winched up or down the slopes. Enhanced erosion control and revegetation measures may be required in areas of rugged terrain.

2.2.5.5 Residential and Commercial Areas

Specific measures that would be implemented on existing residential and commercial areas include the following, unless otherwise directed or approved by Hess, based on site-specific conditions or circumstances. All work would be conducted in accordance with applicable permits.

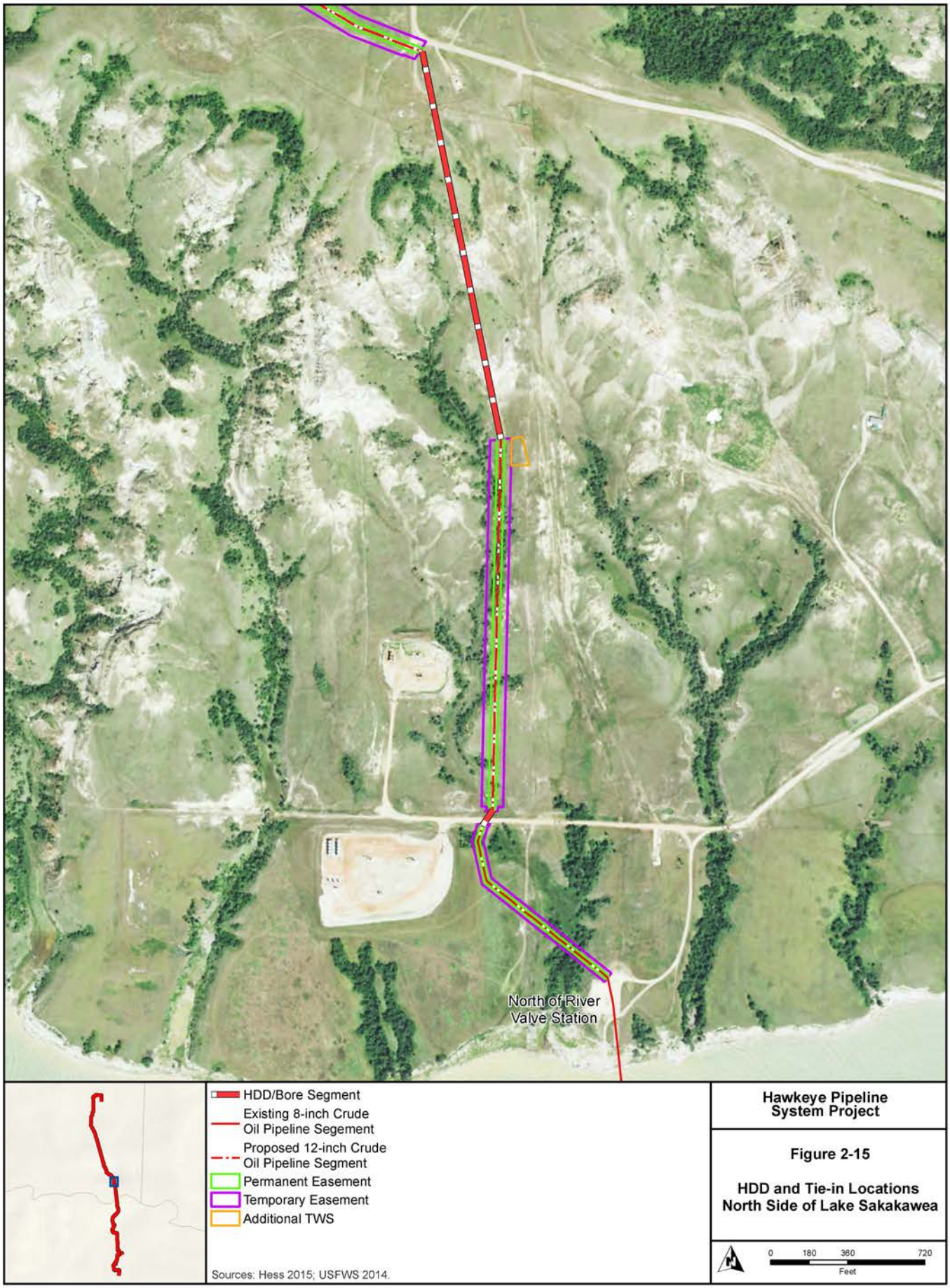
- Notifying landowners prior to construction;
- Posting warning signs as appropriate;
- Reducing the width of construction ROW, if practicable, by eliminating the construction equipment passing lane, reducing the size of work crews, or utilizing the “stove pipe” or “drag section” construction techniques (“stove pipe” construction method involves installing one joint of 40-foot pipe at a time; the welding, weld inspection, and coating activities are all performed in the open trench);
- Removing fences, sheds, and other improvements as necessary for protection from construction activities;
- To the extent possible, preserving mature trees and landscaping while ensuring the safe operation of construction equipment;
- Fencing the edge of the construction work area adjacent to a residence for a distance of 100 feet on either side of the residence to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area;
- Limiting the hours during which operations with high-decibel noise levels (i.e., drilling and boring) can be conducted;
- Limiting dust impact through prearranged work hours and by utilizing dust minimization techniques;



Hawkeye Pipeline System Project

Figure 2-14

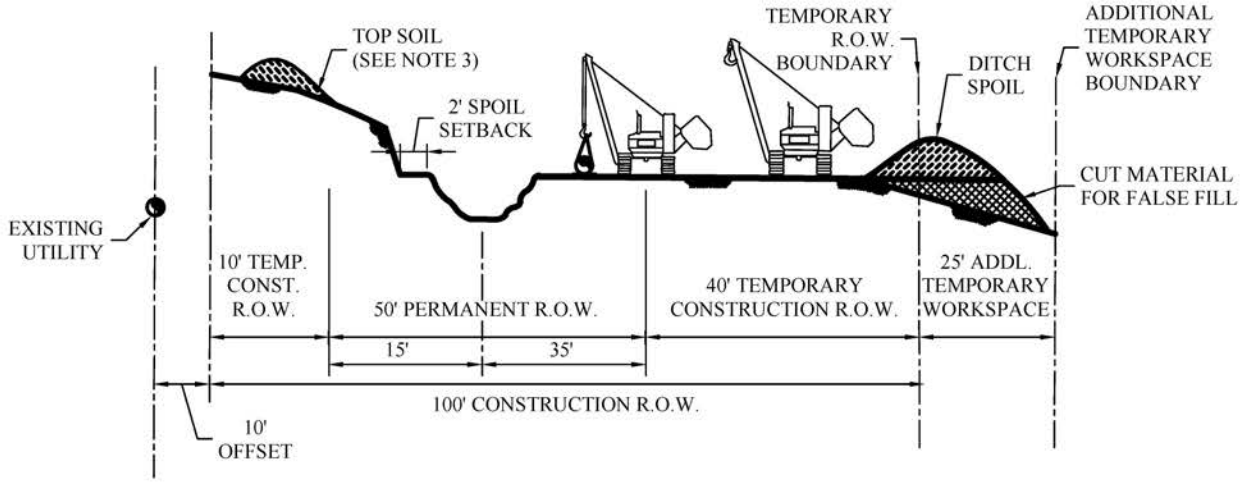
HDD and Tie-in Locations South Side of Lake Sakakawea



Hawkeye Pipeline System Project

Figure 2-15

HDD and Tie-in Locations North Side of Lake Sakakawea



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH, AND SPOIL SIDES.

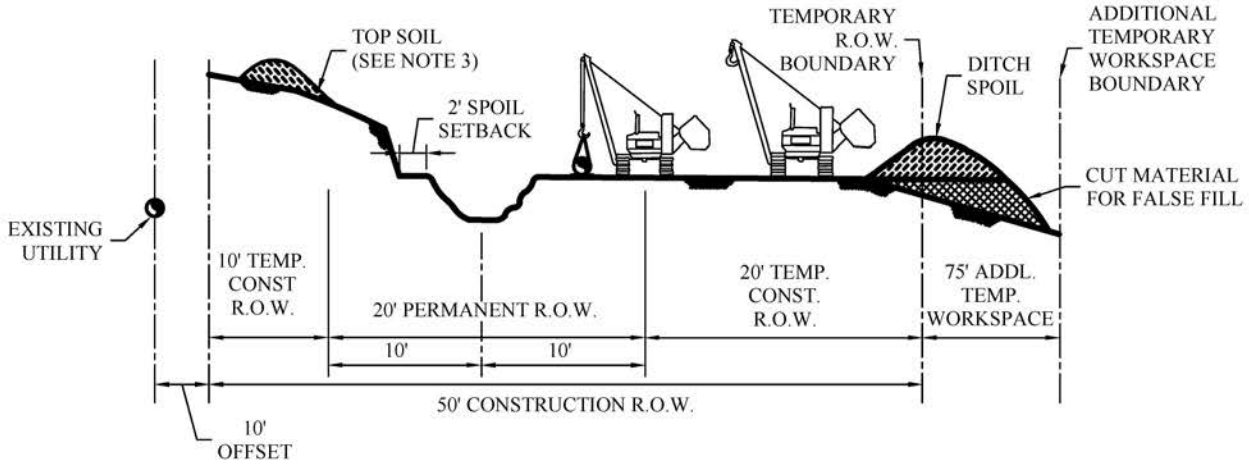
Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-16

Construction ROW - Down Side Slope



NOTES:

1. DIMENSIONS ARE DESIRED, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH, AND SPOIL SIDES.

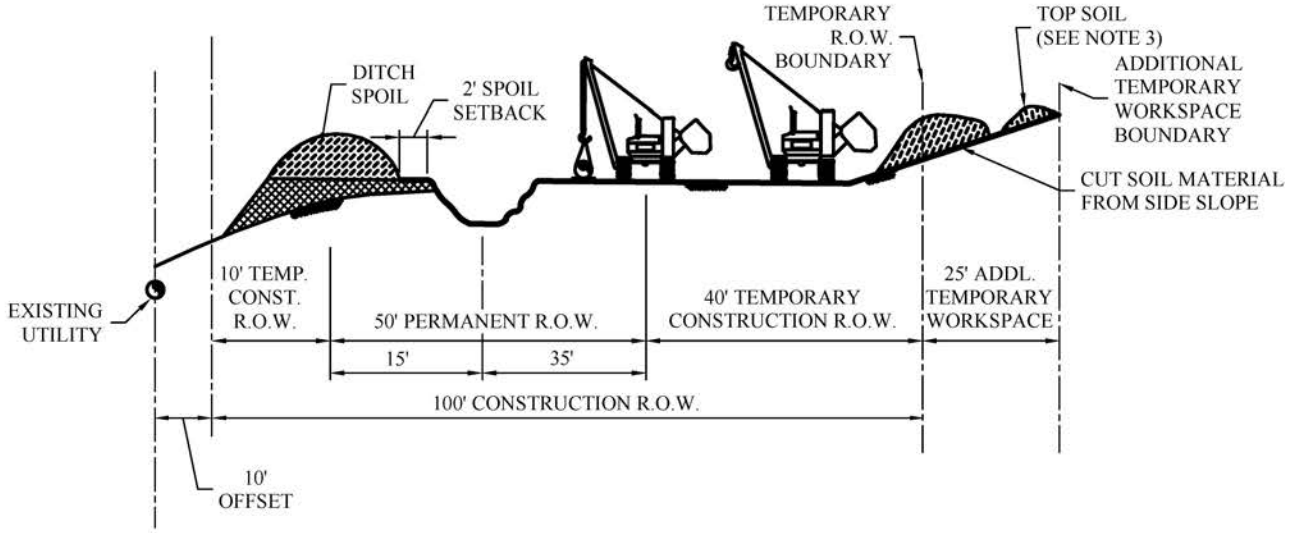
Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-17

Construction ROW - Down Side Slope on USFS Land



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH AND SPOIL SIDES.

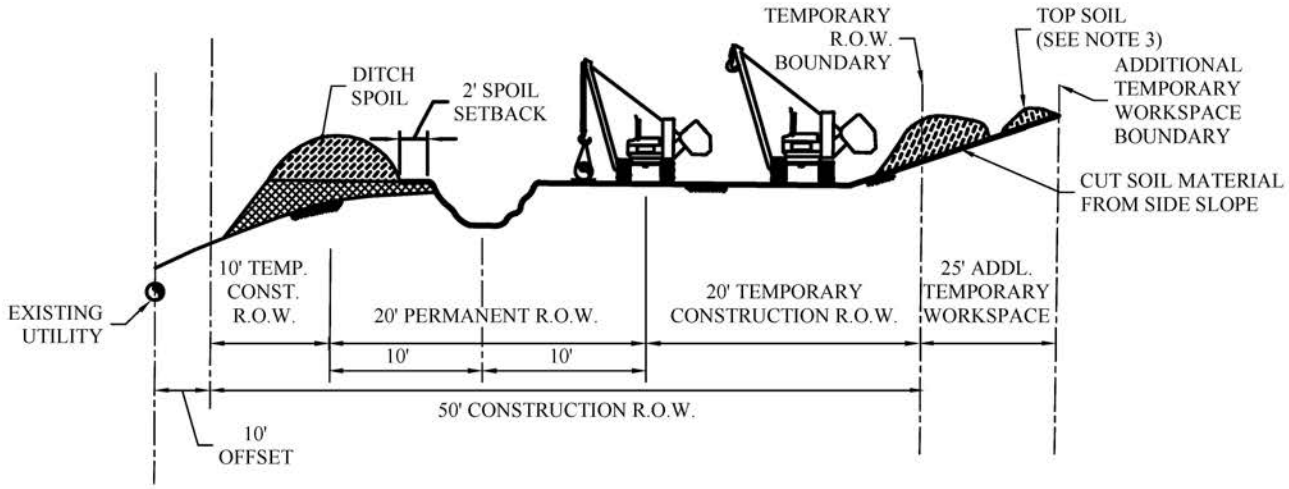
Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-18

Construction ROW - Upward Side Slope



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FT WIDE, CONSISTING OF 20 FT OF PERMANENT EASEMENT, 30 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE STRIPPED AND SEGREGATED FROM THE ENTIRE 75 FT R.O.W. (TRENCH, SPOIL, AND WORKING SIDES).

Not to Scale

Source: Hess 2015.

Hawkeye Pipeline System Project

Figure 2-19

Construction ROW - Upward Side Slope on USFS Land

- Ensuring that construction proceeds quickly through such areas, thus minimizing exposure to nuisance effects such as noise and dust;
- Maintaining access and traffic flow during construction activities, particularly for emergency vehicles;
- Cleaning up construction trash and debris daily;
- Fencing or plating open ditches during non-construction activities; and
- Immediately after backfilling the trench, restoring all lawn areas, shrubs, specialized landscaping, fences, and other structures within the construction work area to its pre-construction appearance or the requirements of the landowner. Restoration work would be done by personnel familiar with local horticultural and turf establishment practices.

2.2.5.6 Agricultural Areas

Specific construction measures would be implemented during different phases of construction including:

- Grading
  - Topsoil would be salvaged and segregated from subsoil piles.
  - Terraces would be surveyed to establish pre-construction contours to be utilized for restoration of the terraces after construction.
  - Natural flow patterns would be maintained.
- Drain Tiles and Irrigation Systems
  - Landowners would be contacted prior to construction to locate existing drainage tiles and irrigation facilities. Future plans for drainage tiles and irrigation facility locations also would be requested.
  - The Project would be installed at a depth of cover and elevation so as not to interfere with the elevation and grade of existing drain tiles where practicable. Typically, the pipeline would be installed below the elevation of drain tiles with a minimum clearance of 12 inches.
  - Hess would review drain tile mains and consider their size, flow rate, type of material, depth of cover, and geographic location. If determined to be practicable and reasonable for construction, the drain tile main would not be cut and repaired during mainline installation (a pipe section would be left out and installed by a tie-in crew without damaging the drain tile main).
  - Drain tiles damaged or cut during the excavation of the trench would be marked with a lath and ribbon in the spoil bank. Care would be taken to locate markers and the chance of disturbance would be minimized and a written record maintained of each drain tile crossing. A work crew following the pipeline trench crew would complete a temporary repair to allow continuing flow. If a drain tile line is not temporarily repaired, the open ends of the drain tile would be screened to prevent entry of foreign materials and small animals.
  - Permanent repairs would be made for all drain tiles damaged by installation of the pipeline.
  - Drain tile repairs would be inspected by Hess construction inspectors, county inspectors, as applicable, and the landowner or tenant or his representative.
- Restoration and Revegetation
  - Rutting and compaction would be repaired prior to revegetation.

In general, the ROW would revert to previous land uses after construction is completed and during operation of the pipeline. Landowners would be compensated for loss of use due to construction.

2.2.6 Operation and Maintenance

Hess periodically would use the permanent ROW to perform inspections, maintain equipment, and make repairs during the life of the pipeline. Undesired vegetation that may interfere with the safe and reliable operations of the pipeline would be removed. Per federal regulations, the pipeline surveillance would occur at least 26 times per year, not to exceed a 3-week interval. This helps identify unauthorized activities along the ROW and facilitates leak detection. Historically, one of the most significant risks associated with operating a crude oil pipeline is the potential for third-party excavation damage. To minimize the risk of third-party damage, the pipeline would be built within an approved ROW and markers would be installed at all road, railway, and water crossings. Hess also would mitigate third-party excavation risk by implementing comprehensive Public Awareness and Damage Prevention programs focused on education and awareness in accordance with 49 CFR 195.440 and API RP1162. Further, Hess would complete regular visual inspections (ground or aerial) of the ROW as per 49 CFR 195.412 and monitor activity in the area to prevent unauthorized trespass or access.

In addition, the pipeline would be monitored 24 hours a day, 365 days a year from the operation control center (OCC) using a sophisticated SCADA system. The OCC would be located at Hess's Tioga, North Dakota, Office Complex. Hess would implement multiple leak detection methods and systems that are overlapping in nature and progress through a series of leak detection thresholds. The leak detection methods are as follows:

- Remote monitoring performed by the OCC operator, which would consist of monitoring pressure and flow data received from pump stations and valve sites fed back to the OCC by the Hess SCADA system. Remote monitoring typically is able to detect leaks down to approximately 25 to 30 percent of the pipeline flow rate.
- Software-based volume balance systems that would monitor receipt and delivery volumes. These systems typically are able to detect leaks down to approximately 5 percent of the pipeline flow rate.
- Computational Pipeline Monitoring (CPM) or model-based leak detection systems that would break the pipeline into smaller segments and monitor each of these segments on a mass balance basis. These systems typically are capable of detecting leaks down to a level of approximately 1 to 2 percent of pipeline flow rate.
- ATMOS Wave, a system that gathers all of the pressure data collected and sends it back to the central SCADA system for detailed filtering and analysis. ATMOS Wave uses pressure data to examine all aspects of a potential negative pressure wave front (also known as a rarefaction wave) and its propagation through the pipeline to 3-dimensionally map time, distance, and wave intensity. This allows the system to accurately interpret true leak events from the pressure changes caused by transient operation. If a leak occurs, the system generates an alarm within 2 to 3 minutes and allows location of the leak within 1 to 2 percent of the distance between pressure sensors (ATMOS Wave 2012).
- Computer-based, non-real time accumulated gain/loss volume trending that would assist in identifying low rate or seepage releases below the 1.5 to 2 percent by volume detection thresholds.
- Direct observation methods, which include aerial patrols, ground patrols, and public and landowner awareness programs that would be designed to encourage and facilitate the reporting of suspected leaks and events that may suggest a threat to the integrity of the pipeline.

The leak detection system would be configured in a manner capable of alarming the OCC operators through the SCADA system and also would provide the OCC operators with a comprehensive assortment of display screens for incident analysis and investigation. In addition, there would be a redundant, stand-by OCC to be used in case of emergency.

The pipeline also is protected from over pressure by means of a safety instrument system (SIS) where required. Should the pressure rise beyond the normal operating range, the SIS would initiate the close of

shutdown valves and stopping of pumps without the intervention of the operator. This occurrence only would happen should the operator miss an alarm.

The control system would be configured that on loss of communications between stations, valves/pumps would close/stop. The communications system has been designed in a collapsed ring (should a cable be severed communications would not be lost). Fiber optic cables would be installed on both sides of the pipeline to minimize disturbance. At the river crossing an additional backup microwave radio system would be installed.

2.2.7 Emergency Response and Pipeline Integrity Management

Hess would develop an ERP, as required by federal regulations. The content of the ERP is prescribed by USDOT regulations. PHMSA would review and approve the ERP prior to commencing line fill and operations. The ERP would contain comprehensive manuals, notification processes and contact information, detailed training plans, equipment requirements, resourcing plans, auditing plans, and continuous improvement processes. The goals of Hess's ERP are to:

- Establish guidelines and procedures to follow in an emergency that protect the health and safety of the public and responders;
- Minimize environmental impacts and safety hazards from pipeline emergencies;
- Establish procedures for training and educating employees on emergency procedures; and
- Establish guidelines for and procedures to follow in recognizing, reporting, and responding to an emergency condition.

Emergency response activities take place in stages. A release begins with a cause and a resulting initial loss of product (natural gas, crude oil, or NGL) from the pipeline system. Once a release is detected, the emergency response is conducted as follows:

- Stage 1: pump station/compressor station shutdown;
- Stage 2: valve closure to isolate the affected pipeline segment;
- Stage 3: stop flow from the pipeline; and
- Stage 4: initiate emergency response activities and notifications. For liquid pipelines this includes containment and recovery activities, which can be conducted concurrently with stage 3.

For liquid pipelines (crude oil, NGL), the duration of stages 1 through 3 determine the volume of product released. The fourth stage limits the spread of product and seeks to mitigate the possible impacts.

In the event of a release, Hess would leverage its regional relationships to conduct a rapid, comprehensive response. Hess is 1 of 11 companies belonging to the Sakakawea Area Spill Response LLC (SASR). The SASR is a mutual aid group operating in the upper Missouri River and Lake Sakakawea regions that shares emergency response and spill containment equipment and resources in order to respond to spills and other emergencies. In the event of a spill originating from the Project, Hess would have access to its own response trailers, including two on both the north and south sides of the Lake Sakakawea crossing, in addition to more than 50 additional trailers owned by SASR. These response trailers contain a variety of spill response equipment, including absorbent boom, boats, chain saws, generators, personal protective equipment, and oil dry. Although Hess does not maintain any response boats in their North Dakota trailers, SASR maintains two response boats at their Marathon Facility in New Town for use during any spill on the water. The trailers also contain equipment for responding to spills during the winter. Federal regulations require Hess to have sufficient equipment and trained personnel capable of responding to a worst case discharge. PHMSA will review and confirm that Hess's ERP and contractual commitments meet these requirements.

If a spill occurs in the lake, emergency response measures would seek to contain the product and prevent surface spreading and shoreline contamination through the use of floating containment and absorbent boom. If an emergency occurred during the winter, a number of techniques could be used to prevent the spread of product, including ice slotting and the insertion of barriers to contain the material or guide it to a predetermined location. Once crude oil is contained, it can be recovered and, depending on its condition, transported to an off-site facility for recycling, treatment, or disposal. Typical recovery equipment and materials are:

- Tanker trucks equipped with vacuum pumps (i.e., vacuum trucks);
- Mechanical pumps;
- Earth-moving equipment (e.g., backhoes, front end loaders, dump trucks, hand shovels);
- Floating oil skimmers; and
- Portable storage, including frac tanks and tanker trucks.

In addition to the ERP, Hess would develop a Pipeline IMP, which would outline preventive maintenance, inspection, line patrol, leak detection systems, SCADA, and other pipeline integrity management procedures to be implemented during operation.

2.2.8 Abandonment

BLM regulations at 43 CFR 2880, ROWs under the MLA, would be followed for the abandonment process. These regulations and stipulations developed by the land management agencies would be incorporated into the approved ROW grant. Upon Project termination, Hess would be required to follow the abandonment procedures that are required at that future date. These likely would include removal of surface facilities and reclamation of the disturbed acreage. The areas would be reshaped to blend into adjoining areas to the extent permitted by existing conditions. Disturbed areas would be seeded with the appropriate seed mixture to ensure that an acceptable stand of vegetation is established.

2.3 No Action Alternative

The No Action Alternative was retained for further consideration in compliance with NEPA requirements. Selection of the No Action Alternative would deny the requested ROW. This means the Project would not be authorized to cross federal lands and would preclude construction and operation of the Project. Neither the benefits nor the impacts outlined in the EA would occur.

2.4 Alternatives Considered but Eliminated From Detailed Analysis

2.4.1 New Pipeline Construction Crossing Lake Sakakawea

HDD was evaluated for new pipeline installation across Lake Sakakawea as an alternative to repurposing the existing lines at the lake crossing. This alternative was not further developed because there was greater potential for land disturbance and effects on sensitive wildlife species in and adjacent to the lake. Additionally, all three of the existing lines across Lake Sakakawea proposed for product use for the current project have been hydrostatically tested, and the pressure tests of all three lines have proven their integrity, in accordance with USDOT requirements and standards.

2.4.2 Trucking Alternative

Alternatives to transporting crude oil, NGL, and natural gas via pipeline include continued trucking of the liquids and continued flaring of the gas, which are environmentally undesirable. The new high pressure gas and crude oil pipelines would allow Hess to capture current and future production in the Buffalo Wallow, Hawkeye, Antelope, and Blue Buttes area. Without these pipelines, the level of flaring and crude oil trucking would continue to increase from the latter half of 2015 onwards. The new high pressure gas line that is proposed would increase the capacity to move gas from the Hess properties south of the river to the existing

Tioga Gas Plant. Therefore, the alternative to continue trucking liquids with an increased volume was eliminated from further analyses.

2.4.3 Route Alternatives

Due to the relatively short length of the pipeline system and the proposal to tie into the existing pipelines for the Lake Sakakawea crossings, major pipeline route alternatives that would connect the proposed Hawkeye Oil Facility and existing Hawkeye Compressor Station to the existing Ramberg Truck Facility and existing Silurian Compressor Station were not identified. With the exception of slight modifications based on landowner requests and/or federal agency guidance, the Project route mostly follows existing pipeline and utility easements. Many of the aboveground facilities associated with the Project are to be located within existing Hess facilities to reduce additional disturbance and potential environmental effects.

Table 2-7 summarizes and compares the environmental impacts between the Proposed Action and No Action Alternative. Detailed descriptions of impacts are presented in Chapter 4.0, Environmental Consequences. The summarized impacts assume Hess's environmental protection measures but the absence of potential mitigation measures. Implementation of the potential monitoring and mitigation measures identified in Chapter 4.0 potentially would further reduce impacts.

2.5 Agency Preferred Alternative

The agency preferred alternative is not a final agency decision; rather, it is an indication of the agencies' preference. The BLM has not selected a preferred alternative at this time but will identify the preferred alternative in the Final EA.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Air Quality	Construction Construction equipment would emit gaseous criteria pollutants and particulates as a result of tailpipe emissions. Construction equipment also would cause fugitive dust emissions from disturbed areas and along paved and unpaved roads. Carbon dioxide (CO_2) emissions are expected to be far below 25,000 tons per year (tpy), which would be seen as a significant level of emissions. The CO_2 emitted from construction equipment is expected to be only a small fraction of this amount and a minor contribution to national and statewide CO_2 emissions. Negligible impacts to air quality from the operation of heavy construction equipment are expected. Operation Total uncontrolled volatile organic compound (VOC) emissions would be 1,028,549 lbs/year, for a total of 514 tpy of VOC emissions from all storage tanks at the proposed facilities. Even though all hazardous air pollutants (HAPs) emitted would be only a small fraction of VOC emissions, based on estimated VOC emissions, HAPs emissions may approach major source limits. However, tanks emissions can be controlled through use of various emissions control devices; therefore, negligible impacts to air quality would be expected. It is expected that operation of the Project would preclude the need for approximately 380 oil tanker trucks to haul oil each day. Using the conservative assumptions that each truck hauls 200 barrels, a pipeline capacity of 76,000 bpd, and an average roundtrip of 150 miles, approximately 57,000 truck miles per day would be eliminated from western North Dakota roads. This would be expected to provide positive benefits in terms of both traffic congestion and air quality.	Project impacts to air quality would not occur. Continued trucking emissions would occur in lieu of pipeline transport.
Geology and Minerals	Construction Construction would include disturbances to the topography along the Project route and at associated aboveground facilities due to grading and trenching. Trenching may result in slope instability in landslide prone areas on either side of the Missouri River crossing. The Project is committed to safety in landslide prone areas and would utilize construction methods, including HDD, to avoid landslides in areas of slope instability. Construction would have little or no short-term impacts on current mineral extraction activities due to the temporary and localized nature of pipeline construction. The Project would not affect gravel mining activities and would not affect oil and gas operations because of the considerable depth of oil and gas producing formations. Operation Operation of the Project would not alter the geological and physiographic conditions along the Project route. No active faults have been identified along the Project route, so no impacts due to ground deformation are expected. Project operation would not hinder oil and gas operations or affect surface mining activities. Impacts to future mineral development would be minimal because of the narrow, linear corridor of the pipeline ROW.	Project impacts to geologic and mineral resources would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Paleontological Resources	Construction Potential impacts to fossil localities during construction would be both direct and indirect during construction. Because any new significant fossil discoveries from the Bullion Creek and Sentinel Butte formations would have great scientific importance, paleontological resource analyses are recommended for all future surface disturbing actions in the area. Measures outlined in the Unanticipated Discoveries Plan would be implemented to minimize potential impacts to paleontological resources that may be discovered during construction activities. Operation Normal operation of the Project is not expected to disturb important paleontological resources. If there are maintenance activities that would result in surface disturbance, it would occur within previously disturbed ROW and not likely to affect paleontological resources. Therefore, no impacts to paleontological resources are expected during operation of the Project.	Potential impacts to paleontological resources in the Project area would be avoided because the Project would not be implemented.
Soils	Construction Impacts to soil resources would be short-term, since all disturbed areas (except the facility expansion area) would be reclaimed immediately following construction. Additional soil impacts may occur post construction if re-vegetation is not successful or adverse weather conditions (mainly heavy rainstorms) occurred before vegetation becomes established. Operation Very small-scale, isolated surface disturbance impacts, from accelerated erosion, soil compaction, potential spills, and related reductions in the productivity of desirable vegetation could result from pipeline maintenance traffic and incidental repairs. During operation, these types of impacts would be addressed with the affected landowner or land management agency and a mutually agreeable resolution reached. Environmental protection measures similar to those used during the Project construction would be used to avoid and minimize potential impacts resulting from operational maintenance.	There would no impacts to soil under the No Action Alternative.
Water Resources	Construction Surface water quality could be adversely affected by incidental spills during construction. Trenching, stream crossing disturbances, and discharges of hydrostatic water may locally increase runoff, turbidity, and sediment transport. Re-mobilization of sediments could disperse existing contaminants. Appropriate environmental practices outlined in the EA and in the permits to construct would be employed to minimize surface water impacts. Groundwater would not be affected during construction and no unpermitted withdrawals of groundwater would occur.	Project impacts to surface and groundwater resources would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Water Resources (Continued)	Operation During operations, impacts to surface water may occur if a pipeline leak occurs near a surface water feature. The severity and duration of such an impact would depend on the location of the leak, the volume of the leak, the time of year, and the spill response and countermeasures implemented. Pipeline safety measures discussed in the EA along with remotely controlled MLVs and SCADA would minimize the impact of leaks to surface water features. No impacts to groundwater are expected because of the depth of groundwater relative to the depth of pipeline construction.	
Vegetation	Construction Direct impacts from Project-related activities would include the temporary loss of vegetation as a result of trampling/compaction, clearing/trenching/blading of surface cover, and direct removal of aboveground and below ground vegetation as a result of construction. Temporary disturbances would affect agriculture, developed, and grassland vegetation communities within the construction ROW. Operation Permanent disturbances resulting from pipeline operation and maintenance activities would be limited to vegetation communities located within the vicinity of the proposed Hawkeye Oil Facility. A long-term loss of 80 acres of vegetation associated with operation of the oil facility would occur.	Under the No Action Alternative, there would be no impacts to vegetation because surface disturbance associated with construction of the Project would not occur.
Wetlands	Construction Hess has committed to using HDD to avoid disturbance of all wetlands; therefore, no impacts to wetlands would occur. Impacts to surface waters are discussed in detail in Section 4.5, Water Resources. Operation No permanent aboveground facilities would be located within wetlands; therefore, no impacts are anticipated as a result of Project operation.	Implementation of the No Action Alternative would avoid impacts to wetlands and floodplains since surface disturbance associated with the Project would not occur.
Noxious Weeds	Construction Substantial increases in weed prevalence within the Project area are not anticipated. However, despite efforts to prevent the proliferation of noxious weed species, it is possible that construction activities could spread or introduce noxious weed species along the ROW, or that weed species could be transported into areas that previously were relatively weed-free. Operation Impacts to vegetation as a result of noxious weed invasions are anticipated to be minimal during Project operation with the implementation of the Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan, which includes post reclamation monitoring and noxious weed control measures.	The No Action Alternative would avoid impacts to vegetation and the potential establishment and invasion of noxious weeds and invasive species because surface disturbance associated with the Project would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Wildlife and Fisheries		
Management Indicator Species	Three Management Indicator Species (MIS) have been identified for the Project: sharp-tailed grouse, greater sage-grouse, and black-tailed prairie dog. Impacts to sharp-tailed grouse are discussed under Small Game Species. No greater sage-grouse leks occur within the Project area; therefore, impacts to the species are not anticipated. No black-tailed prairie dog colonies occur within the Project area; therefore, impacts to the species are not anticipated.	Project impacts to management indicator species would not occur.
Big Game Species	Construction Impacts to big game habitat (e.g., mule deer, white-tailed deer, elk, pronghorn, and mountain lion) include the temporary loss of potential forage and vegetative cover (native and reclaimed vegetation) and increased habitat fragmentation within the Project area. No big game critical ranges are identified within the Project area. Impacts from Project construction would include the temporary disturbance of 248 acres of potential big game habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat. Operation Project operation may result in direct and indirect impacts to big game species. Direct mortality to individuals may result from collisions with maintenance vehicles. In addition, big game species may experience increased hunting and poaching pressure due to increased public access. Potential indirect impacts would include displacement of individuals and decreased breeding success due to increased levels of noise and human activity. Permanent impacts would occur to 78 acres of big game habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to big game species would not occur.
Small Game Species	Construction Direct impacts to small game would include mortality or displacement as a result of construction activities. Indirect impacts include habitat loss, alteration, and fragmentation. Disturbance from increased levels of noise and human activity also would indirectly impact small game species. Impacts from Project construction would include the temporary disturbance of 248 acres of potential small game habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat. Due to Hess's commitment to bore all wetlands and riparian areas, no impacts to waterfowl habitat would occur. Temporary loss of habitat would reduce productivity for the current breeding season. However, due to the large amount of suitable habitat in the Project area, impacts to small game species are anticipated to be low. Operation Project operation may result in direct and indirect impacts to small game species. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Local populations may experience higher levels of hunting and poaching pressure due to improved public access. Other potential indirect impacts would include displacement of individuals, and decreased breeding success due to increased levels of noise and human activity. Permanent impacts would occur to 78 acres of small game habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to small game species would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Sharp-tailed Grouse	Construction Project construction would result in the temporary loss of 248 acres of potential brooding and winter habitat, including 102 acres of grassland, 142 acres of agricultural land, and 4 acres of woodland and shrubland until reclamation has been completed and vegetation is re-established within the disturbance areas. One active sharp-tailed grouse lek occurs along the Project route. Project construction during the breeding season may impact the sharp-tailed grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young. Impacts also may occur to sharp-tailed grouse breeding habitat, including the loss of lekking grounds and brood-rearing habitat. No construction, operation, or maintenance activities would be allowed within 1 mile (line of sight) of the active sharp-tailed grouse leks on USFS-administered land during the breeding season (March 1 through June 15). Therefore, impacts to breeding sharp-tailed grouse are anticipated to be low. Operation Project operation may result in direct and indirect impacts to sharp-tailed grouse. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Potential indirect impacts would include displacement of individuals and decreased breeding success due to increased levels of noise and human activity. Regarding sharp-tailed grouse habitat along the Project route, Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. Permanent impacts would occur to 78 acres of sharp-tailed grouse habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to sharp-tailed grouse would not occur.
Nongame Species	Construction Construction activities may result in mortalities of less mobile or burrowing nongame species (e.g., small mammals) within the ROW, as a result of crushing by construction vehicles and equipment. Indirect impacts include habitat loss, alteration, and fragmentation. Increased levels of noise and human activity also would indirectly impact nongame species. Impacts from Project construction would include the temporary disturbance of 248 acres of potential nongame habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas. Due to the large amount of suitable habitat in the Project area, impacts to nongame species are anticipated to be low. Operation Project operation may result in direct and indirect impacts to nongame species. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Other potential indirect impacts would include displacement of individuals, and decreased breeding success due to increased levels of noise and human activity. Permanent impacts would occur to 78 acres of nongame habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to nongame species would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Migratory Birds	Construction Migratory birds that utilize various habitats in the Project area may be impacted by construction activities. Direct impacts to avian species include mortality, nest destruction, displacement, and disturbance from increased levels of noise and human activity. Indirect impacts to migratory birds include habitat loss, alteration, and fragmentation. Impacts from Project construction would include the temporary disturbance of 248 acres of potential migratory bird habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas. Hess has committed to conduct pre-construction surveys for active migratory bird nests during the breeding season. To minimize impacts, migratory birds and their nests would be avoided during construction of the pipeline. Mowing, clearing, and grubbing of the Project ROW would occur in the fall or winter to avoid potential impacts to bird nests. Consultation with the USFWS regarding migratory birds would be continued during construction activities. Therefore, impacts to migratory birds are anticipated to be low. Operation Project operation may result in direct and indirect impacts to migratory birds. Direct impacts may result if maintenance activities are conducted during the breeding season. Mortality to individuals or destruction of nests may result from being crushed by, or colliding with maintenance vehicles. Permanent impacts would occur to 78 acres of wildlife habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to migratory birds would not occur.
Raptors	Construction Direct impacts to raptor species may include mortality and displacement. Indirect impacts include the loss or alteration of habitat, reduction in prey base, and disturbance from increased levels of noise and human activity. Impacts from Project construction would include the temporary disturbance of 248 acres of potential raptor habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas. To minimize impacts, raptors and their nests would be avoided during construction of the pipeline. Mowing, clearing, and grubbing of the Project ROW would occur in the fall or winter to avoid potential impacts to raptor nests. Distance buffers for active raptor nests vary by species, ranging from 0.25 mile to 0.5 mile. Consultation with the USFWS regarding migratory birds, including raptors, would be ongoing during construction activities. Therefore, impacts to raptor species are anticipated to be low. Operation Project operation may result in direct and indirect impacts to raptors. Direct impacts may result from collision with maintenance vehicles. Indirect impacts would include displacement of individuals, and decreased breeding success due to increased levels of noise and human activity. Permanent impacts would occur to 78 acres of raptor habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to raptors would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Reptiles	Construction Construction activities may result in direct and indirect impacts to less mobile species, such as reptiles. Direct mortality to individuals may result from crushing of individuals or burrows by vehicles and equipment. Indirect impacts may include habitat loss, alteration, and fragmentation; and disturbance from increased levels of noise and human activity. Impacts from Project construction would include the temporary disturbance of 248 acres of potential reptile habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas. However, due to the presence of suitable habitat adjacent to the disturbed areas and the temporary nature of Project construction, impacts to reptiles are anticipated to be low. Operation Project operation may result in direct and indirect impacts to reptiles. Direct mortality to individuals may result from crushing of individuals or burrows by maintenance vehicles. Potential indirect impacts would include displacement of individuals, and decreased breeding success due to increased levels of noise and human activity. Permanent impacts would occur to 78 acres of reptile habitat (agricultural land), as a result of the construction and operation of aboveground facilities.	Project impacts to reptiles would not occur.
Fisheries	Construction The primary issues related to fisheries resources include increased sedimentation and potential toxicity related to fuel or other hazardous material spills. The Lake Sakakawea crossing would be constructed by tying-in to existing pipelines under the lake. In addition, Hess has committed to boring all wetlands and riparian areas. Therefore, no direct impacts to Lake Sakakawea or wetlands and waterbodies along the Project route are anticipated. Hydrostatic test water would be brought in from a certified outside source and following testing, the water would be trucked offsite for disposal. Since there is no test water discharge, hydrostatic testing would not affect fisheries resources. Operation Project operation may result in indirect impacts to fisheries resources. Erosion control procedures, as part of the Project SWPPP and CMRP (POD, Appendices I and C) would be implemented as part of the Project to minimize any erosion in disturbed areas. In the unlikely event of a spill that would enter Lake Sakakawea, exposure to crude oil or NGL may result in adverse toxicological effects to fisheries resources. Despite this designation, it is unlikely that an oil spill into Lake Sakakawea would result in acute benzene toxicity to fisheries resources. See **Appendix A,** for further information regarding impacts to fisheries resources from a potential spill event. Additionally, the Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195).	Project impact to aquatic resources would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Fisheries (Continued)	*Winter Spill Scenario* During the winter, Lake Sakakawea freezes over with a layer of ice that, in very cold years, can be as thick as 36 to 48 inches. This layer of ice would trap oil released below the lake's surface and prevent benzene evaporation from occurring. Therefore, during the winter, evaporative loss would be negligible and would allow a longer contact between the crude oil or NGL and the water column. However, natural undulations in the bottom of the ice would trap the material and prevent it from spreading horizontally, potentially causing very localized impacts to aquatic organisms in prolonged contact with the near-surface water (e.g., phytoplankton). Exposure to fish deeper in the water column likely would not experience adverse impacts. The natural containment of winter releases facilitates cleanup efforts as the pockets of oil can be accessed and removed using vacuum trucks. Thus, winter releases are predicted to have lower impacts to fisheries, particularly with respect to area of extent, as compared to releases occurring during the warmer seasons.	
Special Status Species		
Plants	Stemless Townsend Daisy *(Townsendia exscapa)* and Hooker's Townsendia *(Townsendia hookeri)* *Construction* Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to these species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROW encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable grassland habitat on USFS-administered lands, would be considered temporary in nature, pending successful reclamation. Because avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that development of the Project would result in the federal listing of these species. *Operation* It is unlikely that permanent facilities would be sited within suitable habitat for these species; therefore, no permanent loss of habitat is anticipated.	Project impacts to special status plant species would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Wildlife (Mammals)	Northern Long-eared Bat *Construction* Potential direct and indirect impacts to the northern long-eared bat would include displacement related to pipeline construction; habitat loss, alteration, and fragmentation; and increased noise levels and human activity. Project construction would result in the temporary loss or alteration of approximately 4 acres of potential roosting habitat and foraging habitat. *Operation* Project operation may result in direct and indirect impacts to the northern long-eared bat. Direct impacts may result if maintenance activities are conducted in during hibernation. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts to suitable roosting and foraging habitat would occur as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals, and decreased breeding success due to increased noise levels and human activity.	Project impacts to the northern long-eared bat would not occur.
	Black-tailed Prairie Dog *Construction* No black-tailed prairie dog colonies have been identified within the Project area. However, suitable habitat exists within the Project area and the species is known to occur near the Project area in the LMNG complex. Impacts to this species, if present, would include direct mortalities of individuals if burrows are crushed by construction vehicles or equipment. Indirect impacts would result from increased noise levels and human activity. There would be no impacts to individual black-tailed prairie dogs as a result of the Project. However, the Project may impact suitable black-tailed prairie dog habitat. Therefore, direct impacts to this species would be limited to the incremental temporary loss of 102 acres of potentially suitable grassland habitat. *Operation* If black-tailed prairie dog colonies become established along the Project ROW in the future, direct and indirect impacts during Project operations may occur. Direct mortality to individuals may result from collisions with maintenance vehicles. Indirect impacts may include habitat fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to potential grassland habitat as a result of the construction and operation of aboveground facilities.	Project impacts to the black-tailed prairie dog would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Bird Species Associated with Open Water/Wetland Habitat	Whooping Crane *Construction* Indirect impacts may result from individual migrants being flushed from the Project area during construction. Based on the rarity of the species and the lack of occurrence data for the Project area, potential impacts from encountering and flushing a migrating whooping crane from the Project area would be minimal. Habitat loss from Project construction would include the temporary disturbance of 142 acres of agricultural land within the Project ROW. Crops and rangeland would return to their original state during the following growing season. In most instances, suitable foraging habitat adjacent to disturbed areas would be available to whooping cranes. *Operation* Project operation may result in indirect impacts to the whooping crane, including habitat reduction and fragmentation as a result of ROW maintenance activities. Permanent impacts would occur to 78 acres of agricultural land as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement and increased stress to individuals during migration by increased noise levels and human activity.	Project impacts to bird species associated with open water/wetland habitat would not occur.
	Interior least tern *Construction* Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing, no direct impacts to suitable interior least tern habitat are anticipated. However, suitable breeding habitat for the interior least tern may be located within 0.5 mile of the Project area at the Lake Sakakawea crossing. Indirect impacts could result from increased noise and human presence at work site locations if breeding terns are located adjacent to the Project area. *Operation* Indirect impacts could result from increased noise and human presence during any pipeline maintenance activities if breeding interior least terns are located adjacent to the Project. Prior to any Project activities that would occur adjacent to potential breeding habitat, Hess operations personnel would coordinate with the USFWS to establish authorized mitigation if maintenance activities are required during the breeding season adjacent to suitable breeding habitat.	

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Bird Species Associated with Open Water/Wetland Habitat (Continued)	Piping Plover *Construction* Designated critical habitat for the piping plover is present along the Missouri River at the Lake Sakakawea crossing. Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing, no direct impacts to suitable piping plover critical habitat are anticipated. Indirect impacts could result from increased noise and human presence at work site locations if breeding piping plovers are located adjacent to the Project area. *Operation* Indirect impacts could result from increased noise and human presence during pipeline maintenance activities if breeding piping plovers are located adjacent to the Project. Prior to Project activities that would occur adjacent to potential breeding habitat, Hess operations personnel would coordinate with the USFWS to establish authorized mitigation measures if maintenance activities are required during the breeding season adjacent to suitable breeding habitat.	
	Rufa Red Knot *Construction* Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing, no direct impacts to potentially suitable rufa red knot habitat are anticipated. Indirect impacts could result from increased noise and human presence at work site locations if migrating rufa red knots are located adjacent to the Project area. *Operation* Project operation may result in indirect impacts to the rufa red knot. Indirect impacts would include displacement and increased stress to individuals during migration by increased noise levels and human activity at operations and maintenance locations if migrating rufa red knots are located adjacent to the Project area.	

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Bird Species Associated with Grassland Habitat	Sprague's Pipit, Baird's Sparrow, and Long-billed Curlew *Construction* Direct and indirect impacts to the Sprague's pipit, Baird's sparrow, and long-billed curlew would include mortalities or displacement related to pipeline construction if construction occurs during the breeding season (February 1 through July 15); habitat loss, alteration, and fragmentation; and disturbance from increased noise levels and human activity. In addition to habitat loss, reductions in bird population densities also may be attributed to a reduction in habitat quality produced by elevated noise levels. Project construction would result in temporary impacts to 102 acres of potential breeding and foraging grassland habitat. *Operation* Project operation may result in direct and indirect impacts to the Sprague's pipit, Baird's sparrow, and long-billed curlew. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals or nests may result from being crushed by, or colliding with maintenance vehicles. Indirect impacts may include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to suitable breeding and foraging habitat, as a result of the construction of aboveground facilities. Other potential indirect impacts include displacement of individuals, and decreased breeding success due to increased noise levels and human activity.	Project impacts to bird species associated with grassland habitat would not occur.
	Burrowing Owl *Construction* Potential impacts to the burrowing owl, if present, would result from the incremental reduction of suitable habitat within the Project area during construction activities. Temporary impacts to 102 acres of potential grassland habitat would occur. Direct mortality to individuals or nests may result from being crushed by, or colliding with maintenance vehicles. Construction activities also would cause an increase in temporary, short-term noise levels and human activity, which potentially may displace individual owls from the Project area and decrease breeding success. Potential for construction-related impacts to the species are low due to the lack of primary nesting habitat (i.e., prairie dog colonies). *Operation* Project operation may result in direct and indirect impacts to the burrowing owl, if present. Direct impacts may result if maintenance activities are conducted during the breeding season (May 1 to September 15). Direct mortality to individuals or nests may result from being crushed by, or colliding with maintenance vehicles. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to potential burrowing owl habitat, as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals, and decreased breeding success due to increased noise levels and human activity.	

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Bird Species Associated with Shrubland Habitat	Loggerhead Shrike *Construction* Potential indirect impacts to the loggerhead shrike would include displacement related to pipeline construction if construction occurs during the breeding season (February 1 through July 15), and increased noise levels and human activity. Project construction would result in temporary impacts to 4 acres of potential breeding and foraging woodland/shrubland habitat. *Operation* Project operation may result in indirect impacts to the loggerhead shrike. Indirect impacts would include displacement of individuals, and decreased breeding success due to increased noise levels and human activity near suitable habitat. No permanent impacts would occur to woodland/shrubland habitat as a result of the construction and operation of aboveground facilities.	Project impacts to bird species associated with shrubland habitat would not occur.
Butterfly Species	*Construction* The main reasons for the decline of Dakota skippers, Ottoe skippers, regal fritillary butterflies, and tawny crescents include the loss and fragmentation of native habitat through grazing, fire, weed control, pesticide use, and other ground disturbances (Opler et al. 2012). Pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the construction ROW encourages the establishment of weeds and other invasive species. Project construction would result in the temporary disturbance to 102 acres of grassland habitat, including mixed-grass prairie and sand prairie. *Operation* Project operation may result in direct and indirect impacts to the Dakota skipper, Ottoe skipper, regal fritillary butterfly, and tawny crescent. Direct impacts may result if maintenance activities are conducted when these species are present. Direct mortality to individuals may result from being crushed by or colliding with maintenance vehicles. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to mixed-grass prairie habitat and sand prairie habitat as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals due to increased noise levels and human activity. Project operation would allow vegetation to become established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary maintenance during operations to allow for aerial inspections of the ROW.	Project impacts to butterfly species would not occur.
Fish Species	Pallid Sturgeon *Construction* No impacts to the pallid sturgeon would occur from construction of the Project. Hess proposes to tie-in to existing pipelines under Lake Sakakawea and therefore would not be disturbing lake shoreline or lake bottom. The tie-in locations are within existing Hess facilities on both the north and south sides of Lake Sakakawea and not within the Missouri River floodplain.	Project impacts to fish species would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Fish Species (Continued)	*Operation* Routine pipeline operations likely would not impact the pallid sturgeon. In the improbable event of a spill or leak in Lake Sakakawea, exposure to crude oil may result in adverse toxicological effects to the species. However, the probability of adverse effects to the pallid sturgeon is unlikely due to the low probability of a spill or leak of a sufficient amount to cause toxic effects in Lake Sakakawea. Further, if a spill or leak event were to occur, federal and state laws would require cleanup of an event of sufficient size to potentially impact pallid sturgeon.	
Land Use	Construction Based on the Project plans and proposed management practices, it is anticipated that impacts to land use from the Project would be minor. Operation Land use effects from operation of the Project would be minimal.	Impacts to land use would not occur if the Project where not constructed.
Recreation	Construction The nature of pipeline construction tends to be quite localized and relatively fast moving, affecting a particular area for only a few weeks, at most, from clearing and grading through reclamation. Construction during the fall could affect hunting access; during the summer months, construction could affect camping, hiking, fishing, and other summer activities. However, these impacts would be short-term, potentially affecting only one season. Minimal impacts are expected to urban and dispersed recreation from the influx of construction workers. Operation Impacts to recreational activities from operation of the Project would be minimal; once disturbed areas are reclaimed to pre-construction conditions, the Project would be largely invisible to casual observers.	No surface disturbance would occur; therefore no impacts to recreation in the vicinity.
Visual Resources	Construction During construction, the Project would be visible from Lake Sakakawea and sensitive viewers from recreational usage and lake access from the boat ramp and campground approximately 1.5 miles east. Visual impacts to the LMNG would be low because the USFS Scenic Integrity Objective (SIO) accommodates a moderate modification to the visual character. Vegetation clearing, associated dust, and topographic alternatives associated with construction activities would be visible from recreational public areas and roadways. Construction of aboveground facilities would have minor effects to visual resources because construction of these facilities would be in an area where there are existing structures and previous disturbance and, therefore, would not be noticeable to casual viewers. Operation The Project would temporarily disturb 29.7 acres of land on the LMNG. Visual impacts would be weak to moderate for changes in color, texture, and the linear character for the ROW until revegetation is successful. Decommissioning would have temporary effects on the visual environment similar to construction phase impacts.	There would be no impacts to visual resources because no surface disturbance would occur and there would be no other modifications to the existing visual environment.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Noise	Construction Project construction would be limited to the hours from 7:00 a.m. to 7:00 p.m. within 1,000 feet of occupied residences and would not substantially affect noise levels during the more sensitive nighttime hours. Also, construction would not occur within 1,000 feet of the Trinity Lutheran Church on Sundays. Therefore, noise effects would comply with the 65 dBA HUD standard for day-night average outdoor noise levels. Operation Operation of the Project would generate modest levels of additional noise. Pig launchers and receivers would be used only sporadically with minimal influence on noise. Therefore, impacts from operation of the Project would be minimal; although there may be occasions when they would mimic construction activities in limited areas.	With no construction and no new facilities to generate noise, there would be no additive noise effects on the area.
Socioeconomics *(Employment)*	Construction An extremely tight labor market in northwest North Dakota where unemployment rates are estimated at less than 1 percent suggests that required personnel would come from outside of the Project area. Local employment opportunities as a result of the Project would be considered beneficial to the local area economies. Operation There would be no measurable effect on employment from operation of the Project because the Project would be maintained and operated by existing Hess staff.	Under the No Action Alternative, construction of the Project would not occur; therefore, there would be no changes to the existing employment condition in the two-county Project area.
Socioeconomics *(Population)*	Construction As a result of the short duration of construction, it is assumed that very few, if any, of the non-local construction work force would bring their families with them to the Project area. Based on a small percentage of worker inflow combined with short construction duration, a minimal adverse social, economic, and community infrastructure impacts during construction would be expected. No measurable effect of demography of the Project area would be expected. Operation Assuming operations and maintenance of the Project would be conducted by existing Hess employees, there would be no effect from the Project on the population or demography of the Project area during its operating life.	Under the No Action Alternative, construction of the Project would not occur; therefore, there would be no effects on the existing population in the two-county Project area.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Socioeconomics *(Economic Conditions, Income and Poverty)*	Construction Construction of the Project is expected to have a beneficial effect on the local economy. The magnitude of the benefit would be tempered by the fact that construction would be short-term and most construction workers would only live in the area temporarily. Nevertheless, for the time they are in the area, they would spend some portion of their wages on housing, food, transportation and other everyday expenses and because they would be taking notable portions of their earnings to their permanent residence locations, the economic benefits would extend beyond the Project area. Effects on poverty levels in the Project area would be minimal as most of the jobs would be skilled positions and most of the workers would be brought in from outside the Project area. Operation The overall economic effect of the small operations and maintenance workforce would be small because the number of workers would constitute a very small percentage of the local labor force.	Under the No Action Alternative, construction of the Project would not occur; therefore, there would be no effects on the economic conditions or income and poverty in the two-county Project area.
Socioeconomics *(Housing)*	Construction Hess plans to house non-local workers in man camps near Tioga or Watford City. Because of the short duration of construction, housing demand would be temporary and it is likely that few, if any, of the non-local construction workers would pursue housing in more permanent accommodations. A potential effect of the construction work force on housing would be competition with travelers, recreationists, and more notably, industry workers for temporary accommodations, particularly if construction occurs during the summer tourist and fall hunting seasons. Operation Because operation of the Project is expected to be handled by existing Hess workers, no additional housing would be required after completion of construction.	Under the No Action Alternative, construction of the Project would not occur; therefore, there would be no effects on the socioeconomic condition of the two-county Project area.
Socioeconomics *(Public Facilities & Services)*	Construction The Project would increase the demands on facilities and services, but the effects would be temporary, lasting for approximately 6 months during the scheduled construction period. Effects to government services also would be a relatively minor incremental increase. Effects on schools would be minimal because most workers on such a short-term construction project would not be expected to bring school aged children with them to the Project area. Operation No substantive, incremental effects on public facilities and services would be anticipated from operation of the Project because operational activities are proposed to be conducted by existing employees currently living in the area and using public resources.	Under the No Action Alternative, construction of the Project would not occur; therefore, there would be no effects on the existing condition of public services and facilities.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Socioeconomics *(Public Finances)*	Construction The sales tax receipts from construction worker spending would be a short-term beneficial effect ending at completion of construction. In addition to construction worker local expenditures, local material purchases by contractors and other support personnel, fuel sales, and repair expenditures would benefit local communities. Operation Each county and school district would benefit from the Project-related tax base increase. The total amount of property tax generated each year would vary, depending on the yearly mill levy and the assessed valuation, which would decline over the life of the Project due to depreciation.	Under the No Action Alternative, construction of the Project would not occur; therefore, sales tax receipts from worker spending, local material purchases, and property taxes would be realized.
Environmental Justice	Construction No disproportionately adverse effects on the health or environment of minority and low-income populations living on the Fort Berthold Indian Reservation (located approximately 4 miles from the Project) or in McKenzie and Williams counties are anticipated. Operation No disproportionate adverse effects on minority or low-income populations would occur as a result of operation of the Project.	Under the No Action Alternative, project impacts to Environmental Justice would not occur.
Transportation	Construction During construction, truck traffic would increase; however, all these highways have sufficient capacity to accommodate Project-related traffic; effects on traffic flows would be minor and short-term. Local motorists may experience minor delays from heavy trucks traveling under restrictions for weight and speed; these effects would be minor and short-term. Effects on traffic safety are expected to be minor. All road crossings would be bored; therefore, Project-related traffic interruptions would be minor. Operation During operation, truck traffic would be reduced from current levels.	The No Action Alternative would avoid the short-term heavy traffic from Project construction; however, long-term continuation of current levels of truck traffic would be expected to increase in future years to transport increased production in the Bakken Field.
Public Safety	Construction With emergency response procedures for incidents involving hazardous materials and fire emergencies, conducting pre-construction safety coordination meetings as part of construction mobilization, and complying with the Hess Safety Plan and Procedures, impacts to public safety during construction are not anticipated. Operation A Project-specific ERP would be in place, as required by PHMSA, to address potential impacts from the transportation of product by pipeline. Additionally, Hess would monitor for pipeline release and ensure emergency shutdown procedures should a leak occur. Impacts to public safety would be limited with these measures in place.	The No Action Alternative would avoid impacts to public safety because construction and operational activities associated with the Project would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Hazardous Materials and Solid Waste	Construction Hazardous materials would be controlled, labeled, and used only by authorized personnel. Management of hazardous materials during construction would be in accordance with Hess's Waste Management Plan (POD, Appendix B). The Project's SPCC Plan) (POD, Appendix N) would address procedures to ensure the proper handling and storage of these materials and procedures for containment and cleanup of spills at aboveground facilities. Implementation of these procedures would reduce the potential for impacts associated with hazardous materials and solid waste. Operations The Project would be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR 195. During operation, Hess would conduct hydrostatic testing and internal pipe inspection using "smart pigs." Remotely activated valves would be used at key locations. Additionally, a SCADA system would continuously monitor the pipeline and its pressure. With these measures in place, impacts are expected to be minimal.	The potential effects associated with the transportation, storage, or use of hazardous materials or the disposal of solid waste would not occur.
Cultural Resources	Construction Direct effects to historic properties and unevaluated sites would be avoided through the use of protective fencing and monitoring during Project construction. Indirect effects such as soil erosion, illegal artifact collecting, and vandalism would be minimized through the use of the environmental protection measures. Ground-disturbance associated with Project construction has the potential to directly impact unknown historic properties that may be discovered during construction activities. If historic properties are discovered during Project construction, work would cease in the area of the discovery, and the discovery would be handled as stipulated in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K). No adverse effects to historic properties as a result of Project construction are anticipated. Operation Impacts to historic properties are not anticipated as a result of Project operation.	Project impacts to historic properties would not occur.

Table 2-7 Proposed Action and No Action Alternative Comparison

Resource	Proposed Action	No Action Alternative
Tribal Treaty Rights and Interests	Construction Direct effects to areas of tribal concern would be avoided through the use of protective fencing and monitoring during Project construction. Indirect effects such as soil erosion, illegal artifact collecting, and vandalism would be minimized through the use of the environmental protection measures. Sites of tribal concern that may be discovered during Project construction would be handled as stipulated in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K). Construction activities associated with the Project may temporarily reduce the amount of federal lands outside of the reservation where tribal members could exercise their hunting, fishing, and gathering rights; change the way a tribal member accesses resources for tribal use; and, restrict certain activities (e.g., hunting or gathering). However, these temporary impacts would be negligible. There would be no restrictions on access to resources and/or areas for religious purposes after construction has been completed. Operation Impacts to treaty rights and properties of traditional, religious, and cultural importance to the tribes are not anticipated as a result of Project operation.	Project impacts to treaty rights and properties of traditional, religious, and cultural importance to the tribes would not occur.

3.0 Affected Environment

This chapter describes the environment that would be affected by the development of the Project. The baseline information summarized in this chapter was obtained from published and unpublished materials; discussions with local, state, and federal agencies; field studies conducted in the Project area; and on-site experience with oil pipelines in western North Dakota. The affected environment for individual resources was delineated based on the area of potential direct and indirect environmental impacts for the Project. For resources such as soils and vegetation, the affected area was determined to be the physical location and immediate vicinity of the areas to be disturbed by the Project. For other resources such as air quality, water quality, wildlife, and social and economic values, the affected area spans a larger area, as described in each resource section (e.g., airshed, watershed, extent of available habitat, local communities, etc.).

Potential impacts to Authorized Project Purposes as described in the USACE Section 408 regulations need to be addressed for any project that would occur within a USACE Project area (e.g., the Garrison Dam/Lake Sakakawea area). Of the eight Authorized Project Purposes, one Purpose (i.e., wildlife) may be affected by the Project and seven Purposes (i.e., municipal and industrial water supply, recreation, water quality, flood control, navigation, irrigation, and hydropower) would not be affected by the Project. The purpose that may be affected by the Project and the resource sections in which it is addressed include Sections 3.9, Wildlife, and 3.10, Special Status Species.

As described in Chapter 2.0, Hess proposes to convert existing pipelines from natural gas to NGL as part of the Project. Because there would be no ground disturbance associated with conversion of the existing pipelines, no NEPA analysis is required for the proposed conversion. As such, the following sections are specific to the proposed crude oil and natural gas pipelines, ATWSs, access roads, and Hawkeye Oil Facility. Cultural resources and biological resources surveys were conducted as part of the NEPA analysis. The surveys were conducted along the crude oil/natural gas pipeline ROW, new access roads, access roads requiring upgrade, at ATWS locations, and at the location of the proposed Hawkeye Oil Facility.

3.1 Air Quality

3.1.1 Air Quality Standards for Criteria Pollutant

The federal CAA (U.S.C. 7401-7671, as amended in 1990) establishes National Ambient Air Quality Standards (NAAQS) for criteria pollutants to protect public health and welfare. It also sets standards for other compounds that can result in illness, regulates emissions that cause acid rain, and requires federal permits for large sources. NAAQS have been established for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) and 10 microns or less (PM_{10}) and lead (USEPA 2011). Standards for each pollutant meet specific public health and welfare criteria, otherwise known as "criteria pollutants."

The CAA mandates prevention of significant air quality deterioration in certain designated attainment areas and has designated more stringent air quality standards for these areas known as "Secondary Standards." Class I attainment areas have national significance and include national parks greater than 6,000 acres, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres designated prior to 1997 (Ross 1990). Class I regulations (40 CFR 51.307) attempt to protect visibility through a review of major and modified sources of pollutants, and require strict air quality emission standards if there is an adverse impact on visibility within the Class I areas (National Park Service [NPS] 2005).

The nearest designated attainment area to the Project is the Theodore Roosevelt National Park (TRNP), a Class I area that covers about 10 square miles in 3 units within the LMNG. The TRNP is located approximately 13 miles south of Watford City, North Dakota, and approximately 32 miles southwest of the Project. Two air quality monitoring stations are located within the TRNP; the North Unit monitoring station monitors most criteria pollutants (NPS 2005; NDDH 2012). All other parts of the state, including the Fort Berthold Reservation, are classified as Class II attainment areas, affording them protection through the primary NAAQS (NDDH 2012).

The primary and secondary NAAQS for criteria pollutants and the North Dakota Ambient Air Quality Standards (AAQS) are shown in **Table 3.1-1**.

Table 3.1-1 NAAQS and Other Air Quality Standards

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (NAAQS)	North Dakota AAQS
SO_2 (parts per billion [ppb])	1-hour	75	-	75
	3-hour	-	500	500
PM_{10} (micrograms per cubic meter of air [µg/m^3])	24-hour[2]	150	-	150
$PM_{2.5}$ (µg/m^3)	24-hour[3]	35	35	35
	Annual (Arithmetic Average)	12	15	15
NO_2 (ppb)	1-hour[3]	100	-	100
	Annual mean	53	53	53
CO (parts per million [ppm])	1-hour[1]	35	-	35
	8-hour[1]	9	-	9
O_3 (ppb)	8-hour[4]	75	75	75
Lead (µg/m^3)	Rolling 3-month average	0.15	0.15	1.5 (quarterly mean)
Hydrogen sulfide (H_2S) (ppm)	Instantaneous	-	-	10
	1-hour	-	-	0.20
	24-hour	-	-	0.10
	3-month	-	-	0.02

[1] Not to be exceeded more than once per year.
[2] Not to be exceeded more than once per year on average over 3 years.
[3] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed standard.
[4] To attain this standard, the 3-year average of the fourth-highest daily maximum must not exceed the standard.

Sources: USEPA 2014a; NDDH 2014.

North Dakota has separate state standards for SO_2 and H_2S that are different from the federal criteria standards. All other state criteria pollutant standards are the same as the federal standards. In addition, the USEPA averages data from monitoring stations within each county to determine the Air Quality Index (AQI), a general measure of air quality for residents of the county. An AQI greater than 100 is indicative of unhealthy air quality conditions for the county residents, although residents may experience greater or lesser risks depending on their proximity to the sources of pollutants (USEPA 2014b).

3.1.1.1 Greenhouse Gas Emissions and Climate Change

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Some GHGs, such as CO_2, occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The USEPA (2014c) identifies the principal GHGs that enter the atmosphere because of human activities as the following:

- **CO_2:** CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO^2 also is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH_4):** CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N_2O):** N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** Hydrofluorcarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent GHGs thought to contribute significantly to global warming processes (USEPA 2014b).

CO_2 is the primary GHG, responsible for approximately 90 percent of radiative forcing (the rate of energy change is measured at the top of the atmosphere and can be positive [warmer] or negative [cooler]) (USEPA 2014d). To simplify discussion of the various GHGs, the term CO_2 equivalent (CO_2e) has been developed. CO_2e is the amount of CO_2 that would cause the same level of radiative forcing as a unit of one of the other GHGs.

According to the Pew Research Center, which is a fact tank that conducts social science research, "Over the past 50 years, the (worldwide) data on extreme temperatures have shown similar trends of rising temperatures: cold days, cold nights, and frost occurred less frequently over time, while hot days, hot nights, and heat waves occurred more frequently" (Pew Center 2009). Generally, the earth's temperature has increased about 1 degree Celsius since 1850 but some areas have seen an increase of 4 degrees. Sea levels are rising, mountain glaciers are disappearing, and ocean currents, such as the Gulf Stream, are slowing (Intergovernmental Panel on Climate Change [IPCC] 2007).

Energy production and supply was estimated to emit up to 25.9 percent of GHGs worldwide in 2004 (Pew Center 2009). CH_4 with a high radiative forcing CO_2e ratio is a common fugitive gas emission in oil and gas fields (USEPA 2014b). However, oil and gas production is highly variable in potential GHG emissions. Oil and gas producers in the U.S. are not considered large GHG emitters by the USEPA, and are not the subject of any current federal proposals that would regulate GHG emission.

3.1.1.2 Hazardous Air Pollutants

HAPs are a class of compounds known to cause cancer, mutation, or other serious health problems. HAPs usually are a localized problem near the emission source. HAPs are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the USEPA and the State of North Dakota.

Health effects of HAPs may occur at exceptionally low levels; for many HAPs, it is not possible to identify exposure levels that do not produce adverse health effects. Major sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and motor vehicle exhaust. Unlike regulations for criteria pollutants, there are no AAQS for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2011). HAP emissions receive evaluation based on the degree of exposure that can result in illness and premature mortality. The NDDH will review a project and may require an applicant to prepare a risk assessment, particularly if HAPs emissions are a new source that could result in a significant hazard to human health.

3.1.1.3 Existing Air Quality in the Project Area

Air quality in a given location is defined by pollutant concentrations in the atmosphere and generally is expressed in units of ppm or µg/m^3. The Project route traverses McKenzie and Williams counties and representative ambient background levels of pollutants measured in both counties (where possible) from the most recent year of data are shown in **Table 3.1-2**. Data for this table were obtained from the USEPA Air Monitoring Network data archives website. The sites were selected to provide a representative estimate for current background conditions in the Project area.

Table 3.1-2 Ambient Air Quality Background Values

Pollutant	Averaging Period	Ranking[1]	Year	Concentration (ppb)	Monitor/ County	AQS Site ID
NO_2	1-hour	98th Percentile	2011-2013 Average	10.3	Dunn	38-025-0003
		98th Percentile	2011-2013 Average	10	McKenzie	38-053-0002
	Annual	H1H	2013	1.7	Dunn	38-025-0003
		H1H	2013	1.2	McKenzie	38-053-0002
CO	1-hour	H2H	2013	866	Cass [2]	38-017-1004
	8-hour	H2H	2013	400	Cass [2]	38-017-1004
SO_2	1-hour	99th Percentile	2011-2013 Average	8.7	Dunn	38-025-0003
		99th Percentile	2001-2013 Average	8.6	McKenzie	38-053-0002
	3-hour	H2H	2013	4.4	Dunn	38-025-0003
		H2H	2013	5.9	McKenzie	38-053-0002
	24-hour	H2H	2013	1.8	Dunn	38-025-0003
		H2H	2013	2.5	McKenzie	38-053-0002
	Annual	H1H	2013	0.4	Dunn	38-025-0003
		H1H	2013	0.6	McKenzie	38-053-0002
PM_{10}	24-hour	H2H	2013	74.0 [3]	Dunn	38-025-0003
		H2H	2013	19.0 [3]	McKenzie	38-053-0002
$PM_{2.5}$	24-hour	98th Percentile	2013	14.6 [3]	Dunn	38-025-0003
		98th Percentile	2001-2013 Average	15.3 [3]	McKenzie	38-053-0002
	Annual	H1H	2013	4.4 [3]	Dunn	38-025-0003
		H1H	2013	3.6 [3]	McKenzie	38-053-0002
O_3	8-hour	H2H	2013	60	Dunn	38-025-0003
		H2H	2013	62	McKenzie	38-053-0002

[1] H1H represents the highest overall value for the given year. H2H represents the high second high concentration (the second highest value form the highest impact receptor). The 98th and 99th percentile values were averaged over 3 years.

[2] CO measured at Cass County monitor, which is the only CO monitor in the State of North Dakota that is still active.

[3] All PM_{10} and $PM_{2.5}$ concentrations are expressed in units of µg/m^3.

Source: USEPA 2014e.

Air Quality Attainment Status

As indicated in **Table 3.1-2,** the Project area is in attainment for all criteria pollutants; North Dakota currently is in attainment for all criteria pollutants in all counties. However, if an area is designated as non-attainment, the State of North Dakota is required to develop a State Implementation Plan (SIP) under the CAA Section 176(c)(4)(E), which provides the requirements for SIPs.

3.1.1.4 Typical Air Emissions from Pipeline Construction

Pipeline construction, access road construction, and truck traffic would generate emissions of criteria pollutants and HAPs. Primary emission sources during drilling are diesel exhaust, wind-blown dust from disturbed areas and travel on dirt roads, evaporation from pits and sumps, and gas venting. Diesel emissions are being progressively controlled by the USEPA in a nationwide program (USEPA 2014f). This program takes a two-pronged approach. First, fuels are improving to the ultra-low sulfur standard, and secondly, manufacturers must produce progressively lower engine emissions.

3.2 Geology and Minerals

3.2.1 Geology

The Project is located in the Great Plains physiographic province (Fenneman 1928). In western North Dakota, the Great Plains province is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau (**Figure 3.2-1**). The Missouri Plateau is characterized by badlands, buttes and mesas, and exhumed mountain ranges similar to the Black Hills. The Project is located in the Glaciated Missouri Plateau, which generally is of low relief and covered with glacial deposits (Trimble 1980). The boundary between the glaciated and unglaciated sections of the Missouri Plateau is not distinct because glacial deposits thin out gradually.

Elevations of the Glaciated Missouri Plateau range from less than 2,000 feet above mean sea level (amsl) at the Missouri River crossing to 2,400 feet amsl in the upland areas in eastern McKenzie County. The bedrock geology consists of the Bullion Creek member of the Tongue River Formation, and the Sentinel Butte Formation of the Paleocene Fort Union Group, both overlain by the Eocene Golden Valley Formation. These formations are largely composed of claystone, siltstone, sandstone, and lignite. There are very few exposures of bedrock along the Project route north of Keene, North Dakota, in eastern McKenzie County. The bedrock is mostly covered by glacially derived surficial deposits (Carlson 1985; Armstrong 1967; Freers 1970). Glacial materials consist of till, lake deposits, and terraces and are composed of gravel, sand, and clay.

The Project area is located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (**Figure 3.2-2**) (Peterson and McCary 1987). The Williston Basin also extends north into Alberta, Saskatchewan, and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located in McKenzie County. The major structural feature of the Project area is the Nesson Anticline, a north-south trending structure in eastern Williams and McKenzie counties (**Figure 3.2-3**) (Gerhard et al. 1987). North-south trending fault zones paralleling the Nesson Anticline have been mapped in the deeper bedrock in Williams County, but do not extend up to the surface.

3.2.2 Mineral Resources

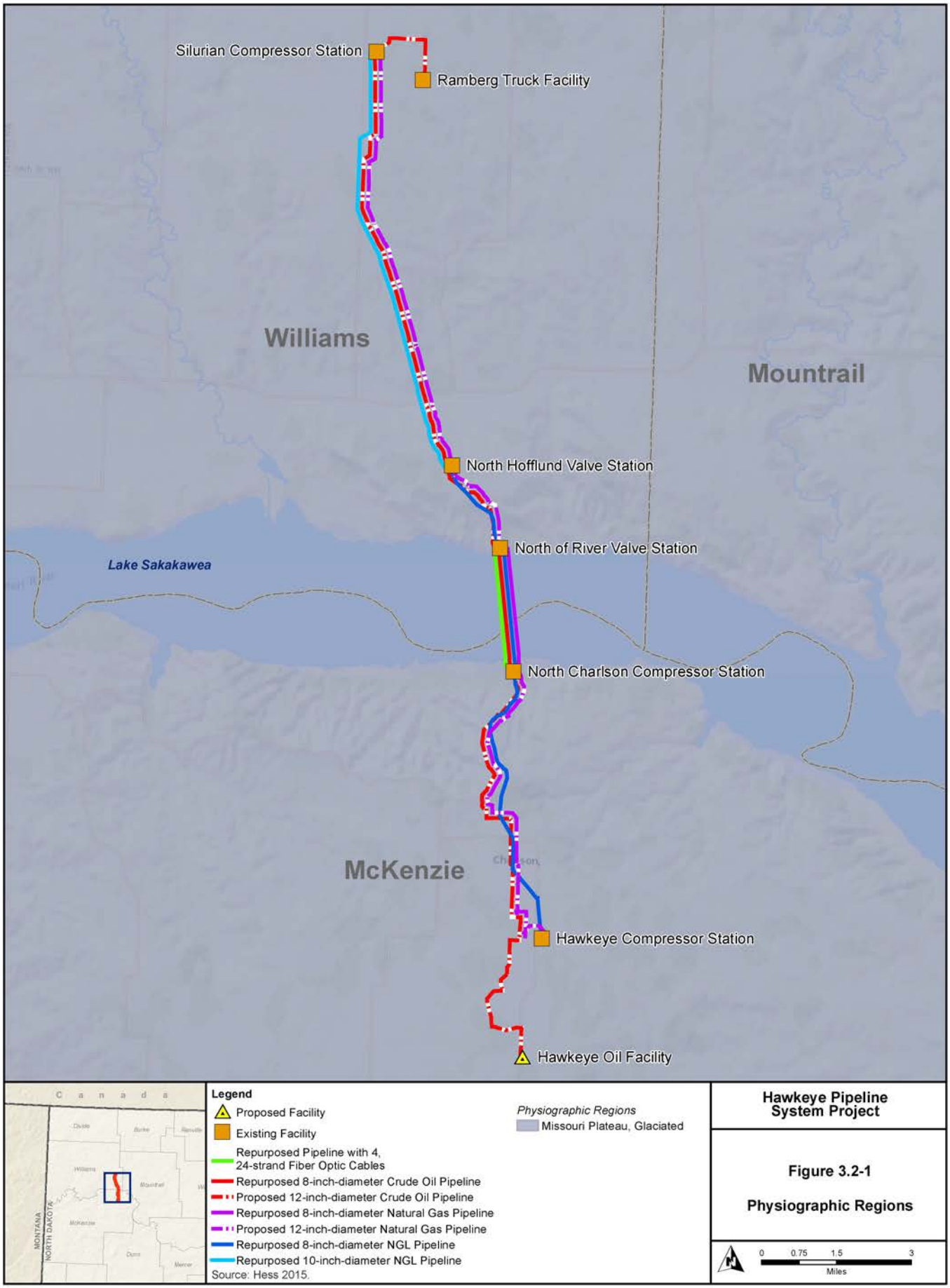
The major mineral resources in the Project area are oil, natural gas, and lignite (**Figure 3.2-3**) (Freers 1970). The important non-fuel mineral resources are sand and gravel, clay, and scoria.

3.2.2.1 Oil and Natural Gas

The Williston Basin is a major oil and gas producing basin. In the U.S. portion of the basin, total production from 1951 to the end of 2012 was approximately 3.8 billion barrels of oil and over 470 billion cubic feet of gas (North Dakota Industrial Commission [NDIC] 2014; U.S. Energy Information Administration 2014; North Dakota Division of Oil and Gas 2014; South Dakota Oil and Gas Section 2014). The first commercial oil well in North Dakota was drilled in Williams County on the Nesson Anticline in 1951, about 7 miles south of Tioga (Freers 1970). The oil production decline in the 1990s has been offset in recent years by technological advances, which have allowed for increased production from the Bakken Formation that has an estimated mean technically recoverable resource of 7.4 billion barrels of oil and 6.7 trillion cubic feet of gas (U.S. Geological Survey [USGS] 2013). The Project route in McKenzie and Williams counties generally parallels the Nesson Anticline where numerous oil and gas fields have been developed and is the epicenter of the current Bakken play in North Dakota. Bakken production has accounted for approximately 24 percent of total cumulative oil production in North Dakota (NDIC 2014).

<u>Lignite</u>

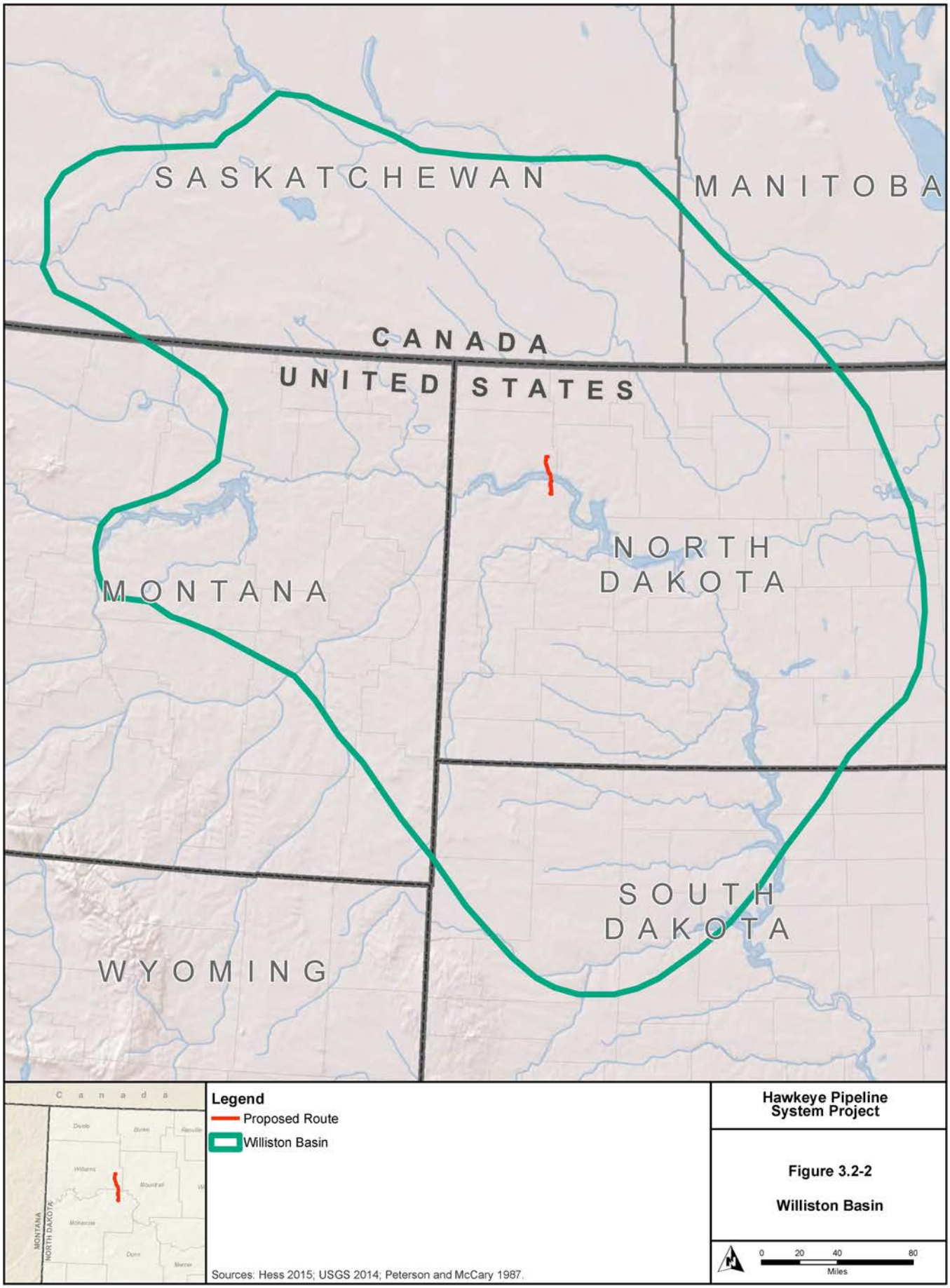
The Project area is located in the Fort Union Coal region (Averitt 1972). Lignite coal in the Project area is found in the Sentinel Butte Formation and Tongue River Formation of the Fort Union Group and may contain economically minable coals (Murphy 2008, 2007, 2006). **Table 3.2-1** summarizes the locations in the immediate vicinity of the Project where there are potentially minable coal deposits.

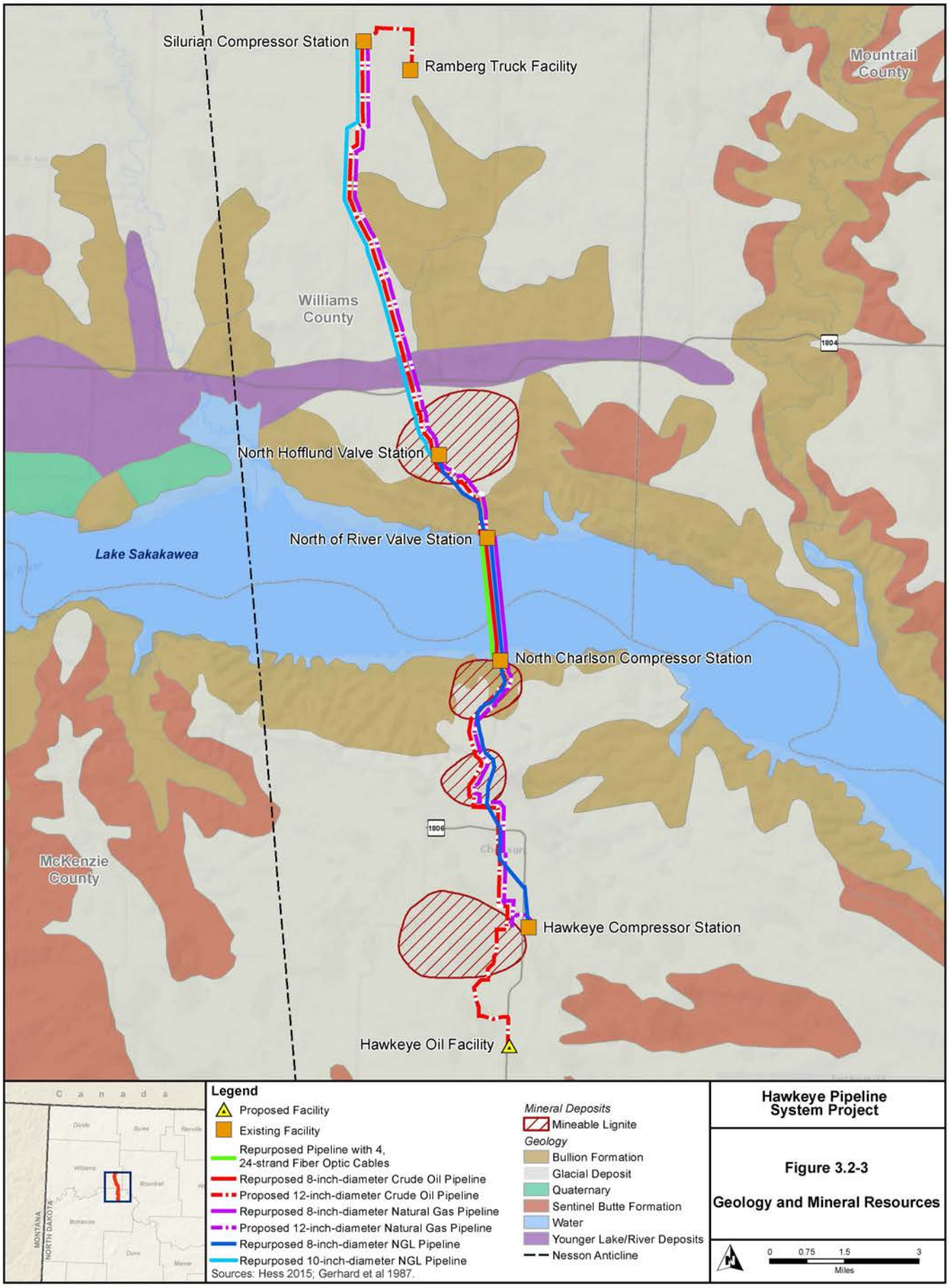


Hawkeye Pipeline System Project

Figure 3.2-1

Physiographic Regions


SASKATCHEWAN
MANITOBA
CANADA
UNITED STATES
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
Canada
MONTANA
NORTH DAKOTA
Legend
Proposed Route
Williston Basin
Hawkeye Pipeline System Project
Figure 3.2-2
Williston Basin
0 20 40 80
Miles
Sources: Hess 2015; USGS 2014; Peterson and McCary 1987.



Hawkeye Pipeline System Project

Figure 3.2-3

Geology and Mineral Resources

Table 3.2-1 Mineable Coal Resources near the Project Area

Approximate Milepost	General Location (Section-Township-Range)	County
MP 6.5	Section 16, T153N, R95W	McKenzie
MP 8.5	Section 4, T153N, R95W	McKenzie
MP 14.0	Section 9, T154N, R95W	Williams

Sources: Murphy 2008, 2007, 2006.

3.2.2.2 Aggregate

Aggregate (sand and gravel) production is from localized deposits in floodplains or glacial till (Carlson 1985; Freers 1970). Some areas in McKenzie County also have scoria deposits used for road topping. Scoria is formed from the in-situ burning of coal seams.

3.2.3 Geologic Hazards

3.2.3.1 Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence within the Project area.

Faults are dislocations where blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth passing each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but not evidence of movement on the faults in the last 10,000 years. No active faults have been identified in the Project area (Crone and Wheeler 2000). An active fault demonstrates that movement has taken place in the last 10,000 years (USGS 2009).

Seismicity includes the intensity, frequency, and location of earthquakes. From 1990 to 2006, no seismic events were recorded in North Dakota (USGS 2006).

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates the potential ground motion hazard in the Project area is low. The hazard map used estimates peak ground motion acceleration expressed as a percentage of the acceleration of gravity with a 2 percent probability of exceedance in 50 years. There has been no seismic activity recorded in North Dakota from 1990 to 2006 (USGS 2006).

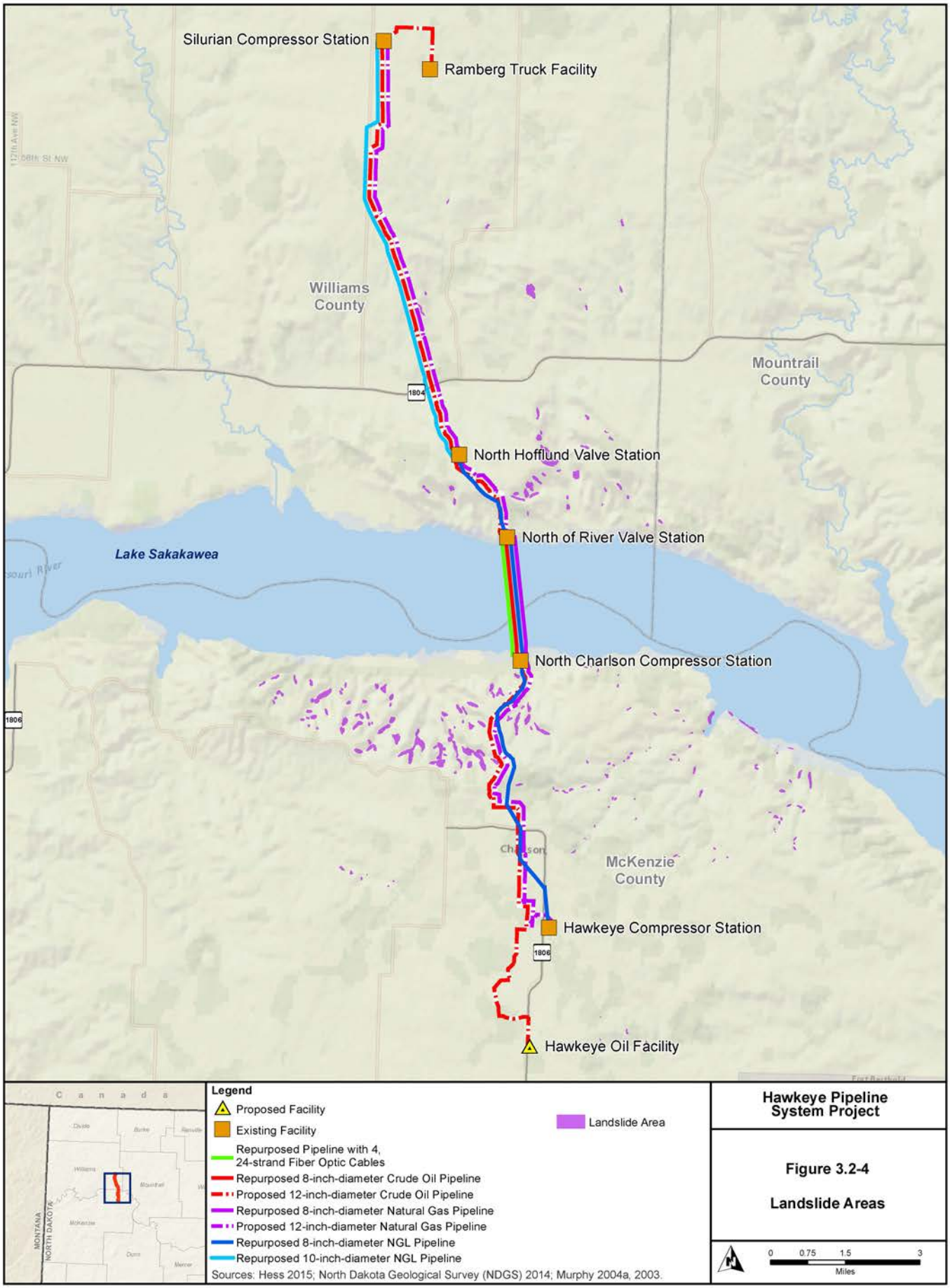
3.2.3.2 Landslides

Landslide is a term used for various processes involving movement of earth material down slopes (USGS 2004). Large masses of earth become unstable and, forced by gravity, move downhill. Instability is caused by a combination of factors such as steep slopes, periods of high precipitation, stream erosion, or unintentional undercutting or undermining the strength of unstable materials during construction of roads and structures. There is the potential for landslides on the north and south sides of Lake Sakakawea (Murphy 2004a,b; 2003). Deeply incised glacial sediment has created “badland” topography. This, combined with steep slopes, has created unstable conditions near the lake. **Figure 3.2-4** shows the Project route through the landslide prone areas near Lake Sakakawea.

3.2.3.3 Subsidence

Subsidence could be a concern due to historical lignite mining in the area. Lignite was heavily mined in the Project area before modern surface mining methods were used. Historical lignite mining practices used underground room-and-pillar methods and because the overburden was relatively thin (often less than 50 feet), underground voids would collapse creating sinkhole-type subsidence resulting in unstable ground conditions. One abandoned mine is in the general vicinity of the Project area and is located in SW Section 9,

T155N, R95W, approximately 1.5 miles east of the Project route (North Dakota Abandoned Mine Land Reclamation Division 2005). **Figure 3.2-3** shows the Project route through areas of known lignite mining.


Silurian Compressor Station
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Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Landslide Area
Sources: Hess 2015; North Dakota Geological Survey (NDGS) 2014; Murphy 2004a, 2003.
Hawkeye Pipeline System Project
Figure 3.2-4
Landslide Areas
0 0.75 1.5 3
Miles

3.3 Paleontological Resources

3.3.1 Regulatory Structure

The PRPA became law in 2009 with the passage of P.L. 111-011 (BLM 2013). The PRPA included specific provisions addressing management of these resources by the BLM, NPS, Bureau of Reclamation (BOR), USFWS, and USFS. It affirmed the authority for many policies that those agencies already had in place for the management of paleontological resources such as issuing permits for collecting paleontological resources, curation of paleontological resources, and confidentiality of locality data. The PRPA only applies to federal lands and does not affect private lands. It provides authority for the protection of paleontological resources on federal lands including criminal and civil penalties for fossil theft and vandalism. Consistent with policy up to the passage of the Act, the PRPA also includes provisions allowing for casual or hobby collecting of common invertebrate and plant fossils without a permit on federal lands managed by the BLM, BOR, and USFS, under certain conditions. Casual collecting is not allowed within national parks or other lands managed by the NPS. The PRPA directed federal agencies to begin developing regulations, establishing public awareness and education programs, and inventorying and monitoring federal lands.

The BLM also manages paleontological resources (fossils) on federal lands under the following statutes and regulations (BLM 2013):

- FLPMA (P.L. 94-579);
- NEPA (P.L. 91-190); and
- Various sections of BLM's regulations found in Title 43 CFR that address the collection of invertebrate fossils and, by administrative extension, fossil plants.

In addition to the statutes and regulations listed above, fossils on public lands are managed through the use of internal BLM guidance and manuals. These include the BLM Manual 8270 and the BLM Handbook H-8270-1 (BLM 2013). Various internal instructional memoranda have been issued to provide guidance to the BLM in implementing management and protection of fossil resources.

According to BLM's Instruction Memorandum (IM) 2009-011 (BLM 2008), a Significant Paleontological Resource is defined as:

> *"Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities."*

North Dakota has two laws (passed in 1989) that deal with the management of paleontological resources (NDGS 2007). The North Dakota Paleontological Resource Protection Act (Section 54-17.3, NDCC) gives the NDIC, acting through the office of the State Geologist, the responsibility to protect paleontological resources located on state land. The second law gives the NDGS authority to operate and maintain a public repository for North Dakota fossils. In addition, the State of North Dakota has entered into a Memorandums of Understanding (MOUs) with the BLM and USFS for cooperative management of paleontological resources within the state.

3.3.2 Potential Fossil Yield Classification System

Recently, the BLM has adopted the Potential Fossil Yield Classification (PFYC) system to identify and classify fossil resources on federal lands (BLM 2013). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants and invertebrates) and their sensitivity to adverse impacts. A higher class number indicates higher potential. The PFYC is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occur occasionally in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions. The BLM intends for the PFYC system to be used as a guideline as opposed to rigorous definitions. Descriptions of the potential fossil yield classes are summarized in **Table 3.3-1**.

Table 3.3-1 Potential Fossil Yield Classification

Class	Description	Basis	Comments
1	Igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservation environments that are not likely to contain recognizable fossil remains.	Fossils of any kind known not to occur except in the rarest of circumstances. Igneous or metamorphic origin. Landslides and glacial deposits.	The land manager's concern for paleontological resources on Class 1 acres is negligible. Ground disturbing activities would not require mitigation except in rare circumstances.
2	Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically important invertebrate fossils.	Vertebrate fossils known to occur very rarely or not at all. Age greater than Devonian. Age younger than 10,000 years before present. Deep marine origin. Aeolian origin. Diagenetic alteration.	The land manager's concern for paleontological resources on Class 2 acres is low. Ground disturbing activities are not likely to require mitigation.
3	Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.	Units with sporadic known occurrences of vertebrate fossils. Vertebrate fossils and significant invertebrate fossils known to occur inconsistently; predictability known to be low. Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.	The land manager's concern for paleontological resources on Class 3 acres may extend across the entire range of management. Ground disturbing activities would require sufficient mitigation to determine whether significant paleontological resources occur in the area of a proposed action. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.

Table 3.3-1 Potential Fossil Yield Classification

Class	Description	Basis	Comments
4	Class 4 geologic units are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation.	Significant soil/vegetative cover; outcrop is not likely to be impacted. Areas of any exposed outcrop are smaller than 2 contiguous acres. Outcrop forms cliffs of sufficient height and slope that most is out of reach by normal means. Other characteristics that lower the vulnerability of both known and unidentified fossil localities.	The land manager's concern for paleontological resources on Class 4 areas is toward management and away from unregulated access. Proposed ground disturbing activities would require assessment to determine whether significant paleontological resources occur in the area of a proposed action and whether the action would impact the paleontological resources. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.
5	Highly fossiliferous geologic units that regularly and predictably produce invertebrate fossils and/or scientifically significant invertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.	Vertebrate fossils and/or scientifically significant invertebrate fossils are known and documented to occur consistently, predictably, and/or abundantly. Unit is exposed; little or no soil/vegetative cover. Outcrop areas are extensive; discontinuous areas are larger than 2 contiguous acres. Outcrop erodes readily; may form badlands. Easy access to extensive outcrop in remote areas. Other characteristics that increase the sensitivity of both known and unidentified fossil localities.	The land manager's highest concern for paleontological resources should focus on Class 5 areas. Mitigation of ground disturbing activities is required and may be intense. Areas of special interest and concern should be designated and intensely managed.

Source: BLM 1998.

3.3.3 Fossil Resources in the Project Area

Based on published geologic mapping (Carlson 1985; Freers 1970), the Project area is underlain by the Paleocene-age Bullion Creek and Sentinel Butte formations of the Fort Union Group and Quaternary surficial deposits. These formations were ranked using the PFYC system. Both the Sentinel Butte and Bullion Creek Formations of the Fort Union Group have high and very high paleontological potential (PFYC Class 4 and Class 5, respectively); whereas, Quaternary surficial deposits have low paleontological sensitivity (PFYC Class 2).

Paleontological field surveys of the Project route were conducted on August 21 and 22, 2012, and October 19, 2012 (SWCA Environmental Consultants [SWCA] 2013). Because the BLM is the lead federal agency, BLM's paleontological resource management policies were followed on all lands. An analysis of existing paleontological records and relevant literature was completed prior to the field surveys. The records and literature search analysis area included the Townships in which the Project area is located. As a result of the records and literature search, 11 previously recorded fossil localities or fossiliferous stratigraphic columns were identified within 1 mile of the Project area (**Table 3.3-2**); however, none of these localities are within the Project area.

Table 3.3-2 Previously Located Fossil Locations (or Stratigraphic Columns) within 1 Mile of the Project Area

Fossil Locality or Stratigraphic Column ID	Geologic Unit[1]	Fossil Description
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
L915	Bullion Creek (Ttr)	
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
32W113-R2	Fort Union	Cetacean vertebra*
L931	Bullion Creek (Ttr)	*Viviparus leai, Viviparus retusus, Viviparus meeki*
L1175	Bullion Creek (Ttr)	*Viviparus leai, Viviparus meeki* (Wenz, float)
L1176	Bullion Creek (Ttr)	*Viviparus leai; Campeloma nebrascense nebrascense?*
L1177	Bullion Creek (Ttr)	*Viviparus leai; Viviparus* sp.
L1178	Bullion Creek (Ttr)	*Viviparus meeki*, apical specimens
L1179	Bullion Creek (Ttr)	*Viviparus leai, Viviparus meeki*
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)

[1] Geologic Unit Details: Area was originally recorded as undivided Fort Union Formation, in later publications it was divided into the Tongue River and Sentinel Butte formations of the Fort Union Group, and even later the Tongue River was split and renamed in part as the Bullion Creek Formation (and Slope Formation southwest of the Project area). Therefore, the geologic units are reported here as reported in the associated publications and/or locality forms.

* Most likely misidentified since cetaceans are not known from this time period, current status of fossil is unknown.

The objective of the field surveys was to provide surface paleontological clearance through a detailed examination of the Project route for the presence of surface fossils and exposures of paleontologically-sensitive geologic units. The paleontological survey area encompassed a 400-foot-wide corridor on USFS land (200 feet on either side of the Project centerline), and a 200-foot-wide corridor (100 feet on either side of the Project centerline) on USACE, State, and private lands where the aerial photo and geologic map review indicated the potential for exposures of paleontologically-sensitive bedrock (PYFC Classes 4 and 5). In total, approximately 18 acres were surveyed on USACE land, 350 acres on USFS land, 19 acres on State land, and 103 acres on private land (SWCA 2013).

A total of two non-significant fossil occurrences were documented on State land and two non-significant fossil occurrences were documented on USFS land during the field surveys (**Table 3.3-3**). All of these were found in the Fort Union Group, two in an area previously documented as containing exposures of the Bullion Creek Formation (Carlson 1985), and two in an area mapped as the Sentinel Butte Formation (Freers 1970), but also may represent exposures of the Bullion Creek Formation. Fossils documented during the field survey included non-significant shells of moderately well preserved invertebrates (gastropod and bivalve) shells, and non-significant fragments of silicified wood.

In September 2014, SWCA completed a desktop review of variations to the Project route that occurred subsequent to the 2012 field surveys (SWCA 2014). The route variations fall in flat and primarily vegetated areas with no exposure of sensitive paleontological bedrock due to the vegetation and surficial glacial deposits; therefore, no field surveys of the route variations were recommended by SWCA. BLM agreed with SWCA's findings and recommendation that no field surveys of the route variations were necessary. Results of the desktop review were submitted to and approved by the BLM in October 2014 (Liggett 2014).

Table 3.3-3 Fossil Localities Documented During the Paleontological Field Surveys

Field No.	Fossil Locality Type[1]	General Fossil Type[2]	Fossil Description	Within Disturbance Area	Ownership	Geologic Formation[3]	Fossils Collected?
F5-120822-01	NFO	I	Gastropoda undet-shells	No	USFS	Tsb (possibly Tb)	No, fossils not significant
F5-120822-02	NFO	I	Bivalvia undet-shell and shell fragments	No	USFS	Tsb (possibly Tb)	No, fossils not significant
F4-121019-01	NFO	I	Gastropoda undet-shell fragments	Yes	State of North Dakota	Tfu	No, fossils not significant
F4-121019-02	NFO	P	Plantae undet-silicified wood	Yes	State of North Dakota	Tfu	No, fossils not significant

[1] NFO=non-significant fossil occurrence.

[2] I=Invertebrate; P=Plant.

[3] Tb=Bullion Creek Formation; Tsb=Sentinel Butte Formation; Tfu=mapped as undifferentiated Fort Union Formation, description and stratigraphic position indicates Tb (Freers 1970).

Source: SWCA 2013.

3.4 Soils

Information on soil characteristics was obtained from NRCS literature or databases, including the Land Resource Regions and Major Land Resource Areas (MLRAs) of the U.S., the Caribbean, and the Pacific Basin, USDA Handbook 296 (NRCS 2006) and the Soil Survey Geographic Database (SSURGO). Soil baseline characteristics for the Project area are based on SSURGO database review and analyses. SSURGO is the most detailed level of soil mapping completed by the NRCS. The SSURGO databases for Williams and McKenzie counties, North Dakota (NRCS 2014), are the source for the soils data in this section and are summarized in **Tables 3.4-1** and **3.4-2**. The soil characteristics evaluated for the Project include wind erodible, water erodible, compaction prone, hydric, droughty, shallow depth to bedrock, Prime Farmland, and Farmland of Statewide Importance. These soil characteristics were selected because soils displaying these characteristics would require diligent and timely adherence to the environmental protection measures selected for the Project. The environmental protection measures are designed to avoid and minimize potential impacts of topsoil loss, erosion, and soil compaction to farmland/pasture and to assist/expedite the reclamation and re-vegetation of natural (non-farmed) areas.

Table 3.4-1 Summary of Soil Characteristics Along the Pipeline Routes (Miles Crossed)

Total Pipeline Route	Wind Erodible	Water Erodible	Compaction Prone	Hydric	Droughty	Shallow Depth to Bedrock	Prime Farmland	Farmland of Statewide Importance
19.2	**0.74**	**1.9**	16.4	12.5	4.8	0.0	**0.01**	**5.2**

Source: NRCS 2014.

Table 3.4-2 Soil Characteristics at Proposed Project Facilities

Receipt/ Delivery Facilities	Wind Erodible	Water Erodible	Compaction Prone	Hydric	Droughty	Shallow Depth to Bedrock	Prime Farmland	Farmland of Statewide Importance
Proposed Above Ground Facility								
Hawkeye Oil Facility			x	x				x

Source: NRCS 2014.

The Project area is located within the following 2 MLRAs of soil resources (NRCS 2006):

- MLRA 53B – Central Dark Brown Glaciated Plains; and
- MLRA 54 – Rolling Soft Shale Plain.

The nearly level to rolling till plains in MLRA 53B include kettle holes, kames, moraines, and small glacial lakes. Moderately steep and steep slopes are adjacent to the major stream valleys. Elevation ranges from 1,640 to 1,970 feet amsl, increasing gradually from southeast to northwest. Almost all of this MLRA is covered by glacial till plains. Some glacio-lacustrine deposits also occur. Alluvial deposits are extensive along the Missouri River but occur in narrow and discontinuous strips along other streams and rivers. Low terraces occur along the major rivers. The dominant soil order in this MLRA is Mollisols. The soils generally are very deep, well drained to very poorly drained, and clayey or loamy.

MLRA 54 is predominantly unglaciated, but the eastern and northern edges have been glaciated. The area is located on an old, moderately dissected, rolling plain with some local badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most of the major drainages. Elevation ranges from 1,650 feet amsl in the east with a gradual slope to about 3,600 feet amsl in the west. The soils generally formed in residuum and alluvium from sedimentary parent materials. They are shallow to very deep, generally somewhat excessively drained to moderately well drained, and loamy or clayey. The dominant soil orders in this MLRA are Mollisols and Entisols. Mollisols are fertile soils with high organic matter and a nutrient-enriched, thick surface. In contrast, Entisols are considered recent soils that lack soil development because erosion or deposition rates occur faster than the rate of soil development.

Soil characteristics such as wind and water erodible, compaction prone, hydric, droughty, shallow depth to bedrock, Prime Farmland, and Farmland of Statewide Importance are important to consider when planning construction, stabilization of disturbed areas, and restoration. These characteristics are a function of many physical and chemical characteristics of each soil, in combination with the climate, vegetation, and land uses. The areas identified on **Figures 3.4-1** through **3.4-7** and summarized on **Tables 3.4-1** and **3.4-2** as having special hazards or limitations would require diligent and timely adherence to the environmental protection measures.

Natural erosion rates depend on inherent soil properties, slope, soil cover, and climate. Water erosion is the detachment and movement of soil by water. Approximately 10 percent of the soils crossed by the Project route are highly erodible to water. Water erodible soils are illustrated in **Figure 3.4-1**. Wind erosion is the physical wearing of the earth's surface by wind. Wind erosion removes and redistributes soil. Approximately 4 percent of the Project route would cross wind erodible soils; the potential occurrence of wind erodible soils is illustrated in **Figure 3.4-2**.

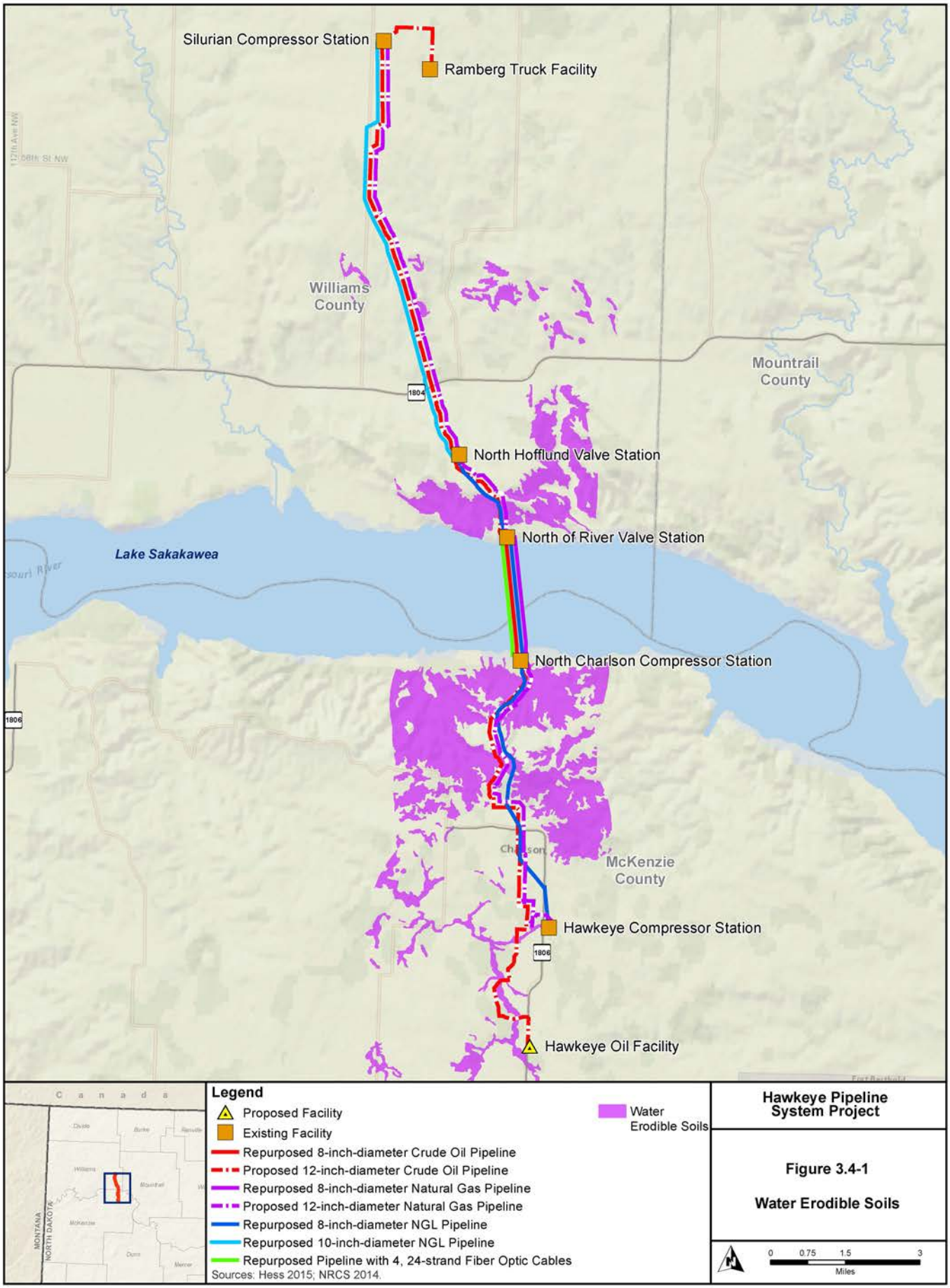
Soil compaction occurs when soil particles are pressed together and the pore spaces between them are reduced and bulk density is increased. Moist, fine-textured soils are most susceptible to severe compaction. Approximately 85 percent of the soils crossed by the Project route are characterized as compaction prone. The occurrence of compaction prone soil is illustrated on **Figure 3.4-3**.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. These soils are commonly associated with floodplains, lake plains, basin plains, riparian areas, wetlands, springs, and seeps. Approximately 65 percent of the soils crossed by the Project route have at least one component of the map unit that is hydric. The occurrence of hydric soils is illustrated on **Figure 3.4-4**. Soils with saturated, ponded, or flowing water conditions can be difficult to stabilize and revegetate.

Soils that are droughty have physical characteristics that may limit plant growth due to low water holding capacity. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical characteristics of the soils. Approximately 25 percent of the Project route would cross soils characterized as droughty; the potential occurrence of droughty soils is illustrated on **Figure 3.4-5**.

Soils with a shallow depth to bedrock include soils that have lithic (hard) bedrock less than 60 inches from the soil surface. This can be an important consideration for trenching. The Project route would not cross soils with a shallow depth to bedrock; the occurrence of soils with a shallow depth to bedrock is illustrated on **Figure 3.4-6**.

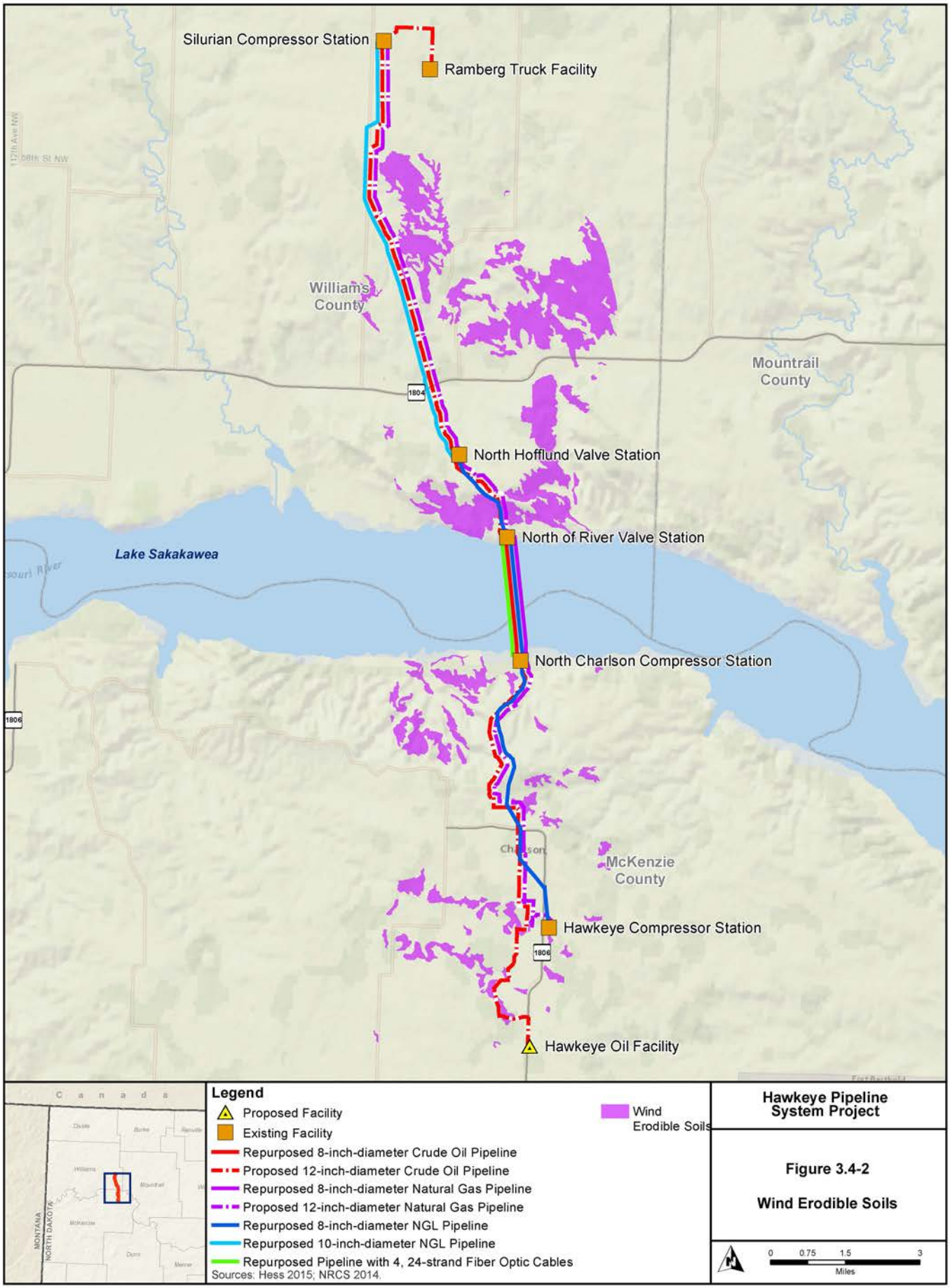
Prime Farmland is land that has the best combination of physical and chemical characteristics for producing crops and is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. These soils have the capability to be Prime Farmland, even if they have not yet been developed for agricultural uses. Farmland of Statewide Importance is land other than Prime Farmland that has a good combination of physical and chemical characteristics for the production of crops. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use. The Farmland Protection Policy Act states that federal programs contributing to the unnecessary and irreversible conversion of farmland to non-agricultural uses would be minimized and shall be administered in a manner that, as practicable, are compatible with state and local government and private programs and policies to protect farmland. Less than 1 percent of soils crossed by the Project route are Prime Farmland and 27 percent of soils crossed are Farmland of Statewide Importance. The occurrence of Prime Farmland and Farmland of Statewide Importance in the Project area are illustrated on **Figure 3.4-7**.



Hawkeye Pipeline System Project

Figure 3.4-1

Water Erodible Soils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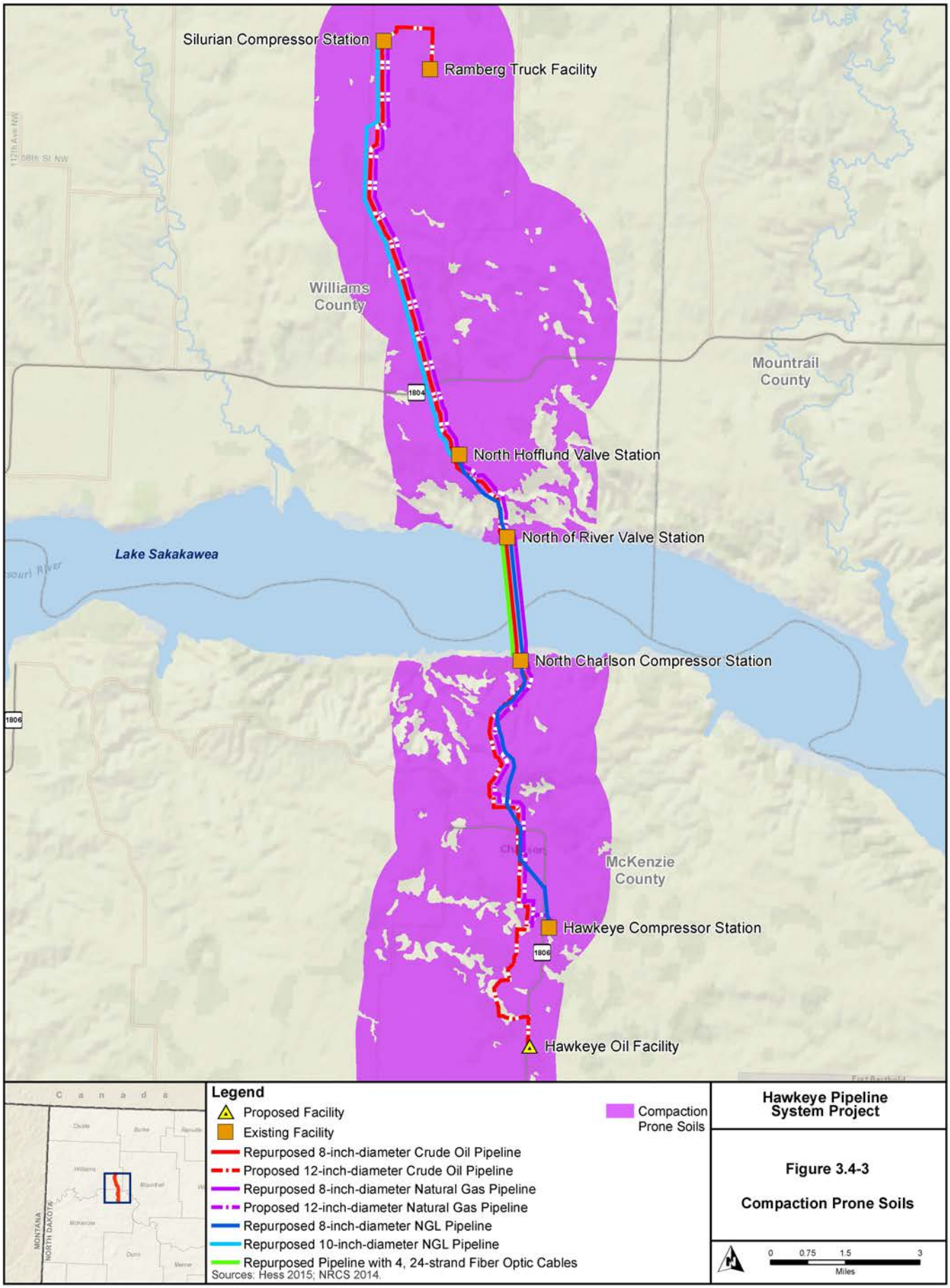
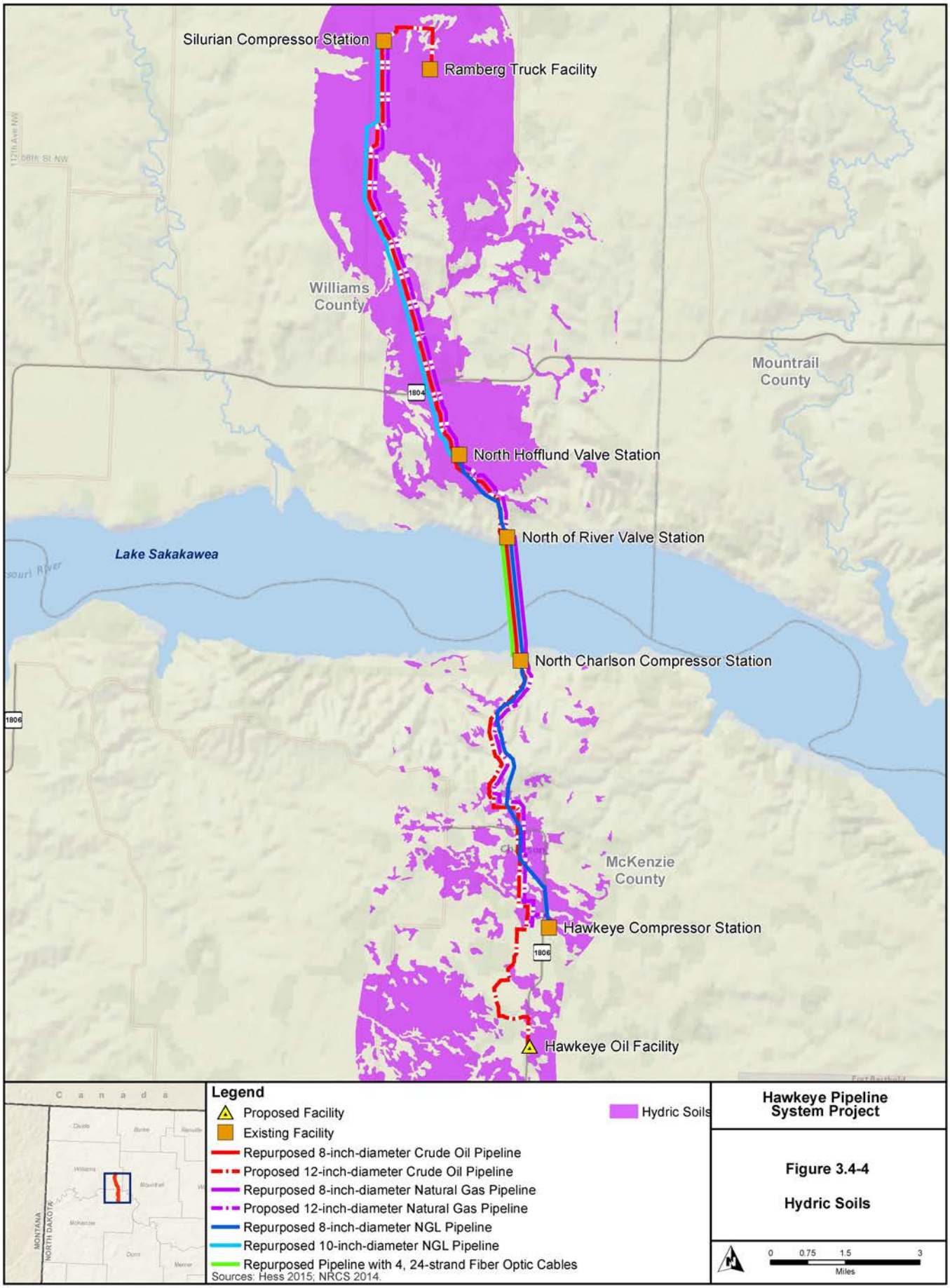
Repurposed 10-inch-diameter NGL Pipeline
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Wind Erodible Soils
Sources: Hess 2015; NRCS 2014.
Hawkeye Pipeline System Project
Figure 3.4-2
Wind Erodible Soils
0 0.75 1.5 3
Miles



Hawkeye Pipeline System Project

Figure 3.4-3

Compaction Prone Soils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Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Hydric Soils
Sources: Hess 2015; NRCS 2014.
Hawkeye Pipeline System Project
Figure 3.4-4
Hydric Soils
0 0.75 1.5 3
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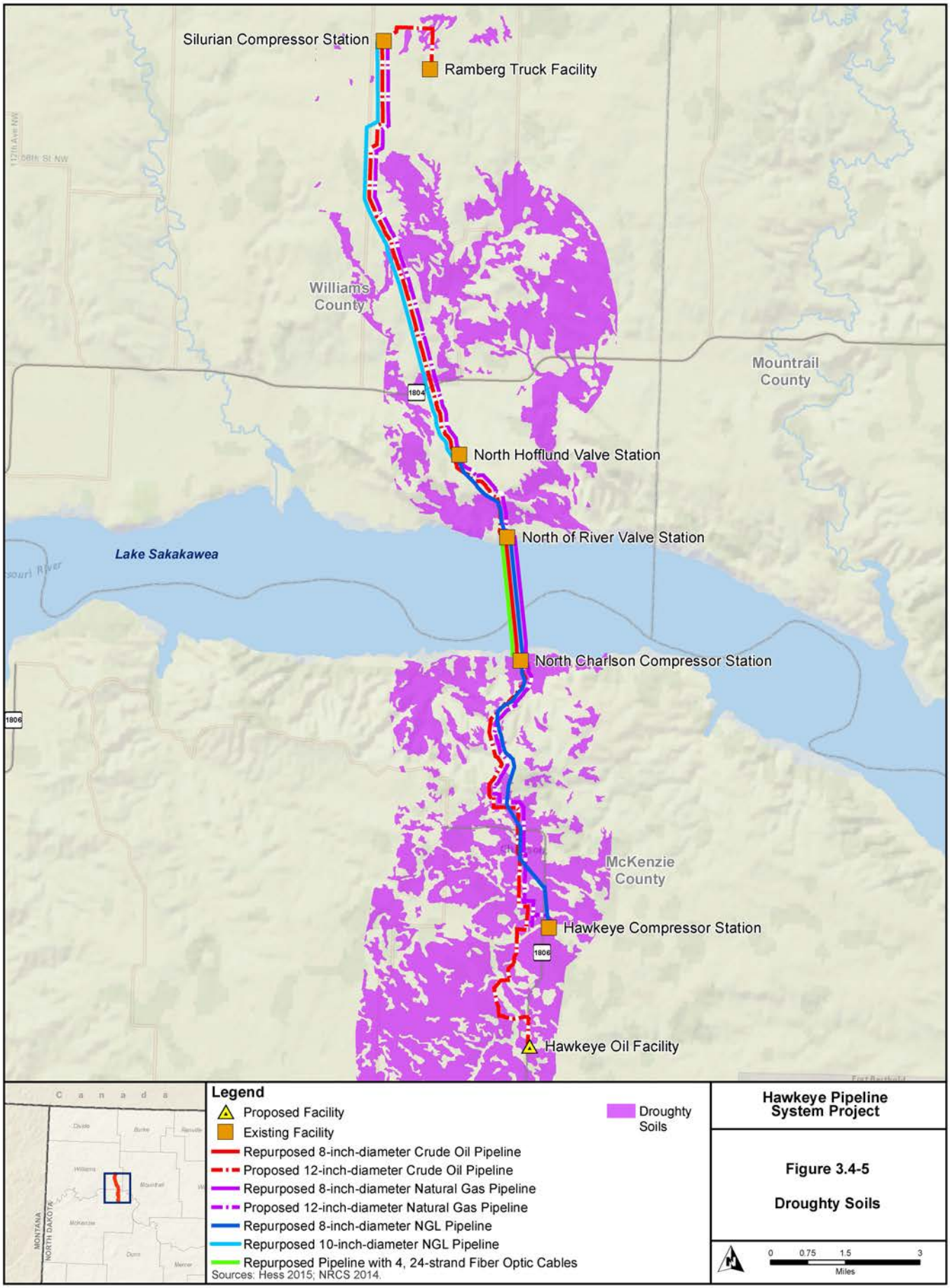
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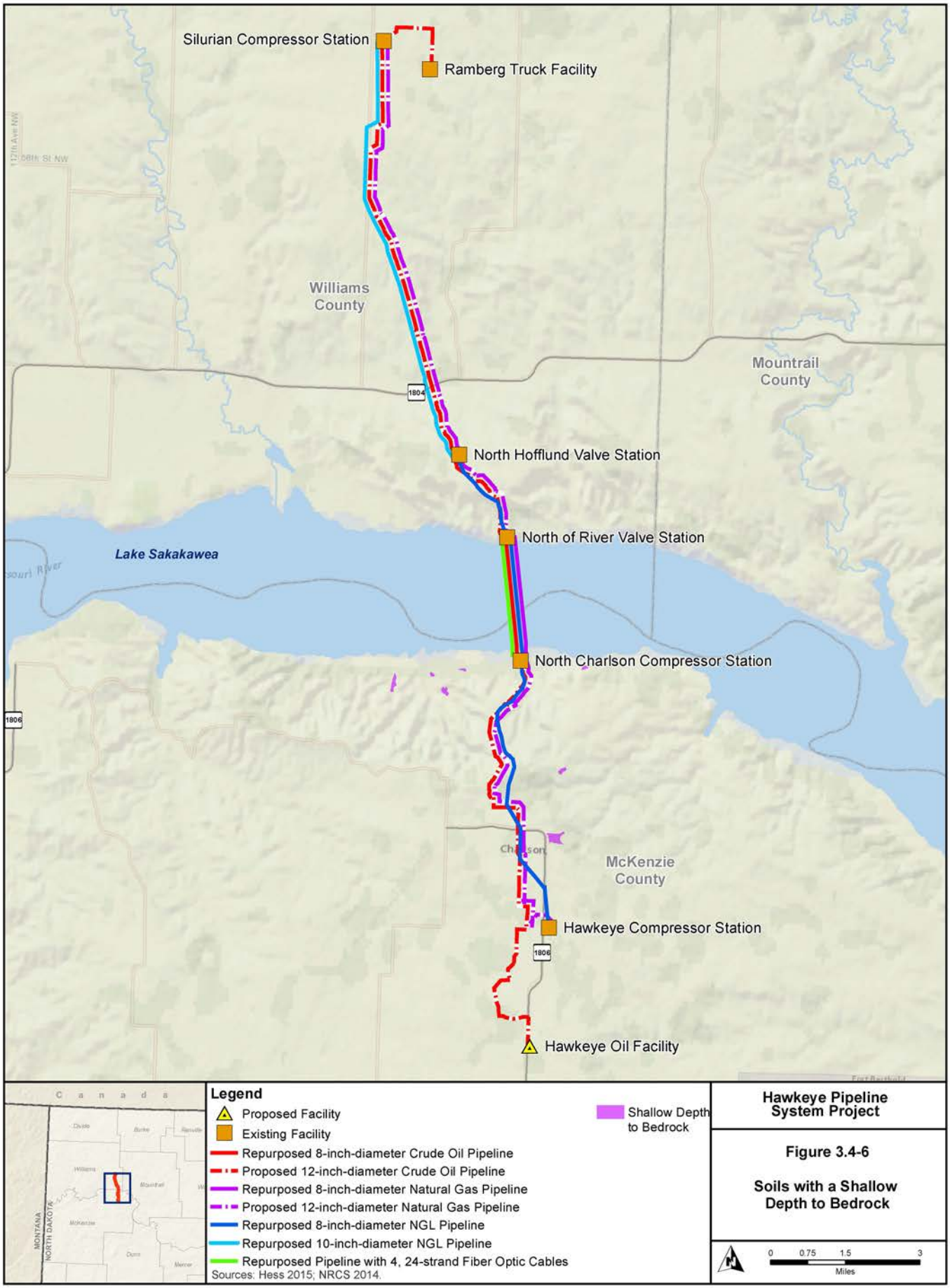
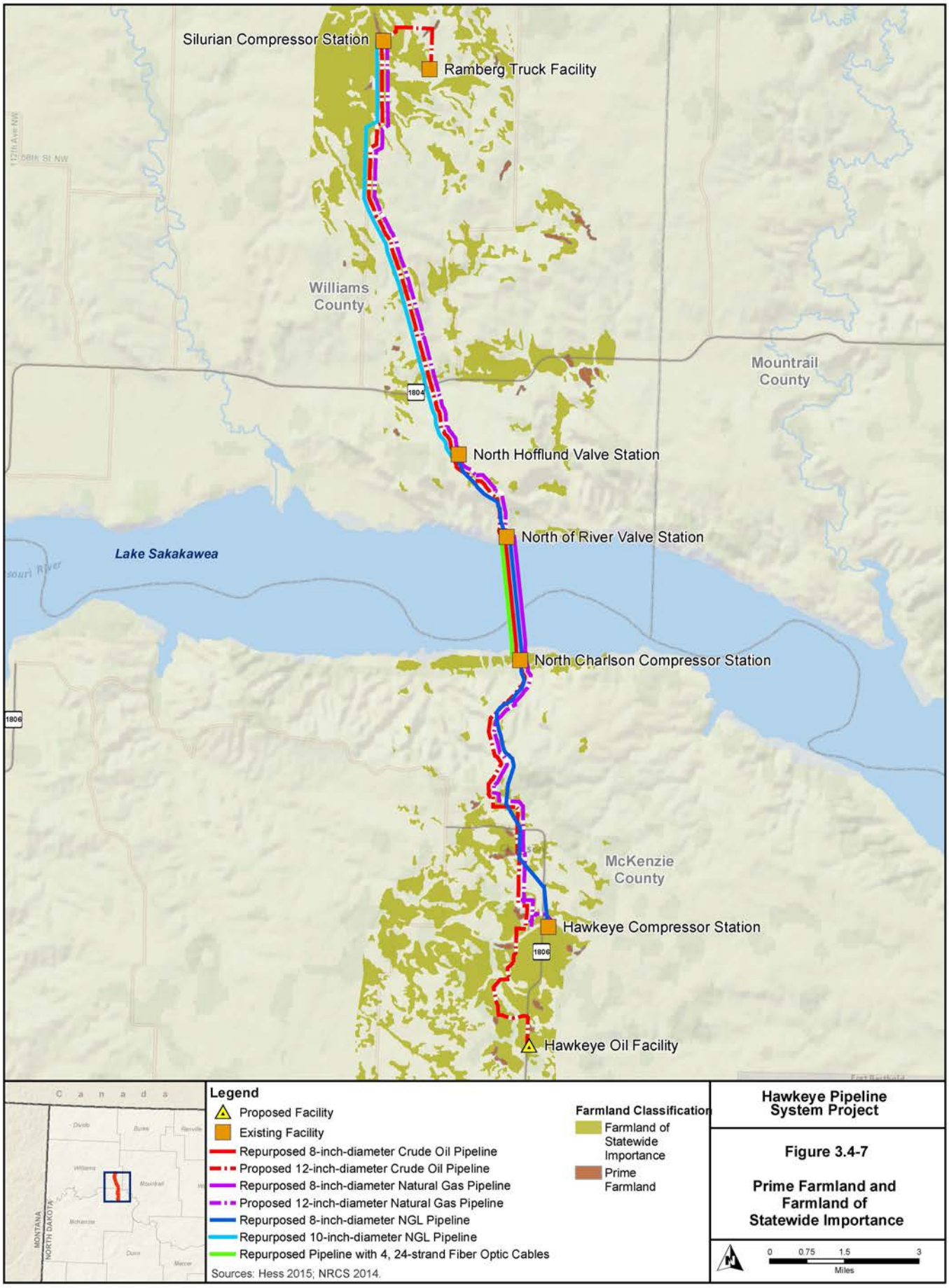
Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Droughty Soils
Sources: Hess 2015; NRCS 2014.
Hawkeye Pipeline System Project
Figure 3.4-5
Droughty Soils
0 0.75 1.5 3
Miles



Hawkeye Pipeline System Project

Figure 3.4-6

Soils with a Shallow Depth to Bedrock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Mountrail County
1804
North Hofflund Valve Station
North of River Valve Station
Lake Sakakawea
North Charlson Compressor Station
1806
McKenzie County
Hawkeye Compressor Station
1806
Hawkeye Oil Facility
Canada
MONTANA
NORTH DAKOTA
Legend
Proposed Facility
Existing Facility
Repurposed 8-inch-diameter Crude Oil Pipeline
Proposed 12-inch-diameter Crude Oil Pipeline
Repurposed 8-inch-diameter Natural Gas Pipeline
Proposed 12-inch-diameter Natural Gas Pipeline
Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Farmland Classification
Farmland of Statewide Importance
Prime Farmland
Sources: Hess 2015; NRCS 2014.
Hawkeye Pipeline System Project
Figure 3.4-7
Prime Farmland and Farmland of Statewide Importance
0 0.75 1.5 3
Miles

3.5 Water Resources

3.5.1 Surface Water

The Project area lies within the Missouri Plateau portion of the Great Plains physiographic province. The northern part of the Project route is located within the glaciated section of the Missouri Plateau; whereas, the southern part is within the unglaciated section of the plateau and is directly underlain by sedimentary rocks. The transition between these two sections occurs in northern McKenzie County, where glacial deposits thin over Tertiary bedrock toward the margin of a Quaternary ice lobe (Bluemle 1986). Topography within the Project area varies from comparatively level to rolling glaciated terrain in the north, to more deeply dissected plains and badlands to the south.

As identified by the USGS Hydrologic Unit Codes (HUCs), the Project route occurs within the Lake Sakakawea watershed (HUC 10110101) (**Figure 3.5-1**). A number of waterbodies, which include the Missouri River as well as intermittent streams, occur along the Project route. In addition to these water features, wetlands and floodplains also occur within the Project area. Those are discussed in Sections 3.7 and 4.7.

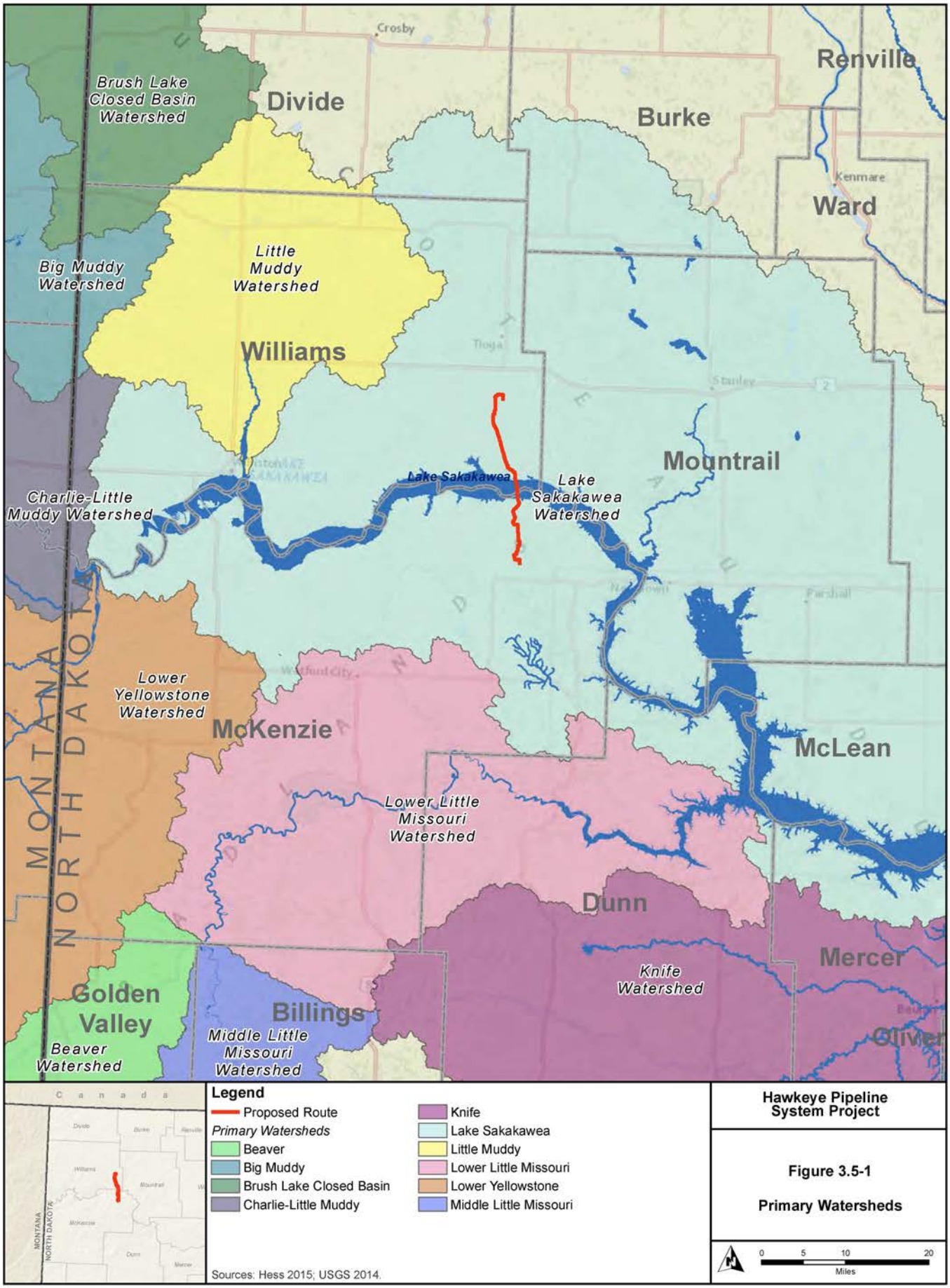
Mean annual precipitation in the Project area is approximately 14 inches, with approximately 10.5 to 11 inches falling from April to September (USGS 2014). Streamflow in the Project area results from precipitation runoff accompanied by groundwater baseflow discharge and is influenced by evapotranspiration, soils, and topography. Although stream flows vary seasonally and from year to year, sustained flows and the largest volumes generally occur in spring and early summer. More localized, short-duration peak flows and flooding may result from thunderstorms. July is the peak month for thunderstorm activity, but thunderstorms also occur nearly as frequently in June and August. Precipitation events totaling more than 0.5 inch in depth over a 24-hour period occur on average approximately 8 days per year at Watford City (USGS 2014).

In addition to the Missouri River course through Lake Sakakawea, a number of named and unnamed intermittent streams would be crossed by the Project route (**Table 3.5-1**).

Table 3.5-1 Stream Crossings within the Project Area

Stream Name	Approximate MP	Crossing Length (feet)	Flow Duration	County	Watershed
Sand Creek	0.8	12.0	Intermittent	McKenzie County	Lake Sakakawea
Sand Creek	0.9	75.2	Intermittent	McKenzie County	Lake Sakakawea
Unnamed tributary	8.3	6.4	Ephemeral	McKenzie County	Lake Sakakawea
Lake Sakakawea	10.2	11,601	Perennial	McKenzie/Williams Counties	Lake Sakakawea
Dry Fork Creek	16.4	21.9	Intermittent	Williams County	Lake Sakakawea
Dry Fork Creek	16.4	14.3	Intermittent	Williams County	Lake Sakakawea

For water quality purposes, the Missouri River (including Lake Sakakawea) is designated a Class I stream (NDDH 2011). According to North Dakota Administrative Code 33-16-02.1-09, “the quality of the waters in this class shall be suitable for the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation. The quality of the waters shall be suitable for irrigation, stock watering, and wildlife without injurious effects. After treatment consisting of coagulation, settling, filtration, and chlorination, or equivalent treatment processes, the water quality shall meet the bacteriological, physical, and chemical requirements of the department for municipal or domestic use.”


Crosby
Renville
Divide
Burke
Kenmare
Ward
Brush Lake Closed Basin Watershed
Big Muddy Watershed
Little Muddy Watershed
Williams
Tioga
Stanley
Mountrail
Lake Sakakawea
Lake Sakakawea Watershed
Charlie-Little Muddy Watershed
Parshall
Lower Yellowstone Watershed
McKenzie
McLean
Lower Little Missouri Watershed
Dunn
Knife Watershed
Mercer
Golden Valley
Billings
Middle Little Missouri Watershed
Beaver Watershed
Oliver
MONTANA
NORTH DAKOTA
Canada
Legend
Proposed Route
Primary Watersheds
Beaver
Big Muddy
Brush Lake Closed Basin
Charlie-Little Muddy
Knife
Lake Sakakawea
Little Muddy
Lower Little Missouri
Lower Yellowstone
Middle Little Missouri
Sources: Hess 2015; USGS 2014.
Hawkeye Pipeline System Project
Figure 3.5-1
Primary Watersheds
0 5 10 20
Miles

All other streams crossed by the Project are intermittent and are all designated as Class III streams (NDDH 2011). According to North Dakota Administrative Code 33-16-02.1-09, “the quality of the waters in this class shall be suitable for agricultural and industrial uses.” Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.

In compliance with USEPA requirements promulgated through the CWA, the NDDH issues a bi-annual integrated report on surface water quality in the state. Under Section 303(b) of the Act, waterbodies with known water quality characteristics that fail to support designated uses are listed as impaired. Within the Project area, Lake Sakakawea is the only impaired water with water quality characteristics that threaten the support of designated uses (due to methyl-mercury) (McCain and Associates, Inc. 2011; NDDH 2010).

No watersheds containing areas of probable concern for sediment contamination have been identified within the Project area (USEPA 2004).

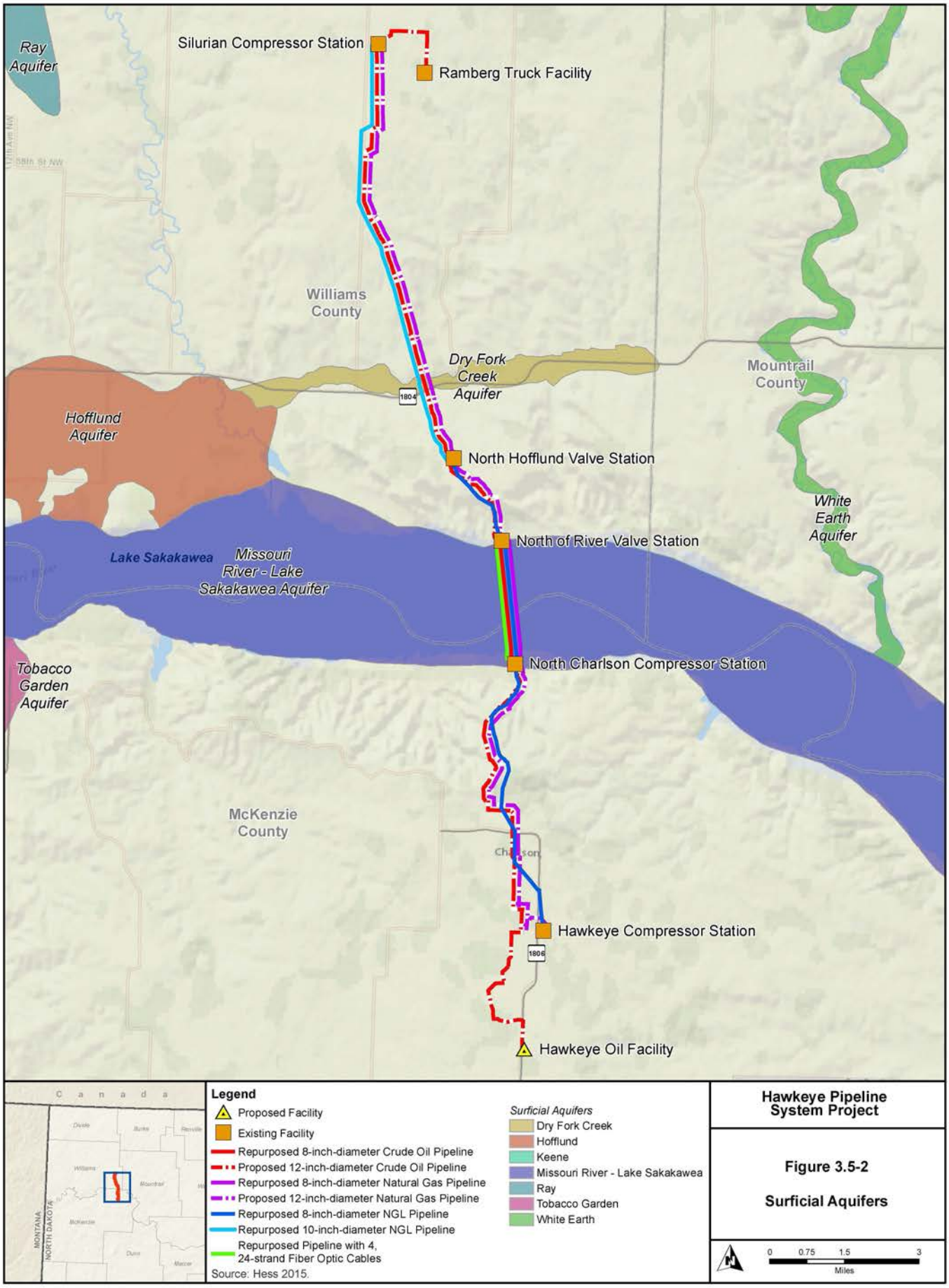
3.5.2 Groundwater

No sole-source aquifers have been designated in North Dakota. Aquifers in or near the Project area occur within unconsolidated glacial and alluvial deposits and porous sedimentary bedrock. Within the northernmost portion of the Project area, aquifers consist mainly of unconsolidated glacial sand and gravel deposits. They supply the majority of water to wells in the extreme northern, glaciated portion of the Project route. Glacial deposits essentially form a veneer 50 to 100 feet thick overlying bedrock from the northern end of the Project route in Williams County, to a location generally near the community of Keene, in northern McKenzie County (Bluemle 1986). Southward from that locale, sand and gravel aquifers occur mainly within buried alluvial or glacial outwash channels (Anna 1981; Armstrong 1969; Croft 1985; Radig 1997). The Project route crosses the Dry Fork Creek Aquifer, a major alluvial or glacial outwash aquifer in Williams County. In addition, the Project route crosses the Missouri River/Lake Sakakawea aquifer between the North of River Valve Station and North Charlson Compressor Station. **Figure 3.5-2** indicates the extent of surficial aquifers in recent alluvium as well as comparatively shallow aquifers formed in ancient buried alluvium and glacial outwash in the region.

The Project route crosses the Missouri River/Lake Sakakawea aquifer between the North Charlson Compressor Station and North of River Valve Station (**Figure 3.5-2**). In this area, the alluvial aquifer along the Missouri River is 23 to 136 feet thick with water levels from a few feet to 62 feet below ground surface. Water quality is variable, but generally dominated by calcium-sodium-magnesium bicarbonate with total dissolved solids in the range of 1,000 to 3,000 milligrams per liter (Armstrong 1967).

In Williams County, the Hofflund Aquifer is located approximately 4 to 6 miles west of the Project route. It generally is considered to be covered by approximately 60 feet of loam, silt, and clay (Radig 1997). In the western part of Williams County, historically reported depths of water in wells range from about 15 to 775 feet, with the majority of depths reported between about 65 to 220 feet (Armstrong 1969). The greater depths (e.g., below 500 feet) are reported from bedrock wells. These are constructed in water-bearing zones of the Fort Union Group. Water in the Fort Union consists of two types: a soft sodium bicarbonate type and a hard sodium sulfate/ bicarbonate type. Typically, the water from deeper portions of the Fort Union is too saline for human consumption or irrigation (Armstrong 1969). The quality of water differs greatly in shallower wells in the Fort Union. Scattered farm wells pump from the Fort Union, and these are reportedly completed in the uppermost saturated sands. The wells are equipped with cylinder pumps generally with capacities of only 2 to 4 gallons per minute (Armstrong 1969).

Deeper bedrock aquifers in McKenzie County include the Late Cretaceous Fox Hills/Hell Creek system, which underlies all of McKenzie County and extends into adjoining counties. This aquifer system generally is 1,100 to 1,800 feet below land surface. Water in the Fox Hills/Hell Creek aquifer system is a soft, sodium



Hawkeye Pipeline System Project

Figure 3.5-2

Surficial Aquifers

bicarbonate type. The water is not suited to irrigation use due to elevated sodium contents; however, it may be suitable for most domestic, livestock, and industrial uses (Croft 1985) for those willing to pump it 1,000 feet or more.

Shallower bedrock aquifers in McKenzie County include water-bearing subgroups of the Fort Union Group. Within the formation, water from the Ludlow system is at depths over 500 feet; the Tongue River and Sentinel Butte zones range in depth from about 150 to 500 feet (Croft 1985).

The shallow Sentinel Butte Formation aquifer, commonly used for domestic supply in the area, outcrops in Dunn and McKenzie counties. This aquifer meets the water quality standards of the NDDH (Croft 1985). The Dry Fork Creek aquifer and the alluvial aquifer along the Missouri River (Lake Sakakawea/Missouri River aquifer) are used locally for domestic supply and irrigation. Water quality analyses can be found in Armstrong (1968), Carlson (1985; pts II and III), Klausing (1979). Review of electronic records of the North Dakota State Water Commission revealed 81 existing water wells within an approximate 5-mile boundary of the Project area. The existing water wells include 7 domestic wells, 7 industrial wells, 1 industrial well-plugged, 1 irrigation well, 18 observation wells, 3 observation wells-plugged, 6 stock wells, 1 surface water monitoring site, 22 test holes, and 15 wells of an unknown type. Eleven of the existing wells are within 1 mile of the Project.

3.6 Vegetation Resources

The Project area is located entirely within the Northwestern Great Plains ecoregion encompassing the Missouri Plateau section of the Great Plains of west-central North Dakota. The northern portion of the proposed route is within the Northwestern Glaciated Plains ecoregion crossing the Missouri Coteau Slope. This area slopes up from the Missouri River with level to gently rolling topography. The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations. Vegetation cover types and characterizations were compiled using the Gap Analysis Program vegetation layers and survey descriptions of the Project route (Stantec 2014). Six vegetation cover types occur within the Project area. Distribution and composition of each vegetation cover type varies based on landscape position, soil type, climatic conditions, moisture, elevation, aspect, and grazing and land management practices. Descriptions of the plant communities within each vegetation cover type are provided below. Species nomenclature is consistent with the NRCS Plants Database (NRCS 2014). **Table 3.6-1** summarizes the vegetation cover types and associated linear miles along the Project route. **Figure 3.6-1** illustrates the vegetation cover types within the Project area.

Table 3.6-1 Vegetation Cover Types within the Project Area

Vegetation Cover Type	Linear Miles[1]	Percent of Project Route[1]
Agriculture	11.8	46
Grassland	10.0	39
Wetlands and Riparian Areas	2.5	10
Developed	0.8	3
Woodlands and Shrubland	0.7	3
Barren	<0.1	<1
Total	**25.9**	**100**

[1] Total discrepancy due to rounding.

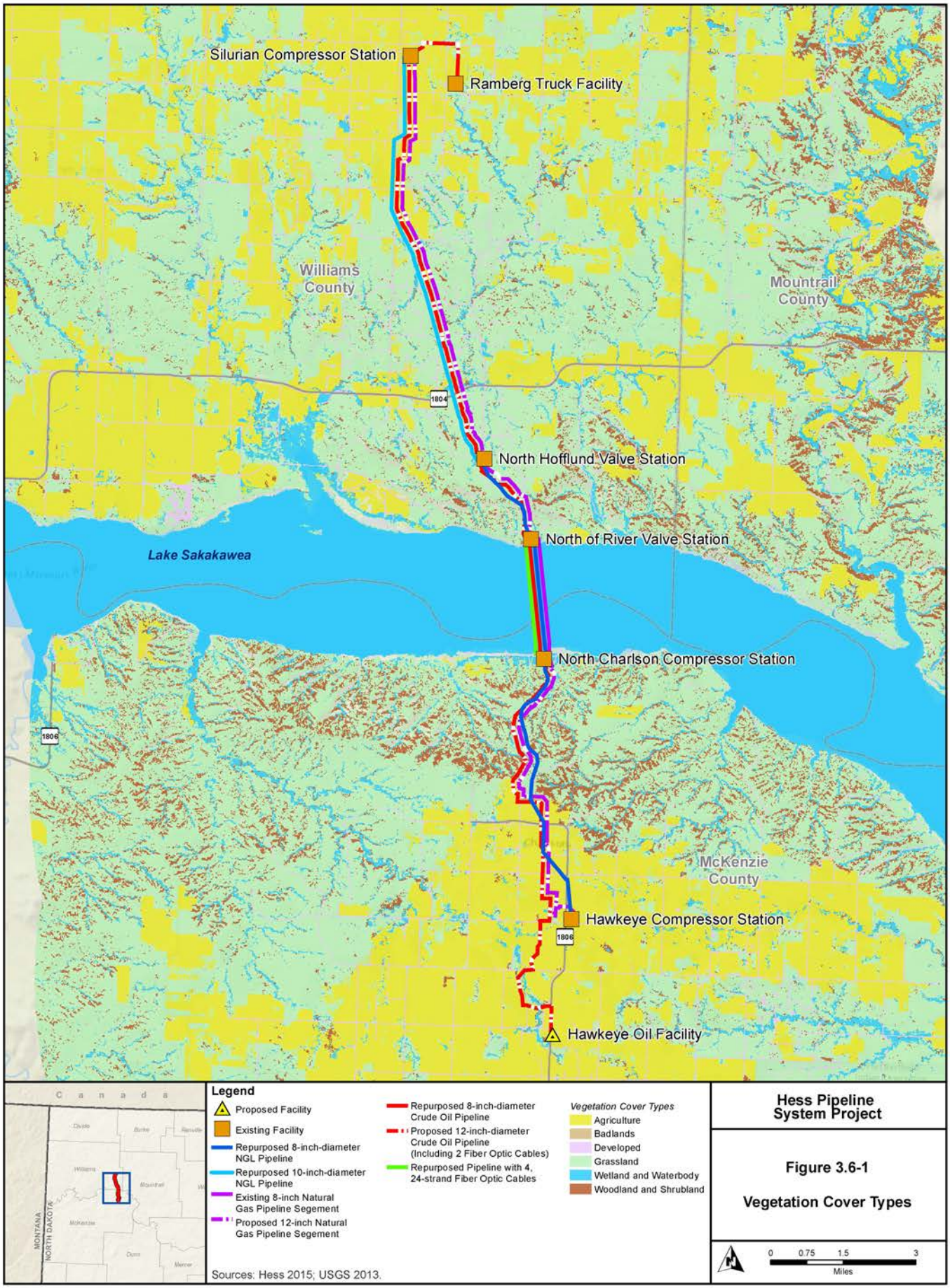
Source: Stantec 2014.

3.6.1 Agriculture

Agriculture is the most prominent cover type along the Project route (11.8 miles, 46 percent) and is comprised of cultivated cropland primarily used for the production of annual crops such as barley, wheat, oats, and canola. In addition, this vegetation cover type may consist of pasture and hay cropland including areas of grass, legumes, or grass-legume mixtures (i.e., planted herbaceous perennials) cultivated for livestock grazing or the production of seed or hay crops.

3.6.2 Grasslands

Grassland is the second most prominent vegetation cover type along the Project route (10.0 miles, 39 percent) and is comprised of untilled areas dominated by herbaceous vegetation occupying valley bottoms, plains, foothills, plateaus, and benches. Many of the grassland areas are grazed by livestock. Areas previously disturbed by oil and gas activities (i.e., pipelines) are in the process of being reclaimed to grassland communities. Graminoid species observed during field surveys include smooth brome (*Bromus inermis*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), big bluestem (*Andropogon gerardii*), sideoats grama (*Bouteloua curtipendula*), threadleaf sedge (*Carex filifolia*), Kentucky bluegrass (*Poa pratensis*), crested wheatgrass (*Agropyron cristatum*), and intermediate wheatgrass (*Elytrigia intermedia*). Common forbs include wavyleaf thistle (*Cirsium undulatum*), stiff goldenrod (*Solidago rigida*), green sagewort *(Artemisia campestris*), Canada goldenrod (Solidago canadensis), purple coneflower (*Echinacea angustifolia*), prairie sagewort (*Artemisia frigida*), American licorice (*Glycyrrhiza lepidota*), curlycup gumweed (*Grindelia squarrosa*), and sweetclover (*Melilotus* spp.) (Stantec 2014).



Hess Pipeline System Project

Figure 3.6-1

Vegetation Cover Types

3.6.3 Woodland and Shrublands

Approximately 0.7 mile (3 percent) of the Project route would traverse the riparian woodland and shrubland ecotype. Woody vegetation communities consist of native woodlands, in woody draws and swales, as well as upland areas dominated by woody-stemmed vegetation and planted windrows. Common shrubs are chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*). Common tree species include green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), and boxelder (*Acer negundo*) (Stantec 2014).

3.6.4 Wetland and Riparian Areas

Approximately 2.5 miles (10 percent) of the Project route would traverse the wetland or riparian vegetation cover type, which is comprised of herbaceous wetlands, and ephemeral and intermittent stream channels. Dominant species observed during on-site wetland delineations include prairie cordgrass (*Spartina pectinata*), foxtail barley (*Hordeum jubatum*), Pennsylvania smartweed (*Polygonum pensylvanicum*), and western dock (*Rumex occidentalis*) (Stantec 2014).

3.6.5 Developed

Approximately 0.8 mile (3 percent) of the Project route would intersect previously disturbed land, which is characterized as high and low intensity commercial, industrial, and transportation surface activities. The majority of the developed lands in the Project route are associated with roads, and oil and gas development.

3.6.6 Barren

Less than 1 mile (less than 1 percent) of the Project route would traverse the barren vegetation cover type. These areas are found on the steep topography north of Lake Sakakawea. The vegetation is sparse to no cover on steep and rocky slopes.

3.6.7 Tree and Shrub Inventory

In accordance with the North Dakota PSC, tree and shrub inventories were conducted in October 2012 and in May and July 2013 within a 200-foot-wide survey corridor centered on the Project route. Subsequent tree and shrub inventories were conducted in October 2013 and in August and October 2014 within a 200-foot-wide survey corridor centered on segments of the Project route that had been realigned. The tree and shrub inventories were conducted to document tree and shrub species, including direct stem counts within the construction ROW. A total of 43,089 stems were present in the survey corridor. **Table 3.6-2** summarizes the field survey data. The results of the tree and shrub inventory will be submitted to the North Dakota PSC prior to construction.

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated
					Survey Corridor (200 feet)	Construction ROW	Mitigation (2:1 Ratio)
SWV-1	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	--	100	--	--
SWV-2	Native woodland	Silver buffaloberry	*Shepherdia argentea*	--	80	--	--
		Green Ash	*Fraxinus pennsylvanica*		11	--	--
		Chokecherry	*Prunus virginiana*		108	--	--
		Boxelder	*Acer negundo*		1	--	--
SWV-3	Native woodland	Fireberry hawthorn	*Crataegus chrysocarpa*	0.05	48	14	28
		Silver buffaloberry	*Shepherdia argentea*		27	8	16
		Green Ash	*Fraxinus pennslyvanica*		2	--	--
		Common juniper	*Juniperus communis*		16	4	8
SWV-4	Native woodland	American elm	*Ulmus americana*	0.09	200	101	202
		Green Ash	*Fraxinus pennslyvanica*		80	44	88
SWV-5	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.28	80	40	80
		Chokecherry	*Prunus virginiana*		300	160	320
		Green Ash	*Fraxinus pennslyvanica*		300	150	300
		Rocky Mountain juniper	*Juniperus scopulorum*		4	1	2
		Skunkbush sumac	*Rhus trilobata*		29	19	38
SWV-6	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	0.1	32	22	44
		Skunkbush sumac	*Rhus trilobata*		13	25	50
		Chokecherry	*Prunus virginiana*		28	12	24
		Common juniper	*Juniperus communis*		--	5	10
		Silver buffaloberry	*Shepherdia argentea*		38	7	14
SWV-7	Native woodland	Chokecherry	*Prunus virginiana*	--	66	--	--
		American elm	*Ulmus americana*		1	--	--
		Green Ash	*Fraxinus pennslyvanica*		11	--	--
		Rocky Mountain juniper	*Juniperus scopulorum*		3	--	--
		Common juniper	*Juniperus communis*		20	--	--
		Creeping juniper	*Juniperus horizontalis*		17	--	--

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-7 (Continued)	Native woodland (Continued)	Skunkbush sumac	*Rhus trilobata*		58	--	--
		Silver buffaloberry	*Shepherdia argentea*		70	--	--
SWV-8	Native woodland	Chokecherry	*Prunus virginiana*	0.06	30	30	60
		Green Ash	*Fraxinus pennslyvanica*		7	6	12
		Silver buffaloberry	*Shepherdia argentea*		10	65	130
SWV-9	Native woodland	Chokecherry	*Prunus virginiana*	0.25	200	27	54
		American elm	*Ulmus americana*		5	3	6
		Green Ash	*Fraxinus pennslyvanica*		70	31	62
		Common juniper	*Juniperus communis*		0	5	10
		Skunkbush sumac	*Rhus trilobata*		20	--	--
		Silver buffaloberry	*Shepherdia argentea*		30	--	--
SWV-10	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	52	--	--
SWV-11	Native woodland	Chokecherry	*Prunus virginiana*	--	3,170	--	--
		Green Ash	*Fraxinus pennslyvanica*		3,047	--	--
		Common juniper	*Juniperus communis*		40	--	--
		Quaking aspen	*Populus tremuloides*		3,045	--	--
		Red osier dogwood	*Cornus stolonifera*		27	--	--
		Silver buffaloberry	*Shepherdia argentea*		24	--	--
SWV-12	Native woodland	Chokecherry	*Prunus virginiana*	--	200	--	--
		Green Ash	*Fraxinus pennslyvanica*		25	--	--
		Silver buffaloberry	*Shepherdia argentea*		37	--	--
SWV-14	Native woodland	Chokecherry	*Prunus virginiana*	--	40	--	--
		Green Ash	*Fraxinus pennslyvanica*		8	--	--
		Fireberry hawthorn	*Crataegus chrysocarpa*		36	--	--
		Silver buffaloberry	*Shepherdia argentea*		70	--	--

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-15	Native woodland	Chokecherry	*Prunus virginiana*	0.03	3,000	0	--
		American elm	*Ulmus americana*		400	200	400
		Green Ash	*Fraxinus pennslyvanica*		500	0	--
		Common juniper	*Juniperus communis*		5	0	--
		Skunkbush sumac	*Rhus trilobata*		36	0	--
		Red osier dogwood	*Cornus stolonifera*		50	0	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		100	0	--
		Nannyberry	*Viburnum lentago*		100	0	--
		Silver buffaloberry	*Shepherdia argentea*		57	113	226
SWV-16	Native woodland	Boxelder	*Acer Negundo*	0.27	35	15	30
		Chokecherry	*Prunus virginiana*		3,000	300	600
		American elm	*Ulmus americana*		300	12	24
		Green Ash	*Fraxinus pennslyvanica*		3,000	129	258
		Saskatoon serviceberry	*Amelanchier alnifolia*		0	150	300
		Silver buffaloberry	*Shepherdia argentea*		3,000	0	--
SWV-17	Native woodland	Boxelder	*Acer Negundo*	<0.01	10	0	--
		Chokecherry	*Prunus virginiana*		3,000	0	--
		American elm	*Ulmus americana*		300	0	--
		Green Ash	*Fraxinus pennslyvanica*		3,000	0	--
		Silver buffaloberry	*Shepherdia argentea*		47	65	130
SWV-18	Native woodland	Boxelder	*Acer Negundo*	--	4	--	--
		Chokecherry	*Prunus virginiana*		3,080	--	--
		Green Ash	*Fraxinus pennslyvanica*		230	--	--
		Silver buffaloberry	*Shepherdia argentea*		300	--	--

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-19	Native woodland	Chokecherry	*Prunus virginiana*	--	3,300	--	--
		Green Ash	*Fraxinus pennslyvanica*		385	--	--
		Common juniper	*Juniperus communis*		30	--	--
		Creeping juniper	*Juniperus horizontalis*		30	--	--
		Chokecherry	*Prunus virginiana*		135	--	--
SWV-20	Native woodland	American elm	*Ulmus americana*	--	1	--	--
		Green Ash	*Fraxinus pennslyvanica*		45	--	--
		Rocky Mountain juniper	*Juniperus scopulorum*		3	--	--
		Common juniper	*Juniperus communis*		51	--	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		10	--	--
		Silver buffaloberry	*Shepherdia argentea*		205	--	--
SWV-21	Native woodland	Chokecherry	*Prunus virginiana*	0.65	300	3000	6000
		Green Ash	*Fraxinus pennslyvanica*		85	28	56
		Common juniper	*Juniperus communis*		15	--	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		10	10	20
		Silver buffaloberry	*Shepherdia argentea*		85	120	240
SWV-22	Native woodland	Chokecherry	*Prunus virginiana*	--	17		--
		Green Ash	*Fraxinus pennslyvanica*		8		--
		Chokecherry	*Prunus virginiana*		11		--
SWV-23	Native woodland	Green Ash	*Fraxinus pennslyvanica*	--	7		--
		Silver buffaloberry	*Shepherdia argentea*		60		--
SWV-24	Native shrubland	Chokecherry	*Prunus virginiana*	0.01	500	25	50
		Fireberry hawthorn	*Crataegus chrysocarpa*		500	--	--
		Common buckthorn	*Rhamnus cathartica*		15	--	--
		Currant	*Ribes spp.*		200	--	--
		Silver buffaloberry	*Shepherdia argentea*		--	10	20

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-25	Native woodland	Chokecherry	*Prunus virginiana*	0.03	0	10	20
		Green Ash	*Fraxinus pennslyvanica*		0	10	20
		Rocky Mountain juniper	*Juniperus scopulorum*		0	1	2
		Silver buffaloberry	*Shepherdia argentea*		20	--	--
SWV-26	Native woodland	Chokecherry	*Prunus virginiana*	0.07	0	10	20
		Green Ash	*Fraxinus pennslyvanica*		10	8	16
		Silver buffaloberry	*Shepherdia argentea*		120	27	54
SWV-27	Native woodland	Chokecherry	*Prunus virginiana*	<0.01	300	3	6
		Green Ash	*Fraxinus pennslyvanica*		85	17	34
		Silver buffaloberry	*Shepherdia argentea*		16	--	--
SWV-28	Native woodland	Chokecherry	*Prunus virginiana*	0.02	1	--	--
		Green Ash	*Fraxinus pennslyvanica*		10	--	--
		Green Ash	*Fraxinus pennslyvanica*		94	9	18
SWV-29	Planted shelterbelt	Russian olive	*Elaegnus angustifolia*	0.24	132	--	--
		Siberian elm	*Ulmus pulmila*		51	--	--
		Siberian elm	*Ulmus pulmila*		25	25	50
SWV-30	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.14	20	25	50
SWV-31	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.11	3	1	2
SWV-32	Planted shelterbelt	Chokecherry	*Prunus virginiana*	0.10	20	20	40
SWV-33	Native woodland	American elm	*Ulmus americana*	0.03	0	2	4
		Green Ash	*Fraxinus pennslyvanica*		0	15	30
		Rocky Mountain juniper	*Juniperus scopulorum*		0	1	2
		Rocky Mountain juniper	*Juniperus scopulorum*		63	27	54
SWV-36	Native woodland	Green Ash	*Fraxinus pennslyvanica*	1.05	40	18	36
		American elm	*Ulmus americana*		5	1	2
		Silver buffaloberry	*Shepherdia argentea*		22	16	32
		Rocky Mountain juniper	*Juniperus scopulorum*		8	5	10

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-37	Native woodland	Green Ash	*Fraxinus pennslyvanica*	0.24	5	3	6
		Silver buffaloberry	*Shepherdia argentea*		17	11	22
		Rocky Mountain juniper	*Juniperus scopulorum*		8	1	2
SWV-38	Native woodland	Rocky Mountain juniper	*Juniperus scopulorum*	0.03	6	4	8
SWV-39	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.02	5	2	4
		Boxelder	*Acer negundo*		5	--	--
SWV-45	Native woodland	Boxelder	*Acer negundo*	--	5	--	--
		Chokecherry	*Prunus virginiana*		5	--	--
SWV-46	Native shrubland	Chokecherry	*Prunus virginiana*	0.11	0	25	50
SWV-47	Native shrubland	Chokecherry	*Prunus virginiana*	0.04	50	10	20
SWV-48	Native shrubland	Chokecherry	*Prunus virginiana*	--	60	--	--
SWV-49	Native shrubland	Common juniper	*Juniperus communis*	--	1	--	--
		Chokecherry	*Prunus virginiana*		19	--	--
SWV-50	Native shrubland	Chokecherry	*Prunus virginiana*	--	65	--	--
SWV-51	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	100	--	--
		Chokecherry	*Prunus virginiana*		30	--	--
SWV-53	Native woodland	Chokecherry	*Prunus virginiana*	--	10	--	--
		Green Ash	*Fraxinus pennslyvanica*		2	--	--
		Silver buffaloberry	*Shepherdia argentea*		5	--	--
SWV-54	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	6	--	--
SWV-55	Native shrubland	Chokecherry	*Prunus virginiana*	--	10	--	--
SWV-56	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	5	--	--
SWV-57	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	5	--	--
SWV-58	Native woodland	Boxelder	*Acer negundo*	--	5	--	--
SWV-59	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	15	--	--
SWV-61	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	22	--	--
SWV-62	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	20	--	--

Table 3.6-2 Woodlands and Shrublands Identified Along the Project Route

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-63	Native shrubland	Chokecherry	*Prunus virginiana*	--	20	--	--
SWV-77	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	20	--	--
		Chokecherry	*Prunus virginiana*		20	--	--
TOTAL				4.02	43,089	5,263	10,526

Source: Stantec 2014.

3.7 Wetlands and Floodplains

3.7.1 Waters of the U.S.

WUS are defined in 33 CFR 328.3 and include: all non-tidal waters that currently are used, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, of which the use, degradation, or destruction could affect interstate commerce; and all impoundments of waters otherwise defined as WUS under this definition. In addition, tributaries of the previously listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the previously listed waters also are considered to be WUS.

Criteria used by the USACE to determine whether a drainage constitutes a WUS include presence of a defined bed (i.e., a linear bed in a topographic depression, which would transport surface water from a watershed); presence of defined banks (i.e., near vertical or steep-sided banks formed by erosion from flowing water); and evidence of an ordinary high water mark (having features, e.g., scoured bed, shelving, an absence of terrestrial vegetation, and recent alluvial or litter deposition, that indicate the drainage is subject to surface water flows on an average annual basis).

WUS within the Project area include, but are not limited to, the Missouri River (Lake Sakakawea), Dry Fork Creek, and Sand Creek. A detailed discussion of surface waters including a tabular summary of the surface water features within the Project area can be found in **Table 3.5-1** (Section 3.5, Water Resources).

3.7.2 Wetlands

As previously described, wetlands adjacent to WUS also are considered to be WUS. The term “wetland” is defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328.7[b]).” The frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

The USACE 1987 Wetland Delineation Manual requires a “three-parameter” approach for delineating USACE-defined wetlands (USACE 1987). Based on this approach, areas are identified as wetlands if they exhibit the following characteristics:

- The prevalence of vegetation consisting of hydrophytic species or plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.
- The presence of soils that are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.
- An area that is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (USACE 1987).

The USACE Wetland Delineation Manual (USACE 1987), in conjunction with the Regional Supplement to the Manual: Great Plains Region (USACE 2008) requires that under normal circumstances, all three of these conditions be met for an area to be considered a wetland under the USACE’s definition. Federal mandates governing regulatory enforcement in wetlands and other WUS include Section 10 of the Rivers and Harbors Appropriation Act of 1899, Sections 401 and 404 of the CWA, as amended (33 U.S.C. 1251 *et seq*.), and EO 11990, Protection of Wetlands (42 Federal Register 26961). The loss, dredging, or filling of

any WUS would be regulated by the USACE under CWA Section 404. Final regulatory authority and delineation boundaries for wetlands and WUS within the Project area lie with the USACE.

On-the-ground wetland and waterbody delineations were conducted in October 2012 and May and July 2013 within a 200-foot-wide survey corridor centered on the Project route. Subsequent wetland and waterbody delineations were conducted in October 2013 and August and October 2014 within a 200-foot-wide survey corridor centered on segments of the Project route that had been realigned. In total, 20 Palustrine Emergent Wetland (PEM) complexes (totaling 6.74 acres) and 2 intermittent waterbody crossing were identified along the Project route (**Table 3.7-1**). **Figures 3.7-1** and **3.7-2** illustrate the delineation results within the Project area. The field survey scope of work, methodology, and survey results, including figures, data forms, and photographs of the aforementioned features, have been summarized in the *Natural Resources Report* (POD, Appendix H). A detailed waterbody crossing table is presented in Section 3.5, Water Resources.

Table 3.7-1 Delineated Wetlands and Waterbodies Present within the Project Area

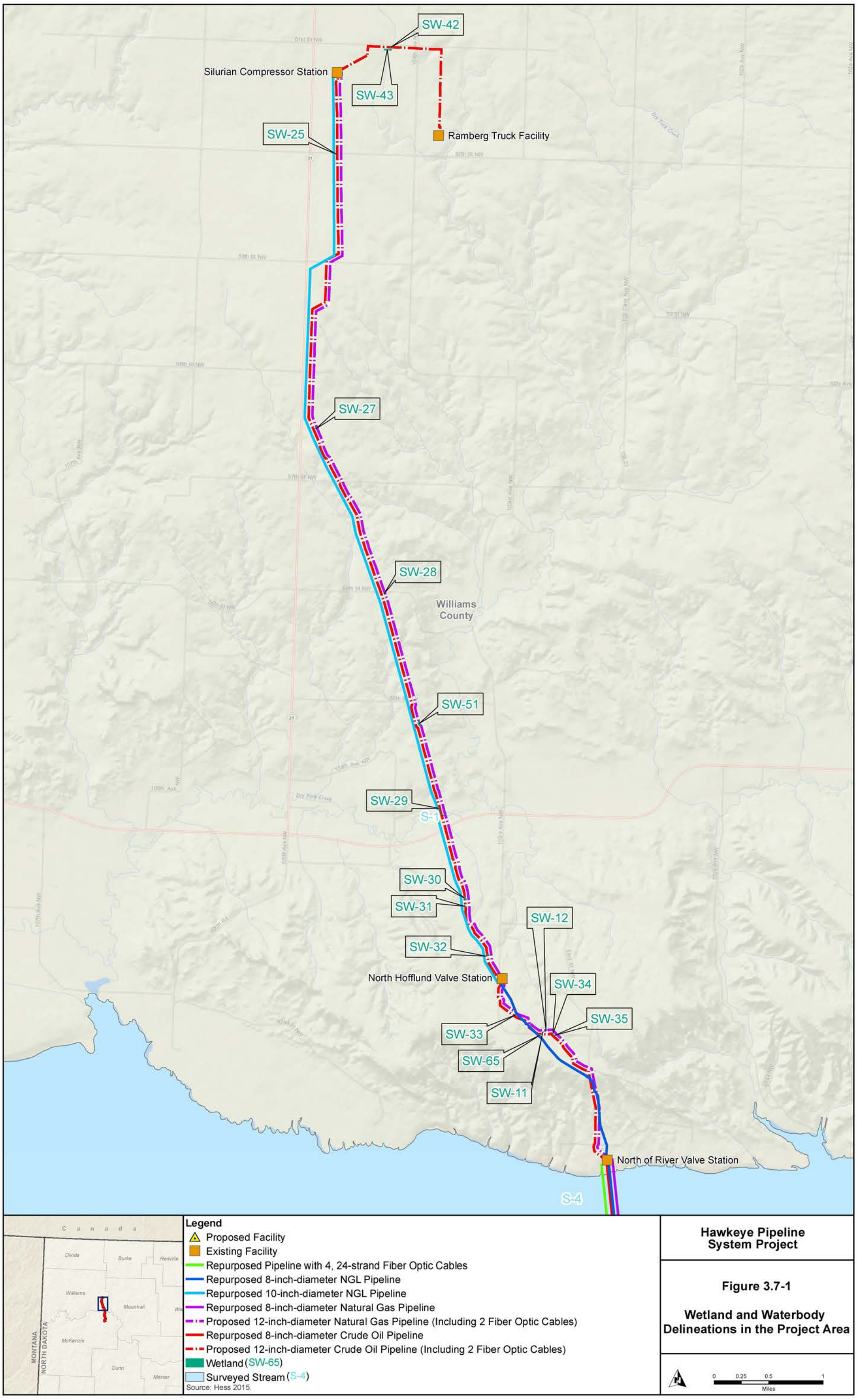
Wetland Type	Linear Miles
PEM	0.25
Riverine (including perennial and intermittent waterbody crossings)	0.02
Total	**0.27**

Source: Stantec 2014.

3.7.3 Floodplains

From a geomorphic perspective, floodplains are relatively low, flat areas of land that surround water bodies and hold overflows during flood events. Floodplains are often associated with rivers and streams where they consist of sediments forming levees (or “terraces”) deposited at different times along the watercourse.

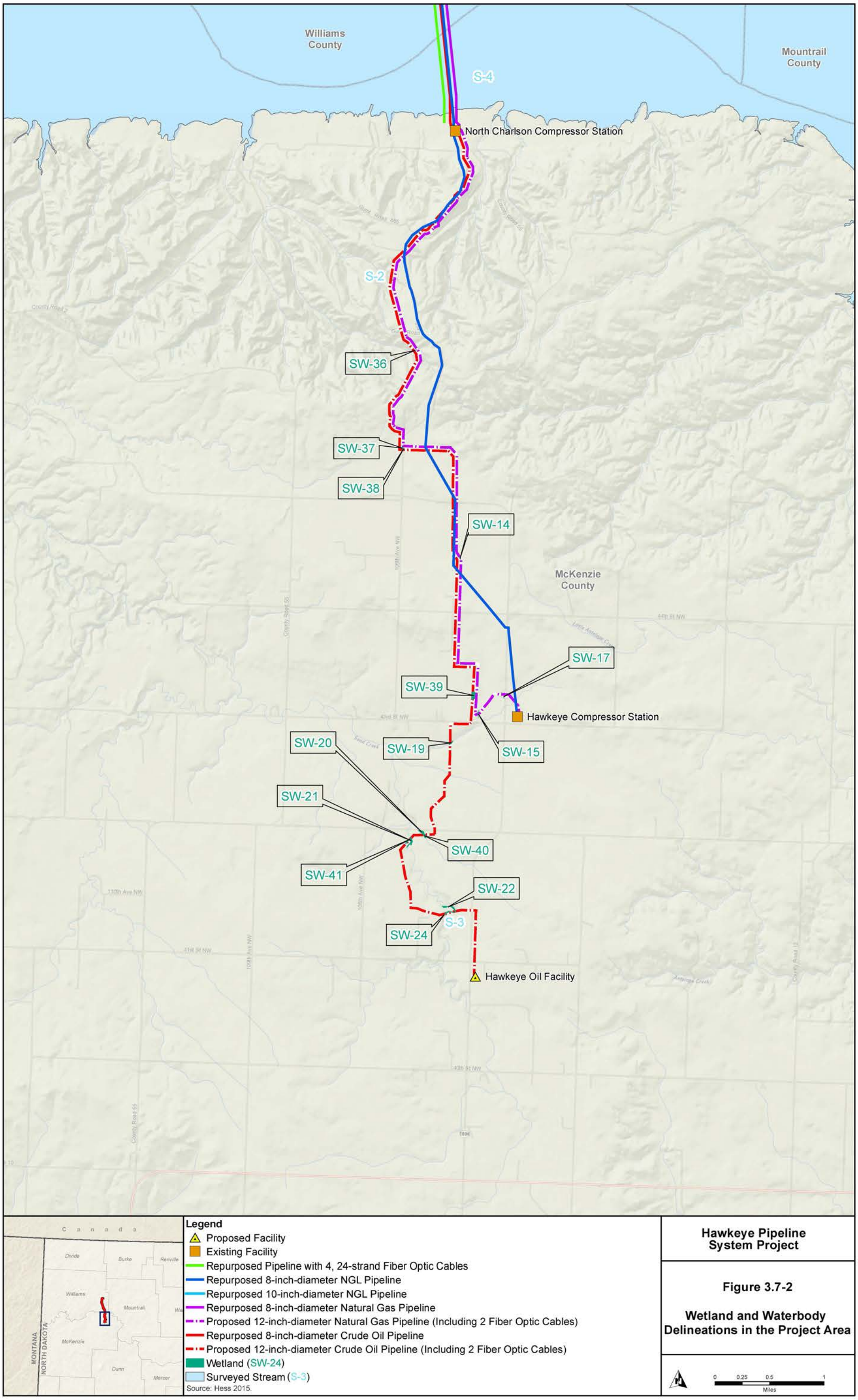
From a policy perspective, the Federal Emergency Management Agency (FEMA) defines a floodplain as being any land area susceptible to being inundated by waters from any source (FEMA 2006). Protection of floodplains and related resource values was established by EO 11988. Local, state, and federal agencies have additional roles and responsibilities under EO 11988 and the FEMA floodplain program, particularly with respect to potential impacts on flooding from projects. In addition, regulatory programs provide rigorous guidance on the types, extent, and location of Project facilities that may be constructed within delineated floodplain boundaries.



Hawkeye Pipeline System Project

Figure 3.7-1

Wetland and Waterbody Delineations in the Project Area



Hawkeye Pipeline System Project

Figure 3.7-2

Wetland and Waterbody Delineations in the Project Area

3.8 Noxious Weeds and Invasive Species

An increasing concern on both public and private lands is the introduction, spread, and proliferation of noxious weed and invasive plant species. Pursuant to the NDCC § 4.1-47, a "noxious weed" is defined as "a plant propagated by either seed or vegetative parts and determined to be injurious to public health, crops, livestock, land, or other property as determined by the commissioner, county, or city weed board." The North Dakota Department of Agriculture currently lists 11 plant species as state-designated noxious weeds. In addition to the North Dakota state-designated species, management is required for 5 additional county-specific species for McKenzie and Stark counties; and 26 USFS-designated invasive species. No additional species were listed for Williams County. State and county-designated noxious weed species, and USFS-designated invasive species are listed in **Table 3.8-1**. Species nomenclature is consistent with the NRCS Plants Database (NRCS 2014).

Table 3.8-1 Designated Noxious Weed Species and Presence within the Project Area

Common Name	Scientific Name	State of North Dakota Designated Species	County Designated Species[1] (MK – McKenzie)	USFS Designated Species	Identified within Project Area[2]
Russian knapweed	*Acroptilon repens*	X	--	X	--
Crested wheatgrass	*Agropyron cristatum*	--	--	X	--
Tall wheatgrass	*Thinopyrum ponticum*	--	--	X	--
Intermediate wheatgrass	*Thinopyrum intermedium*	--	--	X	--
Quackgrass	*Elymus repens*	--	--	X	--
Common burdock	*Arctium minus*	--	MK	X	--
Absinth wormwood	*Artemisia absinthium*	X	--	X	--
Smooth brome	*Bromus inermis*	--	--	X	--
Japanese brome	*Bromus arvensis*	--	--	X	--
Downy brome	*Bromus tectorum*	--	--	X	--
Spiny plumeless thistle	*Carduus acanthoides*	--	--	X	--
Musk thistle	*Carduus nutans*	X	--	X	--
Diffuse knapweed	*Centaurea diffusa*	X	--	X	--
Spotted knapweed	*Centaurea stoebe L. ssp. micranthos*	-X	--	X	--
Yellow starthistle	*Centaurea solstitialis*	--	--	X	--
Canada thistle	*Cirsium arvense*	X	--	X	X
Field bindweed	*Convolvulus arvensis*	--	--	X	X
Houndstongue	*Cynoglossum officinale*	--	MK	X	X
Leafy spurge	*Euphorbia esula*	X	--	X	X
Baby's breath	*Gypsophila paniculata*	--	MK	--	--
Halogeton	*Halogeton glomeratus*	--	MK	X	X
Black henbane	*Hyoscyamus niger*	--	MK	X	--
Dalmation toadflax	*Linaria dalmatica ssp. dalmatica*	X	--	--	--
Yellow toadflax	*Linaria vulgaris*	X	--	--	--
Purple loosestrife	*Lythrum salicaria, L. virgatum*	X	--	X	--
Sweet clover	*Melilotus* spp.	--	--	X	--

Table 3.8 1 Designated Noxious Weed Species and Presence within the Project Area

Common Name	Scientific Name	State of North Dakota Designated Species	County Designated Species[1] (MK – McKenzie)	USFS Designated Species	Identified within Project Area[2]
Kentucky bluegrass	*Poa pratensis*	--	--	X	--
Canada bluegrass	*Poa compressa*	--	--	X	--
Sowthistle	*Sonchus* spp.	--	--	X	--
Saltcedar	*Tamarix spp.*	X	--	--	--

[1] McKenzie and Williams counties both regulate the 11 state-listed noxious weed species. Each county can require enforcement for additional weed species in their jurisdiction. Williams County has not identified any additional species for enforcement (North Dakota Department of Agriculture 2013).

[2] Noxious weed surveys were completed within the 200-foot-wide survey corridor centered along the Project route on all lands.

Sources: North Dakota Department of Agriculture 2014, 2013; USFS 2014.

Noxious and invasive weed surveys were conducted in October 2012 and in May and July 2013 within a 200-foot-wide survey corridor centered on the Project route. Subsequent surveys were conducted in October 2013 and in August and October 2014 within a 200-foot-wide survey corridor centered on segments of the Project route that had been realigned. Populations were identified and mapped within the survey corridor. The results of this survey effort are summarized in **Table 3.8-1**. A complete summary of the species distribution within the Project area based on known population records and field identified populations can be found in the Noxious Weed Control Plan (POD, Appendix F).

3.9 Wildlife and Fisheries

3.9.1 Wildlife

3.9.1.1 Recreationally and Economically Important Species and Nongame Wildlife

The Project area lies within the Great Plains-Palouse Dry Steppe Province and the Great Plains Steppe Province (Bailey et al. 1995). These regions are characterized by rolling plains, valleys, canyons, and buttes, with the more gently rolling plains found around the Missouri River and Lake Sakakawea. The Project route would cross four habitat types, including grassland, agricultural land, woodland and shrubland, and wetland and riparian areas. Grassland is the most common habitat type found along the Project route. A number of waterbodies, including a major river course (Missouri River/Lake Sakakawea) as well as intermittent streams, wetlands, and floodplains occur along the Project route (Section 3.7, Wetland and Floodplains). Water sources, particularly those that maintain a reliable source of open water and provide a multi-story canopy, support a greater diversity and population density of wildlife species than other habitats in the Project region.

Information regarding wildlife species and habitat within the Project area was obtained from a review of existing published sources, site-specific surveys, USFS, NDGFD, and USFWS file information, as well as North Dakota Natural Heritage Inventory (NDNHI) database information. Baseline descriptions of both resident and migratory wildlife include species that have been either documented along the Project route, or those that may occur along the Project route, based on habitat associations. Wildlife species that may occur along the majority of the Project route are typical of the grassland, shrubland, woodland, and wetland communities of west-central North Dakota. A list of representative wildlife species for the Project area is found in **Appendix B**.

U.S. Forest Service Management Indicator Species

A MIS is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Species that have been selected for the LMNG include the sharp-tailed grouse and black-tailed prairie dog (USFS 2011). Surveys completed in 2012, 2013, and 2014 did not identify any black-tailed prairie dog colonies along the Project route (Stantec 2014; SWCA 2013a). USFS data indicates the presence of one sharp-tailed grouse lek within 0.25 mile of the Project route near MP 8.6 (USFS 2013). The sharp-tailed grouse is presented in Section 3.9.1.2, Small Game Species.

3.9.1.2 Big Game Species

Big game species that occur in the Project region include pronghorn, mule deer, white-tailed deer, elk, and mountain lion (Hagen et al. 2005) (**Appendix B**). Population numbers for pronghorn, mule deer, white-tailed deer, and elk fluctuate slightly from year-to-year based on habitat conditions. Winter severity and amount of quality habitat are the limiting factors within the Project area. Forage quality, cover, and weather patterns typically determine the level of use and movement of big game species through the Project area. Winter use in the vicinity of the Project area depends on snow cover and forage availability.

Pronghorn

Pronghorn inhabit grasslands and shrublands on flat to rolling topography, and browse on forbs and shrubs, especially sagebrush, throughout the year. During winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and east-facing slopes (Armstrong et al. 2011). Pronghorn occur throughout the majority of the Project area but in relatively low numbers.

Mule Deer

Mule deer feed on a wide variety of plants including forbs, grasses, sedges, shrubs, and trees. Winter habitat for mule deer occurs in areas of relatively high sagebrush densities and overall low snow accumulation on south- and east-facing slopes (Armstrong et al. 2011). Mule deer occur throughout the majority of the Project area, inhabiting virtually all vegetation types (NDGFD 2013a).

White-tailed Deer

White-tailed deer occur throughout the entire state and are considered widespread and common, inhabiting woodlands, riparian areas and agricultural lands (NDGFD 2013a). White-tailed deer feed on cultivated crops, such as corn and wheat, native forbs and grasses, as well as mushrooms, fruits, and nuts. In winter, white-tailed deer congregate in woodland habitat (Armstrong et al. 2011).

Elk

Elk occur in a variety of habitats in the Project area including woodlands, shrublands, grasslands, and agricultural areas. Elk feed on grasses, forbs, and shrubs; the percentages vary seasonally. Elk have a considerable impact on aspen stands by browsing on twigs, bark, and seedlings (Armstrong et al. 2011). Elk that may occur in the Project area likely would be found south of Lake Sakakawea in McKenzie County (NDGFD 2013b).

Mountain Lion

Mountain lions occur in the Project area in McKenzie County and inhabit a variety of ecosystems, but are most common in rocky foothills, canyons, woodlands, and shrublands. They feed primarily on deer, but also will take elk, Rocky Mountain bighorn sheep, smaller mammals, and livestock (Armstrong et al. 2011).

3.9.1.3 Small Game Species

Small game species that occur in the Project area include upland game birds, furbearers, waterfowl, and small mammals (**Appendix B**).

Upland Game Birds

Upland game birds that occur in the Project area include sharp-tailed grouse, gray (Hungarian) partridge, wild turkey, ring-necked pheasant, and mourning dove. Sharp-tailed grouse, gray partridge, ring-necked pheasant, and mourning dove occur in a variety of grassland, shrubland, riparian, and agricultural habitats. Wild turkeys occur throughout the Project area in woodland habitat (NDGFD 2013c; Stokes and Stokes 1996). Mourning doves are considered widespread and common in the Project area but are only present during the spring, summer, and early fall (NDGFD 2013c).

The sharp-tailed grouse is a USFS MIS. This species was observed during field surveys in 2012 and 2013 (SWCA 2013b). Additionally, USFS data for sharp-tailed grouse leks exists for USFS lands crossed by the Project. **Table 3.9-1** presents a summary of sharp-tailed grouse leks near the Project route.

Furbearers

Furbearers that occur along the Project route include beaver, raccoon, striped skunk, muskrat, mink, long-tailed weasel, short-tailed weasel, badger, bobcat, coyote, and red fox (NDGFD 2013d). These species have wide distributions in North Dakota and are found within all habitat types present in the Project area. Due to increased structural diversity and available food sources, a higher diversity of furbearers is likely present along the perennial and intermittent drainages and wetlands within the Project area.

Table 3.9-1 Sharp-tailed Grouse Leks Near the Project Area

Species	Habitat Association	Potential for Occurrence within the Project Area	Milepost	Distance to Centerline (miles)	Survey Year	Status	Land Owner	County
Sharp-tailed grouse	Grassland and shrubland	High. One active sharp-tailed grouse lek occurs within 0.25 mile of the centerline.	8.6	0.23	2013	Active	USFS	McKenzie

Sources: SWCA 2013b USFS 2013.

Waterfowl

Numerous species of waterfowl nest in, and migrate through, the Project area, utilizing open water and wetland habitats. Common waterfowl species in the Project area include Canada goose, mallard, green-winged teal, northern pintail, gadwall, and American wigeon. Other common summer residents include blue-winged teal, cinnamon teal, northern shoveler, redhead, and ring-necked duck (Stokes and Stokes 1996). Several species of waterfowl including sandhill cranes, snow geese, white-fronted geese, mallards, gadwall, blue-winged teal, and wigeon were observed during field surveys in October 2013 (Stantec 2014).

Small Game Mammals

Small game mammals likely to occur in the Project area include fox squirrel and eastern cottontail (NDGFD 2013d). Fox squirrels occur in riparian and woodland vegetation communities within the Project area. Eastern cottontails occur in a variety of habitat types, but are most common in brushy areas such as shelterbelts and old farmsteads (Armstrong et al. 2011).

3.9.1.4 Nongame Species

A diversity of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupy a variety of trophic levels and habitat types in the Project area (**Appendix B**). Common nongame wildlife species include small mammals, such as bats, voles, gophers, prairie dogs, woodrats, and mice. These small mammals provide a substantial prey base for predators in the Project area, including larger mammals (coyote, badger, and bobcat), raptors (eagles, buteos, accipiters, and owls), and reptiles (snakes). A number of bat species also occur in the Project area, including long-legged myotis, northern long-eared myotis, and western small-footed myotis (Hagen et al. 2005). The northern long-eared myotis is a federally proposed species and is discussed in Section 3.10, Special Status Species.

Raptors and Other Migratory Birds

Nongame birds encompass a variety of passerine and raptor species, including migratory bird species that are protected under the MBTA (16 U.S.C. 703-711), BGEPA (16 U.S.C. 668-668d), and EO 13186 (66 *Federal Register* 3853) (**Appendix B**).

Raptor species that occur in the Project area as residents or migrants include eagles (bald and golden eagles); buteos (e.g., red-tailed hawk, Swainson's hawk, and ferruginous hawk); falcons (e.g., prairie falcon and American kestrel); accipiters (e.g., Cooper's hawk and sharp-shinned hawk); owls (e.g., great-horned owl, burrowing owl, long-eared owl and short-eared owl); northern harrier; and turkey vulture (Stokes and Stokes 1996).

On May 2 and 23, 2013, ground raptor surveys were conducted to identify occupied territories or active nest sites. Records from the NDGFD, North Dakota Parks and Recreation Department Heritage Inventory, USFWS, and USFS were reviewed to determine the locations and status of previously observed and recorded raptor nests. Surveys focused on cliff/bluff nesters (e.g., golden eagle and prairie falcon), species that commonly nest in deciduous trees or on promontory points (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk, and great-horned owl), cavity nesters (e.g., American kestrel), ground nesters (e.g., northern harrier), sub-terranean nesters (e.g., burrowing owl), and conifer nesters (e.g., accipiters).

Based on USFS data and the results of the 2013 raptor nest surveys, one historic golden eagle nest occurs within 1 mile of the Project area in McKenzie County. This nest is approximately 0.55 mile east of the Project route on USFS land (approximately MP 8.9) and was inactive in 2013 (SWCA 2013a; USFS 2013).

Migratory Birds

Nongame birds encompass a variety of passerine and raptor species including migratory bird species that are protected under the MBTA (16 U.S.C. 703-711) and EO 13186 (66 *Federal Register* 3853). Pursuant to EO 13186, a MOU between the BLM and USFWS outlines a collaborative approach to promote the

conservation of migratory bird populations. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. This MOU identifies specific activities where cooperation between the BLM and USFWS would contribute to the conservation of migratory birds and their habitat.

Migratory birds are considered integral to natural communities and act as environmental indicators based on their sensitivity to environmental changes caused by human activities. A variety of passerines occur in the Project area throughout the year; however, they are most abundant during the spring/fall migration, as well as during the breeding season (February 1 through July 15). Representative bird species that occur in the Project area include killdeer, common nighthawk, eastern kingbird, western kingbird, eastern bluebird, common yellowthroat, clay-colored sparrow, vesper sparrow, lark sparrow, western meadowlark, Say's phoebe, horned lark, barn swallow, black-billed magpie, common raven, and lark bunting (Stokes and Stokes 1996). In addition, northern flicker, northern shrike, American tree sparrow, American robin, downy woodpecker, Brewer's blackbird, and spotted towhee were observed within the Project area during field surveys in 2013 and 2014 (Stantec 2014; SWCA 2013a).

Special status bird species that may occur in the Project area are discussed in Section 3.10, Special Status Species.

Reptiles

Representative reptile species that could occur within the Project area include the short-horned lizard, common snapping turtle, common garter snake, bullsnake, prairie rattlesnake, and western hognose snake (USGS 2006) (**Appendix B**).

3.9.2 Fisheries

3.9.2.1 Habitat

Aquatic habitat in the Project area includes streams, wetlands, ponds, rivers, and lakes. Most of the habitat consists of intermittent and ephemeral streams, which provide water only during spring run-off and seasonal storm events. The most significant perennial waterbody crossed by the Project is the Missouri River course through Lake Sakakawea. Aquatic species found in the Project area are typical of the perennial and intermittent waterbodies and wetland communities of west-central North Dakota (**Appendix B**).

3.9.2.2 Aquatic Communities

Aquatic communities are defined as fish and invertebrate communities that inhabit perennial streams and pond/lake environments. The description of aquatic communities focuses on important fisheries, which are defined as species with recreational or commercial value or threatened, endangered, or sensitive status (i.e., special status). This section describes recreationally or commercially important fisheries that occur at, or immediately downstream of, the proposed waterbody crossings. Special status aquatic species are discussed in Section 3.10, Special Status Species. The Project area for aquatic resources includes Lake Sakakawea, intermittent streams, and wetlands that would be crossed by the Project route.

Invertebrate communities in waterbodies in the Project area include worms, immature and adult insect groups, shellfish, and other forms of aquatic life. The composition can vary depending on flowing or standing water and other physical characteristics of the waterbody. They represent important food sources for fish and also are used as indicators of water quality conditions. For the purpose of describing aquatic communities, it is assumed that invertebrates are present in all waterbodies crossed by the Project route.

3.9.2.3 Fish

The Project would cross one perennial stream and numerous intermittent streams (Section 3.5, Water Resources). The Project route would cross only one waterbody (Missouri River [Lake Sakakawea]) that is classified as a valuable fishery.

Game fish include a variety of warm water and cool water species such as walleye, perch, paddlefish, Chinook salmon, crappie, catfish, bluegill, sauger, northern pike, bass, sturgeon, and trout (NDGFD 2013e). Native non-game species include flathead chub, and sturgeon chub (Hagen et al. 2005).

3.9.2.4 Amphibians

Potential habitat for amphibians includes intermittent stream reaches, wetlands, and ephemeral ponds. Common species found in the Project area include the eastern plains spadefoot, Canadian toad, Great Plains toad, Woodhouse's toad, northern leopard frog, western chorus frog, wood frog, and tiger salamander (USGS 2006) (**Appendix B**).

3.9.2.5 Aquatic Nuisance Species

A nuisance species is an introduced species (plant or animal) that threatens the diversity or abundance of native species or the ecological stability of infested waters. Aquatic nuisance species can be introduced accidentally or purposely. The NDGFD (2013f) identifies the following as aquatic nuisance species:

Plants:

- Eurasion water-milfoil
- Curly-leaf pondweed

Animals:

- Zebra mussel
- New Zealand mudsnail
- Common carp
- Silver carp
- Rudd
- Ruffle
- Goby
- Northern snakehead
- Spiny water flea
- Hooked-tail water flea

3.10 Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the USFS. In accordance with the ESA, as amended, the lead agency (BLM), in coordination with the USFWS and USFS, must ensure that any action they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species.

As stated in Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it also is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA." Additionally, as stated in the USFS Manual (FSM 2670.22), it is USFS policy "to develop and implement management practices to ensure that species do not become threatened or endangered because of USFS actions; maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands; and develop and implement management objectives for populations and/or habitat of sensitive species."

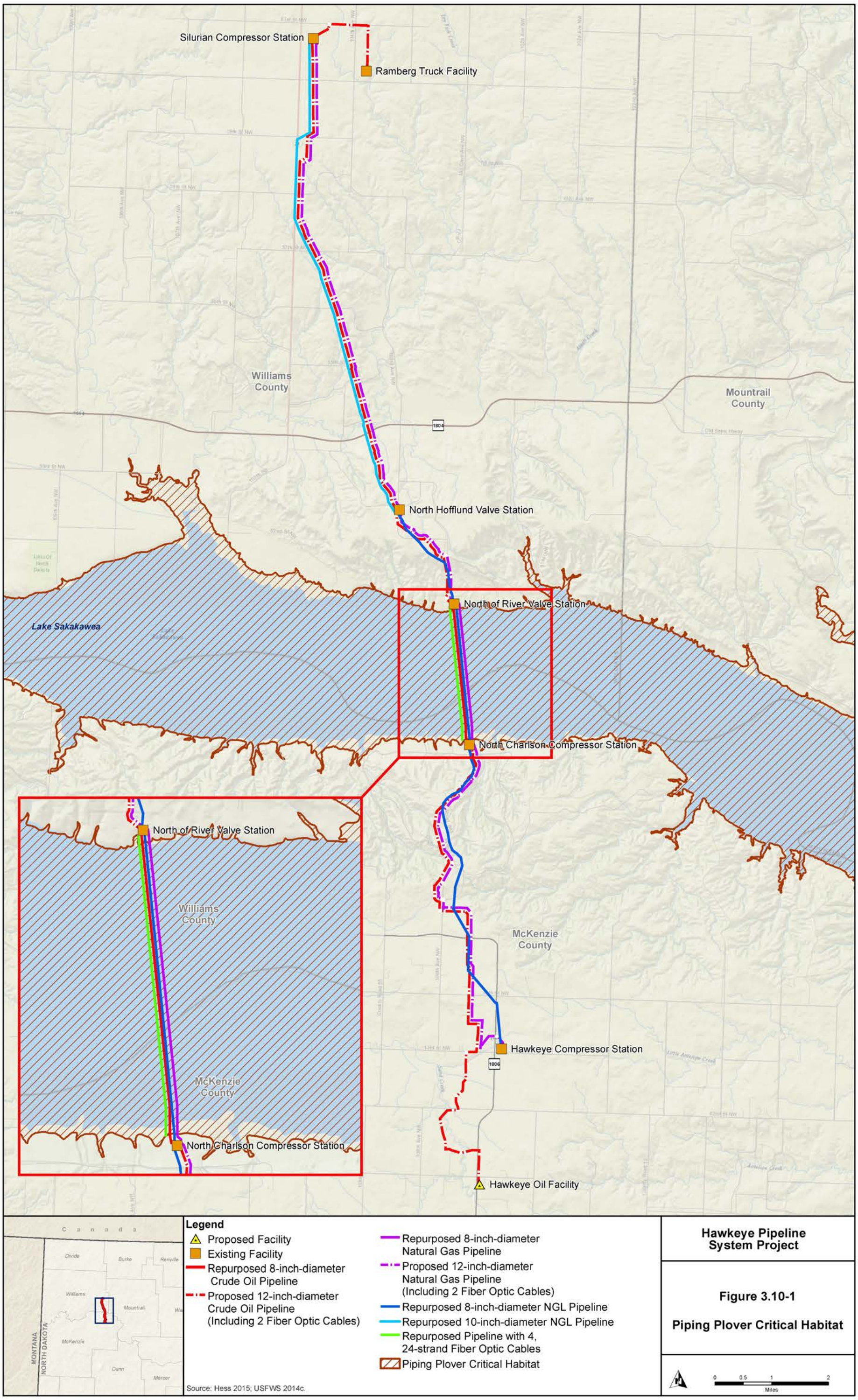
3.10.1 Special Status Plant Species

There are 14 USFS designated sensitive plant species on the LMNG (USFS 2011a,b). No federally listed plant species were identified as potentially occurring within the Project area. The potential occurrence of special status plant species within the Project area was based on range, known distribution, and the presence of suitable habitat crossed by the Project route (**Appendix C**). Of the 14 species, 6 species (Alkali sacaton, lance-leaf cottonwood, limber pine, nodding wild buckwheat, smooth goosefoot, and Torrey's cryptantha) were eliminated from detailed analysis; the remaining 8 species have the potential to occur within the Project area, as described in **Appendix C**.

Field surveys to document potential special status plant populations along the Project route were conducted in October 2012 and in May and July 2013 within a 200-foot-wide survey corridor centered on the Project route. Subsequent surveys were conducted in October 2013 and in August and October 2014 within a 200-foot-wide survey corridor centered on segments of the Project route that had been realigned. No USFS sensitive plant species were observed along the Project route.

3.10.2 Special Status Wildlife Species

A total of 28 special status terrestrial and aquatic wildlife species were identified by the USFWS and USFS as potentially occurring within the Project area (Hagen et al. 2005; USFS 2011a; USFWS 2013). The potential for occurrence of special status wildlife species within the Project area was based on range, known distribution, and the presence of suitable habitat crossed by the Project route. These species, their habitat associations, and their potential occurrence within the Project area are summarized in **Appendix C**. Occurrence potential for each species was based on habitat requirements and known distribution. Based on these evaluations, 12 wildlife species (black-footed ferret, gray wolf, Rocky Mountain bighorn sheep, bald eagle, greater prairie chicken, greater sage-grouse, Argos skipper, broad-winged skipper, Dion skipper, mulberry wing, powesheik skipperling, and northern redbelly dace) have been eliminated from detailed analysis. The remaining 16 species analyzed, including 8 federally listed, proposed, or candidate species (i.e., northern long-eared bat, interior least tern, piping plover [critical habitat shown on **Figure 3.10-1**], rufa red knot, whooping crane, Sprague's pipit, pallid sturgeon, and Dakota skipper) have the potential to occur within the Project area, as described in **Appendix C**.



Hawkeye Pipeline System Project

Figure 3.10-1

Piping Plover Critical Habitat

3.11 Land Use

Land along the Project route is predominantly (74 percent) privately owned. The Project route would cross a unit of the LMNG, which is administered by the USFS, for approximately 2.6 miles (10.0 percent); 1.2 mile of state land (4.6 percent); and 2.9 miles of lands (11.2 percent) associated with Lake Sakakawea that is under the jurisdiction of the USACE (**Table 3.11-1**).

Table 3.11-1 Land Ownership

Ownership	Centerline Distance		Permanent Disturbance	
	Miles	%	Acres	%
North Dakota State Lands	1.2	4.63	NA	0.0
US Forest Service	2.6	10.04	NA	0.0
US Army Corps of Engineers	2.9	11.20	NA	0.0
Private Land	19.2	74.13	79.7	100.0
Total	25.9	100.00	79.7	100.0

Source: Hess 2014.

The corridor along the Project route is entirely rural in character. Lands that would be crossed by the Project route are approximately one-quarter agricultural cropland and three-quarters open lands consisting of mostly prairie grasslands and small amounts of shrubland and woodland. Approximately 39 percent of the vegetation along the Project route is mixed grass prairie, followed by 46 percent agricultural cropland, with the remainder distributed among several vegetation types (**Table 3.6-1**). Use of the open lands is largely for grazing, possibly augmented by dispersed recreation, such as hunting, in some areas where it is permitted by landowners.

There are numerous oil and gas development-related facilities dotted throughout the Project vicinity, which are mostly well pads and a few larger facilities, including compressor stations, pump stations, and trucking terminals. Oil and gas development began in McKenzie and Williams counties in the early 1950s. Production increased gradually into the early 1980s and fluctuated from then until approximately 2008; it has increased dramatically since 2010 (North Dakota Department of Mineral Resources 2013). By late 2013, McKenzie County was producing over 8 million barrels of oil and over 12 million cubic feet (mcf) of natural gas per month, ranking number 1 among all counties in the state for both commodities. For the same time period, Williams County produced more than 4 million barrels of oil and almost 6 mcf of gas, ranking the county 4th and 2nd, respectively, among North Dakota's 53 counties for those products (North Dakota Department of Mineral Resources 2013).

There is a small amount of farmsteads in the vicinity of the Project route. Most of the ones nearest the Project route are south of Lake Sakakawea or near the northern end of the Project; both areas with comparatively high concentrations of cropland. Four of the identified farmsteads include residences within 1,000 feet or less of the Project route.

Private lands that would be crossed by the Project in both McKenzie and Williams counties are all zoned "Agricultural." McKenzie County's Zoning Ordinance (McKenzie County 2013) identifies "oil and gas gathering systems" as an "allowed use" in the agricultural zone. Williams County's ordinance (Williams County 2010) identifies "industrial, municipal and/or commercial pipelines" as Conditional Uses in the agricultural zone district, although reportedly a conditional use is not required if state regulations on pipelines are complied with and an easement is obtained from the landowner (Corbett 2014).

As noted, approximately 2.6 miles of the Project route would cross the LMNG. The Land and Resource Management Plan for the LMNG identifies four overarching goals for management: 1) ensure sustainable ecosystems; 2) multiple benefits to people; 3) scientific and technical assistance; and 4) effective public

service (USFS 2001). In order to achieve these goals, the national grassland guidelines require special use permits for changes in land use. The Land and Resource Management Plan guidelines particularly relevant to the Project indicate:

- Utility lines should be consolidated "within existing corridors or in areas adjacent to roads wherever possible."
- Utility companies may construct new corridors, unless prohibited by management direction.
- All new pipelines should be placed underground.
- New pipelines, roads and other utilities should be routed to minimize visual impacts and conform to approved corridors (USFS 2001).

3.12 Recreation

Recreational opportunities in the Project area include hunting, fishing, boating, hiking, camping, and snowmobiling. Lake Sakakawea provides enhanced recreational opportunities in the Project area, including swimming, boating, fishing, hunting, bird watching, and other nature observations. There are no developed recreation facilities in the area crossed by the Project. The nearest developed facility is the Little Beaver Bay boat ramp on USACE property approximately 1.2 miles east of the Project route, on the north side of the Missouri River. Little Beaver Bay has two boat ramps, 43 camp sites, picnic tables, grills, and a vault restroom.

Deer hunting is a popular activity in the Project area with white-tailed deer and to a lesser extent, mule deer, as the targets. Hunting in the Project area typically begins in late summer and ends in early winter. White-tailed deer season for 2015 ranges from the end of August for archery to mid-December for muzzle-loaders. The entire Project area is included in hunting Unit 3B1. The number of deer licenses issued for Unit 3B1 declined between 2006 and 2009. Despite the decline, the hunter success rates have not increased. Waterfowl and pheasant hunting also are popular. Waterfowl seasons generally run from fall through early winter, except for a spring light goose season. There are no wildlife management areas crossed by the Project route.

Recreational opportunities on Lake Sakakawea are more prevalent during the summer; ice fishing is a popular winter activity. The NDGFD regulates fishing on the lake, but access is regulated by the USACE. Lake Sakakawea provides waterfowl hunting opportunities for Canada geese, mallard, green-winged teal, northern pintail, and numerous other species. Fishing for walleye and northern pike on Lake Sakakawea also is a common recreational activity.

In addition to public land opportunities, hunting and fishing opportunities are provided on designated private lands under a cooperative arrangement between the state of North Dakota and the landowners. The program is titled Private Land Open to Sportsmen (PLOTS). Over and above the objective of providing public recreational opportunities, the PLOTS program also achieves conservation of habitats for fish and wildlife populations. The nearest PLOTS property to the Project would be slightly less than 1 mile to the east of the Project route, south of 59th Street NW. No PLOTS property would be crossed by the Project.

The Project would cross approximately 2.6 miles of the LMNG in McKenzie County. There are no developed recreation facilities on this portion of the LMNG. Recreational use on the LMNG is limited to dispersed activities, including camping, picnicking, hiking, hunting, fishing, and motorized vehicle use where permitted.

3.13 Visual Resources

Federal land management agencies are responsible for identifying and protecting scenic values on public lands under several provisions of FLPMA and NEPA. Relevant sections of FLPMA include: Section 102 (a) that states "...the public lands are to be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values"; Section 103(c) that identifies "scenic values" as one of the resources management should address; Section 201(a) that states "the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values)..."; Section 505(a) that states "each ROW shall contain terms and conditions which will...minimize damage to the scenic and esthetic values..." (FLPMA 1976). Section 101 (b) 2 of the NEPA requires federal agencies to use "all practicable means" to assure "aesthetically and culturally pleasing surroundings" for all Americans.

Approximately 90 percent of the Project area is privately owned or owned and managed by the state or the USACE, which are not governed by visual management regulations or standards. Approximately 2.6 miles of the Project would cross the LMNG just to the south of Lake Sakakawea. The LMNG is administered by the USFS.

In response to the FLPMA and NEPA requirements, the USFS developed the Scenery Management System (SMS) to effectively address visual resources in a systematic, interdisciplinary manner. The SMS outlines procedures for the inventory and analysis of aesthetic values on National Forest Lands. Beginning with an inventory of visual quality and visibility of a particular landscape, the process derives landscape character goals and establishes one of five SIOs, ranging from "very low," where the landscape character is considered to be of lesser value and substantial alterations from the natural landscape are considered permissible, to "very high" where the landscape is highly valued and the objective is to maintain it in as pristine a condition as possible (USFS 1995). SIOs establish limits for the level of human modification to the natural landscape that is acceptable in terms of form, line, color, and texture. SIOs are assigned for all USFS-administered lands through the national forest planning process (**Table 3.13-1**).

Table 3.13-1 USFS Scenic Integrity Objectives

Very High (Unaltered-Preservation Visual Quality Objectives [VQO])	Very high scenic integrity refers to landscapes where the valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
High (Appears Unaltered-Retention VQO)	High scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Moderate (Slightly Altered-Partial Retention VQO)	Moderate scenic integrity refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low (Moderately Altered-Modification VQO)	Low scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but also compatible or complimentary to the character within.

Table 3.13-1 USFS Scenic Integrity Objectives

Very Low (Highly Altered-Maximum Modification VQO)	Very low scenic integrity refers to landscapes where the valued lands appear heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Source: USFS 1995.

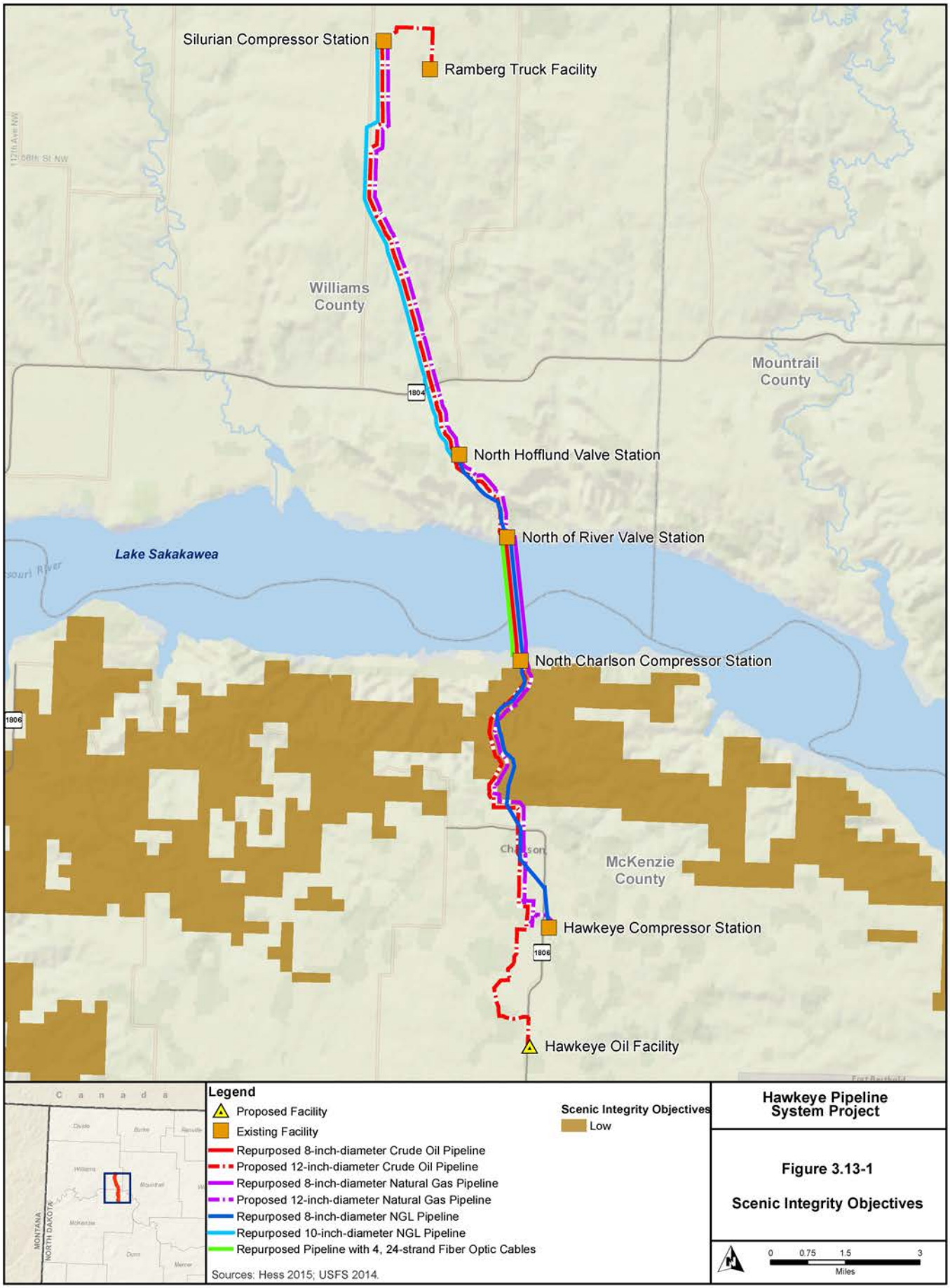
All of the LMNG area that would be affected by the Project has been assigned a “low” SIO, indicating it is acceptable for the landscape to appear “moderately altered” as a result of human activities (**Figure 3.13-1**). The Project would closely parallel existing utility corridors for most of its length through the LMNG.

The Project would be located in the Missouri Plateau Region of the Great Plains physiographic province (Fenneman 1931). The Missouri Plateau is characterized by varied topography formed by glaciation, particularly north and east of the Missouri River; glaciation was not a factor south and west of the river. The visual landscape in the Project area is a semi-arid rolling plain of shale, siltstone, and sandstone with sandstone buttes and badland formations along the shores of Lake Sakakawea. Upland portions of the area are nearly flat, providing for extensive, mostly dry-land farming where it has replaced the natural shortgrass prairie. There also is a network of incised drainages characterized by wooded draws populated with junipers and deciduous groves winding between treeless, shortgrass uplands. This network of drainages and ridges is particularly characteristic of the LMNG unit on the north-facing south shore of Lake Sakakawea where the Project route would cross through it.

Soil colors range from grays and beiges to dark brown. The buff-beige soils are particularly noticeable around oil and gas drilling, pumping, and well sites where the vegetation has been stripped away. Natural vegetation colors range from the dark green of tree groves to pale olives, brighter greens or golds and beiges in grasslands, depending on the season of the year. The most prominent visual feature in the Project area is Lake Sakakawea and its blue water.

Human cultural modifications consist of two main types: ranch buildings, which are widely dispersed through the Project area; and oil and gas development facilities, which are nearly ubiquitous in much of the Project area, including in the LMNG. There also is a network of roads and power distribution lines in the area and fence lines associated with ranching activities. The road network mainly follows a grid pattern on the flatter plateau areas, but is curvilinear, following terrain features in the more rugged topography.

There is only one moderately high volume roadway (State Highway [SH] 1804) that provides public viewing opportunities of the Project area. The area also is visible from a few residences associated with farms and ranches and from the network of lightly travelled rural roads. Boaters on Lake Sakakawea have limited views of the lands rising from the shore lines.


Silurian Compressor Station
Ramberg Truck Facility
Williams County
Mountrail County
1804
North Hofflund Valve Station
North of River Valve Station
Lake Sakakawea
North Charlson Compressor Station
1806
McKenzie County
Hawkeye Compressor Station
1806
Hawkeye Oil Facility
Canada
MONTANA
NORTH DAKOTA
Legend
Proposed Facility
Existing Facility
Repurposed 8-inch-diameter Crude Oil Pipeline
Proposed 12-inch-diameter Crude Oil Pipeline
Repurposed 8-inch-diameter Natural Gas Pipeline
Proposed 12-inch-diameter Natural Gas Pipeline
Repurposed 8-inch-diameter NGL Pipeline
Repurposed 10-inch-diameter NGL Pipeline
Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
Scenic Integrity Objectives
Low
Sources: Hess 2015; USFS 2014.
Hawkeye Pipeline System Project
Figure 3.13-1
Scenic Integrity Objectives
0 0.75 1.5 3
Miles

3.14 Noise

Describing the environment potentially affected by noise from the Project involves identifying noise-sensitive receptors and existing noise sources in the Project vicinity, characterizing terrain features that may affect noise transmission, and determining existing noise levels.

The Project would be constructed entirely through rural areas where there are only a few farm residences and one small church that would be considered noise-sensitive receptors. There are 4 residences within 1,000 feet of the Project route, the nearest of which is approximately 300 feet from the ROW; the other 3 range from 500 feet to approximately 680 feet from the Project route. The church is approximately 340 feet from the Project route.

Background noise sources in the Project vicinity are predominantly natural, including wind, insects, and birds. Other sources of noise typical of rural and agricultural areas include roadway traffic and farm equipment on a seasonal basis. In addition to these noise sources, the Project area is dotted with numerous oil and gas facilities, including compressor stations, pump jacks, and drilling rigs. Oil and gas development also contributes to heavy truck traffic on rural gravel roads on a regular basis.

Background noise levels in the vicinity of the Project are estimated to be in the range of 35 to 50 dBA, based on the agricultural land use pattern in the area and literature sources (USEPA 1971). However, levels likely are substantially higher near compressor stations and somewhat higher near pump jacks or drilling equipment, although drilling activities typically are temporary in nature. Noise levels can be affected by atmospheric conditions, wind speeds, topography, vegetation, time of day, and human activity.

Terrain is essentially flat between the Project route and all of the noise sensitive receptors, such that there would be no barrier effects to block noise transmission. There are mature trees in windbreaks in some locations near residences, although they generally do not have sufficient depth to affect noise transmission to any significant degree.

Neither of the counties in the Project area nor the State of North Dakota has adopted noise control regulations that would apply to the Project. In the absence of specific local standards, the HUD considers a day-night average noise level of 65 dBA to be “acceptable” for outdoor environments (HUD 1984). This is a long-term average level, not a peak level. Also, short-term construction activities are often exempted from stringent noise limits as a matter of practicality, in recognition of the fact that construction typically involves use of heavy equipment for short periods of time and, if appropriate, may be restricted to daytime hours when sensitivity to noise is not as great.

3.15 Socioeconomics

The analysis of socioeconomics encompasses McKenzie County, lying south of Lake Sakakawea, and Williams County north of the lake. The Project area is predominantly rural and sparsely populated with a few small communities and small to medium-sized cities dispersed throughout. Williston, approximately 40 miles to the west of the Project is the largest city in the 2 counties with an estimated 18,532 people in 2012 (U.S. Census Bureau 2014). The nearest population centers to the Project are Watford City, 22 miles to the southwest; Tioga, 6 miles to the north; and New Town on the Fort Berthold Reservation, 18 miles to the east. All 3 of these communities were below 2,000 in population at the time of the 2010 census (U.S. Census Bureau 2014).

3.15.1 Population and Demographics

Following a decline in population from 1990 to 2000, both McKenzie County and Williams County rebounded between 2000 and 2010 at rates more than double the statewide growth rate (**Table 3.15-1**). Booming oil and gas development activity in the Bakken Field of northwestern North Dakota spurred growth in the latter half of the last decade. The growth has continued and is estimated to have risen to exceptional levels in both counties as illustrated in **Table 3.15-1**. In just over 3 years from 2010 to 2013, McKenzie County's population is estimated to have increased by 46.4 percent and Williams County's population is estimated to have increased by 32.1 percent. The Fort Berthold Reservation portion of McKenzie County grew much slower than the county overall, but 5.8 percent per year is noteworthy, especially if it continues for several years. While the state's growth rate is more modest than the counties' rates, reflecting the much larger base, North Dakota is nevertheless the fastest growing state in the nation.

Table 3.15-1 Population and Demographic Composition

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Population				
2000 Population	5,737	19,761	-	642,200
2010 Population (April 1)	6,360	22,398	1,242	672,591
2013 Population Estimate (July 1)	9,314	29,565	1,494	723,393
Average Annual Percent Change 2000-2010	1.0%	1.3%	-	0.5%
Average Annual Percent Change 2010-2013	12.5%	8.9%	5.8%	2.3%
Racial Composition (Percent of Estimated 2013 Population)				
White alone	80.6	91.3	3.8	89.6
Black or African American	0.7	1.3	0.9	1.8
American Indian and Alaska Native	16.3	3.8	89.0	5.4
Asian	0.5	0.8	0.0	1.2
Native Hawaiian and Other Pacific Islander	0.1	0.1	0.0	0.1
Two or more races	1.8	2.8	5.1	1.9
Hispanic or Latino	4.8	4.4	4.8	2.9
White alone, not Hispanic or Latin	77.3	87.5	3.5	87.3

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2014.

Racially and ethnically, Williams County is generally similar to the state at large. Williams County has slightly higher percentages of Hispanic/Latino persons and of persons identified as being of two or more races; all other minority groups are smaller in the county than in the state. McKenzie County differs notably from the state. As host to a portion of the Fort Berthold Indian Reservation, McKenzie County's American Indian/Alaska Native population is more than three times the percentage in the state as a whole, largely

because of the portion of the Fort Berthold Reservation on the eastern edge of the county. McKenzie County also has a slightly higher percentage of Hispanic/Latino persons than the state, but all other minority populations are at or below state levels.

3.15.2 Economic Conditions

Agriculture and ranching historically have been the driving force in North Dakota's economy. The state ranks first in the country in production of several crops, including flaxseed, canola, durum wheat, dry edible beans and peas, sunflowers, barley, and several other crops. Livestock production, including beef, dairy cattle, and hogs, is the most prominent agricultural activity in western North Dakota where the land is less productive for crops than in the east. In recent years however, the mining sector, which includes oil and gas development in particular, has been the largest contributor to growth of the state's gross domestic profit (GDP) (Bureau of Economic Analysis [BEA] 2014a). North Dakota is now the second largest producer of oil in the U.S., trailing only Texas. Average daily production, which was estimated at 860,000 barrels in 2013, had risen by 40 percent to nearly 1.2 million barrels by the 4th quarter of 2014. In 2012, North Dakota's largest industry in terms of GDP was the government sector, followed closely by real estate, the aforementioned mining sector, and then agriculture and wholesale trade (BEA 2014a). By 2013, the mining sector had become the largest contributor to the state's GDP, followed by finance/real estate, and agriculture. Government had fallen to 4th place, not because it had declined, but because the leading sectors had grown faster (BEA 2014b). The rapid growth in oil and gas development has been a major factor in the growth of several other industry sectors, as well, including transportation and warehousing, trade, and real estate.

Williston is the largest city in the Project vicinity. With a population estimated at 18,532 in 2012, it is the 8th largest in the state and the economic center of northwest North Dakota. Williston is the hub of oil and gas development from the Bakken formation. Williston's Sloulin Field International airport has air service from several major and regional airlines flying to Denver, Minneapolis, and several regional cities. Higher education is available in Williston through Williston State College, a 2-year community college that is part of the 11-campus North Dakota University System.

3.15.3 Income and Poverty

Table 3.15-2 summarizes the income status of people in the Project vicinity. Income levels are an indicator of living standards; per capita income includes total wages, plus capital and non-labor income such as net transfers (e.g., pensions, welfare, dividends, etc.) calculated as an average per person (including children and the unemployed). McKenzie County ($33,078) and Williams County ($38,738) both recorded per capita income higher than the state of North Dakota, exceeding the state level by 11.3 percent and 18.3 percent, respectively. Per capita incomes on the Fort Berthold Reservation are much lower than the state level and more than two-thirds lower than either county levels. Median household income is a measure of the midpoint in household earning, where half of the households earn more than the median; and the other half earn less. McKenzie County had a median household income of $64,866 and Williams County was at $76,210; both notably greater than the state median household income of $53,741. Median household income on the reservation lags well behind the state level and is less than half the levels of either county.

Table 3.15-2 Income and Poverty Levels

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Per capita income (2013)	$33,078	$38,738	$11,810	$29,732
Median household Income	$64,866	$76,210	$27,679	$53,741
Persons below poverty level	11.3%	7.8%	38.0%	11.8%

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2014.

The percentages of persons below the poverty level represent 11.3 percent of the population in McKenzie County, slightly above the state's 11.8 percent. Williams County had just 7.8 percent below the poverty level. The Fort Berthold Indian Reservation had a poverty rate of 38.0 percent, well above the rates for the state and both counties. Although the total numbers are small, the unusually high poverty level on the reservation is likely a significant factor in McKenzie County's level exceeding the level in Williams County and being only slightly below the state level.

3.15.4 Employment

The economy in North Dakota, including McKenzie and Williams counties, historically has depended on agriculture. However, the boom in oil and gas development in recent years has dramatically changed the character of employment. Employment in the "mining" sector more than tripled from 2005 to 2010 and, as illustrated in **Table 3.15-3**, it nearly tripled again in just 3 years to 2013. The average annual employment for all industries in McKenzie and Williams counties stood at 12,421 in 2005. By 2010, the total had increased to 19,614, and by 2013, it had more than doubled to 46,626. The mining, quarrying, and oil and gas extraction sector alone makes up nearly one-third of total employment. Similarly, related industries such as transportation and warehousing and professional and technical services experienced major increases during the same timeframe, and the construction sector employment increased by nearly 5 times between 2010 and 2013.

Table 3.15-3 Occupational Wage and Employment Data

	Average Weekly Wage 2010	Average Weekly Wage 2013	% Change Average Weekly Wage	Average Annual Employment 2010	Average Annual Employment 2013	% Change Average Annual Employment
County						
McKenzie County	990	1,388	40.2	3,600	9,191	155.3
Williams County	1,093	1,508	38.0	16,014	37,435	133.8
Occupation (McKenzie and Williams Counties)						
Agriculture, Forestry, Fishing and Hunting	786	910	15.8	110	158	43.6
Construction	1,110	1,574	41.8	1292	6,364	392.6
Mining, Quarrying, and Oil and Gas Extraction	1,556	1,924	23.7	5,381	14,668	172.6
Transportation and Warehousing	1,505	1,539	2.3	1,206	5,070	320.4
Professional and Technical Services	1,664	1,998	20.1	468	1,278	173.1
Health Care and Social Assistance	684	857	25.3	1,737	1695	2.4
Utilities	1,225	1,374	12.2	120	279	132.5

Source: North Dakota Workforce Intelligence Network (NDWIN) 2014.

North Dakota currently has the lowest unemployment rate in the U.S. at 2.4 percent (not seasonally adjusted) (NDWIN 2014). McKenzie and Williams counties had two of the lowest unemployment rates in the state at 1.1 percent and 0.9 percent, respectively, ranking 50th and tied for 52nd out of 53 counties (NDWIN 2014). The combined labor force in the 2 counties in November 2014 was estimated at 49,240; approximately 48,793 of whom were employed. The remaining 447 unemployed individuals represent a 0.9 percent combined unemployment rate for McKenzie and Williams counties together (NDWIN 2014).

3.15.5 Housing

The surge in oil and gas development in northwest North Dakota has stressed the housing markets in the Project area and surrounding counties. Workforce-related housing during construction could be an important concern with any significant project development. Status of the housing market and availability of various types of housing are constantly changing in this market environment. The 2010 Census counted 3,090 housing units in McKenzie County and 10,464 units in Williams County (**Table 3.15-4**). At that time, the vacancy rates in owner units were extremely low: 0.5 percent in McKenzie County and 0.6 percent in Williams County. The commensurate vacancy rates for rental units were notably higher at 8.5 percent and 4.2 percent, respectively. However, rental units made up only slightly over one-quarter of all housing units in both counties so the vacant rental units represented just 2.3 percent of all housing units in McKenzie County and an even lower 1.2 percent of all housing units in Williams County. By the middle of 2013, just over 3 years after the census, the total number of housing units in McKenzie County had increased by 14.8 percent and the total in Williams County had increased by 40.2 percent. Despite the increases in housing supply, vacancy rates had shrunken further in the face of booming demand. For McKenzie and Williams counties, the homeowner vacancy rates had fallen to 0.8 percent and 0.2 percent, respectively, and the rental vacancy rates had fallen to zero percent and 1.2 percent respectively. With the demand for housing continuing to grow much faster than supply, the oil and gas developers and some support industries have brought in temporary worker housing ranging from ad hoc recreational vehicle (RV) sites to full blown man camps to accommodate single status workers. There currently are more than 30 such camps with bed capacity estimated at over 10,000 workers.

Table 3.15-4 Housing Occupancy 2010

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Total Housing Units (2010)	3,090	10,464	442	317,498
Occupied	2,410	9,293	394	281,192
Vacant	680	1,171	48	36,306
Owner Units Vacancy Rate (%)	0.5	0.6	NA	1.5
Rental Vacancy Rate (%)	8.5	4.2	0.0	7.1

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2013.

3.15.6 Public Facilities and Services

McKenzie and Williams county governments generally provide a full complement of governmental services, including general county government, law enforcement, fire protection, road and bridge infrastructure, solid waste disposal, and education. Fire protection typically is in the form of rural volunteer fire departments. The larger cities, such as Williston, also are mostly served by volunteer fire departments.

The Project would traverse portions of two school districts: McKenzie County District #1, serving much of McKenzie County; and Tioga District #15 in the southeast corner of Williams County. McKenzie County District #1 has one K through 5 elementary school and one 6 through 12 junior-senior high school, both located in Watford City. Tioga District # 15 has one K through 6 elementary and one 7 through 12 high school located in Tioga. As noted in **Table 3.15-5**, both districts experienced declining enrollments prior to 2010, but both have seen dramatic increases since the 2009-2010 school year. The Tioga District has had particularly large enrollment increases in the elementary grades and passed a bond issue in early 2014 to support expansion of its elementary school and other improvements (Johnston 2014). The district also has experienced challenges in staffing to accommodate the enrollment growth, resorting to providing subsidized housing in the face of significant increases in rents in recent years (Johnston 2014). The McKenzie County district added on to its elementary school in 2013, but has seen the added capacity nearly used up by enrollment growth. The voters of the district passed a $27 million bond issue with a 90 percent positive vote

in March 2014 to build a new high school. Staffing for the growth has challenged the district, leading to a joint effort with Watford City to provide affordable housing for some public employees (Holen 2014).

Table 3.15-5 School District Enrollments

School District	School Year Total Enrollment			Percent Change	
	1999-2000	2009-2010	2014-2015	'99-'00 to '09-'10	'09-'10 to '14-'15
McKenzie County #1	669	544	1,325	-18.7	143.6
Tioga #15	346	291	490	-15.9	68.4

Source: North Dakota Department of Public Instruction 2014, 2010, 2000.

Public facilities and services throughout the Project area have been stressed by the growth in population and activity related to oil and gas development. All fire protection services are provided by volunteer departments located in communities throughout the two counties. The nearest departments are located in Ray and Tioga in Williams County and in Watford City in McKenzie County. Fire calls in recent years have increased three to four fold from a variety of sources, ranging from grass fires caused by private generators and gas flares to motor vehicle accidents (Hallesy 2014).

Except in Williston and Watford City, where ambulance services have some paid staff, ambulance services also are staffed by volunteers; the departments nearest the Project area in Williams County are located in Tioga and Ray. McKenzie County Ambulance Service is based in Watford City. Medical care is provided by a combination of 24- and 25-bed Critical Access Hospitals in Williston, Watford City, and Tioga, and Rural Health Clinics in Watford City and Tioga. McKenzie County Health Care System is planning to start construction in 2014 on a new hospital, clinic, and nursing home in Watford City.

Law enforcement in the rural portions of the Project area is provided by county sheriffs or the state patrol. The Williams County sheriff's office added 15 deputies in 2013, effectively doubling the staff of sworn officers to approximately 28 individuals. The McKenzie County sheriff has tripled staff in recent years to approximately 15 sworn officers and plans to add 3 more in 2014 (Lass 2014).

3.15.7 Public Finance

The State of North Dakota levies a 5 percent tax on sales and use of most goods. Neither of the counties in the Project area levies a sales tax. The cities of Ray, Watford City, and Williston levy both sales and use taxes and lodging taxes. The rates range from 1.0 percent in Watford City to 2.5 percent in Tioga for sales and use taxes. The lodging tax is 1.0 percent in Ray and 2.0 percent in other communities.

The "true and full value" of pipelines is determined by the state. This value is then halved to determine the assessed value; the taxable value is 10 percent of the assessed value. County mill rates are applied to the taxable value to determine the amount of property tax that is owed. Property taxes are a major source of county and school district revenue. Tax revenues are allocated to county funds, school districts, special districts, and municipalities. **Table 3.15-6** illustrates the total property tax revenue for the two counties in the Project area and the portion that is attributable to pipelines. As shown, pipelines in McKenzie County contribute between 23.2 percent (2010) and 39.4 percent (2013) of the county's total property tax revenue. Williams County has a much larger base of assessed valuation than McKenzie County. As a result, although the tax revenue from pipelines is fairly similar in both counties, the percentage of total property tax revenue in Williams County is much smaller, ranging from 4.8 percent in 2005 to 14.4 percent in 2013.

Table 3.15-6 Property Tax Summary

County	Taxes Levied on Pipelines ($)				Total Ad Valorem Property Taxes and Special Assessments ($)			
	2005	2010	2012	2013	2005	2010	2012	2013
McKenzie County	1,144,329	1,068,321	2,231,083	4,391,587	4,546,665	4,604,562	6,835,766	11,146,876
Williams County	831,112	1,426,198	2,672,424	5,181,870	17,266,076	20,228,934	28,075,639	36,016,525

Source: North Dakota Office of State Tax Commissioner 2014, 2012, 2010, 2005.

3.16 Environmental Justice

EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was issued February 11, 1994 (59 *Federal Register* 7629). EO 12898 "is intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment." It requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations.

Pursuant to EO 12898, the President's CEQ prepared "Environmental Justice: Guidance Under the Environmental Policy Act" (CEQ 1997a) to assist federal agencies in addressing environmental justice under NEPA. CEQ guidelines for evaluating potential adverse environmental justice effects indicate minority populations should be identified when either: 1) a minority population exceeds 50 percent of the population of the affected area, or 2) a minority population represents a "meaningfully greater increment" of the affected area population than the population of some appropriate larger geographic unit, as a whole.

Low-income populations are those communities or sets of individuals whose median income is below the current poverty level of the general population. In identifying low-income populations, a community may be either a group of individuals living in geographic proximity to one another or a set of individuals (e.g., migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997b).

3.16.1 Minority Populations

The Project route would traverse portions of McKenzie and Williams counties. According to the 2010 decennial census and current population estimates, the populations of both counties are primarily white (**Table 3.16-1**). No minority population in either county exceeds 50 percent of the total population. The racial and ethnic composition of Williams County is similar to that of North Dakota as a whole. The percentage of Hispanic or Latino population in Williams County is slightly higher than for the state, but the difference is relatively small and would not be considered "meaningfully greater" than the state population.

Table 3.16-1 Race and Ethnicity by County Crossed by the Project (Percent)

Race or Ethnic Group	McKenzie County	Williams County	State of North Dakota
White	79.2	92.1	90.1
Black or African American	0.4	0.8	1.5
American Indian, Eskimo or Aleut	18.4	3.9	5.5
Asian	0.4	0.5	1.1
Native Hawaiian and Other Pacific Islander	0.1	0.1	0.1
Two or More Races	1.6	2.7	1.8
Hispanic or Latino	3.5	3.1	2.5
White alone, not Hispanic or Latino	77.0	89.5	88.1

Source: U.S. Census Bureau 2013.

The largest minority population in both counties and in North Dakota is American Indian. McKenzie County's American Indian population, at 18.4 percent, would be considered meaningfully greater than the 5.5 percent of the state as a whole and, as such, would be considered an identified minority population for purposes of environmental justice review. Much of the large American Indian population in McKenzie County can be attributed to the portion of the Fort Berthold Indian Reservation that lies in the eastern part of the county.

The southern terminus of the Project at the proposed Hawkeye Oil Facility is approximately 4 miles due west of the northwestern corner of the Reservation.

The Hispanic or Latino population is the second largest minority group in both counties and in the state. However, the percentages of the county populations that are Hispanics or Latinos are not sufficiently larger than the percentage of the state population to be considered "meaningfully greater" for purposes of this analysis.

3.16.2 Low-Income Populations

The Project would cross sparsely populated rural areas. Median household incomes for both McKenzie and Williams counties were substantially above the state median income (**Table 3.16-2**). The 2012 median household income for both counties indicates a general level of income that was well above the poverty threshold. However, the percentages of persons below the poverty level represent 13.2 percent of the population in McKenzie County, slightly above the state's 12.1 percent. Williams County has just 8.1 percent below the poverty level. The Fort Berthold Indian Reservation has a poverty rate of 38.0 percent, well above the rates for the state and both counties in the Project area. Although the total numbers are small, the unusually high level of poverty on the reservation likely is a significant factor in McKenzie County's level exceeding the state level. According to the CEQ guidance, the exceptionally high percentage of the reservation population living below the poverty threshold would classify that as a low-income population for purposes of environmental justice analysis.

Table 3.16-2 Study Area Income and Poverty Levels

	McKenzie County	Williams County	Fort Berthold Indian Reservation[1]	North Dakota
Per capita income (2012)	$33,574	$35,824	$11,810	$28,700
Median household Income	$61,893	$69,617	$27,679	$51,641
Persons below poverty level	13.2%	8.1%	38.0%	12.1%

[1] Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2014.

3.17 Transportation

The Project would intersect public roads at 20 locations. Two of the roadways (ND 1804, ND 1806), representing four separate intersections, are on the state highway classification system. ND 1804 is a paved, two-lane highway designated as a minor arterial and district corridor on the state system. The Project route would cross ND 1806 four times, including one time by the lateral to the Hawkeye Compressor Station; all of the crossings would be south of Lake Sakakawea. ND 1806 is a paved, two-lane highway designated as a major collector and district collector on the state highway system. All other roads intersected by the Project route are minor rural roadways, typically with gravel surfaces; although a few are two-track dirt roads that only provide access to adjoining private property. **Table 3.17-1** provides traffic volume data for the two state highways; counts are not available for the minor roads. As the table illustrates, traffic volumes have increased substantially in recent years due to oil and gas development activities in the Bakken Formation.

Table 3.17-1 Traffic Volumes on Major Roadways

	Traffic Counts[1]					
	2002		2011		2013	
Highway	All Traffic	Commercial Trucks	All Traffic	Commercial Trucks	All Traffic	Commercial Trucks
ND 1804	430	95	1,420	625	1,700	1,000
ND 1806 (E-W)	120	25	200	150	140	55
ND 1806 (N-S)	220	40	445	175	800	255

[1] Annual Average Daily Traffic.

Source: North Dakota Department of Transportation 2013, 2011, 2002.

In addition to the road system, air travel is available to the area via Sloulin Field International Airport in Williston, the Watford City Municipal Airport in Watford City, and Theodore Roosevelt Regional Airport in Dickinson. A Burlington Northern-Santa Fe main line provides rail service through Williston, Tioga, and Ray. The line runs approximately 6.5 miles north of the Project route at its nearest point.

3.18 Public Safety

Increased crude oil production has resulted in an increased demand for crude oil transportation. Railroads, trucks, and pipelines are the three main modes of overland crude oil transportation. Each has benefits and disadvantages related to safety, cost, and efficiency.

3.18.1 Railroad

An analysis of rail incidents in the U.S. reports the average incident rate per million train miles in 2010 was 16.3, and the average human fatality rate for all rail-related accidents or incidents was 1.03 human fatalities per million train miles (Federal Railroad Administration 2010). “Train miles” is defined as the movement of a train for a distance of 1 mile. Recent incidents, including the Lac-Mégantic train derailment in Quebec that resulted in the death of an estimated 47 people, have raised safety concerns related to transportation of crude oil by rail (Giovannetti et al. 2013).

The Project is expected to provide a base capacity of 60,000 bpd. Based on an average railroad car capacity of 714 barrels (Canadian Energy Pipeline Association 2013), more than 80 rail cars would be required to transport the same amount of crude oil as the Project.

3.18.2 Truck

Trucks and motor vehicles supply the final movement of crude oil from the end of pipelines or rail stations to their destinations. Because of the uncertainty of highway driving and the potentially hazardous nature of crude oil, trucks have a less safe record when compared with pipelines or rail.

Transporting crude oil by truck is not cost efficient because of a truck’s limited load capacity. Based on an approximate maximum load of 200 barrels per truck, 300 trucks are required to transport the Project’s base capacity of 60,000 barrels per day. Transporting crude oil by truck also would increase road traffic volume and thus increase the risk of vehicle accidents. However, trucks are necessary for versatility and final delivery, especially where existing road infrastructure allows movement to locations without pipelines.

3.18.3 Pipeline

Pipeline transportation has a lower risk of injury to the general public than overland transportation of oil by truck or rail (Fraser Institute 2013). The risk associated with the operation of the Project can be compared with the general risks encountered in everyday life. The USDOT reports that the average number of fatalities per year in the general population associated with hazardous liquids pipelines from 2002 to 2012 was 2.0 (PHMSA 2014). Based on U.S. Census Population Data and an average incident frequency of 2.0 fatalities per year, the risk to the general population per year associated with all hazardous liquids transmission pipelines is 0.0007 per 100,000 (U.S. Census Bureau 2010, 2000; PHMSA 2014). In comparison, the overall average annual death rate for the general population in the US is 740.6 per 100,000 people (Center for Disease Control 2010).

In 2013, over 99.99 percent of liquid product transported by pipelines in the U.S. was delivered safely and without incident (PHMSA 2014; Association of Oil Pipe Lines 2014). In the previous 20 years, there have been no recorded fatalities attributable to hazardous liquid pipelines in North Dakota.

Table 3.18-1 provides a summary of the main modes of crude oil transport including pipeline, truck, and railroad as they compare to one another.

Table 3.18-1 Crude Oil Transport Methods

Parameter	Transport Method		
	Rail	Truck	Pipeline
Safety: incidents per billion ton-miles	2.08[1]	19.95[1]	0.58[2]
Safety: fatalities–incident frequency	2.4/year	10.2/year	2.0/year
Safety: public exposure	Moderate-high	High	Low
Safety: environmental exposure (volume dependent)	Low to moderate	Low	Low to high
Overall safety (human and environment)	Good	Poor	Best overland
Capacity (barrels)	714 barrels/rail car	200 barrels/truck	60,000 bpd
Number of units required to carry Project's base capacity (60,000 bpd)	84	300 trucks	NA
Percentage of total oil transported (average U.S. 2000–2009)	3%	4%	70%
Destination	Mainland, requires infrastructure	Mainland, no additional infrastructure required	Mainland, requires infrastructure
Flexibility (dependent on infrastructure requirements)	Moderate	High, provides transportation to final destination	Moderate

[1] Fraser Institute 2013.

[2] PHMSA 2014.

3.18.4 Risk Assessment

The Project's Risk Assessment presents the results of a pipeline incident frequency analysis based on the Project's design and operations criteria and applies the resulting risk probabilities to an environmental consequence analysis that incorporates Project-specific environmental data. Specifically, the assessment evaluates the risk of crude oil and natural gas releases during pipeline operations, including probable spill volumes and contribution of natural hazards to spill risk and the subsequent potential effects on humans and other sensitive resources, particularly in areas of high environmental sensitivity, including federally designated HCAs (e.g., certain populated areas, designated zones around public drinking water intakes, and/or ecologically sensitive areas). The complete assessment can be found in **Appendix A**.

3.19 Hazardous Materials and Solid Waste

3.19.1 Hazardous Materials

3.19.1.1 Regulatory Framework

"Hazardous materials," which are defined in various ways under a number of regulatory programs, can represent potential risks to both human health and the environment when not properly managed. The term hazardous materials include the following materials that may be utilized or disposed of during construction and operation:

- Substances covered under Occupational Safety and Health Administration (OSHA) Hazard Communication Standards (29 CFR 1910.1200 and 30 CFR 42): The types of materials that may be used in pipeline construction and operational activities and that would be subject to these regulations would include most, if not all of the materials listed in **Table 3.19-1**.

Table 3.19-1 Hazardous Materials Typically Used in Pipeline Construction and Operation

Canned spray paint
Compressed gases (flammable and nonflammable)
Diesel deicer
Drilling fluid
Fire extinguishers
Gasoline treatment
Glycols (ethylene glycol, propylene glycol, triethylene glycol)
Herbicides
Lead acid batteries
Methanol
Penetrating oil
Pesticides
Petroleum-based lubricants and fluids (motor oil, grease, hydraulic fluid, transmission oil)
Petroleum fuels (gasoline, diesel)
Pipe coating resin
Solvents/solvent containing products
Starter fluid

Sources: BLM 2005; Folga 2007; Pharris and Kolpa 2007.

- “Hazardous materials" as defined under USDOT regulations at 49 CFR 170-177: The types of materials that may be used in construction and operational activities and that would be subject to these regulations would include sodium cyanide, explosives, cement, fuels, some paints and coatings, and other chemical products.
- “Hazardous substances” as defined by Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and listed in 40 CFR Table 302.4: The types of materials that may contain hazardous substances that would be subject to these requirements would include solvent-containing materials (e.g., paints, coatings, degreasers), acids, and other chemical products.
- “Hazardous wastes” as defined in the Resource Conservation and Recovery Act (RCRA): Procedures in 40 CFR 262 are used to determine whether a waste is a hazardous waste. Hazardous wastes are regulated under Subtitle C of RCRA.

- Any “hazardous substances” and "extremely hazardous substances" as well as petroleum products such as gasoline, diesel, or propane, that are subject to reporting requirements if volumes on-hand exceed threshold planning quantities under Sections 311 and 312 of Superfund Amendments and Reauthorization Act (SARA): The types of materials that may be used in construction and operational activities and that could be subject to these requirements would include fuels, coolants, acids, and solvent-containing products such as paints and coatings.
- Petroleum products defined as "oil" in the Oil Pollution Act of 1990: The types of materials that would be subject to these requirements include fuels, lubricants, hydraulic oil, and transmission fluids.

In conjunction with the definitions noted above, the following lists provide information regarding management requirements during transportation, storage, and use of particular hazardous chemicals, substances, or materials:

- The SARA Title III List of Lists or the Consolidated List of Chemicals Subject to Emergency Planning and Community Right-to-Know Act and Section 112(r) of the CAA.
- The USDOT listing of hazardous materials in 49 CFR 172.101.

Certain types of materials, while they may contain potentially hazardous constituents, are specifically exempt from regulation as hazardous wastes. Used oil, for example, may contain toxic metals, but would not be considered a hazardous waste unless it meets certain criteria. Other wastes that might otherwise be classified as hazardous are managed as “universal wastes” and are exempt from hazardous waste regulation as long as those materials are handled in ways specifically defined by regulation. An example of a material that could be managed as a universal waste is lead-acid batteries. As long as lead-acid batteries are recycled appropriately, requirements for hazardous waste do not apply.

Hazardous Materials Use

A number of hazardous substances would be used in the construction, operation, and maintenance of the Project. **Table 3.19-1** lists common types of hazardous materials that could be used, but it is not a comprehensive list.

3.19.2 Solid Waste

3.19.2.1 Regulatory Definition of Solid Waste

Solid waste consists of a broad range of materials that include garbage, refuse, wastewater treatment plant sludge, non-hazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances) resulting from industrial, commercial, mining, agricultural, and community activities (USEPA 2006). Solid wastes are regulated under different subtitles of RCRA and include hazardous waste (discussed in the previous section) and non-hazardous waste. Non-hazardous wastes are regulated under RCRA Subtitle D.

3.19.2.2 Solid Waste Generation

Solid waste generated from pipeline construction is minimal when compared to other types of industrial and commercial construction projects. Solid waste generated from construction and operation of the pipelines and associated facilities generally would consist of construction rubble (e.g., excess or off-spec concrete, soil, and rock), paper, cardboard and packing material, brush, other vegetation, scrap metal, discarded food, trash, garbage, general refuse, equipment maintenance waste (filters, used oil), and regulation-defined empty containers. The generation of hazardous waste during construction is not anticipated and most likely would occur as result of spill cleanup and remediation.

Pipeline operations may generate solid wastes similar to construction activities, but maintenance of the pipeline has the potential to produce waste in the form of sludge and other liquid (including hydrostatic test water) or solid waste generated during cleaning and repair of the pipeline and pumping facilities. These

materials may be hazardous wastes depending upon the outcome of analytical testing or knowledge of process generating the materials.

3.19.2.3 Contaminated Sites

In spite of the generally rural areas crossed by the Project route, there is always the potential that contaminated sites are present, given that proposed pipelines often parallel or are within existing utility and transportation corridors. Contaminated sites can result from industrial activities (mineral extraction, mineral processing, and manufacturing) or from commercial activities (fuel storage for retail outlets, vehicle maintenance). Active or closed landfills or unauthorized dumps within the Project area also may present potential contamination concerns.

3.20 Cultural Resources

3.20.1 Types of Cultural Resources

A cultural resource is a definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence (BLM 2004). Cultural resources generally must be at least 50 years old, and encompass a diverse array of property types including buildings; structures (e.g., bridges, canals, railroads); sites; objects; and districts. In addition, certain cultural resources may be defined as cultural landscapes, which are classified either as historic sites, historic designed landscapes, historic vernacular landscapes, or ethnographic landscapes (NPS 1998). Finally, certain areas that are associated with the cultural practices or beliefs of a living community or cultural group may qualify for consideration as traditional cultural properties (Parker and King 1998).

3.20.2 Applicable Federal Laws and Regulations

Federal historic preservation laws provide a mandate and procedures for the identification, documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings, which can include private undertakings operating under federal license, or on federally managed lands. The NEPA requires federal agencies involved in undertakings to consider the potential effects to the "human environment," an all-encompassing term that has been interpreted to include historical and archaeological resources.

The NHPA requires federal agencies to consider an undertaking's effects on "historic properties," which are defined as cultural resources listed or determined eligible for listing on the NRHP. Section 106 of the NHPA and accompanying implementing regulations specified in 36 CFR 800 ("Protection of Historic Properties") establish a collaborative consultation/review process and specific sequential procedures that enable federal agencies to identify historic properties that may be directly or indirectly affected by a proposed federal undertaking.

In addition to the NHPA, there are other regulations, statutes, and authorities enacted for the protection of historic properties, as well as sites of tribal importance and human remains. These include, but are not limited to:

- The ARPA of 1979 (16 U.S.C. 470aa-mm) was enacted ..."to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals" (Sec. 2(4)(b)). The Act makes it illegal to excavate or remove from federal or Indian lands any archaeological resources without a permit from the land manager. Major penalties for violating the law include both fines and imprisonment.
- The NAGPRA of 1990 (25 U.S.C. 3001-3013) established a means for Native Americans, including Indian Tribes, to request the return of human remains and funerary objects, sacred objects, or objects of cultural patrimony held by federal agencies or federally assisted museums or institutions. NAGPRA also contains provisions regarding the intentional excavation and removal of, inadvertent discovery of, and illegal trafficking in Native American human remains and sensitive cultural items on federal lands.
- NDCC 23-06-27 protects unmarked human burials and NDCC 55-02-07 protects historic and prehistoric sites located on land owned by the State of North Dakota.

The Advisory Council on Historic Preservation (ACHP) is authorized by Section 211 of the NHPA to issue regulations to govern the implementation of Section 106 of the NHPA. These regulations, "Protection of Historic Properties" (36 CFR Part 800), establish the process that federal agencies must follow in order to take into account the effects of their undertakings on historic properties and provide the ACHP its required

opportunity to comment. Section 106 establishes a four-step review process by which historic properties are given consideration during the conduct of federal undertakings.

The four steps are as follows:

1. Initiate the Section 106 process by establishing the undertaking, defining the Area of Potential Effect (APE), and consulting with the appropriate parties, including federal agencies, SHPOs, ACHP, Native American Tribes, local governments, interested parties, and the public;
2. Identify historic properties through inventory and evaluation;
3. Determine effects to historic properties using the criteria of adverse effects found in 36 CFR 800.5; and
4. If adverse effects occur, take appropriate measures to avoid, minimize, or mitigate those effects.

3.20.3 The NRHP Eligibility Criteria

The NRHP, maintained by the NPS on behalf of the U.S. Secretary of the Interior, is the nation's inventory of historic properties. Resources determined officially NRHP-eligible through consultation, as well as those already listed on the NRHP, warrant impact assessment under Section 106 of the NHPA. There are three main standards that a cultural resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, the resource generally must be at least 50 years old. To meet the integrity criteria, the resource must possess the applicable aspects of integrity, which may include location, design, setting, materials, workmanship, feeling, and association. Finally, the resource must be significant according to one or more of the following criteria:

Criterion A: Be associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B: Be associated with the lives of persons significant in our past;

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 800.4).

3.20.4 Area of Potential Effects

The APE is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE should include the following:

- All alternative locations for all elements of the Project;
- All locations potentially subject to ground disturbance resulting from construction activities;
- All locations from which elements of the Project (e.g., aboveground facilities; a pipeline trench scar on the landscape) might be visible; and
- All locations in which the Project might cause permanent changes to traffic patterns, land use, and public access.

The Project APE for cultural resources encompasses the 50- to 100-foot-wide construction ROW, authorized ATWS, and proposed oil receipt facilities. Where applicable, the APE for visual impacts includes

those aboveground ancillary facilities or other Project elements that are visible from historic properties in which setting contributes to their NRHP-eligibility.

3.20.5 Culture History

The south end of the Project APE lies within the Northwestern Plains. As it traverses north, the APE crosses through the Middle Missouri subarea and ultimately ends in the Northeastern Plains. Prehistory and history of the northern Plains are broken into chronological periods or traditions consisting of Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Equestrian Nomad, and Euro-American Settlement. The following is a brief overview of the prehistory and history of the area encompassing the Project.

3.20.5.1 Paleo-Indian Tradition (11,500 – 7,500 years Before Present [BP])

The earliest evidence of human occupation in North Dakota (and North America) is referred to as the Paleo-Indian period. This period is separated into four major complexes based on the variation in projectile points, tool kits, and radiocarbon dates. The four complexes are Clovis, Goshen, Folsom, and Late Paleo-Indian; the Clovis complex being the earliest of the four. Clovis toolkits consisted of basally fluted projectile points and highly developed bone and ivory technology. Early Paleo-Indians were nomadic and followed the movement of extinct megafauna such as mammoth, mastodon, bison, and camel. In addition to hunting, these nomadic people exploited flora and fauna as they moved through different ecosystems. Paleo-Indian sites become more common throughout North Dakota during the Late Paleo-Indian period; however, no Paleo-Indian sites have been documented in the Project area.

3.20.5.2 Plains Archaic Tradition (7,500 – 2,400 years BP)

The Plains Archaic is divided into three periods (Early, Middle, and Late), which are based on changes in material culture. During the Plains Archaic, the climate warmed, glacial ice sheets retreated, and many of the large mammals disappeared, leading to a shift in subsistence patterns that included hunting of smaller mammals and an increased reliance on wild plant foods. Early Archaic sites are more common compared to the earlier Paleo-Indian sites, but still relatively rare compared to subsequent periods. Projectile points of the Early Archaic include the small Simonson Side-Notched and large Hawken and Mummy Cave Side-Notched. The Middle Archaic projectile points include the McKean, Duncan, and Hanna complexes, while Pelican Lake points are associated with the Late Archaic.

3.20.5.3 Plains Woodland Tradition (2,400 years BP – 1000 Anno Domino [AD])

The Plains Woodland typically is divided into the Early, Middle, and Late periods. Technological advancements during this period include the replacement of the atlatl and dart by the bow and arrow and the development of ceramics. Artifacts and lifeways of the Early Woodland period are similar to those of the Late Archaic. Ceramics of the Early Woodland are generally thick-walled conoidal forms with grit temper, and projectile points are precursors of the Besant Side-notched points associated with the Besant complex of the Middle Woodland. The Sonota complex (which is known for burial mounds) and the Besant complex are hallmarks of the Middle Woodland period. During the Middle Woodland, ceramics are conoidal in shape with cord-roughening along the rims, occasionally smoothed, and with decorative bosses or punctuates along the rims. Projectile points are Besant Side-notched, small Samantha Side-notched, and corner-notched points similar to Pelican Lake points. During the Late Woodland, fortified villages and gardening become more common, as well as side-notched arrowheads. Ceramics are more conical in shape and often net-impressed, although cord-roughened pottery remains dominant. The appearance of trade items (e.g., obsidian, native copper, shells) indicates a broader connection with other populations across the Plains and Midwest during this period.

3.20.5.4 Plains Village (1000 – 1780 AD)

The Plains Village tradition is represented by semi-sedentary hunter-gatherer-horticulturists, some of whom live in permanent villages for at least part of the year. Inhabitants of these villages practiced subsistence strategies such as gardening of maize, sunflowers, and tobacco; bison hunting; and general hunting and foraging. Many of the larger villages were situated along the Missouri River, but other villages have been

recorded along the James and Sheyenne rivers. Tool kits include Plains and Prairie side-notched projective points along with unnotched triangular points, bifacially flaked end scrapers, and heavy-duty bifacial cutting tools. Pottery included globular jars with straight, out curved, or braced rims and grit, sand, or shell temper. A number of late Plains Village earthlodge villages have been documented south and east of the APE, especially around the confluence of the Knife and Missouri rivers.

3.20.5.5 Equestrian Period (1780 – 1880 AD)

The Equestrian Period, sometimes referred to as the Fur Trade Period, is a time of great change among Native American people as Euro-Americans continued their westward movement and encroachment onto native lands. Introduction of the horse marks the beginning of the period, while the forcing of Native Americans onto reservations marks the end of the period. Within the Project boundaries, a variety of Native American tribes were present at various times, including the Mandan, Hidatsa, Arikara, Crow, and Sioux (Dakota, Lakota, and Nakota). Several trading posts and forts (e.g., Fort Union, Fort Buford) were situated in the vicinity of the Project, which may account for the presence of these tribes.

Evidence for the presence of these tribes is based largely on ethnographic accounts and archaeological remains; although, it is difficult to identify (with certainty) the cultural affiliation of artifacts found at Equestrian period sites. Typically, Equestrian period sites are identified through the presence of Euro-American trade goods; however, many of these trade goods become weathered and eventually rust away (e.g., metal objects) or are missed during field surveys because of their small size (e.g., trade beads). Historical sources such as SHPO files and records, G.K. Warren's 1855 to 1856 maps, 1879 and 1894 Missouri River Commission maps, Smithsonian Institution River Basin Surveys maps, and General Land Office (1897) maps do not show the presence of any tribal villages or sites/features within the Project APE where it crosses the shoreline of the lake or beneath the lake's surface at the Project crossing.

3.20.5.6 Euro-American/Settlement

There was limited Euro-American exploration in North Dakota. From 1742 to 1744, Pierre La Verendrye and his son traveled through the Red River area along parts of the Souris and Missouri rivers. In 1779, trappers and traders working for the Northwest and Hudson Bay companies first appeared along the Red River. Most notably, Lewis and Clark traveled up the Missouri River in 1804 to 1806 as part of the Corps of Discovery Expedition to explore and map the newly acquired territory and find a practical route across the Western half of the continent. In the early 1870s, railroads brought in the first substantial wave of settlers into eastern North Dakota. Settlers acquired land from the railroads or through the Homestead and Timber Culture acts of the 1870s. By 1883, almost all arable land in central and eastern North Dakota had been claimed, and from 1898 to 1915, the railroad industry boom led to the rise of small towns across the state. Agriculture has been the mainstay of the North Dakota economy even through the "bust" years of the Great Depression in the 1930s, WWI (1914 to 1918), and WWII (1939 to 1945). Since 2000, North Dakota has experience rapid growth, largely due to the oil boom in oil-rich Bakken shale.

3.20.6 Cultural Resources Investigations

From 2013 to 2014, Class I and Class III investigations of the APE were completed to identify and evaluate the NRHP-eligibility of all cultural resources that could be subject to impacts associated with Project construction. The Class I file search involved a review of site files and survey reports maintained by the SHPO for a 2-mile-wide corridor centered on the proposed pipeline centerline. The file search revealed a total of 182 previously recorded cultural resources, including 135 prehistoric sites, 10 architectural sites, 31 historic sites, and 6 multi-component site containing both prehistoric and historic sites (Cardno ENTRIX 2014).

Class III investigations involved an intensive pedestrian survey of the proposed pipeline ROW, access roads, receipt points, and extra workspace locations or APE. The survey corridor along the pipeline ROW measured 200 feet and was centered on the proposed pipeline centerline. Approximately 948 acres were intensively inventoried, resulting in the identification of 30 cultural resources (Cardno ENTRIX 2014). These include 23 prehistoric sites and 7 isolated finds. The isolated finds consist of flakes, projectile points, and

farm machinery. By definition, isolated finds are not eligible for the NRHP and are not discussed further in the cultural resources summary.

The prehistoric sites contain stone features, cairns, stone alignments, and/or cultural material scatter (CMS) (**Table 3.20-1**). Of the prehistoric sites, one site (32MZ2768) is on USFS land and is recommended as eligible for the NRHP, one site (32WI0414) is on USACE land and is recommended as not eligible for the NRHP, and the eligibility of the remaining sites is undetermined.

Table 3.20-1 Cultural Resources Located Within or Adjacent to the Project APE

Site Number	Site Type	Site Description	Land Status	NRHP Evaluation
32MZ0773	Prehistoric	CMS	Private	Undetermined
32MZ0796	Prehistoric	CMS	Private	Undetermined
32MZ2164	Prehistoric	Stone circle	USFS	Undetermined
32MZ2168	Prehistoric	Cairn	USFS	Undetermined
32MZ2599	Prehistoric	Stone features	USFS	Undetermined
32MZ2764	Prehistoric	Stone alignment	USFS	Undetermined
32MZ2766	Prehistoric	CMS/cairn	Private	Undetermined
32MZ2767	Prehistoric	Possible stone effigy	Private	Undetermined
32MZ2768	Prehistoric	Stone features	USFS	Recommended Eligible
32MZ2769	Prehistoric	Stone alignment	USFS	Undetermined
32MZ2770	Prehistoric	Cairn	USFS	Undetermined
32WI0414	Prehistoric	CMS	USACE	Recommended Not Eligible
32WI1522	Prehistoric	Stone features/CMS	State Land	Undetermined
32WI1575	Prehistoric	Stone features	Private	Undetermined
32WI1576	Prehistoric	Cairn	Private	Undetermined
32WI1577	Prehistoric	Stone features	Private	Undetermined
32WI1579	Prehistoric	Stone circle	Private	Undetermined
32WI1580	Prehistoric	Stone features	Private	Undetermined
32WI1581	Prehistoric	Stone effigy	Private	Undetermined
32WI1632	Prehistoric	Stone circle/effigy	Private	Undetermined
32WI1633	Prehistoric	Stone alignment	Private	Undetermined
32WI1634	Prehistoric	Stone circle/alignment	Private	Undetermined
32WI1635	Prehistoric	Stone circle	Private	Undetermined

Source: Cardno ENTRIX 2014.

Half of site 32MZ2768 lies within the Elm Tree Archaeological District, which has been nominated for listing on the NRHP. The District covers 152 acres and consists of 12 sites, 6 of which have undergone evaluative testing and were found eligible for inclusion on the NRHP. Rock features were found at all 12 sites; activity areas and datable features additionally were found at the 6 tested sites. The area encompassing the District functioned as a natural travel corridor and the identified sites reflect short-term camps where stone tool production, stone tool maintenance, and bison processing were performed. A minimum of 50 feet separates the archaeological sites within the District and the pipeline centerline. The segment of the proposed pipeline that is near the District boundary would be constructed using HDD.

Results of the cultural resources inventory were documented in a Class III inventory report that was submitted to the BLM for review. The report contains the cultural and historical overview of the Project area; the location, type, and significance of identified cultural resources; archaeological field methods; artifact analysis; eligibility recommendations for each identified site; and recommended mitigation for NRHP-eligible

sites potentially affected by the Project. Following their review, the BLM submitted the Class III inventory report to the SHPO at the State Historical Society of North Dakota on January 20, 2015, for their 30-day review and concurrence. The BLM also sent copies of the archaeological monitoring plan and Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K) to the SHPO for review. In a letter dated February 17, 2015, the SHPO concurred with BLM's recommendation of "No Historic Properties Affected" and found the monitoring plan and Unanticipated Discoveries Plan acceptable (Berg 2015).

3.21 Tribal Treaty Rights and Interests

The federal government has a unique and distinctive relationship with federally recognized Native American tribes as set forth in the Constitution of the U.S., and various treaties, statutes, EOs, judicial decisions, and agreements. This relationship is different from the federal government's relationship with state and local governments or other entities as the U.S. recognizes Native American tribes as distinct sovereign nations. The U.S. government has a trust responsibility to federally recognized Native American tribes that covers lands, resources, money, or other assets held by the federal government in trust and the ability of those tribes to exercise their tribal rights.

The BLM, and represented federal agencies, have the responsibility to identify and consider potential impacts of the proposed action and project alternatives on Indian trust resources. The BLM, as lead federal agency, also has the responsibility to ensure that meaningful consultation and coordination concerning the impacts of the Project on tribal treaty rights and trust resources are conducted on a government-to-government basis with federally recognized tribes.

Indian treaties are negotiated contracts made pursuant to the Constitution of the U.S. and are considered the "supreme law of the land." They take precedence over any conflicting state laws because of the supremacy clause of the Constitution (Article 6, Clause 2). Treaty rights are not gifts or grants from the U.S., but are bargained for concessions. These rights are grants-of-rights from the tribes rather than to the tribes. The reciprocal obligations assumed by the federal government and Indian tribes constitute the chief source of present-day federal Indian law.

During the 1850s and 1860s, the U.S. negotiated treaties with some tribes in order to acquire Indian lands for homesteading. Tribes with traditional or cultural affiliation within the Project area have the right to conduct traditional cultural activities on federal lands crossed by the Project. Tribes also have treaty rights which enable them to hunt, fish, and gather on unoccupied federal lands within the Project area. Treaties which apply to the Project area include the *Treaty with the Mandan Tribe of 1825, Fort Laramie Treaty of 1851, Treaty with the Sioux—Sisseton and Wahpeton Bands of 1851*, and the *McCumber Agreement of 1892/Turtle Mountain*.

The *Handbook of North American Indians*, published by the Smithsonian Institution, is intended to be the most up-to-date and comprehensive encyclopedic summary of what is known about the prehistory, history, and cultures of the aboriginal peoples of North America. Volume 13 (Parts 1 and 2) is devoted exclusively to the cultures of the Plains Indians (DeMallie 2001). According to DeMallie (2001), the area of the Project is located within the somewhat overlapping aboriginal territories of the Mandan, Hidatsa, Arikara, and Assiniboine (Nakota) peoples. The area also was known to have been traditionally utilized by the Lakota and Dakota Sioux groups primarily for hunting and gathering activities.

Since 1936, the "Three Affiliated Tribes of Fort Berthold Indian Reservation" has been the official name of the Mandan, Hidatsa, and Arikara (DeMallie 2001). These three culturally and linguistically different tribes once lived in earthlodge villages on or near the Missouri River. Archaeological evidence suggests that the centrality of the Missouri River in Mandan and Hidatsa culture and lilfeways extends back to at least 1,000 AD when the Plains Village traditional lifestyle based on horticulture, bison hunting, and riverine settlement emerged in the Northern Plains (Murray et al. 2011). The Arikara migrated north from Kansas and Nebraska sometime after the 14th Century, intermittently settling along tributaries of the Missouri River. Around 1845, the Mandan and Hidatsa established Like-a-Fishhook village; the Arikara later joined the Mandan and Hidatsa in Like-a-Fishhook village in 1862 (DeMallie 2001). The historical location of Like-a-Fishhook village is approximately 105 miles from the Project area.

In the 1950s, the Garrison Dam turned the Missouri River into Lake Sakakawea, flooding the bottomland communities and changing the geography of the reservation. As a result of the flooding, the tribes lost approximately 95 percent of its farming land, as well as entire towns, educational and medical facilities, road systems, timber sources, plant and animal habitats, and cultural places (Murray et al. 2011). Although many present-day tribal members view the construction of the dam as a negative transformational event in their

lives, it also is viewed as a repository of intact yet unreachable cultural sites and objects. There is a belief among the Three Affiliated Tribes that the lake contains the sacred waters and places traditionally associated with the Missouri River (Murray et al. 2011). Sites located either beneath the water's surface or along its shores that still figure predominately in the tribe's community history and identity include inundated shrines, significant reservation-era sites, locations of past healing events, familial trapping areas, and structures (Murray et al. 2011).

3.21.1 Government-to-Government Consultation

Tribal consultation by federal agencies is required by EO 13175, which states, "Each agency shall have a process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." The BLM has engaged and would continue to engage with the appropriate tribal governments in official government-to-government consultation, in accordance with all applicable mandates, including, but not limited to Section 101[d][6] of the NHPA, the AIRFA, EO 13007 (Indian Sacred Sites), EO 13175 (Consultation and Coordination with Indian Tribal Governments), Presidential Memorandum on Government to Government Consultation with Native American Tribal Governments (April 29, 1994), and Presidential Memorandum on Tribal Consultation issued on November 5, 2009. The purpose of these consultations is to ensure meaningful and timely input by tribal officials and representatives in the environmental and cultural analyses for the Project, as well as determine if the Project would have an effect on any known properties of traditional religious and cultural importance, traditional cultural properties, and/or sacred sites.

In 1992, the NHPA was amended to explicitly allow that "properties of traditional religious and cultural importance to an Indian tribe may be determined to be eligible for inclusion on the NRHP," and that in carrying out its responsibilities under Section 106 of the NHPA, a federal agency will consult with any Indian tribe that attaches religious and cultural significance to such properties. Properties of traditional religious and cultural importance are geographic locations prominent in a particular group's cultural practices, beliefs, or values, when those practices, beliefs, or values are widely shared within the group; have been passed down through the generations; and, have served a recognized role in maintaining the group's cultural identity for at least 50 years.

If a resource has been identified as having importance in traditional cultural practices and the continuing cultural identity of a community, it may be considered a traditional cultural property or TCP. National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties (Parker and King 1998) defines a TCP as "one that is eligible for inclusion on the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community."

Indian sacred sites are defined in EO 13007 as "any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." It should be noted that sacred sites are considered under EO 13007 and AIRFA, while TCPs and properties of traditional religious and cultural importance are considered under Section 106 of the NHPA.

The BLM initiated government-to-government consultation with 17 tribes who have tribal treaty interests, and/or traditional connections to, western North Dakota through mail notification posted on March 7, 2013, as part of the scoping process. Of the 17 tribes, only the Standing Rock Sioux and Flandreau Santee Sioux Tribe responded to the mail notification. The Standing Rock Sioux requested a pedestrian survey of the APE by tribal representatives because of the religious and cultural significance of lands within the Project area, and the Flandreau Santee Sioux Tribe requested notification of any unanticipated discoveries, but otherwise had no objections to the Project. **Table 3.21-1** lists the 17 tribes invited to participate in consultation for the Project.

Table 3.21-1 Tribes Contacted by the BLM

Cheyenne River Sioux Tribe	Crow Creek Sioux Tribe	Flandreau Santee Sioux Tribe
Fort Belknap Gros Ventre and Assiniboine Tribes	Fort Peck Assiniboine and Sioux Tribes	Lower Brule Sioux Tribe
Lower Sioux Tribe	Northern Cheyenne Tribe	Oglala Sioux Tribe
Rosebud Sioux Tribe	Santee Sioux Tribe of Nebraska	Sisseton-Wahpeton Oyate Tribe
Spirit Lake Tribe	Standing Rock Sioux Tribe	Yankton Sioux Tribe
Three Affiliated Tribes: Mandan, Hidatsa, Arikara	Turtle Mountain Band of Chippewa	

After the scoping process, the BLM sent a letter, with a follow-up phone call and email, inviting the chairman, THPO, and/or designated contact of the 17 tribes to attend face-to-face tribal coordination/ consultation meetings. The purpose of the meetings was to provide information about the Project, answer questions, and solicit comments or concerns regarding areas of tribal concern potentially located in the Project area. The first tribal coordination/consultation meeting was held on June 17, 2013, in New Town, North Dakota. Tribal representatives from the Turtle Mountain Band of Chippewa and Three Affiliated Tribes: Mandan, Hidatsa, and Arikara (MHA Nation) attended the meeting. Chairman Hall of the MHA Nation also attended the meeting in New Town. A second tribal coordination/consultation meeting was held on June 19 and 20, 2013, in Spearfish, South Dakota. Tribal representatives from the Standing Rock Sioux, Yankton Sioux, Spirit Lake, Crow Creek Sioux, Oglala Sioux, Northern Arapaho, Fort Peck Assiniboine and Sioux, and Northern Cheyenne tribes attended the meeting.

Concerns expressed by tribal representatives at the coordination/consultation meetings included pipeline safety, spill risk and response, job opportunities for tribal businesses and workers, sacredness of the lake and of water, and treaty rights (subsistence fishing). In addition, the tribes requested a pedestrian survey of the Project ROW to identify areas of tribal concern. Pedestrian surveys were conducted on various dates in August, September, and October 2013 by tribal members from the Turtle Mountain Band of Chippewa and MHA Nation. The survey corridor measured 200 feet centered on the proposed pipeline centerline. On September 23, 2013, two representatives from the Sisseton-Wahpeton Oyate Tribe, Crow Creek Sioux Tribe, Rosebud Sioux Tribe, Spirit Lake Tribe, Yankton Sioux Tribe, Fort Peck Assiniboine and Sioux Tribes, Cheyenne River Sioux Tribe, Oglala Sioux Tribe, and Northern Cheyenne Tribe initiated their 10-day field survey. The survey corridor also measured 200 feet centered on the proposed pipeline centerline. Multiple areas of tribal concern, some of which may be properties of traditional religious and cultural importance, TCPs, or sacred sites, were identified by tribal members during the surveys. All of the areas of tribal concern would be avoided by the Project either by a realignment or neckdown of the construction ROW.

From April 8 to 10, 2014, the Crow Creek Sioux Tribe conducted field surveys along portions of the Project ROW not visited in 2013. The survey corridor measured 200 feet centered on the proposed pipeline centerline. On September 16 and 17, 2014, tribal surveys were conducted along several variations to the Project ROW where access had been granted by the landowner. Tribal representatives from the Rosebud Sioux Tribe, MHA Nation, Turtle Mountain Band of Chippewa, Spirit Lake Tribe, Sisseton-Wahpeton Oyate Tribes, Yankton Sioux Tribe, Crow Creek Sioux Tribe, and Northern Cheyenne Tribe participated in the surveys. The survey corridor measured 200 feet centered on the proposed pipeline centerline. Multiple areas of tribal concern, some of which may be properties of traditional religious and cultural importance, TCPs, or sacred sites, were identified by tribal members during the surveys. All of the areas of tribal concern would be avoided by the Project either by a realignment or neckdown of the construction ROW.

Results of the tribal surveys were included in an appendix to the Class III cultural resources inventory report. On December 10, 2014, the BLM sent copies of the Class III cultural resources inventory report to all consulting tribes requesting review and comment on the report. To date, the BLM has not received any comments from the consulting tribes.

4.0 Environmental Consequences

This chapter describes the anticipated direct and indirect impacts of the Proposed Action and No Action Alternative. The analysis of potential impacts from the Proposed Action assumed implementation of the applicant-committed environmental protection measures (Section 2.2.2) associated with the Project. Potential monitoring and mitigation developed in response to anticipated impacts are recommended for individual resources, and are discussed at the end of each resource section. This chapter also identifies residual impacts, which are impacts that would remain after mitigation measures have been implemented.

In general, the impact analysis area encompasses the Project area which includes the construction ROW, ATWSs, new or improved access roads, and the proposed Hawkeye Oil Facility. A 100-foot-wide temporary construction ROW would be allowed in most areas except USFS- and USACE-administered lands, wooded areas, and wetland crossings, which typically would be limited to a nominal 50-foot-wide construction ROW. The impact analysis area is the same for all resources unless otherwise noted in the individual resource analyses.

As stated in Chapter 3.0, Affected Environment, there are eight USACE Authorized Project Purposes for Garrison Dam/Lake Sakakawea. One Purpose (i.e., wildlife) may be impacted by the Project and seven Purposes (i.e., municipal and industrial water supply, recreation, water quality, flood control, navigation, irrigation, and hydropower) would not be impacted by the Project. The Purpose that may be impacted by the Project and the resource sections in which it is addressed include Sections 4.9, Wildlife, and 4.10, Special Status Species.

As described in Chapter 2.0, Description of the Proposed Action and Alternatives, Hess proposes to convert existing pipelines from natural gas to NGL as part of the Project. Because there would be no ground disturbance associated with conversion of the existing pipelines, no NEPA analysis is required for the proposed conversion. As such, the following sections are specific to the proposed crude oil and natural gas pipelines, ATWSs, access roads, and Hawkeye Oil Facility. Cultural resources and biological resources surveys were conducted as part of the NEPA analysis. The surveys were conducted along the crude oil/natural gas pipeline ROW, new access roads, access roads requiring upgrade, at ATWS locations, and at the location of the proposed Hawkeye Oil Facility.

4.1 Air Quality

4.1.1 Proposed Action

Primary issues related to air quality include tailpipe emissions of gaseous criteria pollutants and particulates from construction equipment. Construction equipment also would cause fugitive dust emissions from disturbed areas and along paved and unpaved roads. However, construction would progress continuously through a given area, leading to negligible temporary and localized air quality impacts.

4.1.1.1 Construction

CO_2 emissions result from the combustion of diesel fuel in engines powering trucks, tractors, and other mobile equipment such as dozers, backhoes, and trenchers. CO_2 emissions are expected to be far below the USEPAs 25,000-tpy threshold, which would be seen as a significant level of emissions. To reach this level of concern, the fuel usage would have to be on the order of 2,200,000 gallons of diesel fuel. The CO_2 emitted from construction equipment is expected to be only a small fraction of this amount and a minor contribution to national and statewide CO_2 emissions. Emissions from construction equipment combustion and temporary fuel transfer systems and associated tanks would be controlled to the extent required by state and local agencies through the permit process. Therefore, negligible impacts to air quality resulting from the operation of heavy construction equipment are expected.

4.1.1.2 Operation

The Project would include three 50,000-barrel crude oil tanks at the proposed Hawkeye Oil Facility. Daily throughput for each of the storage tanks is assumed to be approximately 23,000 bpd. VOC emissions due to standing, working, and breathing losses were estimated using the USEPA TANKS 4.09D software and estimated tank characteristics. The tanks are assumed to be vertical fixed roof tanks with an internal floating roof. Results from TANKS 4.09D are provided in **Table 4.1-1**.

Table 4.1-1 Estimated VOC Emissions from 50,000-barrel Storage Tanks

Losses per Tank (lbs/year)				
Rim Seal Losses	**Withdrawal Losses**	**Deck Fitting Losses**	**Deck Seam Losses**	**Total VOC Emissions**
1,390	1,026,390	769	0	1,028,549

Source: TANKS 4.09D, USEPA 2005.

As shown in **Table 4.1-1**, total VOC emissions would be 1,028,549 lbs/year or 514 tpy of VOC emissions from onsite storage tanks at the proposed facility. VOC emissions also include emissions of HAPs, such as benzene, toluene, and formaldehyde, which are known to cause health-related issues and can be fatal at higher concentrations. The major source limit for any individual HAP is 10 tpy and 25 tpy for all HAPs combined. Even though HAPs would be only a small fraction of VOC emissions, based on the estimated VOC emissions, HAPs emissions may approach major source limits.

It is assumed that the Project would help to address anticipated regional pipeline and outlet constraints north of Lake Sakakawea as development of the Bakken Formation increases and that the Project is needed to relieve the large truck traffic congestion on the western North Dakota road system. Using the conservative assumptions that each truck hauls 200 barrels, a pipeline capacity of 76,000 bpd, and an average roundtrip of 150 miles, approximately 57,000 truck miles per day would be eliminated from western North Dakota roads. **Table 4.1-2** provides the estimated pollutant reductions expected on a per truck basis, daily basis, and annual basis.

Table 4.1-2 Total Combustion Emissions Reductions Expected from Diesel-fired Heavy Duty Haul Trucks Being Taken Off the Road

Pollutants	Emissions Reductions		
	(tons/truck-day)	(tons/day)	(tpy)
NO_X	1.36E-03	4.09E-01	149.06
CO	4.13E-03	1.24E+00	451.77
SO_2	2.75E-06	8.29E-04	0.31
VOC	9.83E-04	2.95E-01	107.77
Benzene	2.01E-05	6.01E-03	2.18
Toluene	1.47E-05	4.42E-03	1.61
Ethylbenzene	3.04E-06	9.15E-04	0.33
Xylene	1.04E-05	3.14E-03	1.14
Formaldehyde	1.16E-04	3.49E-02	12.73
Normal hexane	1.57E-06	4.70E-04	0.17
CO_2	3.16E-01	9.48E+01	34,560
CH_4	1.30E-05	3.89E-03	1.43
N_2O	2.59E-06	7.79E-04	0.29
CO_2e	3.16E-01	9.50E+01	34,678

4.1.2 Climate Change

Existing climate change models can predict climate change impacts with a high degree of certainty over global or continental scales. However, these same models find it difficult to simulate climate change on a smaller scale. In the small scale environment, climate variations occur frequently, which make it difficult to distinguish if temperature changes are due to external forces (i.e., local construction, drilling, or production activities) or naturally occurring events.

While the effects of GHG emissions are well-documented on the global level, science does not have the ability to determine what effect GHG emissions from particular activities and projects might have on the environment. Although it is not possible to predict the effects on climate change due to the Project, **Table 4.1-2** demonstrates that upon Project completion, yearly GHG emissions would be greatly reduced as a result of decreased truck traffic on the North Dakota arterial highway system.

4.1.3 No Action Alternative

Under the No Action Alternative, the Project would not be developed, and therefore would have no effect on current air quality in the area. The effects to traffic congestion and air quality would not occur as there would be no increase in the miles driven by trucks on western North Dakota roads.

4.1.4 Mitigation

No additional mitigation measures for air quality have been proposed.

4.1.5 Residual Impacts

Assuming applicable environmental protection measures are effectively implemented, and given the short duration and localized nature of the construction activities, the residual impacts of the Proposed Action on air quality are projected to be minimal and short-term in nature. Long-term impacts to air quality are not anticipated.

4.2 Geology and Minerals

4.2.1 Geology

4.2.1.1 Proposed Action

Primary issues related to geology include ground disturbance to the topography along the Project route and at associated aboveground facilities due to grading and trenching that may result in slope instability, impact underground mine voids, or change surface drainage patterns.

Construction

Because the Project route crosses landslide prone areas on either side of Lake Sakakawea, construction activities could result in instability through undercutting of slopes or changes in drainage and surface flow. Construction over undetected underground mining voids could pose dangers for construction workers, result in loss of equipment, and potentially pose a threat to shallow groundwater through spills of fuel and lubricants. Construction would preserve original drainage patterns.

Blasting is not anticipated for the Project. If hard bedrock is encountered, it can be disaggregated by using rippers, trenchers, or other equipment.

Operation

As previously identified, landslide areas would be crossed by the Project route. Pre-construction geotechnical investigations would help to identify site-specific engineering design and monitoring that would lessen the risk and potential impact of landslide and ground instability concerns. Operation of the Project would not alter the geological and physiographic conditions.

Mine subsidence has the potential to create ground instability with a risk of damaging the pipelines, disruption of service, and possible contamination from leaks. As with landslides, pre-construction investigations in areas of known or suspected historic mining, and avoidance of those identified, would lessen the risks associated with ground subsidence.

Because there are no identified active faults along the Project route, no impacts from ground deformation due to fault movement are expected. The Project is in an area not likely to experience strong ground motion during a maximum credible earthquake; therefore, impacts due to ground motion are not anticipated.

4.2.2 Minerals

4.2.2.1 Proposed Action

Primary issues related to minerals include the potential for construction activities to damage wells and associated underground fluid lines and pipelines, and disrupt normal operations and routine maintenance. Also, damage to oil and gas facilities, should it occur, could present severe health and safety and contamination hazards. Abandoned wells also could be impacted because construction potentially could remove existing abandoned well markers and damage near surface cement plugs.

Construction

Because oil and gas are produced at depths considerably deeper than the excavation depth, construction of the Project would not be expected to affect the oil and natural gas producing formations. Rather, any construction-related impacts would be limited to surface or near-surface components of the wells and gathering systems, which would temporarily disrupt production until repairs are made.

As described in **Table 4.2-1**, the Project crosses multiple oil and gas fields. In addition, the Project route may cross aggregate resources (e.g., gravel, sand) in alluvial valleys and river terraces. Aggregate production is formed from localized deposits in floodplains or glacial deposits (Carlson 1985, 1983; Freers 1970). Some areas in McKenzie County also have scoria deposits that are used for road topping.

Scoria is formed from the natural burning of coal seams by lightning strikes that result in baked rock. No gravel or scoria pits are located within the vicinity of the Project route. Nevertheless, construction would have very minor and short-term impacts on current mineral extraction activities due to the temporary and localized nature of pipeline construction activities. Construction of the Project is not expected to impact gravel mining operations.

Table 4.2-1 Oil and Gas Wells within 200 Feet of the Project Route

Pipeline[1]	MP	Direction and Distance from Centerline (feet)	API Number	Operator	Well Name	Well Type[2]	Status[3]
Oil CL	3.8	West, 142	33-053-02099-00-00	Thomas A. Haugen Operating Co.	Vern Sherven 27-1	OG	PNC
Oil CL	7.6	East, 31	33-053-00259-00-00	The Texas Co.	S. Holman 1	OG	DRY
Oil CL	8.4	East, 36	33-053-00165-00-00	Texaco Exploration & Production Inc.	Charlson-Madison North Unit D-404	OG	PA
Oil CL	9.1	East, 134	33-053-00590-00-00	Texaco Exploration & Production Inc.	Charlson-Madison North Unit B-203	OG	PA
Oil CL	9.7	West, 44	33-053-03279-00-00	Denbury Onshore, LLC	Charlson 24-34h	OG	PNC
Oil CL	10.2	East, 180	33-053-00099-00-00	William Herbert Hunt Trust Estate	CMNU B-234	OG	PA
Oil CL	13.3	West, 36	33-105-00417-00-00	Sm Energy Company	Hofflund 16	OG	PA
Oil CL	13.7	West, 16	33-105-00499-00-00	Sm Energy Company	Hofflund 15	OG	PA
Oil CL	16.5	West, 93	33-105-00480-00-00	Koch Industries, Inc.	Capa-Madison Unit N-203	OG	PA
Oil CL	17.3	West, 126	33-105-00473-00-00	Hess Bakken Investments II, LLC	Capa-Madison Unit M-206	OG	PA
Oil CL	19.8	East, 170	33-105-00765-00-00	Hess Bakken Investments II, LLC	BLDU G-303	OG	A
Oil CL	20.5	East, 174	33-105-00118-00-00	New Concord Development Co.	Math Iverson 2	OG	DRY
Oil CL	20.8	East, 164	33-105-00142-00-00	Hess Bakken Investments II, LLC	Beaver Lodge-Devonian Unit G-305i	WI	PA
Oil CL	23.0	East, 2	33-105-00559-00-00	Hess Bakken Investments II, LLC	Beaver Lodge-Devonian Unit G-309	OG	A
Gas CL	0.9	West, 142	33-053-02099-00-00	Thomas A. Haugen Operating Co.	Vern Sherven 27-1	OG	PNC
Gas CL	4.7	East, 31	33-053-00259-00-00	The Texas Co.	S. Holman 1	OG	DRY
Gas CL	5.6	East, 36	33-053-00165-00-00	Texaco Exploration & Production Inc.	Charlson-Madison North Unit D-404	OG	PA
Gas CL	6.3	East, 134	33-053-00590-00-00	Texaco Exploration & Production Inc.	Charlson-Madison North Unit B-203	OG	PA
Gas CL	6.9	West, 44	33-053-03279-00-00	Denbury Onshore, LLC	Charlson 24-34h	OG	PNC
Gas CL	7.4	East, 180	33-053-00099-00-00	William Herbert Hunt Trust Estate	CMNU B-234	OG	PA
Gas CL	10.5	West, 35	33-105-00417-00-00	Sm Energy Company	Hofflund 16	OG	PA
Gas CL	10.9	West, 16	33-105-00499-00-00	Sm Energy Company	Hofflund 15	OG	PA
Gas CL	13.7	West, 93	33-105-00480-00-00	Koch Industries, Inc.	Capa-Madison Unit N-203	OG	PA
Gas CL	14.5	West, 126	33-105-00473-00-00	Hess Bakken Investments II, LLC	Capa-Madison Unit M-206	OG	PA
Gas CL	17.0	East, 170	33-105-00765-00-00	Hess Bakken Investments II, LLC	BLDU G-303	OG	A
Gas CL	17.7	East, 174	33-105-00118-00-00	New Concord Development Co.	Math Iverson 2	OG	DRY
Gas CL	17.9	East, 164	33-105-00142-00-00	Hess Bakken Investments II, LLC	Beaver Lodge-Devonian Unit G-305i	WI	PA
Gas CL	20.2	East, 2	33-105-00559-00-00	Hess Bakken Investments II, LLC	Beaver Lodge-Devonian Unit G-309	OG	A
Gas CL	20.2	East, 199	33-105-01513-00-00	Hess Bakken Investments II, LLC	BLMU L-014 Ah	OG	PA

[1] CL – Centerline.

[2] SWD – Salt Water Disposal Well; C – Confidential; OG – Oil or Gas Well.

[3] IA – Inactive; C – Confidential, PA – Plugged and Abandoned; TA – Temporarily Abandoned; PNC – Permit Now Cancelled; AB – Abandoned; DH – Dry Hole.

Source: North Dakota Oil and Gas 2014.

Operation

The primary issues of concern regarding mineral resources and operation of the Project are the potential for reduced access to underlying minerals and interference with future mineral extraction operations.

Long-term operation of a pipeline has the potential to preclude access to mineral resources. Overall, the Project does not pose a hindrance for accessing oil and gas resources. With the current propensity to drill horizontal laterals or directionally drill wells to access oil and gas resources, the Project would not restrict access to those resources. Although the Project is within an area of coal and uranium resources, no current plans to mine such resources along the Project route were identified.

Additionally, impacts on future mineral development would not constitute a substantial loss of mineral resource or mineral availability because of the narrow, linear nature of the Project relative to the expanse of areas with mineral resource potential. The pipeline trench would be backfilled with materials derived from the trench excavation, and it might be necessary to obtain some construction sand and gravel from local, existing commercial sources for use as pipe padding, road base, or surface facility pads. These demands for sand and gravel would not affect the long-term availability of construction materials in the area.

4.2.3 No Action Alternative

Impacts to geologic materials and minerals in the Project area would be avoided because the Project would not be implemented.

4.2.4 Mitigation

No additional mitigation measures for geology and minerals have been proposed.

4.2.5 Residual Effects

A negligible risk of facility damage would remain after implementation of geologic hazard avoidance or geotechnical engineering design protection measures for slope instability and underground mine subsidence.

4.3 Paleontological Resources

4.3.1 Proposed Action

The primary issue of concern with regard to paleontological resources is the potential damage to and loss of scientifically important fossils from ROW clearing, grading, trench excavation, and construction of other pipeline facilities. Potential impacts to fossil localities during construction would be both direct and indirect. Direct impacts to or destruction of fossils could occur from trenching or facility construction activities conducted through significant fossil beds. Indirect impacts would include erosion of fossil beds due to slope re-grading and vegetation clearing or the unauthorized collection of scientifically important fossils by construction workers or the public due to increased access to fossils along the Project route.

4.3.1.1 Construction

The Project route is within areas where the Tongue River/Bullion Creek and Sentinel Butte formations are the primary bedrock strata. BLM has ranked these Paleocene formations as Class 4 (PFYC) formations due to the high potential of these formations to consistently and predictably produce paleontologically significant vertebrate fossils or scientifically significant invertebrate and plant fossils.

A total of four non-significant fossil occurrences were documented during the field surveys conducted in August and October 2012. A desktop review of variations to the Project route that occurred subsequent to the 2012 field surveys was conducted in September 2014. The desktop review indicated that the route variations fall in flat and primarily vegetated areas with no exposure of sensitive paleontological bedrock due to the vegetation and surficial glacial deposits; therefore, no field surveys were recommended.

Although only four non-significant fossil occurrences were documented during the field surveys of the Project route, and no exposure of sensitive paleontological bedrock was identified during the desktop review of the route variations, data provided by the North Dakota Geologic Survey and University of North Dakota show numerous paleontological resource localities within proximity of the Project route, which suggest that ground-disturbing Project activities through areas underlain by these bedrock units could uncover paleontological resources. Therefore, monitoring for paleontological resources during ground-disturbing activities in areas identified with PFYC Class 4 bedrock would be warranted. If paleontological resources are discovered during Project-related construction activities, all construction activity would cease within 100 feet of the discovery and would be reported to the construction supervisor and a qualified BLM-permitted paleontologist for assessment and recommended actions. The discovery would be handled as stipulated in the Unanticipated Discoveries Plan for Paleontological Resources (POD, Appendix L). Construction activities would not resume until the BLM Project Manager has issued a Notice to Proceed.

4.3.1.2 Operation

Operation of the Project is not expected to disturb important paleontological resources. If there are maintenance activities that would result in surface disturbance, it would occur within previously disturbed ROW and likely would not affect paleontological resources. Therefore, no impacts to paleontological resources during operation of the Project are anticipated.

4.3.2 No Action Alternative

Impacts to paleontological resources in the Project area would be avoided because the Project would not be implemented.

4.3.3 Mitigation

The following mitigation measure is proposed for paleontological resources:

PR-1: Monitoring for paleontological resources during ground-disturbing activities in areas identified with PFYC Class 4 bedrock.

Protection measures for paleontological resources that may be discovered during Project-related ground-disturbing activities are included in the Unanticipated Discoveries Plan for Paleontological Resources (POD, Appendix L).

4.3.4 Residual Effects

Even though construction monitoring would be implemented, some scientifically valuable fossils may be disturbed and lost during excavation and grading over areas that are expected to be disturbed. As a consequence, there would be a small incremental loss of fossil material that would be offset by the material that is recovered and preserved for scientific study purposes.

4.4 Soils

4.4.1 Proposed Action

The primary issues related to soils would be compaction of soil by construction equipment, accelerated erosion due to a lack of vegetative cover and temporary surface grade changes affecting storm water runoff patterns, alteration of the soil profile within the excavated trench, a reduction in soil productivity within permanent facilities, and potential effects of fuel spills.

4.4.1.1 Construction

The Project would have surface disturbing activities that would result in temporary and permanent impacts. Temporary impacts are those impacts to soil resources that are related to initial construction and installation of the pipeline. Surface disturbance areas would be reclaimed and soils would be returned to a condition that currently exists within approximately 5 years following installation of the Project. Permanent impacts are those impacts associated with features used for operations and maintenance of the Project that would not be reclaimed until after the Project is decommissioned at the end of the Project's life. The acreage of sensitive soils impacted by the Project was estimated to assess the overall impacts to soil resources. The acreage of sensitive soils within disturbance areas is listed in **Table 4.4-1**.

Soil compaction likely would result from the movement of heavy construction vehicles along the construction ROW; at facilities, ATWSs, emergency response equipment storage areas, and receipt and delivery points; and on temporary access roads. The degree of compaction would depend on the moisture content and texture of the soil at the time of construction. Compaction would be most severe where heavy equipment operates on moist to wet soils with high clay contents. Detrimental compaction also can occur on soils of various textures and moisture contents if multiple passes are made by equipment. Although all construction areas would be subject to some degree of compaction, soils characterized as compaction prone would require strict adherence to the environmental protection measures (**Table 2-4)** and the CMRP (POD, Appendix C).

Typically, soils that are compaction prone also are prone to rutting or displacement when saturated. Rutting occurs when the soil strength is not sufficient to support the applied load from vehicle traffic. Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting physically severs roots and reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting also disrupts natural surface water hydrology by damming surface water flows, creating increased soil saturation up gradient from ruts, or by diverting and concentrating water flows, thereby causing accelerated erosion and gullying. Rutting is most likely to occur on moist or wet fine-textured soils, but also may occur on dry sandy soils due to low soil strength. Protection measures intended to reduce impacts to soils from rutting can be found in **Table 2-4** and the CMRP (POD, Appendix C).

Accelerated wind and water erosion would occur where land has been disturbed. Soils with unfavorable properties, including thin topsoil layers, moderate to strong salinity and alkalinity, clayey or sandy topsoil, and areas that have steep and/or long continuous slopes would present challenges for erosion control and revegetation. Project-related disturbances would accelerate the potential erosion rates during construction; however, accelerated erosion potential would be mitigated through installation of erosion control measures during construction and by re-establishment of natural contours and vegetative cover post-construction as a function of reclamation. Protection measures intended to reduce impacts to soils from erosion during construction and post construction can be found in **Table 2-4**, the CMRP (POD, Appendix C), and SWPPP (POD, Appendix I).

Table 4.4-1 Soil Characteristics within Disturbance Areas (Acres)

Disturbance Type	Wind Erodible	Water Erodible	Compaction Prone	Hydric	Droughty	Shallow Depth to Bedrock	Prime Farmland	Farmland of Statewide Importance
New Pipelines (Temporary)	11.7	16.3	127.2	85.2	0	0	1.6	49.7
Proposed Hawkeye Oil Facility (Permanent)	0	0	78.9	74.9	0	0	0	59.9
Total	11.7	16.3	206.1	160.1	0	0	1.6	109.6

Source: NRCS 2014.

To avoid soil mixing or alteration of the soil profile, topsoil would be removed and segregated from the underlying subsoil for the entire width of the Project ROW for the length of the pipeline (**Table 2-4** and POD, Appendix C). Typically, stripped topsoil would be stored within the temporary construction ROW on the spoil side of the trench. After pipeline installation is complete, the subsoil would then be replaced in the pipeline trench and adjacent areas to restore the land's natural contours. At that time, the topsoil would be replaced in the locations from where it was initially removed.

Prime Farmland, Farmland of Statewide Importance, and general farmland and pastures would be temporarily impacted during construction of the pipeline. With proper topsoil segregation and de-compaction techniques, impacts to farmland are expected to be short-term. No permanent facilities would be constructed on Prime Farmland; however, Farmland of Statewide Importance would be permanently impacted by the proposed Hawkeye Oil Facility. Strict adherence to the environmental protection measures for agricultural lands would be required to minimize and prevent future loss of crop/soil productivity (**Table 2-4**).

Most of the impacts to soil resources would be temporary, because all disturbed areas not needed for operations would be reclaimed within 1 year of construction. Most reclamation would be completed within a few months of disturbance. However, soil impacts may occur if revegetation is not successful or adverse weather conditions (mainly heavy rainstorms) occurred during construction or before reclamation and erosion control measures could be implemented.

Some unquantifiable soil loss resulting from accelerated wind and water erosion would occur until erosion measures were implemented (generally measures would be implemented before and concurrently with construction and reclamation, and seeding would occur within 20 days of backfilling the trench). In addition to the sensitive soils described in **Table 4.4-1**, a few small unquantifiable areas (mainly abrupt steep slopes and localized areas with soil containing unfavorable physical and chemical properties) would be subject to accelerated erosion and require intensive and continuing maintenance of erosion control measures.

With effective use of erosion control/revegetation procedures, herbaceous vegetation on sites without soil limitations is expected to return to near pre-construction conditions within 5 years after construction. Problem areas may require replanting and/or use of special revegetation techniques if revegetation does not respond in one to two growing seasons. In areas of limited precipitation or drought (less than 9 inches), and where there are shallow soils and/or low permeability soils, reclamation techniques that enhance permeability and conserve moisture would increase the potential for successful revegetation.

Potential effects of fuel spills on soils would include contamination at the spill site and possible removal of contaminated soils. Contaminant BMPs incorporated into the SPCC Plan (POD, Appendix N) would be implemented to minimize fuel spills and their potential effects.

4.4.1.2 Operation

As previously described, some soil loss would result from wind and water erosion until erosion control measures begin to take effect. Very small-scale, isolated surface disturbance impacts, resulting in accelerated erosion, soil compaction, spills, and related reductions in the productivity of desirable vegetation, could result from pipeline maintenance traffic and incidental repairs. Impacts related to excavation and handling of the topsoil likely would not occur. However, if they do occur, they would be limited to small areas where certain pipeline maintenance activities occur.

4.4.2 No Action Alternative

Implementation of this alternative would avoid impacts to soils because surface disturbance associated with the Project would not occur.

4.4.3 Mitigation

Based on implementation of the environmental protection measures (**Table 2-4**) and the measures outlined in the SWPPP and CMRP (POD, Appendix I and Appendix C, respectively), no additional mitigation measures are recommended.

4.4.4 Residual Effects

Residual effects to soils would include the permanent loss of 79.7 acres of soils and soil productivity from the construction and operation of the proposed Hawkeye Oil Facility.

4.5 Water Resources

4.5.1 Proposed Action

Primary issues related to water resources include clearing, grading, trenching, and soil stockpiling activities that could temporarily alter overland flow. In addition, surface soil compaction caused by the operation of heavy equipment could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for ponding. These impacts would be localized and temporary. Other temporary impacts, mainly in the form of erosion and sedimentation effects on surface water quality, generally would be expected from land disturbance during construction.

Potential construction impacts to surface water would depend on the construction techniques employed and the physical characteristics of the streams and watersheds crossed by the Project route. Construction of the Project could affect surface water in several ways.

4.5.1.1 Surface Water

Construction

Potential impacts to surface water would be minimized with the implementation of the environmental protection measures discussed in **Table 2-4**. In addition, the SPCC Plan (POD, Appendix N) would address preventive and mitigation measures that would be used to avoid or minimize the potential impact of hazardous material spills during construction. Areas of disturbance adjacent to and directly upslope of intermittent streams might contribute to temporary impacts of surface water through increased rates of erosion that contribute sediment to intermittent streams during storm runoff events. Measures contained in the SWPPP (POD, Appendix I), typical construction practices indicated in the POD, and committed protection measures set forth in **Table 2-4** would be utilized during construction and reclamation to minimize impacts. The Project would be designed and constructed so it would not impede the flow of any waterway. Pipeline crossings would be scheduled at times of low rainfall to minimize the risks of debris, stockpiled soil, and other sources of sediment from being washed into waterbodies or wetlands. Temporary erosion and sediment control measures would be installed across the entire width of the construction ROW after clearing and before ground surface disturbance. No silty/turbid discharge water from the trench dewatering operations would be allowed to enter any waterbody or wetland. The pipeline would be installed below the bed of the waterway, at a level so the channel bed gradient does not change.

If temporary dewatering of groundwater is required during construction activities, water would be discharged in compliance with a NPDES permit and the SWPPP (POD, Appendix I). The SWPPP would provide guidance on the location of dewatering structures, resulting in no deposition of sediments into wetlands and waterbodies, and no impacts on cultural resources or habitat for sensitive species. The discharge of water from dewatering and hydrostatic testing operations would comply with relevant state discharge guidelines, and would follow the Hydrostatic Test Plan (POD, Appendix E). Effects from dewatering would be localized, temporary, and generally insignificant.

Operation

During operation, impacts to surface water resources would occur if a pipeline leak or rupture released crude oil. The severity and duration of such an impact would depend on its location, the volume of oil released, and the spill response and countermeasures implemented. Hess would install remotely controlled MLVs at proposed and existing Hess facilities. MLVs would be installed in accordance with federal regulations as described in the POD and as reviewed by PHMSA.

The pipeline would be monitored 24 hours a day, 365 days a year from an OCC using a sophisticated SCADA system. The SCADA system would allow abnormal operating conditions to be discussed immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance. Hess would implement additional and multiple leak detection methods and systems that are overlapping in nature and progress through a series of leak detection thresholds. The leak

detection system would be configured in a manner capable of alarming the OCC operators through the SCADA system and also would provide the OCC operators with a comprehensive assortment of display screens for incident analysis and investigation. The pipeline operator also would develop a pipeline IMP, which together with an ERP, outlines the preventative maintenance, inspection, line patrol, leak detection systems, SCADA, and other pipeline integrity management procedures to be implemented during the operation of the Project.

4.5.1.2 Groundwater

Construction

Construction and operation of the Project is not expected to adversely affect groundwater resources in the Project area. Blasting is not anticipated as a means for trench excavation. No measurable alteration of aquifer recharge should occur. The trench excavated for pipe placement would be above the water table along the Project route in most locations, with the exceptions of surficial alluvial aquifers along streams and shallow glacio-fluvial aquifer zones. Portions of the Project route in the immediate vicinity of these features may encounter shallow groundwater during excavation. Following backfilling of the trench, these areas would be returned to their original condition, and groundwater impacts would not be expected. No unpermitted withdrawals of groundwater would occur. Therefore, impacts to groundwater resources due to construction of the Project are not anticipated.

Some dewatering of construction areas and the pipeline trench may occur; however, relatively small volumes are expected and effects on the overall groundwater system would be minimal and temporary. Potential impacts on groundwater would include minor fluctuations in groundwater levels and/or increased turbidity within the aquifer adjacent to the activity. Because of the relatively small amount of water removed, the short duration of the activity, and the local discharge of the water, groundwater levels would quickly recover after pumping stops. If temporary dewatering of groundwater is required during construction, dewatering would be discharged in compliance with a NPDES permit.

There is a risk for small spills of liquids during construction, but these would be contained to small, isolated areas centered along the construction ROW. Potential leaks or spills of petroleum products or other hazardous materials from construction equipment and vehicles have the potential to adversely affect near-surface groundwater. In such an event, actions and reporting conducted in accordance with the Project SPCC Plan would reduce the extent and severity of groundwater impacts.

Operation

The greatest risk for impacts to groundwater would result from the accidental release of a hazardous substance during construction or from a release during operations of the pipeline. Hess's SPCC Plan (POD, Appendix N) and SWPPP (POD, Appendix I) address preventive and mitigation measures that would be used to avoid or minimize the potential impact of hazardous material spills during construction. The Project would be monitored through a fiber optic cable control system, which would alert operations personnel to any potential leaks. Additionally, communications equipment would be installed allowing valves to be operated remotely to minimize any potential impacts of a spill. Expected actuator locations include both sides of the Lake Sakakawea crossing; however, additional locations are pending consultation with the PHMSA.

Water for hydrostatic testing, dust abatement, and other construction uses may temporarily impact groundwater resources, as a result of withdrawals from public or private wells. No surface water sources would be utilized for hydrostatic testing of the pipeline. Water would be obtained through Temporary Use Agreements with current water users, as applied for and pending approval by the State of North Dakota. Disposal of the water used for hydrostatic testing would be in accordance with applicable federal, state, and local regulations. Test water would be discharged into a selected dispersion device as described in the Hydrostatic Test Plan (POD, Appendix E) to avoid erosion and sedimentation in upland settings. The Hydrostatic Test Plan provides guidance on the location of dewatering structures, which would be located

and constructed to avoid deposition of sediments into waterbodies or shallow aquifers. The discharge of water from dewatering and hydrostatic testing operations would comply with relevant state discharge guidelines.

No perennial streams would be crossed utilizing the HDD construction method. Therefore, inadvertent releases of drilling fluids and lubricants through seepage, which sometimes can reach surface water or shallow groundwater, would not occur.

4.5.2 No Action Alternative

Implementation of this alternative would avoid impacts to surface water and groundwater because surface and subsurface disturbance associated with the Project would not occur.

4.5.3 Mitigation

Based on the implementation of environmental protection measures and construction plans (i.e., SWPPP, SPCC Plan, and Hydrostatic Test Plan), no additional mitigation measures for water resources are recommended.

4.5.4 Residual Effects

Assuming that successful site stabilization and revegetation are completed, residual impacts to surface water and groundwater resources are expected to be negligible. Once established, controls on runoff, erosion, and sedimentation would reduce the long-term potential for impacts from disturbance. Implementation of the practices set forth in construction plans (i.e., SWPPP, SPCC Plan, and Hydrostatic Test Plan) would avoid or reduce impacts during Project construction. Burial depths at intermittent stream crossings and the existing Lake Sakakawea pipelines would counteract the potential for pipeline rupture or leaks at those locations. In addition, the SCADA system, and periodic pipeline inspections would monitor conditions during operations. Therefore, if pipeline releases occurred, responses would be triggered to address impacts to water resources. All of these Project features would minimize residual impacts to water resources if a spill were to occur during pipeline operation.

4.6 Vegetation Resources

4.6.1 Proposed Action

The primary issues associated with vegetation resources include direct and/or indirect impacts to native vegetation communities and riparian/wetland habitats, and impacts associated with the potential introduction and/or spread of noxious weed species.

4.6.1.1 Construction

Direct impacts from Project-related activities would include the temporary loss of vegetation as a result of trampling/compaction, clearing/trenching/blading of surface cover, and direct removal of aboveground and belowground vegetation as a result of construction. Temporary disturbances predominately would affect agriculture, developed, and grassland vegetation communities in the construction ROW (**Table 4.6-1**). HDD would be used at all crossings of wetland and riparian areas resulting in no disturbance to wetland and riparian areas. Long-term impacts (greater than 30 years) would be limited to the loss of woodland and shrublands until successful reclamation of these communities is achieved. Increased fugitive dust emissions associated with vehicle and equipment travel along access roads during construction may result in a potential decrease in species and habitat productivity in the short term.

4.6.1.2 Operation

Permanent disturbances resulting from pipeline operation and maintenance activities would be limited to the agriculture vegetation communities located within the footprint of the proposed Hawkeye Oil Facility (**Table 4.6-1**). Woody species present within the woodland and shrubland vegetation communities would be replaced pursuant to the PSC Tree and Shrub Mitigation Specifications (POD, Appendix O). Tree and shrub replacement would be completed on a 2:1 basis within the disturbed ROW. However, tree and shrub replacement would not be permitted within a 20-foot-wide path over the pipeline centerline on federal lands, and a 30-foot-wide path on private lands to facilitate periodic visual inspections of the ROW. Mitigation for these species would be determined in consultation with the PSC and could include off-site mitigation options. Although there would be a loss of woody-dominated vegetative cover from Project construction, an increase of woody species individuals and herbaceous-dominated vegetative cover acreage would result from tree and shrub replacement plantings. Based on tree and shrub inventories conducted, 5,263 stems are predicted to be impacted by Project construction in the ROW. The total estimated mitigation commitment with a 2:1 mitigation ration is 10,526 stems (Stantec 2014).

Indirect impacts resulting from the Project may include the potential for introduction of noxious weed species in areas of vegetation removal or soil disturbance, in areas of prolonged, unsuccessful reclamation, or in areas of high soil erosion or low vegetation cover. Noxious weed species can be introduced to the Project area through weed-contaminated vehicles, equipment, and erosion control devices (e.g., straw bales) and, if not controlled, can displace native plant species, rendering infested areas unproductive.

To minimize environmental impacts and ensure site stabilization and revegetation, Hess would implement the environmental protection measures detailed in **Table 2-4**. The CMRP (POD, Appendix C) outlines the procedures Hess would follow during construction and reclamation, and the subsequent mitigation necessary to return all vegetation cover types to pre-disturbance conditions. Timely stabilization of areas disturbed by construction and seeding with the approved USFS native seed mix would minimize the magnitude and duration of vegetation disturbance. Trees and shrubs would be replaced in accordance with the PSC Tree and Shrub Mitigation Specifications (POD, Appendix O). Hess would coordinate with the appropriate agencies to identify efficient restoration and mitigation measures. In addition, ROW monitoring would be conducted to determine reclamation success. The Noxious Weed Control Plan (POD, Appendix F) outlines BMPs to use prior to construction, and during construction, reclamation, and monitoring timeframes.

To minimize fugitive dust emissions, Hess would follow the measures detailed within the CMRP.

Table 4.6-1 Temporary and Permanent Vegetation Disturbances

Vegetation Type	Temporary Disturbance (Acres)[1]			Permanent Disturbance (Acres)[1]
	Construction ROW	ATWS	Access Roads	Hawkeye Oil Facility
Agricultural	138	4	--	78
Barren	--	--	--	--
Wetland and Riparian Areas	--	--	--	--
Developed	6	<1	--	2
Grasslands	91	10	1	--
Woodland and Shrubland	4	<1	--	--
Total	**238**	**15**	**1**	**80**

[1] Total discrepancy due to rounding

Source: Stantec 2014.

Direct spills of fuels, drilling fluids, or other hazardous materials would saturate soils and adversely affect vegetation resources. To minimize the potential for spills, Hess would employ the spill prevention, contingency plans, and spill containment and countermeasures outlined in the SPCC Plan and CMRP (POD, Appendix N and Appendix C, respectively).

4.6.2 No Action Alternative

Implementation of the No Action Alternative would avoid impacts to vegetation since surface disturbance associated with the Project would not occur. Under the No Action Alternative, the potential for indirect impacts from the introduction and spread of noxious weeds and invasive species would not occur as a result of project construction activities.

4.6.3 Mitigation

No additional mitigation measures for vegetation resources have been proposed.

4.6.4 Residual Effects

Residual effects to vegetation would include the long-term loss of approximately 80 acres of vegetation associated with the operation of permanent aboveground facilities (i.e., proposed Hawkeye Oil Facility).

4.7 Wetlands and Floodplains

4.7.1 Proposed Action

The primary issues associated with wetland resources could include direct and/or indirect impacts to wetlands and floodplains including impacts associated with the potential introduction and/or spread of noxious weed species and potential for accidental oil spills.

4.7.1.1 Construction

Hess has committed to using HDD to avoid disturbance of all wetlands; therefore, no impacts to wetlands would occur. While HDD eliminates direct surface disturbance, inadvertent release of drilling fluid to the surface (frac-out) is a possibility when pressure in the drill hole exceeds the inherent strength of overlying soil. While frac-outs are relatively uncommon, they can impact wetland vegetation and water quality. The potential for a frac-out can be reduced through pre-drilling geotechnical assessments, and careful drill planning activities. Prevention and mitigation measures for frac-outs are outlined in the Inadvertent Returns Contingency Plan (POD, Appendix G).

Setbacks, which include at least 50 feet for ATWSs and equipment staging areas, would be implemented during construction, and activities involving potential hazardous materials, fuel, or other petroleum product spills would be restricted within 100 feet of wetlands. Environmental monitors would inspect the construction areas to ensure that leaks or spills have not occurred near wetlands and waterbodies.

Hydrostatic testing would be accomplished using approved locations or municipal water sources. No surface water sources would be used for hydrostatic test water. As a result, impacts from hydrostatic testing on wetlands and riparian areas would not occur. The Hydrostatic Test Plan for the Project is provided in Appendix E of the POD. Impacts to surface waters are discussed in detail in Section 4.5, Water Resources.

Hess would implement the environmental protection measures detailed in **Table 2-4**. Avoidance and minimization measures include the use of HDD to avoid direct impacts in wetland areas, the exclusion of permanent facilities within wetlands, installment of signs denoting wetland areas so that specific BMPs and work practices are adhered to, and the implementation of BMPs (e.g., installation of erosion control devices to reduce sediment transport into wetlands). No refueling or lubricating would occur within 100 feet of wetlands and hazardous materials, chemicals, and fuels would not be stored within 100 feet of wetlands.

To minimize fugitive dust emissions, Hess would follow the measures detailed in the CMRP (POD, Appendix C). The primary protection measure focuses on the use of water or chemical soil binders and BMPs to control dust along the ROW and access roads during construction in accordance with federal, state, and local requirements.

4.7.1.2 Operation

No permanent aboveground facilities would be located within wetlands; therefore, no impacts are anticipated as a result of Project operation.

If an accidental spill were to occur within a wetland during construction or operation, Hess would employ the spill prevention, contingency plans, and spill containment and countermeasures outlined within the CMRP (POD, Appendix C). Per the CMRP, Hess would retain emergency response equipment at all areas where hazardous materials are handled and stored. If a spill should occur, Hess would have appropriate equipment onsite for containment. A Risk Assessment has been completed to identify potential impacts as a result of an accidental release of crude oil and natural gas during pipeline operation (**Appendix A**). Specifically, the Risk Assessment evaluates the risk of product releases during pipeline operations, including probable spill volumes and contribution of natural hazards to spill risk and the subsequent potential effects on humans and other sensitive resources, particularly in areas of high environmental sensitivity such

as federally designated HCAs (e.g., certain populated areas, designated zones around public drinking water intakes, and/or ecologically sensitive areas).

As required by 49 CFR 195.452(i) and enforced by the PHMSA, Hess would create a detailed engineering Risk Assessment and IMP if the Project is approved and constructed. Throughout the life of the Project, federal regulations would require Hess to continue to evaluate and monitor the integrity of its pipelines. PHMSA would routinely audit the Project to ensure Hess's compliance with 49 CFR 195.452(i) regulations, and would review the technical basis for the Risk Assessment's assumptions during integrity management inspections. Based on the Risk Assessment, CMRP, adherence to federal regulations, and HDD of all wetlands crossed by the Project, adverse impacts to wetlands would not be anticipated.

4.7.2 No Action Alternative

Implementation of the No Action Alternative would avoid impacts to wetlands and floodplains because surface disturbance associated with the Project would not occur.

4.7.3 Mitigation

No additional mitigation measures for wetlands and floodplains have been proposed.

4.7.4 Residual Effects

Residual impacts to wetlands and floodplains as a result of Project construction and operation are not anticipated.

4.8 Noxious Weeds and Invasive Species

4.8.1 Proposed Action

The primary issues associated with noxious weeds and invasive species include their potential introduction and/or spread into native vegetation communities and riparian/wetland habitats, and subsequent reduction of suitable vegetation species and overall habitats, or decreased land values.

4.8.1.1 Construction

Substantial increases in weed prevalence within the Project area are not anticipated. However, despite efforts to prevent the proliferation of noxious weed species, it is possible that construction activities could spread or introduce noxious weed species along the ROW, or that weed species could be transported into areas that were relatively weed-free. Implementation of the Project's Noxious Weed Control Plan (POD, Appendix F) would minimize the introduction and spread of noxious weed species within the Project area. The Noxious Weed Control Plan identifies pre-construction, construction, and post-construction measures including, but not limited to, pre-construction biological monitors and weed control, use of weed-free erosion control devices, pressure washing all construction equipment, and post-reclamation monitoring and control.

4.8.1.2 Operation

Noxious weed species can be introduced to the Project area via weed-contaminated vehicles, equipment, and erosion control devices (e.g., straw bales) and, if not controlled, can displace native plant species, rendering infested areas unproductive. Impacts to vegetation as a result of noxious weed invasions are anticipated to be minimal during Project operation with the implementation of the Noxious Weed Control Plan, which includes post-reclamation monitoring and noxious weed control measures.

4.8.2 No Action Alternative

The No Action Alternative would avoid impacts to vegetation and the potential establishment and invasion of noxious weeds and invasive species because surface disturbance associated with the Project would not occur.

4.8.3 Mitigation

No additional mitigation measures for noxious weed control have been proposed.

4.8.4 Residual Effects

With implementation of the Noxious Weed Control Plan, residual effects to native vegetation as a result of invasion by noxious weeds and invasive species are not anticipated.

4.9 Wildlife and Fisheries

4.9.1 Proposed Action

The primary issues related to wildlife species include the loss or alteration of native habitats, increased habitat fragmentation, animal displacement, and direct mortalities. Direct impacts to wildlife species include mortality and displacement related to pipeline construction and operation. Habitat loss, alteration, and fragmentation also would occur. Indirect impacts include disturbance from increased levels of noise and human activity.

Potential impacts to wildlife species can be further classified as temporary and permanent. Temporary impacts consist of habitat removal, activities associated with Project construction, and changes in wildlife habitats until reclamation activities have been completed and vegetation is re-established. Permanent impacts consist of permanent changes to habitats and the wildlife populations that depend on these habitats, regardless of reclamation success. The extent of both temporary and permanent impacts depends on factors such as species sensitivity to human activity, seasonal use patterns, type and timing of construction activities, and physical parameters (e.g., topography, cover, forage, precipitation).

Impacts to game and nongame wildlife species, which occur in the Project area, are anticipated to be minimal because: 1) only a small portion of the potentially suitable available habitat would be impacted by Project construction activities; 2) established topsoil handling techniques and subsequent reseeding of disturbed areas would aid in the re-establishment of habitats; 3) the temporary nature of Project construction would minimize the length of time that wildlife potentially would avoid habitats along the Project ROWs; and 4) measures to avoid impacts to wetland and waterbody habitat would be implemented (e.g., boring all wetlands and waterbodies).

As presented in Section 4.6, Vegetation Resources, a total of four vegetation and two land use (barren and developed) cover types occur in the Project area. Impacts from Project construction would include the temporary disturbance of 248 acres of potential wildlife habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat. Permanent impacts would occur to 78 acres of wildlife habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

4.9.1.1 Management Indicator Species

Three MIS have been identified for the Project: sharp-tailed grouse, greater sage-grouse, and black-tailed prairie dog. Impacts to sharp-tailed grouse are discussed under Section 4.9.1.3, Small Game Species. No greater sage-grouse leks occur within the Project area; therefore, impacts to the species are not anticipated. No black-tailed prairie dog colonies occur within the Project area; therefore, impacts to the species are not anticipated.

4.9.1.2 Big Game Species

Construction

Impacts to big game habitat (e.g., mule deer, white-tailed deer, elk, pronghorn, and mountain lion) include the temporary loss of potential forage and vegetation cover (native and reclaimed vegetation) and increased habitat fragmentation within the Project area. No big game critical ranges are identified within the Project area. Impacts from Project construction would include the temporary disturbance of 248 acres of potential big game habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat.

Disturbances associated with construction activities would be temporary, and it is assumed that animals would return to the area following construction. Based on the amount of available habitat within the Project area, impacts to big game species are anticipated to be minimal and primarily limited to displacement from areas of human activity and habitat alteration. In most instances, suitable habitat adjacent to disturbed areas

would be available for big game species until herbaceous and woody vegetation are re-established within the disturbance areas.

Operation

Project operation may result in direct and indirect impacts to big game species. Direct mortality to individuals may result from collisions with maintenance vehicles. Potential indirect impacts would include displacement of individuals and decreased breeding success due to increased levels of noise and human activity. Displacement of big game as a result of direct habitat loss and indirect reduction in habitat quality has been widely documented (Irwin and Peek 1983; Lyon 1983, 1979; Rost and Bailey 1979; Ward 1976). Big game species tend to move away from areas of human activity and roads, which reduces habitat utilization near disturbance areas (Cole et al. 1997; Sawyer et al. 2006; Ward 1976). Displacement distances are strongly influenced by the level and timing of human activity, topography, and vegetation cover (Cole et al. 1997; Lyon 1979), which affects noise attenuation and visual barriers. Mule deer and pronghorn appear to be more tolerant of human activity than elk. For mule deer, displacement distances ranged from 330 feet to 0.6 mile, depending on the presence of vegetation cover (Ward 1976). For evaluation purposes, 660 feet was the most common displacement distance used for mule deer, especially in areas with minimal vegetation cover. Mule deer and pronghorn have been observed to habituate to vehicles. Displacement distances decreased when traffic was predictable, moved at a constant speed, and were not associated with out-of-vehicle activities (Ward 1976).

Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. The loss of available woody/shrubby vegetation would require more than 20 years to become re-established. Herbaceous species may become established within 3 to 5 years, depending on reclamation success, weather conditions, and grazing management practices in the Project area. Permanent impacts would occur to 78 acres of big game habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to big game due to oiling of the body, ingestion of crude oil from contaminated fur and vegetation/prey, and transfer of crude oil to young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to big game is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of a big game species. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to wildlife species.

4.9.1.3 Small Game Species

Construction

Direct impacts to small game would include mortality or displacement as a result of construction activities. Indirect impacts include habitat loss, alteration, and fragmentation. Disturbance from increased levels of noise and human activity also would indirectly impact small game species. Impacts from Project construction would include the temporary disturbance of 248 acres of potential small game habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat. Due to Hess's commitment to bore all wetlands and riparian areas, no impacts to waterfowl habitat would occur.

Habitat fragmentation impacts to some small game species have been demonstrated to negatively impact populations. In most instances, suitable habitat adjacent to disturbed areas would be available for small game species until herbaceous and woody vegetation become re-established. Temporary loss of habitat would reduce productivity for the current breeding season. However, due to the large amount of suitable habitat in the Project area, impacts to small game species are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to small game species. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Other potential indirect impacts would include displacement of individuals, and decreased breeding success from increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROW. Permanent impacts would occur to 78 acres of small game habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to small game due to oiling of the body, ingestion of crude oil from contaminated plumage/fur and vegetation/prey, and transfer of crude oil to eggs and/or young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to small game is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of a small game species. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to wildlife species.

Sharp-tailed Grouse

Construction

Project construction would result in the temporary loss of 248 acres of potential brooding and winter habitat, including 102 acres of grassland, 142 acres of agricultural land, and 4 acres of woodland and shrubland until reclamation has been completed and vegetation is re-established within the disturbance areas.

One active sharp-tailed grouse lek occurs along the Project route. Project construction during the breeding season may impact the sharp-tailed grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young. The species is particularly sensitive to disturbance while the birds gather on lekking grounds each morning and evening from March to June. Construction activities and associated noise, which may occur in the early morning or late evening near lekking grounds, may disrupt and displace individuals that have gathered for breeding activities. Once breeding activities have concluded, hens build their nests on the ground beneath vegetation near the lekking grounds. As presented in **Table 2-4**, no construction activities would be allowed within 1 mile (line of sight) of identified sharp-tailed grouse leks on USFS-administered land during the breeding season (March 1 through June 15). Therefore, impacts to breeding sharp-tailed grouse are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to sharp-tailed grouse. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Potential indirect impacts would include displacement of individuals and decreased breeding success from increased noise levels and human activity. However, as presented in **Table 2-4**, no operation or maintenance activities would be allowed within 1 mile (line of sight) of identified sharp-tailed grouse leks on USFS-administered land during the breeding season (March 1 through June 15). Therefore, impacts to breeding sharp-tailed grouse are anticipated to be low. Regarding sharp-tailed grouse habitat along the Project route, Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. Permanent impacts would occur to 78 acres of sharp-tailed grouse habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to sharp-tailed grouse due to oiling of plumage, ingestion of crude oil from contaminated plumage and prey,

and transfer of crude oil to eggs and young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to sharp-tailed grouse is unlikely because: 1) the low probability of a spill and 2) the low probability of the spill coinciding with the presence of sharp-tailed grouse. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to wildlife species.

4.9.1.4 Nongame Species

Construction

Construction activities may result in mortalities of less mobile or burrowing nongame species (e.g., small mammals and reptiles) within the ROWs from crushing by construction vehicles and equipment. Indirect impacts include habitat loss, alteration, and fragmentation. Increased noise levels and human activity also would indirectly impact nongame species. Impacts from Project construction would include the temporary disturbance of 248 acres of potential nongame habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat. Impacts would occur until herbaceous vegetation returns to pre-construction conditions (approximately 3 to 5 years). For species dependent on shrubland habitat, displacement would occur until shrubs become re-established, which would require over 20 years. However, due to the large amount of suitable habitat in the Project area impacts to nongame species are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to nongame species. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals may result from collisions with maintenance vehicles. Other potential indirect impacts would include displacement of individuals and decreased breeding success from increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. Herbaceous species may become established within 3 to 5 years, depending on reclamation success, weather conditions, and grazing management practices in the Project area. Permanent impacts would occur to 78 acres of nongame habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to nongame species due to oiling of the body, ingestion of crude oil from contaminated plumage/fur/skin and prey, and transfer of crude oil to eggs and/or young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to nongame species is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of a nongame species. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to nongame species.

Migratory Birds

Construction

Migratory birds that use various habitats in the Project area may be impacted by construction activities. Direct impacts to avian species include mortality, nest destruction, displacement, and disturbance from increased noise levels and human activity. Indirect impacts to migratory birds include habitat loss, alteration, and fragmentation. Impacts from Project construction would include the temporary disturbance of 248 acres of potential migratory bird habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas.

In addition to habitat loss, reductions in bird population densities in both open grasslands and woodlands may be attributed to a reduction in habitat quality caused by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may add to density reduction at relatively short distances, the effect of noise appears to be the most critical factor. Breeding birds of open grasslands (threshold noise range of 43 to 60 dBA) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold level for effects to bird species as 47 dBA.

As discussed in **Table 2-4**, Hess has committed to conducting construction activities outside of the migratory bird breeding season (February 1 to July 15), or conducting pre-construction surveys for active migratory bird nests within 5 days of construction during the breeding season. If nests are identified, Hess would coordinate with the BLM and USFWS to avoid impacts to migratory birds and their nests during construction of the pipeline. Therefore, impacts to migratory birds are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to migratory birds. Direct impacts may result if maintenance activities are conducted during the breeding season. Mortality to individuals or destruction of nests may result from being crushed by, or colliding with maintenance vehicles. Potential indirect impacts would include displacement of individuals and decreased breeding success due to increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. Herbaceous species may become established within 3 to 5 years, depending on reclamation success, weather conditions, and grazing management practices in the Project area. Permanent impacts would occur to 78 acres of wildlife habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to migratory birds due to oiling of plumage, ingestion of crude oil from contaminated plumage and prey, and transfer of crude oil to eggs and young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to migratory birds is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of most migratory birds (5 months per year). The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to migratory birds from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to bird species.

Raptors

Construction

A number of raptor species (e.g., bald eagle, golden eagle, red-tailed hawk, ferruginous hawk, Swainson's hawk, prairie falcon, American kestrel, Cooper's hawk, sharp-shinned hawk, great-horned owl, long-eared owl, short-eared owl, and northern harrier) use various habitats in the Project area. Direct impacts to raptor species may include mortality and displacement. Indirect impacts include the loss or alteration of habitat, reduction in prey base, and disturbance from increased noise levels and human activity. Impacts from Project construction would include the temporary disturbance of 248 acres of potential raptor habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas.

The loss of native habitat to human development has resulted in declines of hawks and eagles throughout the West (Boeker and Ray 1971; Schmutz 1984). In some cases, habitat changes have not reduced numbers of raptors, but have caused shifts in species composition (Harlow and Bloom 1987). Impacts to small mammal populations from habitat loss and fragmentation can cause a reduced prey base for raptors, resulting in lower raptor densities. Thompson et al. (1982) and Woffinden and Murphy (1989) found that golden eagles and ferruginous hawks had reduced nesting success where native vegetation had been lost

because the habitat was no longer able to support jackrabbit (prey) populations. Raptors have low tolerance of disturbance while nesting or roosting, which results in displacement and reduced nesting success (Holmes et al. 1993; Postovit and Postovit 1987; Stalmaster and Newman 1978). Thompson et al. (1982) and Woffinden and Murphy (1989) found that increased levels of noise and human activity also can preclude otherwise acceptable raptor habitat from use (USFWS 2002). Vehicles that stop and go cause greater levels of disturbance to raptors than continuously moving vehicles (Holmes et al. 1993; White and Thurow 1985).

As described in **Table 2-4**, a preconstruction survey would be conducted to identify migratory bird nests (including raptor nests) in, and adjacent to, surface disturbance areas. The typical raptor nesting season in North Dakota is February 1 through July 15 (USFWS 2013). To minimize impacts, Hess would coordinate with the BLM and applicable federal agencies to make sure raptors and their nests would be avoided during construction of the pipeline. Distance buffers for active raptor nests vary by species, ranging from 0.25 mile to 0.5 mile. Consultation with the USFWS regarding migratory birds, including raptors, would be ongoing during construction activities. Therefore, impacts to raptor species are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to raptors. Direct impacts may result from collision with maintenance vehicles. Indirect impacts would include displacement of individuals and decreased breeding success due to increased levels of noise and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. Herbaceous species may become established within 3 to 5 years, depending on reclamation success, weather conditions, and grazing management practices in the Project area. Permanent impacts would occur to 78 acres of raptor habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to raptors due to oiling of plumage, ingestion of crude oil from contaminated plumage and prey, and transfer of crude oil to eggs and young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to raptors is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of a raptor species. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to wildlife species.

Reptiles

Construction

Construction activities may result in direct and indirect impacts to less mobile species, such as reptiles. Direct mortality to individuals may result from crushing of individuals or burrows by vehicles and equipment. Indirect impacts may include habitat loss, alteration, and fragmentation; and disturbance from increased levels of noise and human activity. Impacts from Project construction would include the temporary disturbance of 248 acres of potential reptile habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established. However, due to the presence of suitable habitat adjacent to the disturbed areas and the temporary nature of Project construction, impacts to reptiles are anticipated to be low.

Operation

Project operation may result in direct and indirect impacts to reptiles. Direct mortality to individuals may result from crushing of individuals or burrows by maintenance vehicles. Potential indirect impacts would include displacement of individuals and decreased breeding success due to increased levels of noise and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial

inspections of the ROWs. Herbaceous species may become established within 3 to 5 years, depending on reclamation success, weather conditions, and grazing management practices in the Project area. Permanent impacts would occur to 78 acres of reptile habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with a crude oil spill could result in adverse effects to reptiles due to oiling of the body, ingestion of crude oil from contaminated skin and prey, and transfer of crude oil to eggs and/or young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to reptiles is unlikely because: 1) the low probability of a spill, and 2) the low probability of the spill coinciding with the presence of a reptile species. The Project's Risk Assessment (**Appendix A**) provides additional information regarding impacts to wildlife from a potential spill event. If a spill event of sufficient size were to occur, federal and state laws would require cleanup to prevent impacts to wildlife species.

4.9.1.5 Fisheries

Construction

The primary issues related to fisheries resources include increased sedimentation and potential toxicity related to fuel or other hazardous material spills. The Lake Sakakawea crossing would be constructed by tying-in to existing pipelines under the lake. In addition, Hess has committed to boring all wetlands and riparian areas. Therefore, no direct impacts to Lake Sakakawea or wetlands and waterbodies along the Project route are anticipated.

Erosion control procedures, as part of the Project SWPPP and CMRP (POD, Appendices I and C, respectively) would be implemented as part of the Project to minimize any erosion in disturbed areas. Surface water quality may be impacted if construction equipment and vehicles leaked or spilled petroleum products or other hazardous materials into or near any streams or waterbodies. Direct spills of fuels or other hazardous materials would saturate soils and adversely affect fisheries habitat, less mobile species, and young, which are still dependent on the nest or burrow site. Environmental protection measures are presented in **Table 2-4** and the SWPPP. Hazardous materials, chemicals, fuels, etc., would not be stored within 100 feet of wetlands or perennial/intermittent waterbodies (**Table 2-4**). Other setbacks would include at least 50 feet for ATWS and equipment staging areas. Therefore, impacts to fisheries resources from potential fuel or other petroleum product spills are not anticipated.

Hydrostatic test water would be brought in from a certified outside source and following testing, the water would be trucked offsite for disposal. Since there is no test water discharge, hydrostatic testing would not affect fisheries resources.

Operation

Project operation may result in indirect impacts to fisheries resources. Erosion control procedures, as part of the Project SWPPP and CMRP (POD, Appendices I and C) would be implemented as part of the Project to minimize any erosion in disturbed areas. Project operation would allow vegetation to become re-established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs.

In the unlikely event of a spill that would enter Lake Sakakawea, exposure to crude oil may result in adverse toxicological effects to fisheries resources. Despite this designation, it is unlikely that an oil spill into Lake Sakakawea would result in acute benzene toxicity to fisheries resources. Benzene was chosen as the primary contaminant of concern due to its relatively high toxicity and solubility, which results in the highest relative toxicity of crude oil hydrocarbons. Even following a worst-case scenario spill volume, benzene levels in affected areas are not expected to raise benzene concentrations to a level sufficient to cause acute toxicity in the most sensitive fish species, such as rainbow trout. While this species is not found within Lake Sakakawea, rainbow trout are much more sensitive than most other fish species, and therefore are often

used as a baseline species when determining toxicity levels from a spill. The Project's Risk Assessment (**Appendix A**) provides further information regarding impacts to fisheries resources from a potential spill event. Additionally, the Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR Part 195).

Also, it is unlikely that the Bakken crude oil would sink to the bottom sediments where it potentially could come in contact with benthic fisheries resources. The composition of Bakken crude oil contains minor amounts of heavy molecular weight hydrocarbons; therefore, Bakken crude oil would float on the water's surface facilitating containment and cleanup, even as the crude oil weathers. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills, so that the potential impacts to fisheries resources are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of fisheries resources in the same area as the spill, coupled with the mandated cleanup of spills, impacts to fisheries resources are considered unlikely.

Winter Spill Scenario

During the winter, Lake Sakakawea freezes over with a layer of ice that, in very cold years, can be as thick as 36 to 48 inches. This layer of ice would trap oil released below the lake's surface and prevent benzene evaporation from occurring. Therefore, during the winter, evaporative loss would be negligible and would allow a longer contact between the crude oil and the water column. However, natural undulations in the bottom of the ice would trap the material and prevent it from spreading horizontally, potentially causing very localized impacts to aquatic organisms in prolonged contact with the near-surface water (e.g., phytoplankton). Exposure to fish deeper in the water column likely would not experience adverse impacts.

The natural containment of winter releases facilitates cleanup efforts as the pockets of oil can be drilled to and removed using vacuum trucks. Thus, winter releases are predicted to have lower impacts to fisheries, particularly with respect to area of extent, as compared to releases occurring during the warmer seasons.

4.9.2 No Action Alternative

The temporary disturbance of 248 acres of potential habitat and the permanent disturbance of 78 acres of potential habitat would not occur if the No Action Alternative were to be implemented. Impacts to wildlife and fisheries resources would not occur.

4.9.3 Mitigation

No additional mitigation measures for wildlife and fisheries have been proposed.

4.9.4 Residual Effects

Residual impacts to wildlife and fisheries resources as a result of surface disturbance would include the permanent reduction of approximately 78 acres of potential wildlife habitat associated with aboveground facilities. In addition, a 20- to 50-foot-wide easement would be permanently maintained, including vegetation removal as necessary. Habitat fragmentation and displacement of wildlife species also may occur. Increased human presence during operations and maintenance activities would continue to affect the overall distribution of wildlife. Since Hess is using existing pipelines under Lake Sakakawea, no residual impacts to aquatic species would occur at the lake crossing.

4.10 Special Status Species

4.10.1 Proposed Action

The Project may result in both direct and indirect impacts to special status species. Direct impacts to special status plants could include the temporary loss of individual plants or local plant populations as a result of partial removal of vegetation from trampling or crushing by construction vehicles and equipment, or permanent loss of individuals from ROW clearing. Direct impacts to special status wildlife could include mortalities or displacement related to pipeline construction and operation, as well as habitat loss, alteration, and fragmentation.

Indirect impacts to special status plants could include temporary and long-term establishment of noxious weeds and invasive species, temporary and long-term accumulation of fugitive dust on plant species within suitable habitat resulting from construction and operation vehicle and equipment use, and potential loss of species from adjacent noxious weed-related herbicide application. Indirect impacts to special status wildlife could include short-term displacement of mobile species (e.g., mammals, adult birds) caused by increased noise levels and human activity. Impact levels would depend on timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

Potential impacts to special status plant and wildlife species can be further classified as temporary and permanent. Temporary impacts consist of habitat and vegetation removal, disturbance from Project construction, and changes in wildlife habitats and plant assemblages until reclamation activities have been completed and/or native vegetation populations are re-established. Permanent impacts consist of permanent changes to habitats and the plant and wildlife populations that depend on these habitats, regardless of reclamation success. The extent of both temporary and permanent impacts depends upon the sensitivity of the species, seasonal use patterns, type and timing of construction activities, and physical parameters (e.g., topography, cover, forage, precipitation).

4.10.1.1 Plant Species

A total of four vegetation cover types occur in the Project area on USFS-administered lands. Impacts from Project construction on USFS-administered lands would include the temporary disturbance of 24 acres of vegetation, including 17 acres of grassland and 7 acres of woodland and shrubland, until reclamation has been completed and vegetation is re-established within the disturbance areas. No permanent impacts would occur on USFS-administered lands as a result of the construction and operation of aboveground facilities.

Species-specific impact summaries and applicant-committed environmental protection measures for the eight USFS sensitive plant species carried forward in detailed analysis are presented below. As summarized in Section 3.10.1, species-specific surveys were conducted to determine the presence of special status species individuals and populations within and adjacent to the Project area on USFS-administered lands.

<u>Blue Lips (*Collinsia parviflora*)</u>

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

To minimize environmental impacts to suitable habitat and ensure site stabilization and revegetation, Hess would implement the environmental protection measures detailed in **Table 2-4,** as well as the following mitigation measures:

- The revegetation plan would include a commitment to reseed disturbed native prairie with an approved comparable native grass/forb seed mixture and planting a diverse mixture of native cool- and warm-season grasses and forbs; the approved USFS-approved seed mix to be used for reclamation meets these commitments. and
- Obtaining a seed source that is as local as possible to insure the particular cultivars are well adapted to the local climate.

Implementation of the CMRP (POD, Appendix C) and Noxious Weed Control Plan (POD, Appendix F) would minimize the magnitude and duration of suitable habitat disturbance. Hess would coordinate with the appropriate agencies to identify effective restoration and mitigation measures following construction. In addition, ROW monitoring would be conducted to determine reclamation success and identify post-reclamation noxious weed populations. To minimize fugitive dust emissions, Hess would follow the environmental protection measures (**Table 2-4**) and design features detailed within the CMRP. The primary protection measures focus on the use of water or chemical soil binders and BMPs to control dust along the ROWs and access roads during construction in accordance with federal, state, and local requirements.

Avoidance of viable populations and implementation of environmental protection measures would reduce impacts to suitable habitat, and therefore, it is not anticipated that development of the Project would result in the federal listing of this species.

Operation

Permanent facilities would not be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Dakota Buckwheat (*Eriogonum visheri*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for the species and its habitat would be the same as presented for the blue lips.

Avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, and therefore, it is not anticipated that development of the Project would result in the federal listing of this species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Missouri Pincushion Cactus (*Escobaria missouriensis*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for the species and its habitat would be the same as presented for the blue lips.

Due to avoidance of viable populations and environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that project development would result in the federal listing of this species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Sand Lily (*Leucocrinum montanum*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for the species and its habitat would be the same as presented for the blue lips.

Through avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that development of the Project would result in the federal listing of this species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Golden Stickleaf (*Mentzelia pumila*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of

suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for the species and its habitat would be the same as presented for the blue lips.

Through avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that development of the Project would result in the federal listing of this species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Alyssum-leaved Phlox (*Phlox alyssifolia*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to this species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable habitat (mixed-grass prairie and sand prairie) on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for the species and its habitat would be the same as presented for the blue lips.

Through avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that development of the Project would result in the federal listing of this species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for this species; therefore, no permanent loss of habitat is anticipated.

Stemless Townsend Daisy (*Townsendia exscapa*) and Hooker's Townsendia (*Townsendia hookeri*)

Construction

Although suitable habitat is present, no individuals or populations were identified within the Project area; therefore, no direct impacts to these species are anticipated. However, pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the Project ROWs encourages the establishment of weeds and other invasive species. Construction-related disturbances, occupying approximately 17 acres of suitable grassland habitat on USFS-administered lands, would be considered temporary in nature, pending successful reclamation.

Impact minimization measures for these species' suitable habitat would be the same as presented for the blue lips.

Through avoidance of viable populations and implementation of environmental protection measures to reduce impacts to suitable habitat, it is not anticipated that development of the Project would result in the federal listing of these species.

Operation

It is unlikely that permanent facilities would be sited within suitable habitat for these species; therefore, no permanent loss of habitat is anticipated.

4.10.1.2 Wildlife Species

As presented in Section 4.6, Vegetation Resources, a total of four vegetation and two land use (barren and developed) cover types occur in the Project area. Impacts from Project construction would include the temporary disturbance of 248 acres of potential wildlife habitat, including 142 acres of agricultural land, 102 acres of grassland, and 4 acres of woodland and shrubland habitat, until reclamation has been completed and vegetation is re-established within the disturbance areas. Permanent impacts would occur to 78 acres of wildlife habitat (agricultural land) as a result of the construction and operation of aboveground facilities.

Species-specific impact summaries and applicant-committed environmental protection measures for the 16 special status wildlife species carried forward in detailed analysis are presented below.

Mammals

Northern Long-eared Bat

Construction

Direct and indirect impacts to the northern long-eared bat may include mortalities or displacement related to Project construction; habitat loss, alteration, and fragmentation; and increased levels of noise, activity, and human presence. To reduce impacts to wooded areas, the construction ROWs would be reduced to a maximum width of 50 feet in areas where the Project crosses windbreaks, shelterbelts, and native woodlands and shrublands. Project construction would result in the temporary loss or alteration of approximately 4 acres of potential roosting habitat and foraging habitat.

Operation

No direct impacts to the northern long-eared bat are anticipated during operations. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts to suitable roosting and foraging habitat would occur as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals due to increased noise levels at facilities and human activity. During operation, vegetation would be re-established. Operations maintenance would remove trees and shrubs within 15 feet either side of the centerline to allow for aerial inspections of the ROWs.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to northern long-eared bats due to oiling of fur and transfer of crude oil to eggs and young. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated fur or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to northern long-ear bats are unlikely due to: 1) the low probability of a spill of any size; 2) the low probability of a spill coinciding with the presence of northern long-ear bats; 3) the unlikely exposure of bats through direct contact or from a reduction in its food base or drinking water; and 4) the requirement for containment and cleanup of a release in coordination with federal and state authorities. It is estimated that a crude oil spill would occur while northern long-eared bats are in the area approximately once every 677 years. This estimate is based on the estimated spill frequency of 0.0015 incidents per mile per year, the maximum anticipated species presence in the Project area (i.e., 12 months out of the year), and a combined total of 0.7 mile of potentially suitable habitat crossed by the Project. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline

incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the "pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills, so that the potential impacts to the northern long-eared bat would be temporary with reduced magnitude. Due to the low probability of a release coupled with the low probability of concurrent species presence in the same area as the spill, exposure pathways for becoming exposed to crude oil, and the mandated immediate cleanup of spills, adverse impacts to this species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. Specifically, trees and shrubs (i.e., potential roosting habitat), would be replaced in accordance with the PSC's tree and shrub mitigation specifications (POD, Appendix O). As a result, it is anticipated that impacts to northern long-eared bats would be low.

Black-tailed Prairie Dog

Construction

No black-tailed prairie dog colonies have been identified within the Project area (Stantec 2014). However, suitable habitat exists within the Project area and the species is known to occur near the Project area in the LMNG complex. Impacts to this species, if present, would include direct mortalities of individuals if burrows are crushed by construction vehicles or equipment. Indirect impacts would result from increased noise levels and human activity. There would be no impacts to individual black-tailed prairie dogs as a result of the Project. However, the Project may impact suitable black-tailed prairie dog habitat. Therefore, direct impacts to this species would be limited to the incremental temporary loss of 102 acres of potentially suitable grassland habitat.

Operation

If black-tailed prairie dog colonies become established along the construction ROWs in the future, direct and indirect impacts during Project operations may occur. No permanent impacts would occur to potential grassland habitat as a result of the construction and operation of aboveground facilities. Direct mortality to individuals may result from collisions with maintenance vehicles. Indirect impacts may include habitat fragmentation as a result of ROW maintenance activities. Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs. This may in fact benefit black-tailed prairie dogs, which prefer grassland habitat as opposed to shrubland habitat.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to black-tailed prairie dogs due to oiling of fur and transfer of crude oil to young. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated vegetation. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to black-tailed prairie dogs are unlikely due to: 1) the low probability of a spill; 2) the low probability of the spill coinciding with the presence of this species; and 3) the requirement for containment and cleanup of a release in coordination with federal and state authorities. **Appendix A** provides additional information regarding impacts to wildlife from a potential spill event.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If black-tailed prairie dog colonies are found during construction, appropriate avoidance measures would be implemented to protect the colonies. Therefore, impacts from implementation of the Project to black-tailed prairie dogs are anticipated to be low.

Bird Species Associated with Open Water/Wetland Habitat

Whooping Crane

Construction

No direct impacts to the whooping crane are anticipated from the construction of the Project. Although potentially suitable roosting and foraging habitat occurs along the Project route, historic records for this species in the Project area do not exist, and established communal roost sites have not been documented within or adjacent to the Project area. Based on the current migration pathway of this species through the Project area and the presence of suitable roosting and foraging habitat, potential occurrence within or near the Project would be limited to migrants.

Indirect impacts could result from migrating individuals being flushed from the Project during construction-related activities. Since whooping cranes are highly mobile, it is anticipated that individuals would move to other suitable resting and foraging habitats within the Project region. Based on the rarity of the species and the lack of occurrence data for the Project area, potential impacts from encountering and flushing a migrating whooping crane from the Project would be negligible.

Habitat loss from Project construction would include the temporary disturbance of 142 acres of agricultural habitat within the Project disturbance areas. Crops and rangeland would return to their original state during the following growing season. In most instances, suitable foraging habitat adjacent to disturbed areas would be available to whooping cranes.

Operation

Project operation may result in indirect impacts to the whooping crane, including habitat reduction and fragmentation as a result of ROW maintenance activities. Permanent impacts would occur to 78 acres of agricultural habitat as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement and increased stress to individuals during migration by increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to whooping cranes due to oiling of plumage and transfer of crude oil to eggs and young. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to whooping cranes are unlikely due to: 1) the low probability of a spill; and 2) the extremely low probability of the spill coinciding with the presence of whooping crane individuals. Based on the species presence in the Project area a possible 4 months out of the year (i.e., spring and fall migration) and a combined total of 13.9 miles of potentially suitable habitat crossed by the Project, a spill frequency of 0.0098 incidents per mile per year was derived, which estimates that a crude oil spill could occur while whooping cranes are in the area approximately once every 102 years. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the “pre-modern” era (i.e., the 1970s or earlier), these baseline

frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements or BMPs. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills so that the potential impacts to the whooping crane are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during migration, appropriate avoidance measures would be implemented if birds are seen. As a result, it is anticipated that impacts to whooping cranes as a result of the Project would be low.

Interior Least Tern

Construction

Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing (**Figures 2-14** and **2-15**), no direct impacts to suitable interior least tern habitat are anticipated. However, suitable breeding habitat for the interior least tern may be located within 0.5 mile of the Project area at the Lake Sakakawea crossing. According to Hess's proposed construction schedule, construction activities are planned for May 2015 through October 2015, overlapping with the interior least tern breeding season (April 1 to August 31). Therefore, indirect impacts could result from increased noise and human presence at work site locations if breeding terns are located adjacent to the Project area.

Operation

Indirect impacts could result from increased noise and human presence during any pipeline maintenance activities if breeding interior least terns are located adjacent to the Project. Prior to any Project activities that would occur adjacent to potential breeding habitat, Hess operations personnel would coordinate with the USFWS to establish authorized mitigation if maintenance activities are required during the breeding season adjacent to suitable breeding habitat.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to interior least terns due to oiling of plumage and transfer of crude oil to eggs and young. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to interior least terns is very low due to: 1) the low probability of a spill; and 2) the low probability of the spill coinciding with the presence of least tern individuals (5 months per year). It is estimated that a spill would occur while interior least terns are in the area approximately once every 495 years. This estimate is based on the estimated spill frequency of 0.0020 incidents per mile per year, the maximum anticipated species presence in the Project area (i.e., 5 months out of the year), and a combined total of 2.3 miles of potentially suitable habitat crossed by the Project. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the "pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. The Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195), which specifies how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect HCAs within the U.S. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills, so that the potential impacts to the interior least tern are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during the breeding season, pre-construction surveys would be conducted in suitable breeding habitat. Appropriate avoidance measures would be implemented, if nests are identified. As a result, impacts on interior least terns would be low.

Piping Plover

Construction

Threats to piping plover nesting habitat include reservoirs, channelization of rivers, and modifications of river flows that have eliminated hundreds of miles of nesting habitat along Northern Great Plains' rivers (USFWS 1994). Eggs and young are vulnerable to predation and human disturbance, including recreational activities and off-road vehicle use.

Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing (**Figures 2-14** and **2-15**), no direct impacts to suitable piping plover critical habitat are anticipated. However, suitable breeding habitat for the piping plover may be located within 0.5 mile of the Project area at the Lake Sakakawea crossing. According to Hess's proposed construction schedule, construction activities are planned for May 2015 through October 2015, overlapping with the piping plover breeding season (April 1 to August 31). Indirect impacts could result from increased noise and human presence at work site locations if breeding piping plovers are located adjacent to the Project area.

Operation

Indirect impacts could result from increased noise and human presence during pipeline maintenance activities if breeding piping plovers are located adjacent to the Project. Prior to Project activities that would occur adjacent to potential breeding habitat, Hess operations personnel would coordinate with the USFWS to establish authorized mitigation measures if maintenance activities are required during the breeding season adjacent to suitable breeding habitat.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to piping plovers due to oiling of plumage and transfer of crude oil to eggs and young. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to piping plover is very low due to: 1) the low probability of a spill,; and 2) the low probability of the spill coinciding with the presence of piping plover (5 months per year). It is estimated that a spill would occur while piping plovers are in the area approximately once every 495 years. This estimate is based on the estimated spill frequency of 0.0020 incidents per mile per year, the maximum anticipated species presence in the Project area (i.e., 5 months out of the year), and a combined total of 2.3 miles of suitable habitat crossed by the Project. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the

"pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. The Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195), which specifies how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect HCAs within the U.S. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills, so that the potential impacts to the piping plover are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during the breeding season, pre-construction surveys would be conducted in suitable breeding habitat. Appropriate avoidance measures would be implemented if nests are identified. As a result, impacts to piping plovers would be low.

Rufa Red Knot

Construction

Due to the location of the existing tie-in locations for the pipelines at the Lake Sakakawea crossing (**Figures 2-14** and **2-15**), no direct impacts to potentially suitable rufa red knot habitat are anticipated. Indirect impacts could result from increased noise and human presence at work site locations if migrating rufa red knots are located adjacent to the Project area.

Operation

Project operation may result in indirect impacts to the rufa red knot. Indirect impacts would include displacement and increased stress to individuals during migration by increased noise levels and human activity at operations and maintenance locations if migrating rufa red knots are located adjacent to the Project area.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to rufa red knots due to oiling of plumage. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to rufa red knot is very low due to: 1) the low probability of a spill; and 2) the low probability of the spill coinciding with the presence of individual rufa red knots (9 months per year). It is estimated that a spill would occur while rufa red knots are in the area approximately once every 275 years. This estimate is based on the estimated spill frequency of 0.0036 incidents per mile per year, the maximum anticipated duration of species presence in the Project area (i.e., 9 months out of the year), and a total of 2.3 miles of suitable habitat crossed by the Project. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the "pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements.

Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. The Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195), which specifies how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect HCAs within the U.S. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills, so that the potential impacts to the rufa red knot are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during migration, appropriate avoidance measures would be implemented if birds are seen. As a result, impacts to rufa red knots would be low.

Bird Species Associated with Grassland Habitat

Sprague's Pipit, Baird's Sparrow, and Long-billed Curlew

Construction

Direct and indirect impacts to the Sprague's pipit, Baird's sparrow, and long-billed curlew would include mortalities or displacement related to pipeline construction if construction occurs during the breeding season (February 1 through July 15); habitat loss, alteration, and fragmentation; and disturbance from increased noise levels and human activity. Project construction would result in temporary impacts to 102 acres of potential breeding and foraging grassland habitat.

In addition to habitat loss, reductions in bird population densities also may be attributed to a reduction in habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may negatively affect densities at relatively short distances, the effects of noise appear to be the most critical factor, since breeding birds of open grasslands (threshold noise range of 43 to 60 dBA) and woodlands (threshold noise range of 36 to 58 dBA) respond similarly to disturbance by traffic volume. Reijnen et al. (1996) determined a threshold effect for bird species to be 47 dBA.

Operation

Project operation may result in direct and indirect impacts to the Sprague's pipit, Baird's sparrow, and long-billed curlew. Direct impacts may result if maintenance activities are conducted in suitable habitat during the breeding season. Direct mortality to individuals or nests may result from being crushed by or colliding with maintenance vehicles. Indirect impacts may include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to suitable breeding and foraging habitat as a result of the construction of aboveground facilities. Other potential indirect impacts include displacement of individuals and decreased breeding success due to increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROW.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to these species due to oiling of plumage. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to these species are unlikely due to: 1) the low probability of a spill; and 2) the low

probability of the spill coinciding with the presence of Sprague's pipits, Baird's sparrows, and long-billed curlews (5 months per year). Based on the estimated species presence in the Project area of 5 months and 9.8 miles of suitable habitat crossed by the Project, a spill frequency of 0.0086 incidents per mile per year was derived, which is used to estimate that a spill could occur while these species are in the Project area approximately once every 116 years. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the "pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills so that the potential impacts to the Sprague's pipit, Baird's sparrow, and long-billed curlew are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to these species are considered unlikely.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during the breeding season, pre-construction surveys would be conducted in suitable habitat for nests of these species. Appropriate avoidance measures would be implemented if nests are identified. As a result, it is not anticipated that implementation of the Project would contribute to a trend toward federal listing or cause a loss of viability to the population or species.

Burrowing Owl

Construction

No black-tailed prairie dog colonies occur within the Project area; therefore, the potential for nesting burrowing owls to be present is minimal. However, burrowing owls are known to nest in other types of mammalian burrows that may be present in the Project area. Therefore, according to the Land and Resource Management Plan for the Dakota Prairie Grasslands, if an active nest is identified within 0.25 mile of construction activities, no surface occupancy or use is allowed within 0.25 mile (line of sight) of burrowing owl nests (USFS 2001).

Potential impacts to the burrowing owl, if present, would result from the incremental reduction of suitable habitat within the Project area during construction activities. Temporary impacts to 102 acres of potential grassland habitat would occur. However, due to the lack of primary nesting habitat (i.e., prairie dog colonies), potential for construction-related impacts to the species are low.

Operation

Project operation may result in direct and indirect impacts to the burrowing owl, if present. Direct impacts may result if maintenance activities are conducted during the breeding season (May 1 to September 15 [Grondahl and Schumacher 1997]). Direct mortality to individuals or nests may result from being crushed by or colliding with maintenance vehicles. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to potential burrowing owl habitat as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals and decreased breeding success due to increased noise levels and human activity. Project operation would allow vegetation to become re-established. However, trees and shrubs over 15 feet in height within 15 feet either side of the centerline would be removed as necessary to allow for aerial inspections of the ROWs.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to burrowing owls due to oiling of plumage. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to burrowing owls are unlikely due to: 1) the low probability of a spill; 2) the low probability of the spill coinciding with the presence of burrowing owls; and 3) the requirement for containment and cleanup of a release in coordination with federal and state authorities. **Appendix A** provides additional information regarding impacts to wildlife from a potential spill event.

Based on the low potential for occurrence of nesting burrowing owls within the Project area and implementation of Hess's environmental protection measures (**Table 2-4**), it is not anticipated that implementation of the Project would contribute to a trend toward federal listing or cause a loss of viability to the population or species.

Bird Species Associated with Shrubland Habitat

Loggerhead Shrike

Construction

Direct and indirect impacts to the loggerhead shrike would include mortalities or displacement related to pipeline construction if construction occurs during the breeding season (February 1 through July 15); habitat loss, alteration, and fragmentation; and disturbance from increased noise levels and human activity. Project construction would result in temporary impacts to 4 acres of potential breeding and foraging woodland/ shrubland habitat.

Potential indirect impacts to the loggerhead shrike, if present, include displacement related to pipeline construction; and habitat avoidance and disturbance from increased noise, activity, and human presence. However, reductions in bird population densities in both open grasslands and woodlands also may be attributed to a reduction in adjacent habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may add to density effects at relatively short distances, the effects of noise appear to be the most critical factor since breeding birds of open grasslands (threshold noise range of 43 to 60 dBA) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold effect for bird species to be 47 dBA, while a New Mexico study in a pinyon-juniper community found that impacts of gas well compressor noise on bird populations were strongest in areas where noise levels were greater than 50 dBA. However, moderate noise levels (40 to 50 dBA) also showed some effect on bird densities in this study (LaGory et al. 2001).

Operation

Project operation may result in indirect impacts to the loggerhead shrike. Indirect impacts would include displacement of individuals and decreased breeding success due to increased noise levels and human activity. No permanent impacts would occur to shrubland habitat as a result of the construction and operation of aboveground facilities.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to loggerhead shrikes due to oiling of plumage. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated plumage or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to loggerhead shrikes are unlikely due to: 1) the low probability of a spill; 2) the low probability of the spill coinciding with the presence of loggerhead shrikes; and 3) the requirement for

containment and cleanup of a release in coordination with federal and state authorities. **Appendix A** provides additional information regarding impacts to wildlife from a potential spill event.

As described in **Table 2-4**, appropriate agency consultation and implementation of environmental protection measures would occur. If construction occurs during the breeding season, pre-construction surveys would be conducted in suitable habitat for loggerhead shrike nests. Appropriate avoidance measures would be implemented if nests are identified. As a result, it is not anticipated that implementation of the Project would contribute to a trend toward federal listing or cause a loss of viability to the population or species.

Butterfly Species

Dakota Skipper, Ottoe Skipper, Regal Fritillary Butterfly, Tawny Crescent

Construction

The USFS has documented one historic occurrence of the tawny crescent near the Project route near MP 7.3 (USFS 2013). Historic occurrences for the other butterfly species do not occur near the Project area. However, proposed critical habitat for the federally threatened Dakota skipper occurs approximately 3.1 miles west and approximately 1.9 miles east of the Project area on USFS-administered lands south of Lake Sakakawea.

The main reasons for the decline of Dakota skippers, Ottoe skippers, regal fritillary butterflies, and tawny crescents include the loss and fragmentation of native habitat through grazing, fire, weed control, pesticide use, and other ground disturbances (Opler et al. 2012). Pipeline construction reduces native grassland areas by removing vegetation and disturbing the prairie sod. Once disturbed, this sod is extremely slow to redevelop. Disturbing soil along the construction ROWs encourages the establishment of weeds and other invasive species. Project construction would result in the temporary disturbance to 102 acres of grassland habitat, including mixed-grass prairie and sand prairie.

Operation

Project operation may result in direct and indirect impacts to the Dakota skipper, Ottoe skipper, regal fritillary butterfly, and tawny crescent. Direct impacts may result if maintenance activities are conducted when these species are present. Direct mortality to individuals may result from being crushed by or colliding with maintenance vehicles. Indirect impacts would include habitat reduction and fragmentation as a result of ROW maintenance activities. No permanent impacts would occur to mixed-grass prairie habitat and sand prairie habitat as a result of the construction and operation of aboveground facilities. Other potential indirect impacts would include displacement of individuals due to increased noise levels and human activity. Project operation would allow vegetation to become established. However, trees and shrubs within 15 feet either side of the centerline would be removed as necessary maintenance during operations to allow for aerial inspections of the ROWs.

In the unlikely event of a spill or leak, direct contact with crude oil could result in adverse physical effects to these species due to oiling of the body. In addition, adverse toxicological effects could occur via ingestion of crude oil from contaminated vegetation or prey. In this case, acute toxicity would be dictated by the benzene content of the products.

While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to these species are unlikely due to: 1) the low probability of a spill; 2) the low probability of the spill coinciding with the presence of Dakota skippers, Ottoe skippers, and tawny crescents; and 3) the requirement for containment and cleanup of a release in coordination with federal and state authorities. Based on the maximum duration of species presence in the Project area of 12 months out of the year and a combined total of 9.8 miles of suitable habitat crossed by the Project, a spill frequency of 0.0207 incidents per mile per year was derived, which is used to estimate that a spill may occur while these species are in the area once every 48 years. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach

was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the "pre-modern" era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills so that the potential impacts to the Dakota skipper, Ottoe skipper, regal fritillary butterfly, and tawny crescent are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

Based on implementation of Hess' environmental protection measures (**Table 2-4**), it is not anticipated that implementation of the Project would contribute to a trend toward federal listing or cause a loss of viability to the populations or species.

Fish Species

Pallid Sturgeon

Construction

As discussed in Chapter 2.0, Description of the Proposed Action and Alternatives, Hess proposes to tie-in to existing pipelines under Lake Sakakawea (**Figure 2-14** and **Figure 2-15**) and therefore would not be disturbing the lake shoreline or lake bottom. The tie-in locations are within existing Hess facilities on both the north and south sides of Lake Sakakawea and not within the Missouri River floodplain.

Potential hazardous materials, fuel, or other petroleum product spills will not affect pallid sturgeon or their habitat since these activities will be restricted to within a minimum of 100 feet of Lake Sakakawea and its tributaries. Other setbacks would include at least 50 feet for ATWS and equipment staging areas. Environmental monitors will inspect the construction areas to ensure that leaks or spills have not occurred at the lake crossing.

Hydrostatic testing would not affect this species since Lake Sakakawea or its tributaries would not be used as test water. In addition, hydrostatic test water would not be discharged into the Missouri River or Lake Sakakawea.

Operation

Routine pipeline operation would not affect the pallid sturgeon.

In the unlikely event of a spill that would enter Lake Sakakawea, exposure to crude oil would not be anticipated to cause adverse toxicological effects to pallid sturgeon. Benzene, which is present in Bakken crude oil, was chosen as the primary contaminant of concern due to its relatively high toxicity and solubility. This results in the highest relative toxicity of petroleum hydrocarbons to aquatic species. Assuming a worst-case scenario spill volume, benzene levels in affected areas are not expected to raise benzene concentrations to a level sufficient to cause acute toxicity in the most sensitive fish species, such as rainbow trout (LC_{50} of 7.4 ppm). While this species is not found within Lake Sakakawea, rainbow trout are much more sensitive than most other fish species (including pallid sturgeon), and therefore are often used as a baseline species when determining toxicity levels from a spill.

If released into the aquatic environment, Bakken crude oil would float on the water's surface facilitating evaporation, containment, and cleanup. The composition of Bakken crude oil is largely composed of volatile

compounds with crude oil containing only minor amounts of heavy molecular weight hydrocarbons (**Appendix A**). The majority of benzene would evaporate within the first 12 to 18 hours following a spill. Therefore, it is unlikely that the products would sink to the bottom sediments where they potentially could come in contact with pallid sturgeon.

Because crude oil sinking and incorporating into sediments is not anticipated, ingestion-contaminated prey is not anticipated for pallid sturgeon. Chronic toxicity is not anticipated since Bakken crude has relatively low persistence and polycyclic aromatic hydrocarbons within crude oil are readily metabolized and do not biomagnify within food chains. Cleanup activities would be conducted until crude oil concentrations in the environment pose negligible threats to the environment, including aquatic species.

It is estimated that a spill from the Project could occur in pallid sturgeon habitat approximately once every 206 years. This estimate is based on the maximum duration of species presence in the Project area of 12 months out of the year, a combined total of 2.3 miles of potentially suitable habitat crossed by the Project, and a spill frequency of 0.0049 incidents per mile per year. Because the Project has not yet been constructed, it does not have an operational history from which to derive incident frequency rates. Consequently, a conservative approach was taken by first determining the baseline incident frequencies from industry data (i.e., PHMSA data). Baseline incident frequencies are derived from historical national pipeline incident data for both hazardous liquid and natural gas transmission. Because the majority of pipelines in the U.S. were constructed in the “pre-modern” era (i.e., the 1970s or earlier), these baseline frequencies reflect incident rates associated with earlier pipeline design and construction methods that often do not meet the current regulatory requirements or best management practices. Further, these historical data do not account for supplemental protective measures that Hess would implement.

Appendix A provides additional information regarding impacts to wildlife from a potential spill event. The Missouri River also is subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195), which specifies how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect HCAs within the U.S. Further, if a spill event were to occur, federal and state laws would require containment and cleanup of spills so that the potential impacts to the pallid sturgeon are further reduced in magnitude. Due to the low probability of a release that would need to coincide with the presence of the species in the same area as the spill, and mandated cleanup of potential spills, impacts to this species are considered unlikely.

4.10.2 No Action Alternative

The temporary disturbance of 248 acres of potential habitat and the permanent disturbance of 78 acres of potential habitat would not occur if the No Action Alternative were implemented. Impacts to special status species would not occur.

4.10.3 Mitigation

4.10.3.1 Northern Long-eared Bat

1) In areas along the Project route where woodlands and shrublands would be crossed, Hess would conduct acoustic bat surveys (minimum of 2 detector nights per 0.6 miles of suitable summer habitat) between May 1 and August 31, in coordination with the USFWS, to determine if northern long-eared bats are present within the Project area (as per the Northern Long-Eared Bat Interim Conference and Planning Guidance [USFWS 2014]).
2) If acoustic surveys indicate the presence of northern long-eared bats, Hess would conduct surveys prior to construction to identify potential roosting trees/snags within and immediately adjacent to the Project ROWs that are potentially suitable habitat for the northern long-eared bat. Once identified, Hess would not construct in these areas from June 1 to August 15, when there may be young present. In the case that construction occurs between June 1 and August 15, Hess would

implement additional measures to ensure potential roosting trees/snags are not impacted by Project activities, including fencing-off and/or monitoring.

4.10.3.2 Dakota Skipper

1. In order to further reduce impacts to potential grassland habitat, Hess would reduce the construction ROW width from 100 feet to 75 feet in 3 areas (MP 14.0 to 14.5, MP 14.8 to 16.2, MP 16.5 to 19.5) to reduce impacts to potential grassland habitat. To the extent practical, Hess would utilize the existing high pressure natural gas pipeline ROW for additional temporary workspaces.

Reducing the construction ROW width from 100 feet to 75 feet in these 3 areas, as well as utilizing the existing high pressure natural gas pipeline ROW for ATWS, would avoid impacts to approximately 14.8 acres of grassland habitat potentially suitable for Dakota skippers (i.e., native and native-invaded grassland habitat). This would result in an 18.4 percent decrease in overall impacts to potential grassland habitat.

4.10.4 Residual Effects

Upon implementation of the Proposed Action, no residual loss of suitable habitat for special status plant species would occur as a result of permanent aboveground facility placement. Residual impacts to special status wildlife species resulting from surface disturbance would include the permanent reduction of approximately 78 acres of potential habitat (i.e., agricultural land) associated with permanent aboveground facilities. In addition, a 20- to 50-foot-wide easement would be permanently maintained, including vegetation removal (e.g., trees, shrubs) as necessary. Habitat fragmentation and displacement of special status species could occur. Increased human presence during operations and maintenance activities could continue to affect the overall distribution of special status species. Since Hess is using existing pipelines under Lake Sakakawea, no residual impacts to special status wildlife species would occur at the lake crossing.

4.11 Land Use

4.11.1 Proposed Action

Issues of concern for land use include compliance with planning and regulatory requirements on both private and USFS lands and potential conflicts with existing uses, including a small number of nearby residences and agricultural production activities on lands that the Project would cross.

4.11.1.1 Construction

The Project would require approximately 254 acres for the construction ROW and associated facilities and approximately 79.7 acres for the proposed Hawkeye Oil Facility (**Table 2-1**). For most of its length, the construction ROW would be 100 feet wide and the permanent easement would be 50 feet wide. Where the proposed route would cross USFS land, the construction ROW would be 50 feet wide and the permanent easement would be 20 feet wide. ATWS would be needed in some areas, particularly where additional space would be required for boring under roads and water courses, and for staging areas and access roads. Permanent easements also would be needed for the proposed Hawkeye Oil Facility.

The Project would be consistent with McKenzie County's agricultural zone standards, which identify pipelines as an allowed use in the agricultural zone district. The Project may need to obtain a conditional use permit from Williams County, or demonstrate to the county that requirements of the county's agricultural zoning district have been satisfied (Corbett 2014).

The Project would be compliant with relevant provisions of the LMNG Land and Resource Management Plan as the Project route would be underground and would parallel an existing pipeline for most of its route on the LMNG, except where the USFS has recommended deviations. Visual effects would be minimal upon successful completion of reclamation as demonstrated by the degree to which existing pipelines in the area have been visually blended with the natural landscape.

No residential lands would be crossed by the Project. There is one farm residence approximately 200 feet west of the existing Hawkeye Compressor Station and approximately 300 feet from the center of the Project. Other residences near the Project route are a minimum of 500 feet from the center of the ROW. Because the closest residence is so near the existing compressor station, it is assumed that effects from construction of the Project would be minor in comparison. The other residences in the vicinity are far enough from the Project ROW that effects on the use and enjoyment of the properties would be minor and short-term. The Project ROW would be approximately 340 feet from the Trinity Lutheran Church on 61st Street NW (Section 31 in Pleasant Valley Township). The precise construction schedule is not known, but it is assumed that it would be coordinated with the church's activities schedule, if necessary, to prevent conflicts so the effects would be minor and short-term. There are no schools, parks, or other sensitive land use areas within more than 1 mile of the Project ROW.

The most common land cover types that would be crossed by the Project ROW include grassland (10 miles) and cultivated cropland (11.8 miles). Approximately 0.8 mile is considered "developed" (**Table 3.6-1**). All other land cover types in the construction ROW are less than 3 miles in length. Potential effects on these lands would include temporary reductions in use of small percentages of the total rangeland and pasture in the Project area. Potential effects on cultivated cropland would occur only if construction were to occur on those lands during the relevant growing season. Construction would impact a maximum of one growing season.

Agricultural lands would be restored to their former use after reclamation of construction disturbance. Landowners would be compensated for crop loss during construction. Topsoil preservation practices and planned alleviation of any substantive compaction that construction would cause would effectively minimize adverse effects to agricultural lands and restrict such effects to the short term during and immediately after construction. Reclamation plans include measures to ensure that soil productivity is not diminished in agricultural lands. Revegetation would comply with landowner preferences, including on rangelands where

the ROW would be seeded using the USFS approved native seed mix selected in consultation with the NRCS, BLM, USFWS, or a specific seed mix requested by the landowner during easement negotiations.

Areas disturbed by pipeline construction on the LMNG would be reclaimed and restored to the standards and reclamation requirements of the USFS. Topsoil preservation and alleviating compaction would be similar on USFS land to the approaches planned for private lands as noted above. Adverse effects to use of USFS land would be minor and short-term, limited to the construction period and the time needed for successful reclamation of ROW disturbance.

Based on the Project plans and proposed management practices, it is anticipated that impacts to land use from the Project would be minor.

4.11.1.2 Operation

The pipelines would be underground with minimal aboveground ancillary facilities. The largest aboveground facility would be the proposed 79.7-acre Hawkeye Oil Facility. Other new pipeline facilities would occur within currently developed properties where the land uses already are established. No substantive conflicts have been identified between the proposed project facilities and existing land uses or county land use plans and ordinances. Land use effects from operation of the Project would be minimal.

4.11.2 No Action Alternative

Under the No Action Alternative, no surface disturbance would occur and there would be no identifiable effects on land use in the vicinity.

4.11.3 Monitoring and Mitigation Measures

No monitoring or mitigation measures have been proposed for land use.

4.11.4 Residual Impacts

Residual effects to land use would be minimal; surface use of lands for Project facilities would continue for the life of the Project. There would be minor limitations on potential uses of the land on the ROW as a result of the Project.

4.12 Recreation

4.12.1 Proposed Action

The primary issue of concern is the potential of the Project to disrupt recreational activities in the vicinity, including hunting on private and public lands, and water-related activities on Lake Sakakawea.

4.12.1.1 Construction

Concerns regarding the potential effects of pipeline construction on recreational activities include possible degradation of recreational experiences from noise, dust, and intrusion of heavy equipment. There also is the potential that this activity could displace recreation activity, prevent access to recreation areas, or disturb wildlife in an area where hunting is an especially popular recreational activity. Countering these concerns, the nature of pipeline construction is that it tends to be localized and relatively fast moving, affecting a particular area for only a few weeks, at most, from clearing and grading through reclamation.

The Project would not cross any Wildlife Management Areas; national, state or municipal parks; or developed recreational facilities. One PLOTS site out of approximately two dozen in deer hunt unit 3B1 would be crossed by the Project. Construction during the fall could affect hunting activities. Heavy construction equipment use and noise may displace game during construction, and hunting access may be temporarily affected by construction activities, depending on season and location. To the extent that these effects occur, they would be short-term in nature. Additional information on wildlife effects of the Project is presented in Section 4.9, Wildlife and Fisheries.

Scenic views, particularly on the bluffs above Lake Sakakawea, would be temporarily affected during construction until reclamation and revegetation return the vegetation colors and textures of the ROW to their pre-disturbance visual character. Additional information on visual effects of the Project is presented in Section 4.13, Visual Resources.

Construction during the summer months could affect camping, hiking, fishing, and other summer activities when they are at their peak, particularly on public lands of the LMNG and on the shores of Lake Sakakawea. However, there are no formal recreation facilities or opportunities identified in these areas, and any such effects would be short-term in nature, affecting parts of one summer season at most.

Impacts to urban and dispersed recreation resources from the influx of the construction workforce are expected to be minimal due to the modest size and short-term nature of the population increase (see Section 4.15, Socioeconomics). Further, the intensive nature of the construction schedule suggests most non-local construction workers would have little time to engage in recreation pursuits during their time in the Project area.

4.12.1.2 Operation

Recreation effects of operation of the Project would be minimal. Following construction, the construction disturbance would be restored to near pre-construction conditions, and long-term effects to recreational opportunities in the area would be limited to those effects associated with aboveground facilities (see Section 4.13, Visual Resources). After disturbed areas are reclaimed to pre-construction conditions, the Project would be largely invisible to casual observers. The pipelines would be buried with only small route markers along the ROW. Aboveground facilities would be adjacent to substantial existing facilities and would be visible as incremental expansions rather than new intrusions in the largely rural area of the Project.

At Project termination, all surface facilities would be removed, and the disturbed areas would be reclaimed. Chapter 2.0, Description of the Proposed Action and Alternatives, contains more details regarding Project abandonment.

4.12.2 No Action Alternative

Under the No Action Alternative, no surface disturbance would occur and there would be no identifiable effects on recreation in the vicinity.

4.12.3 Monitoring and Mitigation Measures

No monitoring or mitigation measures have been proposed for recreation.

4.12.4 Residual Impacts

Residual effects to recreation would be negligible.

4.13 Visual Resources

4.13.1 Proposed Action

The primary visual resources issues for construction or operation would be degradation of scenic quality of the LMNG public lands crossed by the Project, with some additional concern for the potential effects on views from Lake Sakakawea, the most prominent recreation resource in the Project vicinity.

4.13.1.1 Construction

There are foreground views of short segments of the Project route from Lake Sakakawea and from SH 1804. Lake Sakakawea is the most sensitive viewing perspective because of its recreational usage and lake access from a boat ramp and campground (Little Beaver Bay) approximately 1.5 miles east of the Project route on the north shore of the lake. Construction disturbance would be visible from the lake up to a distance of approximately 4,300 feet inland from the shore on the north lake shore and approximately 3,400 feet inland from the shore on the south lake shore before it would be hidden by terrain. Views from SH 1804 would be seen by approximately 1,700 motorists per day (2013 traffic count), which is likely the most viewers from any point on the Project ROW. However, the sensitivity of the average viewer on the highway is relatively low because nearly 70 percent of the traffic on the road is commercial trucks. The Project also would be visible from a network of very low volume rural roads and from a small number of rural farm residences.

The LMNG border lies approximately 1,000 feet inland from the south shoreline of the lake. From that point on, for approximately 3.1 miles, the USFS Visual Management System applies to visual effects of the Project. As noted in Section 3.13, Visual Resources, the LMNG in this area has a “low” SIO, which accommodates modification to a “moderately altered” visual character. Currently, there are approximately one dozen drill pads and other oil and gas facilities in the foreground viewshed where the Project is proposed to enter the LMNG.

Construction activities, including vegetation clearing, trenching, pipeline material stringing, heavy construction equipment, and support vehicles would be visible from these public viewing locations. Dust raised by the movement of vehicles, excavation work, and by wind blowing across exposed soil would affect views. Construction activities may use lights for safety and illumination of work areas if night construction is required, which would introduce strong visual contrast with existing dark night skies in the Project area. During construction, there would be periods of high activity in an area that currently has little activity most of the year. While construction activity would resemble modern agricultural activity in some respects, the level of intensity would be higher for the short duration of construction. From immediate foreground viewing perspectives, the degree of visual impact would be temporarily moderate to strong.

Construction would temporarily modify the topography with parallel linear mounds of topsoil and subsoil removed to the edge of the construction ROW. This topographic alteration would last for a very short time at any particular location during stringing and burying of the pipelines and fiber optic cables. Surface disturbance would change the color and texture of the landscape along the length of the ROW, creating a visually moderate linear contrast with the existing landscape that would continue after construction ends, lasting until restoration of vegetation is successfully complete. On lands of the LMNG, and other lands where the existing landscape is mostly mixed prairie and shrubland of various types, this visual contrast would last from 3 to 5 years, depending largely on the amount of precipitation received in the growing seasons following construction. On cultivated agricultural lands, the visual effects of the pipeline ROW would effectively disappear during the first growing season after construction is completed.

Construction of new aboveground facilities at the proposed Hawkeye Oil Facility would increase the visual effects of the Project at that location. However, the effects would be minor because viewing locations near the new facility include SH 1806, a relatively low-volume highway, and only two farm residences, one of which benefits from substantial visual screening provided by a mature wind break. All other new

aboveground facilities (e.g., pig launchers and receivers) would be located on existing disturbed sites and would not be prominently noticeable to casual observers.

4.13.1.2 Operation

The Project would temporarily disturb 19.7 acres of land on the LMNG, all of which is rated “low” for its SIO (**Figure 3.13-1**). Visual impacts would be weak to moderate for changes in the color, texture, and the linear character of the ROW until reclamation and revegetation are successfully completed. As reclamation progresses, moderate impacts for changes in vegetation colors would gradually become weak to imperceptible. Both the initial moderate and the eventual weak to imperceptible impacts would readily meet the objectives for low SIO landscapes.

The Project’s overall effects on visual conditions both in the daytime and at night would be low. Night lighting would be required for operational safety and security at expanded aboveground facilities, but existing facilities at those locations are already lighted at night so the incremental increase in lighting would have minor to moderate effects. All of these facilities are on private lands.

With application of reclamation measures designed for the soils and climate of the Project area, croplands likely would achieve visual compatibility in the first growing season after construction, while prairie and shrubland landscapes likely would reach the same level in 3 to 5 years during the operations phase of the Project.

Decommissioning of the Project at the end of its productive life would have temporary effects on the visual environment similar to construction phase impacts.

4.13.2 No Action Alternative

There would be no impacts to visual resources under the No Action Alternative because no surface disturbance would occur and there would be no other modifications to the existing visual environment.

4.13.3 Monitoring and Mitigation Measures

No monitoring or mitigation measures have been proposed for visual resources beyond the proposed reclamation requirements.

4.13.4 Residual Impacts

Residual effects to visual resources would be minimal because all Project-related surface facilities would be located adjacent and visually subordinate to existing oil and gas facilities.

4.14 Noise

4.14.1 Proposed Action

The primary issue related to noise is the potential for high noise levels from construction or operation of the Project at the residences or recreation areas in the vicinity.

4.14.1.1 Construction

The significance of noise impacts is a function of several factors, including existing ambient noise levels at noise sensitive areas (NSAs), noise emissions from construction and operation of the Project, and the timing and duration of Project-related noise emissions.

Pipeline construction would generate noise primarily from heavy equipment used to prepare the corridor, assemble and bury the pipe, and reclaim the ROW. The equipment roster would include bulldozers; backhoes; excavators; HDD boring machines; sidebooms; and a variety of trucks, generators, welders, and air compressors. Noise emissions from these types of equipment typically range from 70 dBA to 85 dBA at 50 feet from the source (USEPA 1971). Construction noise for this type of project is not steady-state through the course of a work day, varying substantially as different pieces of equipment would be used at different times and at differing levels of intensity. Most of the equipment also is mobile, which moves the noise sources nearer and farther from a NSA in the course of a day, and modern pipeline construction progresses rapidly so that noise effects at any given NSA would be short-term and temporary.

Based on this scenario, it is assumed noise levels from a typical assemblage of pipeline construction equipment would average 80 dBA at a distance of 50 feet from the pipeline during the course of a work day. This approach yielded results indicating construction would generate noise levels of approximately 64.4 dBA at a distance of 300 feet from the center of the trench, the distance to the nearest residence. Noise levels at the next closest residences, approximately 500 feet from the pipeline, would experience noise levels of approximately 60.0 dBA. These are average daily levels; there likely would be episodes of higher levels for brief periods of time and periods of lower levels. The calculations represent a conservative approach to the impact analysis, however, utilizing only the effects of noise dispersion to calculate levels at NSAs. Consequently, actual average noise levels might be further reduced in certain cases by intervening terrain barriers, ground absorption, atmospheric conditions, or other factors.

It is assumed that construction activities would be limited to the hours between 7:00 a.m. and 7:00 p.m. within 1,000 feet of any residence. Consequently, construction would not substantially affect noise levels during the more sensitive nighttime hours. It is further assumed that construction would not occur within 1,000 feet of the Trinity Lutheran Church on Sundays. Based on the preceding evaluation and these assumptions, construction of the Project would comply with the 65 dBA HUD standard for day-night average outdoor noise levels near NSAs.

4.14.1.2 Operation

Operation of the Project would generate modest levels of additional noise. The proposed truck off-loading facility at the proposed Hawkeye Oil Facility would generate an unknown amount of additional truck traffic, but it would be more than 2,000 feet from the nearest residence and on the opposite side of the proposed Hawkeye Oil Facility from the residence. Noise from this type of source is of somewhat greater concern than construction noise because it would operate around the clock for the life of the Project. Consequently, it would increase both day and night noise levels, adversely impacting day-night average levels for the long term.

Proposed pig launchers and receivers would be located within existing facilities. They would be used only sporadically and would be expected to minimally affect project-related noise levels. There would be some monitoring, maintenance, and repair activities over the life of the Project, but they would occur only

occasionally. Most such activities would generate little noise, although there may be occasions when they would mimic construction activities in limited areas.

4.14.2 No Action Alternative

Under the No Action Alternative, no construction would take place and there would be no new facilities to generate noise. There would be no effects on noise in the area.

4.14.3 Monitoring and Mitigation Measures

Moderate to minor noise impacts from construction would be short-term and temporary; no mitigation measure would be required for construction.

Estimated noise levels from operations are qualitative, but no monitoring or mitigation measures have been proposed.

4.14.4 Residual Impacts

Residual noise effects to the immediate areas of the proposed Hawkeye Oil Facility would continue during project operations for the life of the Project. Quantitative levels at the nearest NSAs are not known.

4.15 Socioeconomics

4.15.1 Proposed Action

The primary socioeconomics-related issues would include a need to bring in skilled construction workers to the Project area because of exceptionally low local unemployment levels and the effects they would have on the housing market and on local facilities and services.

4.15.1.1 Employment

Construction

The Project would take approximately 6 to 7 months to construct from start to finish. Construction of the Project would require an estimated 400 workers divided among 4 spreads. The total workforce would include foremen, inspectors, equipment operators, welders, laborers, and other skilled workers. The number of construction workers in the Project area at any particular time would vary somewhat depending on the stage of construction. Although Hess has indicated it would hire as many local workers as possible, the extremely tight labor market in northwest North Dakota, where unemployment rates are estimated at less than 1.0 percent, suggests most of the required personnel would come from outside the Project area. Local employment opportunities initiated by Project construction would be considered beneficial to the local area economies.

Operation

It is assumed that the Project would be operated and maintained by existing Hess staff. Consequently, there would be no measurable effect on employment from operations.

4.15.1.2 Population

Construction

As a result of the short duration of construction, it is assumed that very few, if any, of the non-local construction work force would bring their families with them to the Project area. If the estimates from the 1979 Pipeline Construction Workers and Community Impact Surveys Report are still valid, there would be 0.3 dependents per worker in addition to the workers themselves (Mountain West, Inc. 1979). Assuming 90 percent of Project construction workers would be non-local (360 persons at peak), with 0.3 dependents each (108 persons), the maximum Project-related increase in the area population would be 468 people, or 1.2 percent of the estimated 2013 population of the 2 counties. This very small percentage, combined with the short duration of construction and some variation in the particular workers needed during changing stages of construction, would at worst produce minimal adverse social, economic, and community infrastructure impacts during construction. No measurable effect on demography of the Project area would be expected.

Operation

Assuming operations and maintenance of the Project would be conducted by existing Hess employees, there would be no effect from the Project on the population or demography of the Project area during its operating life.

4.15.1.3 Economic Conditions, Income and Poverty

Construction

Construction and oil and gas development workers are among the higher paid professions in both McKenzie and Williams counties. As such, construction of the Project is expected to have a beneficial effect on the local economy. The magnitude of the benefit would be tempered by the fact that construction would be short-term and most construction workers would only live in the area temporarily, taking a substantial portion of their earnings with them to their permanent places of residence. However, for the time they are in the

area, they would spend some portion of their wages on housing, food, transportation, and other everyday expenses, which would contribute to the local economy and would support secondary employment to a small degree.

Effects on poverty levels in the Project area would be minimal as most of the jobs would be skilled positions and most of the workers would be brought in from outside the Project area.

Operation

The Project's operations workforce would be made up of existing residents of the local area. As such, they would contribute to the local economy over the long term through spending for goods and services. The overall economic effect of the operations and maintenance workforce would be small because the number of workers would constitute a very small percentage of the local labor force.

In addition to the wages and salaries, operation of the Project would benefit the local economy through purchases of materials, services, motor fuels, etc., in support of the ongoing operation.

4.15.1.4 Housing

Construction

Hess plans to house non-local workers in man camps near Tioga or Watford City. There are over 10,000 beds in man camps in the 2 counties, although it is not known how many are now or would be available at the time of construction. There also are numerous RV park type facilities where some construction workers may prefer to locate, and there are numerous hotel and motel facilities as well. Because of the short duration of construction, housing demand would be temporary and it is likely that few, if any, of the non-local construction workers would pursue housing in more permanent accommodations. Although actual vacancy rates for any of the temporary/transient housing resources are not known, housing continues to be at a premium in the area. Construction of new residential housing has greatly accelerated in recent years, which may be reducing pressure on temporary housing to some degree by providing alternative opportunities for new workers who are in more permanent work, but who have been using temporary housing resources in the short term. If local housing is not available for construction workers, some may commute long distances and some may locate RVs in ad hoc locations.

A potential effect of the construction work force on housing would be competition with travelers, recreationists, and more notably, other industry workers for temporary accommodations. Peak construction would occur during the summer tourist and fall hunting seasons; however, accommodations in the Project area are limited such that the construction work force would at worst have an incremental impact on an already strained housing environment.

Operation

Because operation of the Project is expected to be handled by existing Hess workers, no additional housing would be required after completion of construction.

4.15.1.5 Public Facilities & Services

Construction

As noted in Section 3.15, Socioeconomics, Project area government services have been stressed by the rapid expansion of oil and gas development in the region. The Project would increase the demands on facilities and services, but the effects would be temporary, lasting only for approximately 6 months during the scheduled construction period. Effects to government services also would be a relatively minor incremental increase over existing demands because the estimated Project-related population increase is projected to be at most approximately 1.3 percent of the estimated current Project area population. Effects on schools would be minimal because most workers on such a short-term construction project would not be expected to bring school-aged children with them.

Operation

No substantive, incremental effects on public facilities and services would be anticipated from operation of the Project because operational activities most likely would be conducted by existing employees currently living in the area and using public resources.

4.15.1.6 Public Finance

Construction

The estimated cost of constructing the Project would be $59 million dollars, of which labor cost would be approximately $26.5 million, and capital approximately $32.5 million. Although most of the construction workforce likely would be non-local, some portion of the construction wages would be spent locally, which would generate local economic activity and state sales taxes; it is likely that some local sales taxes and possibly lodging taxes also would accrue to Williston, Watford City, Tioga, and Ray. Since the two counties in the Project area do not levy sales taxes, the counties would not benefit from that potential revenue source. The sales tax receipts from construction worker spending would be a short-term beneficial effect ending at completion of construction.

In addition to construction worker local expenditures, other income generated by construction would include local material purchases by contractors and other support personnel. It is assumed that the contractor would purchase as many materials as possible from local sources. These expenditures would include tools, fuel, oil, parts, and repairs. Local communities would benefit from fuel sales and repair expenditures.

Operation

The estimated total Project-related ad valorem tax receipts for the first year of operations are presented in **Table 4.15-1.** The estimates are based on the 2012 county-wide average mill levy, although the actual mill levy may vary somewhat from the average. The estimates also are based on an assumption that the actual value of the Project would approximately equal the capital cost noted above. Each county and school district would benefit from the Project-related tax base increase. The total amount of property tax generated each year would vary, depending on the yearly mill levy and the assessed valuation, which would decline over the life of the Project due to depreciation.

Table 4.15-1 Estimated Ad Valorem Tax Receipts from the Project

County	Miles of Pipeline	2012 Average Tax Rate[1] (mills)	Estimated Taxable Value of Pipeline and Facilities[2] ($)	Estimated Property Tax Receipts From Pipeline and Facilities[3] ($)
McKenzie	11.8	122.09	$740,347	$90,389
Williams	14.1	219.75	$884,653	$194,402
Total	**25.9**	**N/A**	**$1,625,000**	**$284,791**

[1] Estimated average county-wide tax rates may not reflect actual tax rate applied to pipeline.

[2] Estimated values of pipe and facilities were multiplied by 0.50 to determine the assessed value and 0.10 to determine the estimated taxable value. Typically this value is calculated by the North Dakota Office of State Tax Commissioner.

[3] Estimated annual taxes based on first year valuation and 2012 average mill rates.

N/A – Not Applicable.

At the end of the Project's useful life, abandonment of Project facilities would decrease the tax bases of the affected counties and districts.

4.15.2 No Action Alternative

If the Project is not constructed, there would be no effects on the socioeconomic condition of the two counties.

4.15.3 Monitoring and Mitigation Measures

No additional mitigation measures for socioeconomics have been proposed.

4.15.4 Residual Impacts

Economic benefits of the Project, including primarily purchases of supplies and services and provision of tax revenues, would continue for the life of the Project.

4.16 Environmental Justice

4.16.1 Proposed Action

The primary issue related to environmental justice would be a potential for disproportionately adverse effects on minority or low-income populations from construction or operation of the Project.

4.16.1.1 Construction

Estimated percentages of minority and low-income populations in McKenzie and Williams counties are either lower than statewide percentages, or slightly higher than statewide percentages, but not high enough to be considered “meaningfully greater” for purposes of the environmental justice analysis.

The Fort Berthold Indian Reservation, a portion of which lies in McKenzie County, does have substantially higher percentages of American Indians and persons below the poverty level. However, the reservation is approximately 4 miles from the Project and there is no indication that residents of the reservation would be affected by construction or operation of the Project differently than the rest of the population in the 2-county area. Consequently, it is anticipated that there would not be any disproportionately high adverse effect on the health or environment of minority and low-income populations living on the reservation.

4.16.1.2 Operation

No disproportionate adverse effects on minority or low-income populations would occur as a result of operation of the Project.

4.16.2 No Action Alternative

The No Action Alternative would continue existing trends in economic and environmental effects of oil and gas development in northwest North Dakota, but would not be expected to disproportionately adversely affect minority or low-income populations as compared with effects on the population at large.

4.16.3 Mitigation

No additional mitigation measures for environmental justice have been proposed.

4.16.4 Residual Effects

No disproportionate adverse residual effects on minority or low-income populations are anticipated to occur as a result of construction and operation of the Project.

4.17 Transportation

4.17.1 Proposed Action

The primary issues related to transportation include potential degradation of traffic flows due to Project-related traffic, damage to light-duty roads from heavy truck traffic, and a potential increase in traffic accidents from an increase in Project-related traffic, especially from large slow-moving vehicles during construction.

4.17.1.1 Construction

Construction of the Project would generate an increase in traffic on local roads from trucks hauling pipe and other construction materials and from construction workers accessing the ROW. Pipe and construction materials would either arrive by rail or be trucked in via state and U.S. highways to staging areas in preparation for distribution to the ROW as needed.

Truck traffic would arrive in the area via U.S. 2 in Williams County or U.S. 85 in McKenzie County. Major access routes within the Project area would be SH 1804 and County Roads 21 and 23 in Williams County and SH 1806 and SH 23 in McKenzie County. All of these highways have sufficient capacity to accommodate the Project-traffic without creating major delays. Effects on traffic flows would be minor and short-term, although the increase in heavy trucks could create some queuing delays on road segments where passing is restricted.

In addition to the paved highways, there is a grid of gravel surface, rural roads that would provide direct access to the ROW. Traffic on these roads is generally light. Specific local roads used would vary as construction progressed along the Project ROW. Local motorists may experience minor delays caused by heavy trucks traveling under restrictions for weight and speed, but the rapid progression of the construction process and the relatively short total duration of construction would minimize the adverse effects.

There are load limit restrictions on county and township roads and bridges that must be observed at all times to prevent surface and structural damage. If construction occurs during the spring freeze-thaw cycle, additional restrictions may apply. Oversize loads would comply with special permit requirements of the North Dakota Department of Transportation and county highway departments.

Effects of the Project on traffic safety would be expected to be minor. The number of total accidents could be expected to increase approximately in proportion to the Project-related increase in total traffic. The incremental increase in traffic would be relatively small, and the accident rate per mile would not be expected to increase.

Increased heavy truck traffic would tend to accelerate deterioration of road surfaces. This effect would be minimal on state and U.S. highways built to accommodate such traffic. Road maintenance requirements on unpaved county roads may increase somewhat during the construction period, but county restrictions on weight and speed of heavy vehicles, especially during freeze-thaw cycles, should minimize the damage.

Hess plans to bore all road crossings; consequently, project-related traffic interruptions would be minor, limited to equipment and personnel accessing the ROW and periodically crossing roads.

4.17.1.2 Operation

Operation of the Project would reduce the current level of truck traffic in the vicinity by replacing approximately 270 to 400 daily truck trips transporting oil and NGLs with pipeline transport. This would be a positive effect on local traffic. The new truck off-loading facility proposed as part of the proposed Hawkeye Oil Facility development would increase truck traffic near that location by an estimated 100 trips per day. This increase would be offset by the 320 current trips that would be removed from local roads throughout the area by the Project.

Occasional pipeline maintenance or repair requirements would cause activity similar to construction but only for brief periods and on a smaller scale. Maintenance activities would be more localized than would be experienced during the initial construction of the Project.

4.17.2 No Action Alternative

The No Action Alternative would avoid the short-term heavy traffic generated by construction of the Project. However, it would result in a long-term continuation of current levels of truck transport of oil and NGLs. Trucking activity would be expected to increase in future years to accommodate increased production in the Bakken Field.

4.17.3 Monitoring and Mitigation Measures

No monitoring or mitigation measures have been proposed for land use.

4.17.4 Residual Impacts

Total truck traffic in the Project area would decrease with the operation of the Project, but local truck traffic in the immediate vicinity of the truck off-loading facility at the proposed Hawkeye Oil Facility would be expected to increase above existing levels.

4.18 Public Safety

4.18.1 Proposed Action

The primary focus of this section is on the potential for spills during operation and the subsequent potential effects on humans and other sensitive resources. Other effects on public health and safety that could occur during Project construction and operation are discussed under other resource sections (e.g., Section 4.1, Air Quality; Section 4.5, Water Resources; Section 4.11, Land Use; Section 4.17, Transportation; and 4.19, Hazardous Materials).

4.18.1.1 Construction

Construction of the Project would generate the possibility of elevated risks to public safety through increased traffic, and hazardous chemical and fire-related risks. To address potential impacts associated with increased traffic during construction, workers would be housed in temporary accommodations and would utilize temporary transportation measures to minimize public safety impacts on local citizens. Emergency response procedures for all incidents would be developed involving hazardous materials and possible fire emergencies. The reader is referred to Section 4.17, Transportation, and Section 4.19, Hazardous Materials, for an expanded discussion of impacts related to traffic and hazardous materials.

4.18.1.2 Operation

As previously stated in Section 3.18, Public Safety, pipeline transportation has a lower risk of injury to the general public than overland transportation of oil by truck or rail. In 2013, over 99.99 percent of liquid product transported by pipelines in the U.S. was delivered safely and without incident. In the previous 20 years, there have been no recorded fatalities attributable to hazardous liquid pipelines in North Dakota.

The Project would be designed, constructed, and operated in compliance with applicable portions of the USDOT regulations as set forth in 49 CFR 195, Transportation of Hazardous Liquids by Pipeline. These regulations encompass general requirements, accident reporting and safety-related condition reporting, design requirements, construction, pressure testing, operation and maintenance, qualification of pipeline personnel, and corrosion control.

The crude oil pipeline would be buried a minimum of 5 feet underground, a depth that exceeds federal pipeline safety requirements (49 CFR 195.248). This additional depth helps protect the pipeline from outside force damage, such as excavation damage and stream scour. Because excavation damage is a major cause of pipeline releases, this additional depth of cover is a supplemental mitigation measure Hess would employ to reduce the probability of pipeline incidents.

In the unlikely event of a pipeline release, Hess would use a number of leak detection systems and would implement a system shutdown to isolate the affected pipeline segment. Specific details of these systems would be determined based on system hydraulics as the Project develops. The pipeline would be monitored by an electronic system that would sense pressure and flow rates 24 hours a day, as well as by aerial patrols. Consistent monitoring would allow concerns to be immediately identified and addressed. If abnormal operating conditions are detected, the system would generate an alarm. The system operator would have a prescribed time (minutes) to evaluate the alert. If the operator fails to respond to the alarm or the alarm is caused by a release, shutdown procedures would commence. The shutdown procedure occurs systematically to avoid pressure hammers that could cause damage to the pipeline. Pump stations would be shutdown first, followed by valve closure. Once the valves are closed, the system is in a “shut-in” condition, isolating the affected segment.

Concurrent with an emergency shutdown, the operator would begin emergency response procedures, including emergency notifications and the mobilization of emergency response staff and equipment. Hess is required by federal regulation to have a project-specific ERP that is reviewed and approved by PHMSA prior to initiating pipeline operations. The ERP would be prepared to address any number of potential public

safety hazards (e.g., drinking water contamination, fire/explosions, air pollution hazards) and would be developed, in conjunction with local authorities and first responders, to build site-specific response plans, detail emergency equipment availability and location, and emergency contacts. Additionally, water trucks, portable water pumps, chemical fire extinguishers, hand tools, and heavy equipment would be available to address effects from fire during operation. A pipeline IMP would be developed, which, in conjunction with the ERP, would outline pipeline integrity management procedures to be implemented during operation.

4.18.2 No Action Alternative

Implementation of the No Action Alternative would avoid impacts to public safety because construction and operational activities associated with the Project would not occur.

4.18.3 Mitigation

No additional mitigation measures for public safety have been proposed.

4.18.4 Residual Effects

As stated above, Hess would construct and operate the Project in compliance with federal regulations and safety requirements. Implementation of leak detection systems and shutdown procedures, as well as development and implementation of pipeline integrity management and an ERP would decrease the likelihood of a spill and potential risk to public safety. In the unlikely event of a spill, there is the potential for residential effects to the environment and to public safety.

4.19 Hazardous Materials and Solid Waste

4.19.1 Proposed Action

Issues related to the presence of hazardous materials are the potential impacts to the environment from an accidental release of hazardous materials during transportation and materials use during construction and operation of the Project. Also, the crude oil to be transported in the pipeline is considered a hazardous material that, if leaked or spilled, has the potential to contaminate soil and water resources and pose a threat to public health and safety (see also Section 4.18, Public Safety).

4.19.1.1 Construction

Hazardous Materials

Hazardous materials would be carefully controlled, labeled, and used only by authorized personnel. Storage sites for hazardous materials and fuels would be located at a minimum distance of 100 feet from any wetland or waterbody or other sensitive environmental area to ensure no risk of contamination. Storage sites holding in excess of 300 barrels of lubricants, oils, and fuels would be surrounded with an impermeable berm. Should an accidental spill occur, the contractor would contact Hess and the appropriate authorities immediately, and would clean up and dispose of contaminated material. All fuel and service vehicles would be equipped with commercial absorbent material for cleaning up hazardous materials. The Project SPCC Plan (POD, Appendix N) would address procedures to ensure the proper handling and storage of these materials and procedures for the containment and cleanup of spills. In addition, the Waste Management Plan (POD, Appendix B) provides additional protection measures for the handling of hazardous materials with respect to sensitive receptors such as streams, wetlands/riparian areas, or populated areas.

Solid Waste

Hess would dispose of construction waste in accordance with applicable regulations (POD, Appendix B, Waste Management Plan). Construction debris would not be placed in or adjacent to waterways and construction trash would be removed from the construction ROW. Hess would comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations.

Contaminated Sites

It is possible that contaminated soil and groundwater (e.g., hydrocarbon contamination) could be encountered during trench excavation operations. If contaminated soils are encountered, Hess would suspend work in the area of the suspected contamination until the type and extent of the contamination was determined. The specific procedures for handling the discovery of potentially contaminated soils are described in the SPCC Plan (POD, Appendix N). The type and extent of contamination; the responsible party; and local, state, and federal regulations would determine the appropriate cleanup method for contaminated soil and groundwater.

4.19.1.2 Operation

Hazardous Materials

Table 4.19-1 lists various hazardous materials that would be used in the operation of the pipeline. Hess would provide, maintain, and make available the appropriate material safety data sheet documents for each of these materials and those for any other hazardous or controlled materials utilized on the Project at a location accessible to all contractor and Hess employees.

Table 4.19-1 Typical Fuel, Lubricants, and Hazardous Materials

Fluid Uses	Fluids	Typical Quantity Per Location (gallons)	Method of Storage	Storage Location
Fuels	Diesel	5,000 – 10,000	Tanks or Tankers	Contractor Yard Warehouse/ Fuel Vehicle Parking Areas
	Gasoline	5,000 – 10,000	Tanks or Tankers, 10-Gallon Containers, Pick-up Tanks	Contractor Yard Warehouse/ Fuel Vehicle Parking Areas
Lubricants	Engine Oil	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse
	Transmission/ Drive Train Oil	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse/ Service Trucks
	Hydraulic Oil	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse/ Service Trucks
	Gear Oil	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse/ Service Trucks
	Lubricating Grease	<25	Tubes Stored in Paper Cases	Contractor Yard Warehouse/ Service Trucks
Miscellaneous/ Coolants, Hydraulic fluids	Ethylene Glycol	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse/ Service Trucks
	Propylene Glycol	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse/ Service Trucks
	Power Steering Fluid	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse/ Service Trucks
	Brake Fluid	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse/ Service Trucks
	Propane	25 – 100	Pressurized Tanks	Contractor Yard Warehouse/ Welding Trucks

The USDOT classifies crude oil as a hazardous liquid. Accordingly, the pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR Part 195. The regulations are intended to ensure adequate protection for the public and to prevent pipeline and facility accidents and failures. Part 195 specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Hess would design, construct, and operate the pipeline in accordance with federal regulations. Important features to ensure the safe operation of the pipeline include:

- Hydrostatic testing to verify the pipeline's integrity prior to operations;
- Corrosion protection by using high integrity FBE coating and CP;
- Internal inspection of the pipe using "smart pigs" designed to detect irregularities on the internal and external surfaces of the pipe;
- SCADA system to continuously monitor the pipeline and the pressure of its contents;
- Utilizing their ATMOS Pipe Leak Detection System;
- Participation in state "one call" programs;
- Use of remotely activated valves at key locations; and
- Construction of emergency response equipment storage areas.

Solid Waste

The waste generated during operations would be similar to waste generated during construction, except for certain waste that may be generated from pipeline maintenance operations. Such waste materials may be considered hazardous and would have to be accumulated, stored, and disposed in accordance with applicable rules and regulations.

4.19.2 No Action Alternative

Under the No Action Alternative, the Project would not be constructed and the potential effects associated with the transportation, storage, or use of hazardous materials or the disposal of solid waste would not occur. Unknown contaminated sites that may exist along the construction ROW would not be discovered and impacts would continue undetected until discovery sometime in the future by other parties.

4.19.3 Mitigation

No additional mitigation measures for hazardous materials and solid waste have been proposed.

4.19.4 Residual Effects

Residual adverse effects from the use of hazardous materials under the Proposed Action would depend on the substance, quantity, timing, location, and response involved in the event of an accidental spill or release. Operation in compliance with applicable regulations and in accordance with the Project's SPCC Plan, as well as the prompt cleanup of potential spills and releases, would minimize the potential of residual adverse effects due to accidental spills or releases of hazardous materials.

4.20 Cultural Resources

4.20.1 Proposed Action

Primary issues associated with Project construction include potential direct, indirect, and visual impacts to cultural resources. Direct impacts to known and unknown cultural resources could occur as a result of ground disturbance associated with Project-related construction activities. Indirect impacts could include soil erosion and the potential for illegal artifact collecting and vandalism due to the presence of increased numbers of people during construction and increased public access. Visual impacts could result from the introduction of visual intrusions (e.g., aboveground ancillary facilities) resulting in changes to the setting surrounding cultural resources.

4.20.1.1 Construction

The BLM 8100 Manual states that cultural resources need not be determined eligible for the NRHP to receive consideration under NEPA (BLM 2004). Under the NHPA, potential impacts to historic properties are assessed by applying the "criteria of adverse effect" (36 CFR 800.5[a][1]). "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." The analysis of impacts using the criteria is limited to those resources that are either listed in the NRHP or have been recommended as eligible for inclusion in the NRHP.

Cultural resources inventories conducted for the Project identified a total of 23 prehistoric sites in the APE. The prehistoric sites contain stone features, cairns, or alignments, and/or CMS. Of the prehistoric sites, 1 is on USACE land and is considered not eligible for listing on the NRHP, 1 is on USFS land and is recommended as eligible for the NRHP, and the eligibility of the remaining sites is undetermined.

Minor variations to the Project ROW have resulted in avoidance of all sites by at least 50 feet, thereby avoiding direct impacts to these resources. Although all sites would be avoided by a 50-foot buffer, monitoring during Project-related construction activities is recommended for the sites listed on **Table 4.20-1** because of the possibility for buried deposits associated with the sites and where the 50-foot avoidance buffer is on the edge of the construction corridor.

Table 4.20-1 Cultural Resources Requiring Avoidance Measures

Site Number	Site Type	Site Description	Land Status	NRHP-eligibility	Protection Measure
32MZ0773	Prehistoric	CMS	Private	Undetermined	Monitoring; protective fencing
32MZ0796	Prehistoric	CMS	Private	Undetermined	Monitoring; protective fencing
32MZ2168	Prehistoric	Cairn	USFS	Undetermined	Monitoring; protective fencing
32MZ2599	Prehistoric	Stone Features	USFS	Undetermined	Monitoring; protective fencing
32MZ2766	Prehistoric	CMS/Cairn	Private	Undetermined	Monitoring; protective fencing
32MZ2767	Prehistoric	Possible stone effigy	Private	Undetermined	Monitoring; protective fencing
32MZ2769	Prehistoric	Stone alignment	USFS	Undetermined	Monitoring; protective fencing
32MZ2770	Prehistoric	Cairn	USFS	Undetermined	Monitoring; protective fencing
32WI1575	Prehistoric	Stone features	Private	Undetermined	Monitoring; protective fencing
32WI1577	Prehistoric	Stone Features	Private	Undetermined	Monitoring; protective fencing
32WI1579	Prehistoric	Stone circle	Private	Undetermined	Monitoring; protective fencing
32WI1580	Prehistoric	Stone Features	Private	Undetermined	Monitoring; protective fencing
32WI1581	Prehistoric	Stone effigy	Private	Undetermined	Monitoring; protective fencing
32WI1632	Prehistoric	Stone circle/effigy	Private	Undetermined	Monitoring; protective fencing

Table 4.20-1 Cultural Resources Requiring Avoidance Measures

Site Number	Site Type	Site Description	Land Status	NRHP-eligibility	Protection Measure
32WI1633	Prehistoric	Stone alignment	Private	Undetermined	Monitoring; protective fencing
32WI1634	Prehistoric	Stone circle and alignment	Private	Undetermined	Monitoring; protective fencing
32WI1635	Prehistoric	Stone circle	Private	Undetermined	Monitoring; protective fencing

Source: Cardno-ENTRIX 2014

Resolution of Effects

All of the sites identified during the Class III inventory have been avoided by minor variations to the Project ROW; therefore, no direct impacts to the sites are anticipated. Potential indirect effects to historic properties or unevaluated sites located adjacent to the APE as a result of drainage or soil erosion would be minimized through implementation of procedures described in the BMPs and environmental protection measures (**Table 2-4**). Other indirect effects, such as illegal collecting of artifacts and inadvertent damage to archaeological sites, could occur in the area of the Project due to an increase in the number of workers during construction and increased public access. In accordance with the environmental protection measures (**Table 2-4**), Project-related personnel would be educated as to the sensitive nature of the resources; a strict policy of prohibiting collecting of these resources would be implemented. To prevent unauthorized use of the ROW, access would be blocked at locations specified by agencies and/or private landowners (**Table 2-4**).

To reduce potential visual effects to a historic property in which site setting contributes to its NRHP eligibility, aboveground structures would be painted with BLM-approved environmental colors to minimize contrasts with surrounding landscapes (**Table 2-4**).

Per the environmental protection measures and as described in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K), if any previously unknown archaeological sites are discovered on private, state, or federal land during Project construction, all construction activities would cease in the area of the discovery and the consulting archaeologist, BLM, and North Dakota SHPO would be notified of the find. Steps would be taken to protect the site from vandalism or further damage until the appropriate federal agency and North Dakota SHPO could evaluate the nature of the discovery. If the site qualifies as a historic property, a mitigation plan would be developed and executed before construction can resume in the vicinity of the discovery. If the site does not qualify as a historic property, construction can resume in the vicinity of the discovery. The BLM Project Manager would provide written notice for when construction can resume at the discovery location for both scenarios (i.e., historic property and discovery that does not qualify as a historic property).

If construction or other Project personnel discover what may be human remains, funerary objects, or items of cultural patrimony, construction would cease within a 300-foot radius from the point of discovery, and the local law enforcement agency, North Dakota SHPO, BLM, and/or applicable land-managing agency would be notified of the find. Any discovered Native American human remains, funerary objects, or items of cultural patrimony found on federal land would be handled in accordance with the NAGPRA. Non-Native American human remains found on federal, state, or private lands would be handled in accordance with the NDCC §23-06-27 and the administrative rules in the North Dakota Administrative Code Chapter 40-02-03. Construction activities would not resume until the BLM Project Manager has issued a Notice to Proceed.

4.20.1.2 Operation

No impacts to cultural resources associated with operation of the Project are anticipated.

4.20.2 No Action Alternative

Under the No Action Alternative, the Project would not be developed, and therefore, no potential impacts to cultural resources would occur.

4.20.3 Mitigation

Additional mitigation has not been proposed for cultural resources. Protection measures for unknown cultural resources and human remains that may be discovered during Project construction are described in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K).

4.20.4 Residual Effects

The Proposed Action would result in the loss of cultural resources that are not eligible for the NRHP. Although these sites would be recorded to BLM and North Dakota SHPO standards and the information integrated into local and statewide databases, the sites ultimately would be destroyed by Project construction. Historic properties and unevaluated sites identified within the Project APE have been avoided by minor variations to the Project ROW, thereby avoiding direct impacts to these properties and sites. Monitoring of Project-related construction activities is recommended near selected sites with the potential for buried deposits or in close proximity to the NRHP-eligible Elm Tree Archaeological District. Unknown historic properties potentially discovered during Project construction would be handled as stipulated in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K). Based on Hess's avoidance of all sites, proposed monitoring at selected sites, and plan for unanticipated discoveries, no residual effects to known and unknown cultural resources are anticipated.

4.21 Tribal Treaty Rights and Interests

4.21.1 Proposed Action

Primary issues related to tribal treaty rights and interests would be the potential for direct, indirect, and visual impacts to sacred sites, TCPs, or properties of traditional religious and cultural importance to the tribes, as well as the potential limitation on tribal members to exercise their hunting, fishing, and gathering rights on federal lands because of restricted access to these lands during Project construction. Potential direct, indirect, and visual impacts to sacred sites, TCPs, or properties of traditional religious and cultural importance would be similar to those described for cultural resources. The reader is referred to Section 4.20, Cultural Resources, for an expanded discussion of these potential impacts.

4.21.1.1 Construction

In accordance with all applicable mandates, including, but not limited to Section 101[d][6] of the NHPA, the AIRFA, EO 13007 (Indian Sacred Sites), EO 13175 (Consultation and Coordination with Indian Tribal Governments), Presidential Memorandum on Government to Government Consultation with Native American Tribal Governments (April 29, 1994), USACE Upper Missouri River Programmatic Agreement (2004), and Presidential Memorandum on Tribal Consultation issued on November 5, 2009, the BLM has consulted with federally recognized Native American tribes regarding potential impacts to sacred sites, TCPs, and properties of traditional religious and cultural importance to the tribes. During face-to-face meetings with THPOs and other tribal representatives, the tribes expressed several concerns associated with Project construction, in particular, pipeline safety, spill risk and response, job opportunities for tribal businesses and workers, sacredness of water and the lake, and treaty rights (subsistence fishing). For concerns related to pipeline safety, spill risk and response, job opportunities, water, and fishing, the reader is referred to **Appendix A** (Risk Assessment), and Sections 4.5, Water Resources, 4.9 Wildlife and Fisheries, and 4.15, Socioeconomics.

In 2013 and 2014, the tribes conducted field surveys of the Project ROW. Numerous areas of tribal concern were identified by tribal members participating in the surveys. As a result of the surveys, Hess adjusted the Project ROW to avoid all of these areas. No adverse effects to identified areas of tribal concern are anticipated as a result of Project construction.

Unanticipated discoveries of sacred sites, TCPs, or properties of traditional religious and cultural importance, including human remains, on federal, state, or private land during Project construction would be handled in accordance with the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K) and as described in Section 4.20, Cultural Resources.

Public lands retain social, economic, and both traditional and contemporary cultural value for tribal people, as well as contemporary and ongoing spiritual and cultural uses (United Nations Declaration on the Rights of Indigenous Peoples 2008). Some of the tribes with traditional or cultural affiliation with the Project area may have treaty rights that give them the right to hunt, fish, gather, and conduct traditional cultural activities on federal lands crossed by the Project. Construction activities associated with the Project may temporarily reduce the amount of federal lands outside of the reservation where tribal members could exercise their hunting, fishing, and gathering rights; change the way a tribal member accesses resources for tribal use; and restrict certain activities (e.g., hunting or gathering). However, there would be no restrictions on access to resources and/or areas for religious purposes after construction has been completed.

The BLM would continue to consult with federally recognized tribes that have treaty rights pertinent to the Project area, have aboriginal territories encompassing the Project area, or have expressed an interest in the Project area. Tribal consultation currently is ongoing and would continue up to and including Project construction.

4.21.1.2 Operation

No impacts to treaty rights, sacred sites, TCPs, or properties of traditional religious and cultural importance associated with operation of the Project are anticipated.

4.21.2 No Action Alternative

Under the No Action Alternative, the Project would not be developed, and therefore, no impacts to treaty rights, sacred sites, TCPs, or properties of traditional religious and cultural importance to the tribes would occur.

4.21.3 Mitigation

Additional mitigation has not been proposed for areas of tribal concern identified during the tribal surveys. Protection measures for unknown sites of tribal concern and human remains that may be discovered during Project construction are described in the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K).

4.21.4 Residual Effects

Residual effects to identified areas of tribal concern would be the same as those described for cultural resources (see Section 4.20.4, Residual Effects).

5.0 Cumulative Impacts

5.1 Introduction

The NEPA requires the identification and consideration of incremental impacts that are related to the Project when added to other past, present, and reasonably foreseeable future actions (RFFAs), regardless of what agency (federal or non-federal) or private entity undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7). Impacts first must be identified for the Project before cumulative impacts with past, present, and RFFAs can occur.

The cumulative effects study area (CESA) includes a 4-county (McKenzie, Williams, Dunn, and Mountrail counties) area (approximately 5,780,380 acres) in western North Dakota, as illustrated on **Figure 5-1**. Past actions and RFFAs with the potential to cause cumulative impacts in combination with the Project also are illustrated on **Figure 5-1**. These actions were identified primarily by geographic location and type of activities associated with the projects that are being considered in the analysis, as well as the type of resources potentially affected. A brief description of these actions is provided in **Table 5-1**. The area of concern for cumulative impacts would vary by resource. Impacts to certain resources would be restricted to the actual area of disturbance. Other resources, such as vegetation, wildlife and socioeconomics, may be affected by a wider area, and cumulative impacts could involve more than surface disturbance.

As stated in Chapter 3.0 and Chapter 4.0, there are eight USACE Authorized Project Purposes for Garrison Dam/Lake Sakakawea. One Purpose (i.e., wildlife) may be impacted cumulatively by the Project and past, present, and RFFAs. Seven Purposes (i.e., municipal and industrial water supply, recreation, water quality, flood control, navigation, irrigation, and hydropower) would not be impacted by the Project and past, present, and RFFAs. The Purpose that may be impacted cumulatively by the Project and past, present, and RFFAs, and the resource sections in which it is addressed include Sections 5.9, Wildlife and Fisheries and 5.10, Special Status Species.

5.2 Past, Present and Reasonably Foreseeable Future Actions

Table 5-1 briefly describes past, present, and reasonably foreseeable future projects within the CESA that were considered in the cumulative impacts analysis. The table is organized by past, present, and RFFAs, and under each category, the various types of linear projects such as crude oil, natural gas, electric transmission line projects and one CO_2 line.

5.2.1 Past Projects

Past projects within the CESA include crude oil, natural gas, NGL, and electric transmission lines (**Table 5-1**). The CESA includes 13 crude oil pipelines (742 miles; 4,498 acres), 14 natural gas, NGL, and other pipelines (565 miles; 3,422 acres), and 7 electric transmission lines (467 miles; 2,832 acres). These projects extend a total of 1,774 miles and have permanently disturbed 10,752 acres. The majority of the surface disturbances associated with these projects has been reclaimed and returned to their previous land uses, with the exception of the associated permanent, aboveground facilities.

5.2.2 Present Projects

A total of 11 projects currently are under construction within the CESA, undergoing NEPA review, or applications are being developed to meet state permitting requirements (**Table 5-1**), in addition to the Project. These other projects include 7 crude oil pipelines (446 miles; 2,702 acres), 3 natural gas pipelines (104 miles; 631 acres), and 1 electric transmission line (45 miles; 273 acres). Therefore, the total combined surface disturbance including all present projects would be 3,606 acres and 595 total miles.

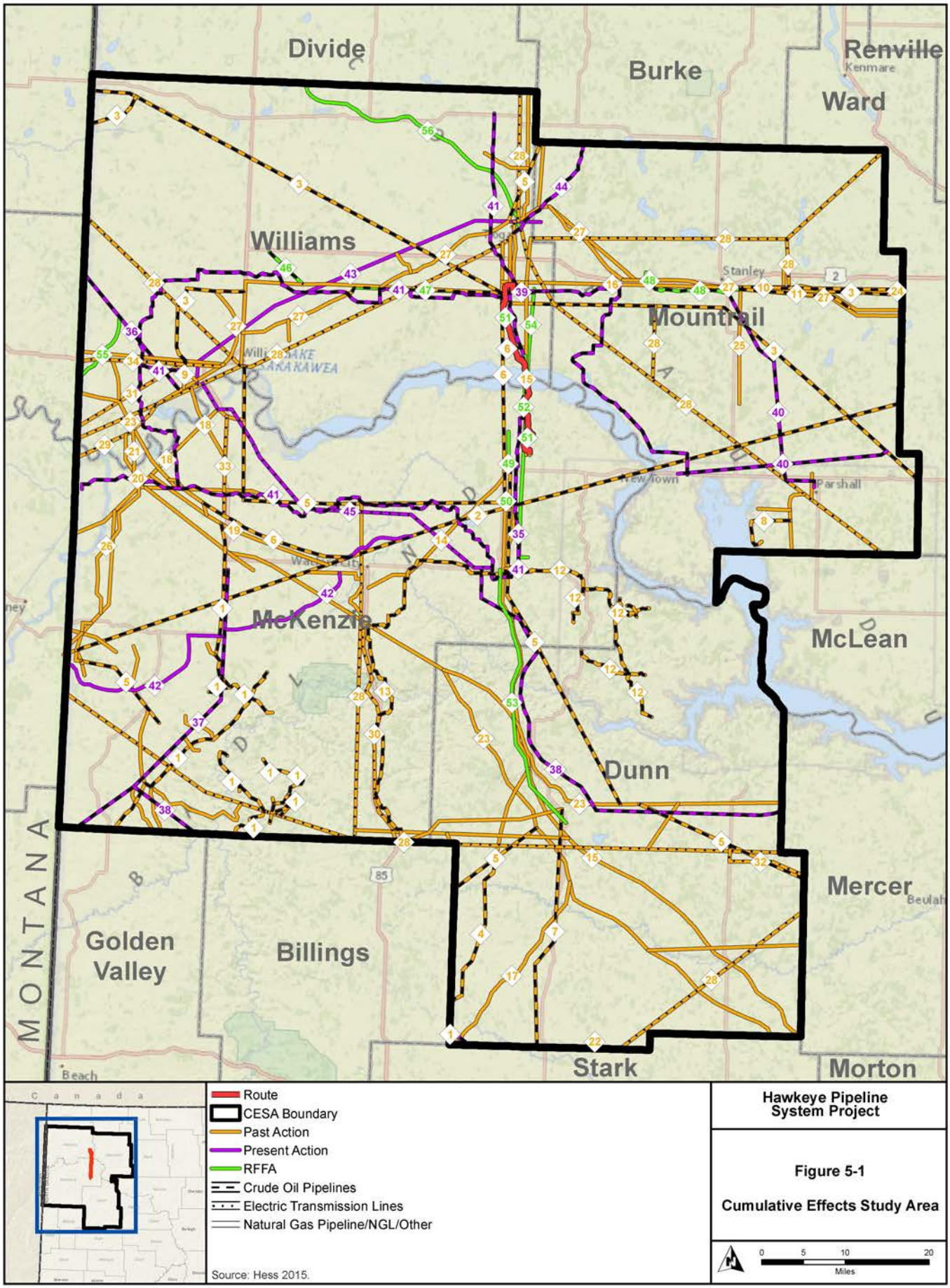

Divide
Burke
Renville
Kenmare
Ward
Williams
Mountrail
Stanley
McKenzie
McLean
Dunn
Mercer
Beulah
Golden Valley
Billings
Stark
Morton
MONTANA
Canada
Route
CESA Boundary
Past Action
Present Action
RFFA
Crude Oil Pipelines
Electric Transmission Lines
Natural Gas Pipeline/NGL/Other
Source: Hess 2015.
Hawkeye Pipeline System Project
Figure 5-1
Cumulative Effects Study Area
0 5 10 20
Miles

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
Past Actions					
Crude Oil Pipelines					
1	Bicentennial to Dickinson Pipeline (McKenzie and Dunn)	Belle Fourche Pipeline Co.	This project included the construction of a 32-mile-long, 8-inch-diameter liquid petroleum pipeline that interconnected with the Belle Fourche facilities at Alexander Station and Bowling Junction. The pipeline has a 30,000 bpd capacity.	102	618
2	Cenex Pipeline System (McKenzie and Mountrail)	Cenex Pipeline	This project included the construction of an 8-inch-diameter petroleum pipeline.	105	636
3	EPND Pipeline (McKenzie, Dunn, and Williams)	Enbridge	This project included the construction of a 204-mile-long, 16-inch-diameter crude oil pipeline and the installation of new station facilities and tank age at EPND's existing Beaver Lodge, Stanley, and Berthold Station and Terminal facilities.	142	861
4	Heart River Pipeline System (McKenzie, Mountrail, and Dunn)	Bridger Pipeline LLC	This project included the construction of a 10-inch-diameter crude oil pipeline with 3 gathering pipeline interconnects and 2 truck receipt points interconnecting with the Little Missouri System at Fryburg Station and Belle Fourche Pipeline at Skunk Hill Station.	19	115
5	High Plains Pipeline (Mckenzie, Mountrail, Williams, and Dunn)	Tesoro – High Plains Pipeline Company	This is a crude oil pipeline. Tesoro High Plains Company operates approximately 700 miles of pipeline and related storage assets in the Bakken Shale and Williston Basin area.	148	897
6	Keystone XL On-ramp Pipeline System (McKenzie, Williams, and Dunn)	BakkenLink Pipeline LLC	This project included the construction of an 110-mile-long, 10-inch-diameter and 55-mile-long, 12-inch-diameter crude oil header pipelines and a 145-mile-long, 16-inch-diameter Trunk line from Watford City to the Keystone XL Pipeline System in Fallon, Montana.	48	290
7	Killdeer Dickinson Pipeline (Williams, Mountrail, and Dunn)	Plains All American Pipeline, LP	This project included the construction of a 33-mile-long, 6-inch-diameter crude oil gathering pipeline from the Killdeer Crude Oil Gathering Facility in Dunn County to 2 miles northwest of Dickinson. The capacity of the pipeline is 10,000 bpd.	29	175
8	Parshall Pipeline System (McKenzie, Mountrail, and Dunn)	Bridger Pipeline LLC	This project included the construction of 210 miles of 4.5-, 6.6-, and 8.6-inch-diameter steel and 4.5-inch-diameter composite pipelines at various operating pressures, which was part of a gathering system for crude oil.	9	54

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
9	Trenton Gathering Pipeline (Williams, Mountrail, Dunn)	Plains Pipeline LP	This project included the construction of 303 miles of 4-, 6-, and 10-inch-diameter crude oil pipelines, of which 280 miles were constructed in Montana.	3	18
10	Stanley Plant to Storage Pipeline (Mountrail)	Hawthorn Oil Transportation (North Dakota), Inc.	This project included the construction of an 11-mile-long, 4.5-inch-diameter pipeline from the Stanley Gas Plant to a storage facility in Mountrail County.	19	115
11	Stanley to Railroad Pipeline (Mountrail)	Hawthorn Oil Transportation (North Dakota), Inc.	This project included the construction of a 4-mile-long, 12-inch-diameter pipeline for crude oil from 1 mile southeast of Stanley to a railroad loading facility 2 miles northeast of Stanley.	4	24
12	The Saddle Butte Gathering System (McKenzie and Dunn)	Saddle Butte Pipeline Company	This project consisted of 5 segments ranging from 3- to 6-inch-diameter up to 16-inch diameter pipes totaling 1,592 miles of crude oil and natural pipelines within the McKenzie and Dunn county area. The pipelines carry the crude oil to a crude oil stabilization and transfer facility while the natural gas is transported to a main gas processing facility.	56	339
13	BakkenLink Pipeline (AMS to Fryburg Pipeline) (McKenzie and Williams)	BakkenLink Pipeline LLC	This project would include the construction of a crude oil pipeline system consisting of approximately 58 miles of 12-inch-diameter crude oil pipeline extending from multiple receipt points in McKenzie and Williams counties, North Dakota.	58	352
Crude Oil Pipeline Totals				**742**	**4,498**
Natural Gas, NGL, and Other Pipelines					
14	Amerada Hess Natural Gas Pipeline (McKenzie and Williams)	Amerada Hess	This project included the construction of a 62-mile-long, 10.75-inch-diameter natural gas pipeline from the AHC Tioga Gas Plant to a delivery point on the Northern Border Pipeline.	21	127
15	Dakota Gasification CO_2 Pipeline (Williams and Dunn)	Dakota Gasification Company	This project included the construction of 205 miles of pipeline including a12-inch-diameter pipeline segment from the Synfuels Plant site to Tioga, North Dakota, and a 14-inch diameter pipeline from Tioga, North Dakota, to Weyburn Oil Field in southeastern Saskatchewan, Canada.	88	533

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
16	Beaver Lodge Loop Pipeline (McKenzie, Williams, and Dunn)	Enbridge	This project included the construction of 56 miles of a 16-inch-diameter NGL pipeline from Berthold Station in Ward County to Beaver Lodge Station in Williams County. This 145,000-bpd capacity pipeline was constructed parallel to the EPND pipeline.	26	158
17	Belle Creek Northern Border System Pipeline (Williams and Mountrail)	Williston Basin Interstate Pipeline Co.	This project included the construction of an 81-mile-long, 16-inch-diameter natural gas pipeline.	24	145
18	Cabin Creek Williston System Pipeline (Williams and Mountrail)	Williston Basin Interstate Pipeline Co.	This project included the construction of a 66-mile-long, 8- and 12-inch-diameter natural gas pipeline.	32	193
19	Cartwright to Trenton System Pipeline (McKenzie and Williams)	Hiland Operating LLC	This project included the construction of a 10-mile-long, 4-inch-diameter NGL pipeline.	24	145
20	Cartwright to Trenton System Pipeline (McKenzie and Williams)	Hiland Operating LLC	This project included the construction of a 10-mile-long, 6-inch-diameter NGL pipeline.	7	42
21	Cartwright to Trenton System Pipeline (McKenzie and Williams)	Hiland Operating LLC	This project included the construction of a 10-mile-long, 8-inch-diameter NGL pipeline.	5	30
22	Fryburg Gathering Pipeline (Williams, Mountrail, and Dunn)	Plains Pipeline LP	This project included the construction of a 14.1-mile-long, 6-inch-diameter NGL pipeline in McKenzie County.	2	12
23	NBPL Pipeline (Williams)	Northern Border Pipeline Company	This project included the construction of a 1,407-mile-long, 8-inch-diameter natural gas pipeline through the Williston Basin of Montana and North Dakota.	170	1,030
24	Prairie Rose Pipeline "Acquired by AUX Sable" (Mountrail)	Pecan Pipeline (North Dakota), Inc.	This 12-inch diameter, 83-mile Prairie Rose Pipeline commenced operation in February 2010 and gathers gas from the Stanley Plant and other sources for delivery into the Alliance Pipeline system at Bantry, North Dakota. The pipeline has an estimated capacity of 110 million cubic feet per day and can be easily expanded to meet additional demand.	9	55
25	Robinson Lake Gas Pipeline (Mountrail)	Whiting Petroleum Corp	This project included the construction of a 16.5-mile-long, 6-inch-diameter natural gas pipeline that interconnected with the Williston Basin Interstate Pipeline System. The maximum design operating pressure of the pipeline is 720 psig with a maximum design flow rate of 20 million cubic feet per day.	14	85

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
26	Williston Basin Pipeline (McKenzie)	Bear Paw Energy LLC	This project included the construction of a 64.2-mile-long, 10.75-inch-diameter NGL pipeline. The pipeline was designed to transport approximately 65,000 bpd.	17	103
27	Williston Tioga Minot System Pipeline (Williams and Mountrail)	Williston Basin Interstate Pipeline Co.	This project included the construction of a 166-mile-long, 12-inch-diameter NGL pipeline.	126	764
Natural Gas, NGL, and Other Pipeline Totals				**565**	**3,422**
Electric Transmission Lines					
28	Electrical Transmission Lines (Williams)	North Dakota Electric Companies	Detailed project descriptions or operating companies were not available.	373	2,261
29	Buford Trenton Tap-Buford Trenton P.P. 57-kV Transmission Line (McKenzie and Dunn)	Western Area Power Administration	Upper Great Plains Region Transmission Line Network.	12	73
30	Charlie Creek – Watford City Transmission Line (McKenzie)	Western Area Power Administration	Upper Great Plains Region Transmission Line Network.	27	164
32	Watford City – Beulah 115-kV Transmission Line (McKenzie and Mercer)	Western Area Power Administration	Upper Great Plains Region Transmission Line Network.	11	67
33	Williston – Watford City Transmission Line (Williams and McKenzie)	Western Area Power Administration	Upper Great Plains Region Transmission Line Network.	12	73
34	Wolf Point – Williston 115-kV Transmission Line (Williams)	Western Area Power Administration	Upper Great Plains Region Transmission Line Network.	17	103
Electric Transmission Line Totals				**467**	**2,832**
Past Actions Totals				**1,774**	**10,752**

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
Present Actions					
Crude Oil Pipelines					
35	Hawkeye Pipeline System Project (McKenzie and Williams)	Hess Corporation	This project would consist of a crude oil, NGL, and high pressure natural gas pipeline system from the proposed Hawkeye Central Oil Facility near Keene, North Dakota, to the Ramburg Truck Facility and Silurian Compressor Station near Tioga, North Dakota.	26	334
36	Bakken North Project Pipeline (Williams, Mountrail, and Dunn)	Plains Pipeline LLC	This project would include the construction of a 103-mile, 12.75-inch-diameter crude oil pipeline (44 miles in North Dakota) extending from Trenton, North Dakota, to Regina, Saskatchewan, Canada. The pipeline capacity would be 50,000 bpd.	18	109
37	Belle Fourche Pipeline (McKenzie and Dunn)	True Companies	This project would include the construction of a crude oil pipeline (50,000-bpd capacity) from the Williston Basin of western North Dakota to the Powder River Basin in Wyoming.	39	236
38	Bicentennial to Dickinson Pipeline (McKenzie and Dunn)	Belle Fourche Pipeline	This project would include an 8-inch-diameter liquid petroleum pipeline.	71	430
39	COLT Connector Pipeline Project (Williams)	Rangeland Energy	This project would include a 21-mile-long, 8-inch-diameter crude oil pipeline from Epping to Tioga, North Dakota.	3	18
40	Parshall System Pipeline (McKenzie, Mountrail, and Dunn)	Bridger Pipeline LLC	This project would include a 54-mile-long crude oil pipeline that would gather Bakken crude oil from over 250 wells in Mountrail County with delivery to Stanley, North Dakota.	54	327
41	Market Center Pipeline (McKenzie and Williams)	Hiland Crude	The Project would consist of 6 segments (Tioga, Plains Delivery, Musket Lateral, Epping to Tioga, Johnson's Corner, and New Town Delivery) all within Williams and McKenzie counties in North Dakota.	226	1,370
Crude Oil Pipeline Totals				472	2,824
Natural Gas, NGL, and Other Pipelines					
42	Garden Creek Pipeline (McKenzie)	Bear Paw Energy	This project would include a 64.2-mile-long, 10.75-inch-diameter (55.3 miles in North Dakota) NGL pipeline. The pipeline would operate at 400 to 1,300 psig and have a capacity of 65,000 bpd.	42	255

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
43	Tioga Pipeline (McKenzie and Williams)	Hess Corporation	This project would include 6- and 8-inch-diameter pipelines connected to the Tioga Gas Plant and extending south of Tioga.	48	291
44	Tioga Lateral (Williams and Mountrail)	Alliance Pipeline Company	This pipeline would branch off from the existing Hess processing facility in Tioga, North Dakota, and would connect to the existing Alliance pipeline in Sherwood, North Dakota. It would be an 80-mile pipeline, 12 inches in diameter, and would transport rich natural gas from Tioga to Sherwood.	14	85
Natural Gas, NGL, and Other Pipeline Totals				**104**	**631**
Electric Transmission Lines					
45	Antelope Valley Station to Northwestern North Dakota 345-kV Transmission Line Project (McKenzie, Williams, Mountrail and Dunn)	Basin Electric Power Cooperative	This project would include the construction of approximately 190 miles of 345-kV electric transmission lines extending from the Antelope Valley Station near Beulah, North Dakota, to the existing Williston Substation near Williston, North Dakota, and onto the Neset Substation near Tioga, North Dakota.	45	273
Electric Transmission Line Total				**45**	**273**
Present Actions Totals				**621**	**3,728**
Reasonably Foreseeable Future Actions					
Crude Oil Pipelines					
46	Little Muddy Station Connection Project (McKenzie, Williams, and Dunn)	Enbridge Pipelines (North Dakota) LLC	This project would include the construction of a new pump and terminal facility, the Little Muddy Station, and an approximately 6-mile-long, 10-inch-diameter pipeline from the new Little Muddy Station to Enbridge's East Fork Station in Williams County. The Little Muddy Station would include two 30,000-barrel tanks, pumping facilities, a shipper-owned and operated truck-offloading facility, and pipeline interconnects to allow for a capacity of 55,000 bpd. The Little Muddy Station Connection is a part of Enbridge's 968-mile-long existing underground petroleum gathering and mainline pipeline system that extends from eastern Montana through North Dakota to Minnesota.	6	36

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
47	Crude Oil Pipeline (Williams)	Rangeland Pipeline, LLC	This project would include the construction of approximately 20.5 miles of 10-inch pipeline and a storage tank and meter station approximately 8 miles south of Tioga, for the transmission of crude oil, all in Williams County, North Dakota.	18	109
48	Nelson to Ross Pipeline (Williams and Mountrail)	Plains Pipeline, L.P.	This project would include the construction and operation of approximately 16.9 miles of 10.75-inch crude oil pipeline. The pipeline capacity would be 47,000 bpd.	15	91
49	Confidential Pipeline (McKenzie)	Confidential Proponent	Either 6-inch or 8-inch pipeline (possibly could be up to as big as 12-inch). Assuming 100-foot temporary construction ROW with 50-foot permanent ROW. Aboveground facilities would consist of launcher/receiver, ESD valve, meter facility, associated station piping, power and communications tower.	1	12
50	Confidential Pipeline (McKenzie)	Confidential Proponent	Size of the line could be between 6 inches and 12 inches (yet to be determined). Assuming 100-foot temporary construction ROW with 50-foot permanent ROW. Aboveground facilities would consist of launcher/receiver, ESD valve, meter facility, associated station piping, power and communications tower.	3	36
51	BakkenLink Pipeline (Dry Creek to Beaver Lodge Pipeline) (McKenzie, Williams)	BakkenLink Pipeline LLC	This project would include the construction of a crude oil pipeline system consisting of approximately 35 miles of 16-inch-diameter crude oil pipeline extending from multiple receipt points in McKenzie and Williams counties, North Dakota, to an interconnect with a proposed, future rail loading facility at Fryburg, North Dakota.	37	498
52	Bakken Bridge Pipeline (McKenzie and Williams)	Bakken Bridge	The proposed Bakken Bridge Pipeline Project is an approximately 6.2-mile-long pipeline system consisting of two 60-inch-diameter carrier pipes that will contain multiple crude oil, natural gas, and natural gas liquids pipelines.	6	103
53	Bakken Oil Express Phase II Pipeline (McKenzie and Dunn)	Bakken Oil Express	Project would consist of 12-inch-diamter crude oil pipeline from Johnson's Corner, North Dakota, to Killdeer, North Dakota.	39	473
Crude Oil Pipeline Totals				**125**	**1,358**

Table 5-1 Past, Present, and RFFAs within the Project CESA

Map ID Number	Project Name (County)	Company	Project Description	Estimated Distance Within CESA (miles)	Total Estimated Surface Disturbance (acres)
Natural Gas, NGL, and Other Pipelines					
54	Sanish Project Pipeline (McKenzie, Williams, and Dunn)	Enbridge	This project would include the construction and operation of approximately 36 miles of 12-inch-diameter and 1 mile of 10-inch-diameter pipeline for crude oil.	33	200
55	Stateline to Riverview Pipeline (McKenzie and Williams)	ONEOK Rockies Midstream LLC	This project would include the construction and operation of approximately 53.4 miles (12.4 miles in North Dakota) of 10.75-inch-diameter NGL pipeline. The pipeline capacity would be 65,000 bpd and operating at 400 to 1,300 psig.	9	55
56	Vantage Pipeline Project (McKenzie and Williams)	Vantage Pipeline US LP	This project would include the construction and operation of approximately 430 miles of 10- and 12-inch-diameter NGL pipeline running from the Hess Corporation Gas Plant in Tioga, North Dakota, to Empress, Alberta, Canada.	34	206
Natural Gas, NGL, and Other Pipeline Totals				**76**	**461**
Reasonably Foreseeable Future Action Totals				**201**	**1,819**
All Projects Totals				**2,596**	**16,299**

Notes: Total surface disturbance was calculated assuming a 50-foot disturbance corridor for each line regardless of product.

Pipeline lengths are rough estimates. Data for exact location and length (miles) were not available.

5.2.3 Reasonably Foreseeable Future Actions

Activities considered to be RFFAs were evaluated based on the criteria listed below. Information was gathered to identify potential future actions in the following ways: obtaining information from the North Dakota PSC's website, computer databases, and considering other EIS/EAs recently completed for other projects in the region. The information gathered was evaluated based on the criteria to determine which of these projects are speculative due to limiting factors and which are reasonably foreseeable to occur and relevant to the cumulative impacts discussion.

- **Siting authorities/applications** – identify if an application has been submitted to a siting authority (e.g., a utilities commission, PSC) that regulates the rates and services of a public utility, reviews, and approves and/or denies applications for development of pipeline and electric transmission line projects.
- **NEPA process/federal approvals –** identify if a project is under NEPA review (e.g., federal agencies are required to consider and disclose the potential environmental impacts of their "major" or "significant" proposed actions, prior to decision-making, to keep the decision-making process transparent and cooperative).
- **System studies and planning analysis** – determine if a project requires analysis or an evaluation of proposal design to determine the difficulty in carrying out a designated task. Such studies precede technical development and project implementation. The subsequent discussion describes the activities determined to be RFFAs.

Using the above criteria, 15 projects have been identified as reasonably foreseeable, which are listed in **Table 5-1**. These RFFAs would include 9 crude oil pipelines (approximately 446 miles; approximately 2,702 acres) and 6 NGL pipelines (approximately 76 miles; approximately 461 acres), which would have a combined total surface disturbance of approximately 697 acres and a total length of approximately 115 miles. There are no electric transmission lines proposed for construction within the CESA in the reasonably foreseeable future.

All past, present, and RFFAs within the CESA boundary cover a total of 15,055 acres (estimated surface disturbance) and stretch 2,484 miles (estimated distance).

5.3 Resource-specific Cumulative Effects

5.3.1 Air Quality

To the extent that construction of the Project would occur simultaneously and in the same general area as other projects, there could be minor cumulative temporary impacts to air quality. Simultaneous construction activities in close proximity to one another could result in locally elevated concentrations of pollutants; however, those concentrations are not expected to result in a degradation of local or regional air quality, or result in any exceedences of the NAAQS. There would be no permanent cumulative impacts associated with the Project, and the expected reduction in the number of oil tanker miles driven could result in a net decrease in air quality impacts.

5.3.1.1 Criteria Pollutants

Ambient air quality data for the region reflects impacts of all currently existing operations in the airshed. Air quality in the region meets applicable state and national standards and would be expected to remain in compliance under the existing operations (i.e., the No Action Alternative). As previously discussed, the Project emissions are expected to be negligible because activities are temporary in nature; therefore, it is reasonable to expect that cumulative impacts resulting from the Project would be in compliance with all applicable state and national standards. Evaluating the cumulative impacts of the Project within the CESA can best be completed by comparing the scale and nature of the development to relevant existing and proposed developments and the impacts those projects are predicted to have.

As seen in **Table 5-1**, existing, present, and RFFAs development total a combined 16,299 acres of surface disturbance. The overall scale of the Project, approximately 26 miles and 334 acres of surface disturbance, are consistent with several existing developments that do not have impacts on the NAAQS. In addition, the Project only accounts for less than 1 percent of the total surface disturbance for all existing and proposed developments in the CESA. Therefore, the contribution of the Project to cumulative impacts would be minor compared to the impacts from all existing and proposed developments.

5.3.1.2 HAPs

Total uncontrolled VOC emissions would be 1,028,549 lbs/year, for a total of 514 tpy of VOC emissions from onsite storage tanks at the proposed Hawkeye Oil Facility. Even though all HAPs emitted would be only a small fraction of VOC emissions, based on estimated VOC emissions, HAPs emissions may approach major source limits. However, tanks emissions can be controlled through the use of various emissions control devices; therefore, negligible impacts to air quality would be expected. It is expected that operation of the Project would preclude the need for approximately 380 oil tanker trucks to haul oil each day. Using the conservative assumptions that each truck hauls 200 barrels, a pipeline capacity of 76,000 bpd, and an average roundtrip of 150 miles, approximately 57,000 truck miles per day would be eliminated from western North Dakota roads. This would be expected to provide positive benefits in terms of both traffic congestion and air quality.

5.3.1.3 Air Quality Related Values

Due to the projected negligible emissions associated with the Project, it is not anticipated that the Project would contribute significantly to cumulative impacts at the nearest sensitive area (i.e. Lake Sakakawea), and may provide beneficial effects from reduction of daily truck traffic.

5.3.2 Geology and Minerals

5.3.2.1 Geology

Incremental effects to geology from the Project would consist of a temporary disturbance of surficial glacial and alluvial geologic units along the Project route shown on **Figure 5-1**. This temporary disturbance would be in addition to the temporary disturbances generated by past, present, and RFFAs (**Table 5-1**). The disturbances to surficial geologic units would be reclaimed upon completion of construction of the Project, which would restore surficial geologic units to their approximate pre-construction distribution.

5.3.2.2 Minerals

There are no anticipated impacts to oil and gas or mineral resources during construction or operation of the Project. Therefore, no cumulative impacts to mineral or oil and gas resources are expected. The Project's demand for aggregate would be small compared to the overall aggregate production in North Dakota. The increase in oil and gas drilling and associated construction in North Dakota, along with unforeseen events like the flooding in Minot, North Dakota, in 2011 (Schramm 2011), have put additional pressures on local suppliers of aggregate and have resulted in temporary shortages. The Project would cover a total of approximately 26 linear miles and is expected to use approximately 14,480 tons of aggregate. Current estimates of past, present, and RFFAs related to construction of linear facilities total 2,596 linear miles (**Table 5-1**) compared to the total aggregate demand in the CESA. Thus, the cumulative effect of the Project on aggregate demand is expected to be minimal.

5.3.3 Paleontological Resources

Cumulative impacts to paleontological resources would result from surface disturbance related to industrial development, unauthorized collection, and natural erosion processes within the CESA. With implementation of the environmental protection measures (**Table 2-4**), the Project, when added to past, present, and RFFAs, would not contribute to cumulative impacts to paleontological resources in the

CESA. A cumulative beneficial impact could result from the discovery of important fossil localities because of construction of the Project or other RFFAs in previously undisturbed areas.

5.3.4 Soils

Past and present actions and RFFAs that contribute to cumulative impacts to soil resources in the CESA include construction of pipelines and electric transmission lines. Impacts to soils from construction and operation activities associated with pipeline construction would be similar to those described in Section 4.4, Soils. Cumulative impacts to soils would include removal of vegetation, exposure of the soil, mixing soil horizons, soil compaction, loss of topsoil productivity, and increased susceptibility of soils to erosion. Approximately 16,299 acres of soils would be disturbed as a result of past and present actions, RFFAs, and construction of the Project. As stated in Section 5.2.1, Past Projects, the majority of the past surface disturbances associated with these projects have been reclaimed and returned to their previous land uses, with the exception of permanent, aboveground facility locations.

With implementation of the environmental protection measures (**Table 2-4**), SWPPP (POD, Appendix I), and CMRP (POD, Appendix C), cumulative impacts to soils from Project development are expected to be minimal.

5.3.5 Water Resources

The Project would cross two major aquifers, the Dry Fork Creek alluvial aquifer and the Missouri River/Lake Sakakawea alluvial aquifer. The Missouri River is a Class I stream. All other streams crossed are designated Class III streams and are intermittent. Bedrock aquifers in the Hell Creek/Fox Hills formations and Fort Union Group also would be crossed. These river and aquifer crossings would be in addition to the extensive crossing of streams and aquifers in the CESA by past and present actions and RFFAs**.** The cumulative effect of the Project related to stream and aquifer crossings would be minimal compared to crossings associated with past and present actions and RFFAs. Any spills, ruptures, or leaks from the proposed pipeline would be addressed in a timely manner and impacts to water quality in streams and surficial alluvial aquifers would be remediated and would be temporary in nature. Thus, the cumulative effect of the Project on water resources is expected to be minimal.

5.3.6 Vegetation

Project-related surface disturbance, in addition to past and present actions and RFFAs within the CESA, would result in the cumulative surface disturbance of approximately 16,299 acres. Surface disturbance from these projects would total approximately 0.3 percent of the entire CESA. Potential impacts to vegetation would be minimized by implementing numerous environmental protection measures including proper handling of topsoil and spoil, noxious weed control measures, and reclamation techniques as described in the CMRP (POD, Appendix C), Tree and Shrub Mitigation Specifications (POD, Appendix O), and Noxious Weed Control Plan (POD, Appendix F). With implementation of these measures, the Project, when added to past and present actions and RFFAs, would result in minimal cumulative impacts to vegetation within the CESA.

5.3.7 Wetlands and Floodplains

Hess has committed to using HDD to avoid disturbance of all wetlands; therefore, no impacts to wetlands would occur. Setbacks, which include at least 50 feet for ATWSs and equipment staging areas, would be implemented during construction, and activities involving potential hazardous materials, fuel, or other petroleum product spills would be restricted within 100 feet of wetlands. Environmental monitors would inspect the construction areas to ensure that leaks or spills have not occurred near wetlands and waterbodies. Hydrostatic testing would be conducted at approved locations or using municipal water sources. No surface water sources would be used for hydrostatic test water. As a result, impacts from hydrostatic testing on wetlands and riparian areas would not occur. Implementation of environmental protection measures and BMPs/mitigation measures outlined in the CMRP (POD, Appendix C) would further protect wetlands and riparian areas, as well as floodplains. With implementation of these

measures, the Project, when added to past and present actions and RFFAs, would result in negligible cumulative impacts to wetlands and floodplains within the CESA.

5.3.8 Noxious Weeds and Invasive Species

Impacts to existing vegetation types from noxious weed and invasive species establishment are not anticipated as a result of Project. Environmental protection measures and mitigation measures outlined in the CMRP (POD, Appendix C) and the Noxious Weed Control Plan (POD, Appendix F) would be implemented to minimize impacts. Therefore, cumulative impacts are not anticipated.

5.3.9 Wildlife

The cumulative analysis for wildlife and fisheries focuses on the past and present actions and RFFAs presented in **Table 5-1,** and the Project disturbance presented in **Table 2-1**. It assumes that: 1) human use of the CESA would increase with the implementation of the Project; 2) wildlife habitats currently are at their respective carrying capacities in and adjacent to the Project area; and 3) the overall region has been previously affected by at least some level of historic and current development activities and would be affected by RFFAs.

Cumulative impacts to wildlife and aquatic species would be directly related to habitat loss, habitat fragmentation, animal displacement, and direct mortalities. Permanent surface disturbance incrementally adds to wildlife habitat losses, overall habitat fragmentation, and animal displacement. In areas where development has occurred, habitat fragmentation may have resulted in the disruption of seasonal patterns or migration routes. Historic, current, and future developments in the vicinity of the Project have resulted, or would result in the reduction of carrying capacities, as characterized by the amount of available cover, forage, and breeding areas for wildlife species.

The CESA includes 4 counties and approximately 5,780,380 acres of land. As presented in **Table 5-1**, a total of 16,299 acres are estimated to be disturbed. Impacts from Project construction would include the temporary disturbance of approximately 254 acres and permanent disturbance of approximately 80 acres of wildlife habitat. Surface disturbance from these projects would be less than 1 percent of the entire CESA.

Surface disturbance considered in the CESA results from the construction and operation of pipelines and electric transmission lines. However, other activities such as livestock grazing, agriculture, and recreational activities also contribute to cumulative impacts on wildlife and their habitats. Wildlife species would be susceptible to these cumulative impacts since encroaching human activities in the CESA resulted or would result in habitat loss and fragmentation and animal displacement in areas that may be at their relative carrying capacity for these resident species. Many of the local wildlife populations (e.g., small game, migratory birds, raptors, reptiles) that occur in the CESA likely would continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development.

5.3.10 Special Status Species

5.3.10.1 Special Status Wildlife Species

Special status wildlife species would be cumulatively impacted by past and present actions, RFFAs, and the Project. The resulting direct impacts would be similar to those discussed in Section 4.10, Special Status Species. However, in many cases, surveys for special status species are required in potential or known habitats. Surveys would help determine the presence of any special status wildlife species or the extent of potential habitat, and protective measures would be taken to avoid or minimize direct disturbance in these species and their habitat.

The CESA includes 4 counties and approximately 5,780,380 acres of land. As presented in **Table 5-1**, a total of 16,299 acres are estimated to be disturbed. Impacts from the Project construction would include

the temporary disturbance of approximately 254 acres and permanent disturbance of approximately 80 acres of special status wildlife species habitat. Surface disturbance from these projects would be less than 1 percent of the entire CESA.

Surface disturbance considered in the CESA results from the construction and operation of pipelines and electric transmission lines. However, other activities such as livestock grazing, agriculture, and recreational activities also contribute to cumulative impacts on special status wildlife species and their habitats. Special status wildlife species would be susceptible to these cumulative impacts since encroaching human activities in the CESA have resulted, or would result in habitat loss and fragmentation and animal displacement in areas that may be at their relative carrying capacity for these resident species. Many of the local special status wildlife species populations that occur in the CESA likely would continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development.

5.3.10.2 Special Status Plant Species

Project-related surface disturbance, in addition to past and present actions and RFFAs within the CESA, would result in the cumulative surface disturbance of approximately 16,299 acres. An unknown percentage of this total acreage would be considered potentially suitable habitat for the eight special status plant species potentially impacted by the Project and past and present actions and RFFAs. To minimize environmental impacts to suitable habitat and ensure site stabilization and revegetation, Hess would implement the environmental protection measures detailed in **Table 2-4** and additional mitigation measures listed in Section 4.10, Special Status Species. Implementation of the CMRP (POD, Appendix C) and Noxious Weed Control Plan (POD, Appendix F) would minimize the magnitude and duration of suitable habitat disturbance. With implementation of these measures, the Project, when added to past and present actions and RFFAs, would result in minimal cumulative impacts to special status plant species within the CESA.

5.3.11 Land Use

Cumulative land use effects are at two potential scales: highly localized to the degree that they affect the same property, or at least the same ownership; and CESA-wide representing the degree of disturbance or loss of productivity to the CESA as a whole. No cumulative effects to individual properties have been identified. Past and present actions and RFFAs that contribute to cumulative land use impacts in the CESA include pipeline**,** electric transmission line projects, and oil and gas development. Past actions are pipeline or transmission line projects where a large majority of surface lands have been returned to their pre-project land uses; their effects are represented in the affected environment description in Section 3.11, Land Use. Present actions include potential disturbance of 3,394 acres. The Project would add temporary disturbance during construction of approximately 254 acres, or 7.4 percent. If, as a maximum case, the disturbance would all occur simultaneously with the Project construction area, the cumulative disturbance would be 3,728 acres. This would represent approximately 0.06 percent of the land surface in the CESA, a negligible impact. Long-term impacts would be substantially less after restoring most of the surface land in the Project ROW following completion of construction activities.

Permanent surface disturbance from the Project would be an estimated 80 acres, which would represent approximately 4.4 percent of the disturbance anticipated from RFFAs and 0.5 percent of the total disturbance from past and present actions and RFFAs.

The total potential cumulative disturbance would represent a negligible 0.006 percent of the CESA. With implementation of environmental protection measures, the Project, when added to past and present actions and RFFAs would result in minimal cumulative impacts to land use within the CESA.

5.3.12 Recreation

Past and present actions and RFFAs that contribute to cumulative recreation impacts in the CESA include pipeline, electric transmission line projects, and oil and gas development. Past actions are pipeline or transmission line projects where a majority of disturbed lands have been returned to approximately their pre-project condition. Impacts to recreation from construction and operation or RFFAs would be similar to those described in Section 4.12, Recreation. Construction impacts would include potential temporary disruptions to hikers, hunters, anglers, and campers from increased use of facilities by construction workers. However, these effects would be highly localized and potential impacts would end as soon as construction activities were completed. Cumulative effects would only occur if other individual projects were under construction nearby at the same time as the Project was being constructed. For example, if several present actions and RFFAs were under construction simultaneously during deer hunting season, there could be some temporary adverse effects on hunter success or hunting access; however, the duration of the effects would be at most, one hunting season. Long-term impacts to recreation would be negligible.

With implementation of environmental protection measures, the Project, when added to past and present actions and RFFAs, would result in minimal cumulative impacts to recreation within the CESA.

5.3.13 Visual Resources

The existing visual landscape character of the Project area includes and is defined by past and present land uses and activities. For a majority of the landscape, existing uses include prairie rangeland and cultivated agricultural land with some recreation activity largely focused on Lake Sakakawea from a visual perspective. There also is a network of existing roads, utilities, and fence lines. Although these activities and structures provide the visual background, existing oil and gas wells and support facilities are the most dominant features in the visual character of the Project area. RFFAs would add to the existing number of oil and gas facilities and activities. The Project's contribution to impacts on visual resources would be minor relative to the past, present, and reasonably foreseeable future development in the area. The Project's primary contribution to effects on the visual environment would occur during construction and would be temporary and short-term in nature. Clearing of vegetation and brief changes to land contours would be required. The Project would be located adjacent to other facilities and ROWs where possible such that the level of change in the characteristic landscape would be minimal after successful reclamation and revegetation of the Project ROW. After reclamation, the ROW would be (visually) secondary to other existing and reasonably foreseeable manmade features, including dominating oil and gas facilities and a few farmsteads. The proposed Hawkeye Oil Facility would have long-term, but minor, visual effects.

Because the visual effects from the Project would be temporary or minor compared to existing and reasonably foreseeable future development in the area, the Project would contribute minimally to cumulative visual resources impacts in the Project area.

5.3.14 Noise

Past and present actions contributing to the ambient noise environment in the CESA include primarily oil and gas pipelines. Impacts to soundscapes from noise generated during construction and operation of RFFAs would be similar to those described in Section 4.15, Noise. Noise effects would be highly localized, however, and there are no identified NSAs that would be in the impact areas of both the Project and one or more RFFAs. Consequently, no cumulative noise effects have been identified with RFFAs.

5.3.15 Socioeconomics

Past and present actions and RFFAs that contribute to cumulative socioeconomics effects in the CESA include pipelines and electric transmission lines. Impacts to socioeconomics from construction and operation activities associated with pipeline construction would be similar to those described in

Section 4.15, Socioeconomics. Past actions are pipeline or transmission line projects where most social and economic effects have been assimilated into the affected environment as described in Section 3.15, Socioeconomics. A majority of economic and employment effects from past actions have ended, except for modest ongoing operations such as employment, materials and services purchases, and continuing tax revenues. Cumulative effects from present activities would be similar to those described in Section 4.15, Socioeconomics, for the Project. There would be some cumulative loss of agricultural productivity, although affected landowners would be compensated for the losses. There would be increased cumulative demand for worker housing from present activities, RFFAs, and the Project in the face of limited supply. The degree of competition for housing would depend on construction timing for the various projects. Present actions and RFFAs also would contribute to the local tax base, adding increased public revenue. Cumulative impacts within the CESA generally would be beneficial, except for some additional demand for public services and the competition for worker housing. The Project would be a minor contributor to total cumulative social and economic effects in the CESA.

5.3.16 Environmental Justice

Cumulative environmental justice effects from construction and operation of the identified past, present and RFFAs would be similar to those described in Section 4.16, Environmental Justice. Despite the presence of a meaningfully greater Native American population and comparatively high poverty rates on the Fort Berthold Indian Reservation, no disproportionately high adverse effects on these populations have been identified. Cumulative projects would generate income through direct and indirect employment opportunities and would increase local government revenues through payment of property taxes. Minority and low-income communities would be expected to benefit similarly to the population at large from these effects. The Project, when added to past and present actions and RFFAs, would be expected to contribute proportionately to cumulative effects, both positive and negative, on the population in the CESA.

5.3.17 Transportation

Past and present actions in the transportation CESA include numerous pipelines, which have substantially increased vehicle traffic in the area particularly during construction. However, the pipeline projects have reduced the amount of truck traffic in the longer term by facilitating transport of oil and NGLs via pipelines as an alternative mode of transportation.

Construction of the Project would be expected to temporarily increase traffic throughout the CESA, but primarily in the immediate Project area because of the need to transport materials and construction workers. The temporary increase in traffic would occur on roadways at all levels, but the roads have sufficient capacity to accommodate the expected increases. The traffic increase would be temporary and minor. The degree of cumulative effect would depend on whether construction activities for the Project would occur simultaneously with construction of other RFFAs in the immediate vicinity.

During the operating life of the Project, overall surface traffic is expected to reduce by replacing truck transportation of oil with pipeline transport, as noted in Section 4.17, Transportation. It is anticipated that development of other pipeline RFFAs would have a similar effect on road traffic over the long term, such that the cumulative effect of past, present, and RFFAs would reduce tank truck-related traffic congestion and wear and tear on most roads and highways in the CESA from levels that would occur without the projects.

5.3.18 Public Safety

Past and present actions and RFFAs that contribute to cumulative impacts to human health and safety within the CESA include pipeline and electric transmission lines. Impacts to human health and safety from Project construction and operation activities would be similar to those described in Section 4.18, Public Safety. Given the advances in pipeline construction, leak detection systems, and emergency responses, modern pipelines (including the Project) are less likely to experience a spill incident.

Implementation of Hess's notification systems and shutdown procedures would decrease the potential for a spill and any associated risk to public safety. The potential for cumulative effects to public safety as a result of Project construction and operation is considered unlikely.

5.3.19 Hazardous Materials and Solid Waste

Compliance with existing regulations and implementation of spill plans and environmental protection measures, the Project would represent a small contribution to cumulative impacts and the amount of hazardous materials and solid waste produced when added to past and present actions and RFFAs.

5.3.20 Cultural Resources

As directed by law, cultural resources inventories are conducted for any federal undertakings, and adverse effects to NRHP-eligible sites avoided or mitigated as appropriate. Avoidance through project redesign is the preferred method of mitigation; however, when avoidance is not feasible, data recovery or other forms of mitigation are implemented prior to ground-disturbing activities.

Minor variations to the Project ROW have resulted in avoidance of all known NRHP-eligible or unevaluated sites by at least 50 feet, thereby avoiding direct impacts to these resources. Although these sites would be avoided by a 50-foot buffer, monitoring during Project-related construction activities is recommended for selected sites because of the possibility for buried deposits associated with the sites, and for sites where the 50-foot buffer is on the edge of the construction ROW. Potential impacts to unknown NRHP-eligible sites that may be discovered during construction activities would be minimized or mitigated in accordance with the Unanticipated Discoveries Plan for Cultural Resources (POD, Appendix K). Based on avoidance of all sites, monitoring, and the Unanticipated Discoveries Plan, the Project is not expected to cumulatively impact known or unknown NRHP-eligible sites or unevaluated sites.

Indirect effects, such as illegal collecting of artifacts, have occurred and most likely would continue to occur in the CESA through increased access, development, and increased human presence, as a result of past, present, and RFFAs.

5.3.21 Tribal Treaty Rights and Interests

Tribes may have treaty rights and/or traditional cultural interests within the Project area. Cumulative impacts to these areas and associated traditional values could result from surface disturbance, surface structures, unauthorized collection of artifacts, and natural erosion processes. In addition, the Project temporarily may reduce the amount of federal lands within which tribal members can exercise their hunting, fishing, and gathering rights outside of the reservation. The reader is referred to Sections 5.3.6, 5.3.9, and 5.3.10 for cumulative effects to vegetation, wildlife and fisheries, and special status species.

Temporary impacts may occur by changing the way in which a tribal member accesses resources of tribal use. There also may be temporary impacts to tribal treaty rights by the temporary restrictions of certain activities (e.g., hunting or gathering) in the ROW corridor during construction. However, the Project is not expected to cumulatively impact resources of significance to the tribes when added to past, present, and RFFAs. The Project also is not expected to cumulatively impact tribal trust resources because there would be no restrictions on accessing resources and/or areas for religious purposes in the ROW after construction has been completed.

6.0 Consultation and Coordination

6.1 Agency Scoping

A formal agency scoping meeting was held in Minot, North Dakota, on April 23, 2013. Eight agency personnel participated in the meeting, representing the BLM, USFS, and USACE. An additional formal agency scoping meeting was held at the USFWS North Dakota Ecological Services Field Office on January 15, 2014.

A majority of the comments received from the agencies were related to project development, potential impacts to biological and cultural resources, wetlands, reclamation/restoration practices, and operations and safety measures to minimize impacts from a potential product spill. The following is a general list of issues or concerns noted in the comments:

- Alternatives analysis that includes avoidance of the Lake Sakakawea crossing;
- Direct, indirect, and cumulative impacts to:
  - Wildlife;
  - Special status species (federal listed, proposed, candidate, and USFS sensitive species);
  - Protected raptors and migratory birds;
  - Cultural resources and tribal traditional cultural properties;
  - Vegetation from noxious weed invasion; and
  - Wetlands.
- Reclamation/restoration of disturbance areas with native species; and
- Noxious weed management and control.

6.2 Public Interest/Public Scoping

The BLM compiled a mailing list of agencies, organizations/companies, individuals, and other entities that may have an interest in the Project. The list included federal, state, and local agency offices with jurisdiction over the Project, as well as potentially affected landowners, Native American tribes, and NGOs. A scoping notice describing the Project and requesting comments was distributed on March 11, 2013, to all individuals identified on the mailing list. The 30-day public scoping period ended on April 22, 2013.

Public notices were published in the following regional newspapers, notifying the public of the Project and soliciting comments:

Associated Press

Billings County Pioneer

Dickinson Press

Dunn County Herald

Minot Daily News

Bismarck Tribune, and

Williston Daily Herald

Seven comment letters were received during the public scoping period. A summary of the issues identified in these letters has been provided below.

- Concerns about impacts to cultural resources of significance to the Tribe (Standing Rock Sioux);
- Request that pedestrian surveys be conducted by tribal representatives;
- Construction activities that disturb wetlands should follow NRCS guidelines for wetlands;
- Concerns about landslide hazards in the Project area;
- Forested areas should be avoided and any trees or shrubs removed from Project construction should be replaced;
- Permit requirements: A Sovereign Land Permit will be required from the State Engineer;
- Waste material must be properly disposed;
- Concerns about adverse impacts to significant ecological communities adjacent to the Project area (Jointed-spike sedge, bur Oak Upland Woodland, Western Little Bluestem Prairie);
- USFWS requested an invitation to be a cooperating agency on the Project;
- Alternatives analysis should include the evaluation of an alternative that avoids the Lake Sakakawea crossing;
- Project restoration plan should include grasslands and impacted wetlands, recommendation of native seed mix, and use of broadcast seeding; and
- Concerns about invasive and weedy species with recommendations for weed monitoring.

6.3 Agencies, Organizations/Companies, Native American Tribes, and Persons Consulted

The following agencies, organizations/companies, individuals, and other entities were contacted during the public scoping process.

6.3.1 Agencies

Federal

Bureau of Land Management
U.S. Army Corps of Engineers
    Regulatory Office (Bismarck, North Dakota)
    Omaha District Office (Omaha, Nebraska)
    Garrison Dam Project Office (Riverdale, North Dakota)
U.S. Congress
U.S. Department of Agriculture – Animal and Plant Health Inspection Service, Wildlife Services
U.S. Department of Agriculture – Natural Resources Conservation Service, North Dakota State Office
U.S. Fish and Wildlife Service – North Dakota Ecological Services Field Office
U.S. Forest Service – LMNG, McKenzie Ranger District
U.S. Department of the Interior – Office of Surface Mining Reclamation and Enforcement
U.S. National Park Service, Theodore Roosevelt National Park, North Dakota
U.S. Senate

State

North Dakota Department of Health
North Dakota Forest Service
North Dakota Game and Fish Department
- Bismarck Office
- Williston Office
- Riverdale Office

North Dakota Industrial Commission – Oil and Gas Division
North Dakota Land Department
North Dakota Parks and Recreation Department
North Dakota State Historical Society
North Dakota State University – Department of Soil Science
North Dakota State Water Commission
North Dakota Tourism Division
State of North Dakota
State District #36
State District #39
State District #4

Local

McKenzie County Commissioners
McKenzie County Extension Agent
McKenzie County Water Resource District
McKenzie County Weed Board
Williams County Commissioners
Williams County Water Resource Board

6.3.2 Organizations/Companies

Agassiz Basin Group Sierra Club
American Rivers
Audubon Dakota
Badlands Conservation Alliance Field Office
Badlands Shooting Club
Cliffhangers Four-wheeler Club
Continental Resources, Inc.
Dakota Cyclery
Dakota Prairie Grasslands
Dakota Resource Council
FNAWAS Headquarters
Independent Petroleum Association of Mountain States
Job Development Authority
McKenzie County Farmer
McKenzie County Grazing Association
Medora Grazing Association
MHA Elders Organization
Mule Deer Foundation
National Audubon Society State Office
National Wildlife Federation
North Dakota Council of Humane Societies
North Dakota Farm Bureau
North Dakota Petroleum Council
North Dakota Wildlife Federation
Pheasants Forever

Public Lands Advocacy
Rutland Sportsman
Sierra Club, Teddy Roosevelt Group
Wild West Institute

6.3.3 Tribal Contacts

Bureau of Indian Affairs
Bureau of Indian Affairs, Fort Berthold Agency
Bureau of Indian Affairs, Standing Rock
Cheyenne River Sioux Tribe
Crow Creek Sioux Tribe
Flandreau Santee Sioux Tribe
Fort Belknap Indian Community
Fort Peck Tribes
Lower Brule Sioux Tribe
Lower Sioux Indian Community
Northern Cheyenne Tribe
Oglala Sioux Tribe
Rosebud Sioux Tribe
Santee Sioux Tribe of Nebraska
Sisseton-Wahpeton Oyate Tribes
Spirit Lake Tribe
Standing Rock Sioux Tribe
Three Affiliated Tribes – Mandan, Hidatsa and Arikara Nation
Turtle Mountain Band of Chippewa
Yankton Sioux Tribe

6.3.4 Individuals

Linda Mogen
Adelle E. Ford
Rosemary Grimstad
Leonell Grimstad
Grimestad Farm and Ranch, LLP
Elsie Gilbertson
Vern Sherven
Lynn Swenson and Pearl Swenson
Clark D. Bohmbach
Leif Jelesed
United States Forest Service
United States Army Corps of Engineers
State of North Dakota
Prairie Liquids, LLC
Darwin and Jeane Krenz
Robert and Genevieve Stockman
Roger and Linda Halverson
Thomas John Halverson
Layne and Malinda Ferguson
Shirley Groth
Dorothy Krogen
Nick and Fern Leier
Eugene and Penney Moe
Leon G. Moe
Myron J. Iverson
Sally F. Iverson
Nathan Trauger
Phyllis M. Iverson
Ashley R. Iverson
David A. Iverson
Barry and Melissa Ramberg
Raymond Dilland
Sylvia Mills
Richard Rye

7.0 Preparers and Reviewers

NEPA takes on an interdisciplinary approach to decision-making to ensure that all potential impacts to the physical, natural, social, and human environments from Project development have been evaluated. As such, the preparation of the Hawkeye Pipeline System Project Environmental Assessment has been prepared and reviewed by an interdisciplinary team from several areas of expertise. **Table 7-1** lists the staff that contributed to the preparation and review of the EA.

Table 7-1 List of Preparers and Reviewers

Agency/Company	Name	Responsibility
Bureau of Land Management	Lowell Hassler	NEPA Project Lead
	Shannon Gilbert	Cultural/Native American Consultation Lead
	Greg Liggett	Montana State Office Paleontologist
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