Hawkeye Pipeline System Project

Plan of Development

July 2015

Table of Contents

1.0 INTRODUCTION 1-1

1.1 GENERAL INTRODUCTION 1-1

1.2 PURPOSE OF THE POD 1-1

2.0 PURPOSE AND NEED 2-1

2.1 PURPOSE AND NEED FOR THE PROJECT 2-1

2.2 ALTERNATIVES 2-1

2.2.1 New Pipeline Construction Crossing Lake Sakakawea 2-1

2.2.2 Trucking Alternative 2-1

2.2.3 Route Alternatives 2-2

2.3 FEDERAL, STATE, AND LOCAL GOVERNMENT AGENCIES INVOLVEMENT 2-2

3.0 RIGHT-OF-WAY DESCRIPTION 3-1

4.0 PROJECT DESCRIPTION 4-1

4.1 DESCRIPTION OF PROPOSED FACILITIES 4-1

4.1.1 Crude Oil Pipeline 4-1

4.1.2 Natural Gas Pipeline 4-4

4.1.3 Natural Gas Liquids Pipeline 4-4

4.1.4 Receipt Facilities 4-7

4.1.5 Other Aboveground Facilities 4-6

4.1.6 Storage, Staging, and Access 4-7

4.1.7 Fiber Optic Control System 4-11

4.1.8 Corrosion Protection 4-11

4.2 PROJECT SCHEDULE AND WORKFORCE 4-12

4.2.1 Construction Schedule 4-12

4.2.2 Project Workforce and Equipment 4-13

4.3 HUMAN HEALTH AND SAFETY 4-14

4.3.1 Solid and Hazardous Waste Control 4-14

4.3.2 Emergency Response and Pipeline Integrity Management 4-14

5.0 PIPELINE CONSTRUCTION PROCESS 5-1

5.1 SAFETY REQUIREMENTS AND ENVIRONMENTAL INSPECTION AND MONITORING . 5-1

5.2 GENERAL CONSTRUCTION DESCRIPTION 5-2

5.3 SURVEY AND STAKING 5-2

5.4 CLEARING AND GRADING 5-2

5.5 TRENCHING 5-4

5.6 PIPE STRINGING, BENDING, AND WELDING 5-4

5.7 LOWERING-IN, PADDING, AND BACKFILLING 5-5

5.8 HYDROSTATIC TESTING 5-5

5.9 CLEAN-UP AND RESTORATION 5-6

5.9.1 Clean-up 5-6

5.9.2 Restoration 5-6

6.0 SPECIAL CONSTRUCTION METHODS 6-1

6.1 OPEN CUT CONSTRUCTION 6-1

6.2 HORIZONTAL DIRECTIONAL DRILLING 6-1

6.3 SPECIAL CONSTRUCTION AREAS 6-5

6.3.1 Highway, Road, and Railroad Line Crossings 6-5

6.3.2 Waterbody Crossings 6-5

6.3.3 Wetland Crossings 6-5

6.3.4 Rugged Terrain 6-5

6.3.5 Residential and Commercial Areas 6-12

6.3.6 Agricultural Areas 6-12

6.4 FIRE PREVENTION AND SUPPRESSION 6-13

6.5 DUST CONTROL 6-13

7.0 ENVIRONMENTAL RESOURCE CONCERNS 7-1

7.1 INTRODUCTION 7-1

7.2 CULTURAL RESOURCES 7-1

7.3 WILDLIFE/SPECIAL STATUS SPECIES 7-1

7.4 NOXIOUS AND INVASIVE WEEDS 7-2

7.5 WATER RESOURCES 7-3

7.5.1 Surface Water 7-3

7.5.2 Groundwater 7-4

7.6 VEGETATION 7-4

7.7 SOILS 7-5

7.8 WETLANDS 7-6

8.0 OPERATIONS AND MAINTENANCE 8-1

9.0 ABANDONMENT 9-1

10.0 REFERENCES 10-1

List of Tables

Table 2-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project 2-2
Table 3-1 Pipeline ROW Disturbance by Land Ownership 3-1
Table 3-2 Temporary and Permanent Disturbance Required for Project Development....3-1
Table 4-1 Receipt Facility, Mainline Valve, Pig Launcher/Receiver, and Emergency Shutdown Valve Locations by Milepost....4-3
Table 4-2 New Access Roads 4-11
Table 4-3 Conventional Personnel, Equipment, and Time Requirements for Construction.... 4-12
Table 4-4 Typical Construction Equipment per Spread 4-14
Table 5-1 Hydrostatic Test Segments and Estimated Water Volumes 5-5
Table 6-1 Horizontal Directional Drill and Bore Locations 6-1

List of Figures

Figure 1-1 Project Overview and Land Ownership 1-2
Figure 4-1 Crude Oil Pipeline....4-2
Figure 4-2 Natural Gas Pipeline....4-5
Figure 4-3 Repurposed Natural Gas Liquids Pipeline....4-6
Figure 4-4 Hawkeye Oil Facility 4-8
Figure 4-5 Mainline Valve Site Plan – Oil Pipeline 4-9
Figure 4-6 Mainline Valve Site Plan – Natural Gas Pipeline.... 4-10
Figure 5-1 Typical Construction Sequence 5-3
Figure 6-1 Typical Construction HDD – Upland Obstacle 6-3
Figure 6-2 HDD/Bore Segments Overview 6-4
Figure 6-3 HDD and Tie-in Locations South Side of Lake Sakakawea....6-6
Figure 6-4 HDD and Tie-in Locations North Side of Lake Sakakawea 6-7
Figure 6-5 Construction ROW – Upward Side Slope....6-8
Figure 6-6 Construction ROW – Upward Side Slope on USFS Land 6-9
Figure 6-7 Construction ROW – Down Side Slope 6-10
Figure 6-8 Construction ROW – Down Side Slope on USFS Land.... 6-11

List of Appendices

Appendix A Access Road Report

Appendix B Waste Management Plan

Appendix C Construction, Mitigation, and Reclamation Plan

Appendix D Typical Construction Drawings

Appendix E Hydrostatic Test Plan

Appendix F Noxious Weed and Invasive Weeds and Aquatic Invasive Species Control Plan

Appendix G Inadvertent Returns Contingency Plan

Appendix H Natural Resources Report

Appendix I Storm Water Pollution and Prevention Plan

Appendix J Environmental Protection Measures

Appendix K Unanticipated Discoveries Plan for Cultural Resources

Appendix L Unanticipated Discoveries Plan for Paleontological Resources

Appendix M Raptor Survey Letter Report

Appendix N Spill, Prevention, Control, and Countermeasures Plan

Appendix O Tree and Shrub Sampling Plan

1.0 Introduction

1.1 GENERAL INTRODUCTION

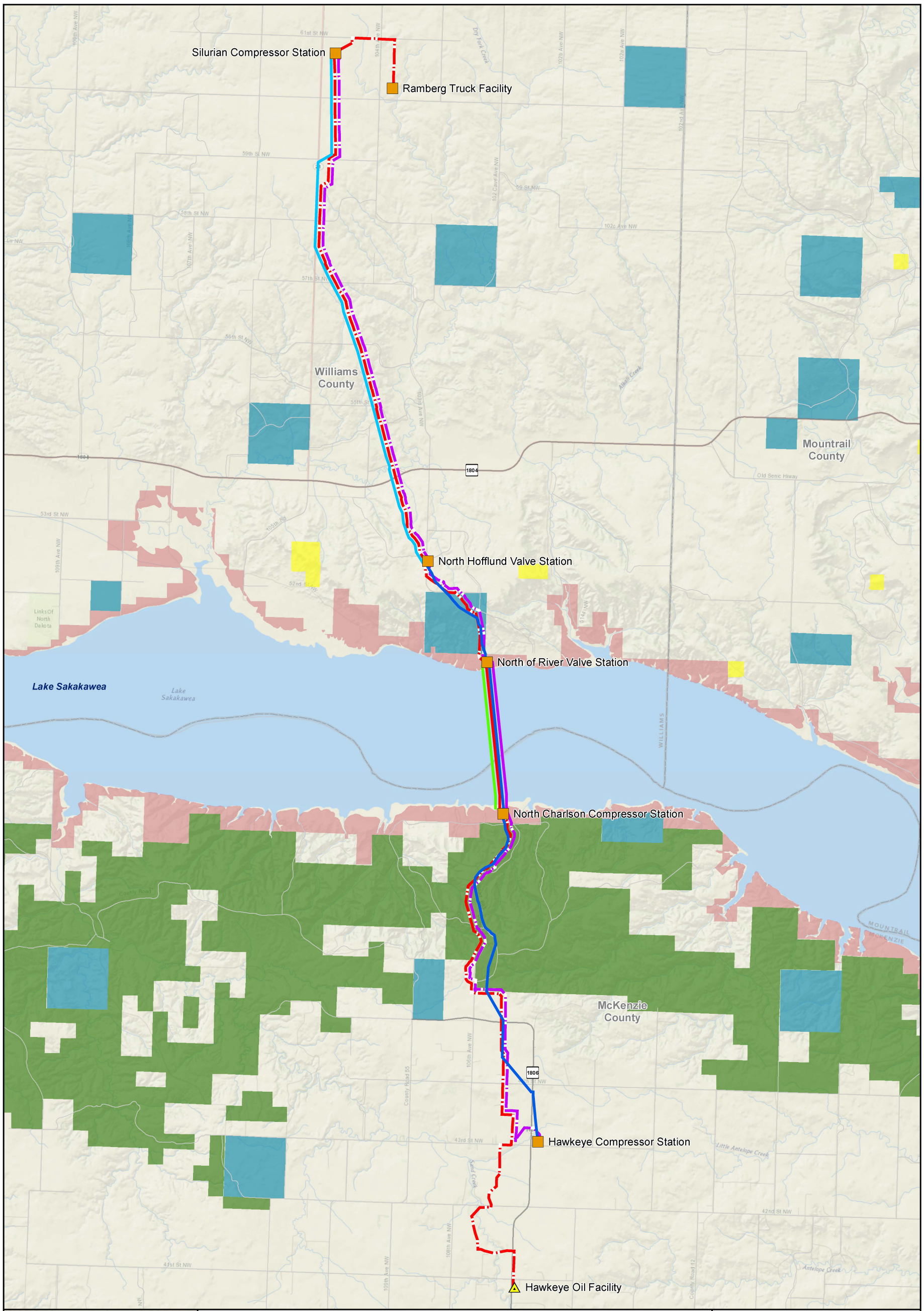
Hess Corporation (Hess) is proposing to construct an approximately 26-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The proposed Hawkeye Pipeline System Project (Project) would transport subsurface crude oil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

This Plan of Development (POD) describes procedures that would be taken by Hess and its contractors (Contractor) during the construction, operation, and maintenance of the Project, and outlines mitigation or protection measures that would be implemented as Project design features to reduce environmental impacts. A detailed description of Hess's or their Contractors' construction, operation, and maintenance procedures are provided in this POD, as well as specific methods for areas of environmental concern (e.g., wetlands, habitat for special status species, etc.). This POD will be revised and updated throughout the Project duration to include additional mitigation measures for reducing impacts resulting from the environmental analysis and/or in the event that changes to the project description, engineering, or design occur.

Proposed actions and measures in this POD apply to actions within the Project area, defined as the construction right-of-way (ROW), proposed Hawkeye Oil Facility, access roads, and all additional temporary workspace (ATWS) utilized during the construction and staging of material for this Project. Hess and Contractor personnel would be aware of and familiar with this POD and its content prior to any Project-related construction.

1.2 PURPOSE OF THE POD

The purpose of this POD is to provide an overview of the Project, construction methods, potential pipeline impacts and mitigation measures, operation and maintenance, and reclamation procedures. The POD incorporates site-specific drawings and schematics for contractors and construction crews to ensure safe and appropriate construction. The POD would be used in conjunction with other site-specific plans.



Legend

- Proposed Facility
- Existing Facility
- FiberOptic_Cable
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline (Including 2 Fiber Optic Cables)
- Repurposed 8-inch-diameter Natural Gas Pipeline
- Proposed 12-inch-diameter Natural Gas Pipeline (Including 2 Fiber Optic Cables)
- Repurposed 8-inch-diameter NGL Pipeline
- Repurposed 10-inch-diameter NGL Pipeline
- Repurposed Pipeline with 4, 24-strand Fiber Optic Cables

Land Ownership

- Bureau of Land Management
- U.S. Forest Service
- Army Corps of Engineers
- State Land

Sources: ESRI 2004; Hess 2015.

Hawkeye Pipeline System Project

Figure 1-1

Project Overview and Land Ownership

0 0.5 1 2 Miles

2.0 Purpose and Need

2.1 PURPOSE AND NEED FOR THE PROJECT

Forecasts predict that hydrocarbon production will exceed the current infrastructure capacity to export product from the Bakken development area to market. The Project would transport hydrocarbon products from new field development areas south of Lake Sakakawea to existing Hess facilities north of the lake, including the existing Ramberg Truck Facility and Silurian Compressor Station. Some of the products ultimately may be transported via existing pipeline infrastructure to the Tioga Gas Plant and Tioga Rail Terminal for processing and/or transport to market or end use. This would enable Hess to reduce gas flaring and crude oil and NGL trucking without having to establish significant new infrastructure south of the lake. Crude oil, natural gas, and NGL would be conveyed via new and existing pipelines from production fields south of Lake Sakakawea to facilities north of the lake for transport to market. The two 24-strand fiber optic cables would allow for operation of the pipeline control system (including remote opening and closing of valves along each of the pipelines), which would improve and enhance the system south of Lake Sakakawea.

2.2 ALTERNATIVES

2.2.1 New Pipeline Construction Crossing Lake Sakakawea

The use of horizontal directional drilling (HDD) for the portion of the Project crossing Lake Sakakawea was not considered in detail as an alternative. As part of the Project, Hess proposed to repurpose two of their existing pipelines currently in use across the lake to transport crude oil and NGL (Hess currently has six pipelines crossing Lake Sakakawea). In order to demonstrate that the pipeline was acceptable for use, Hess conducted hydrostatic testing per 49 Code of Federal Regulations (CFR) 195 Subpart E – Pressure Testing and performed in-line inspections on the existing pipelines proposed for crude oil and NGL use. Hess conducted these tests in 2013 and concluded that the results confirmed the serviceability of the existing pipelines at the lake crossing. The findings also were reviewed by an independent third-party who also found the test results for the existing pipelines under the lake passed these safety tests. The Bureau of Land Management (BLM) and United States (U.S.) Army Corps of Engineers (USACE) also received and reviewed the test results. Hess is required to meet or exceed all applicable federal safety standards to ensure the serviceability of the repurposed pipes and is subject to review and audit by Pipeline and Hazardous Materials Safety Administration (PHMSA), the federal agency responsible for enforcement of pipeline safety standards. HDD was eliminated from detailed analysis because the existing pipelines under the lake were tested and must comply with minimum pipeline safety standards. Other considerations for the elimination of HDD as an alternative were: 1) avoidance of surface disturbance associated with HDD, and 2) HDD would not have met the applicant's purpose of the Project that included the repurposing of existing pipelines.

2.2.2 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 proposed high pressure gas line would increase the capacity to move gas from the Hess properties south of the lake to the existing Tioga Gas Plant. Therefore, the alternative to continue trucking liquids with an increased volume was eliminated from further analyses.

2.2.3 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 would be located within existing Hess facilities to reduce additional disturbance and potential environmental effects.

2.3 FEDERAL, STATE, AND LOCAL GOVERNMENT AGENCIES INVOLVEMENT

Pursuant to the Mineral Leasing Act of 1920 (MLA), as amended (43 CFR Subpart 2884.21J1), when an applicant applies for a ROW that "…crosses lands administered by two or more Federal agencies, regardless of whether or not lands administered by the BLM are involved, the BLM will process the application and issue all grants, temporary use permits, amendments, and assignments." While the Project does not cross lands that are managed by the BLM, the Project does cross lands managed by the U.S. Forest Service (USFS) and USACE. As such, the BLM is the designated lead federal agency for issuing the ROW grant and preparation of the National Environmental Policy Act (NEPA) document, the Environmental Assessment (EA). The USFS, USACE, and U.S. Fish and Wildlife Service (USFWS) are participating as cooperating agencies in the preparation of the EA.

In addition to federal government participation in the Project, Hess will be coordinating with various North Dakota state and local agencies for required permits and stipulations. **Table 2-1** provides a list of permits and authorizations required by federal, state, and local agencies for developing the Project.

Table 2-1 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, American Indian Religious Freedom Act, Executive Orders (EOs) 13007 and 13175, Secretarial Order 3317, and Presidential Memorandums.
	State Historic Preservation Office Consultation	36 CFR Part 800.2(a)(4)
	Management of Paleontological Resources	Paleontological Resources Preservation Act (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

Table 2-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
USFS (Continued)	Issue cultural resource permit to excavate or remove cultural resources on federal lands.	Archaeological Resources Protection Act of 1979 (ARPA), 16 United States Code (U.S.C.) Section 470aa-47011; 43 CFR 3
USACE	Review, provide stipulations, approve, and adopt 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.	Section 404 of the Clean Water Act (CWA) of 1972 (40 CFR 122-123); 33 U.S.C. Section 1344; 33 CFR Parts 323, 325
	Engineer 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 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
North Dakota Department of Health, 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
North Dakota Department of Health, Division of Air Quality	Permit to construct	Clean Air Act
Public Service Commission (PSC)	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; Certificate of Public Convenience and Necessity
North Dakota Game and Fish Department	Consultation and review	Assess potential effects to fish and wildlife

Table 2-1 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
North Dakota State Water Commission	State Sovereign Lands Permit	NDCC 28-32-02, 61-03-13
	Water Use	Temporary Water Use Permit SWC Form 247
North Dakota State Land Department	Easement/Permit	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

3.0 Right-of-Way Description

Between the proposed Hawkeye Oil Facility and existing Hawkeye Compressor Station, the proposed crude oil pipeline and two proposed fiber optic cables would be installed in the same trench. Hess also plans to install the proposed crude oil and natural gas pipelines, as well as the proposed fiber optic cables, in the same trench between the existing Hawkeye Compressor Station and existing Ramberg Truck Facility, except across Lake Sakakawea, where four existing pipelines would be used. The Project would cross lands under the jurisdiction of the USFS, USACE, State of North Dakota, and private lands (**Figure 1-1**). A summary of the approximate temporary and permanent acreage required for the pipeline ROW by land ownership is provided in **Table 3-1**.

Table 3-1 Pipeline ROW Disturbance by Land Ownership

Land Status	Pipeline Length (Miles)	Pipeline Length (Feet)	Permanent Disturbance (Acres)	Temporary Disturbance (Acres)	Additional Temporary Disturbance (Acres)
USFS	2.7	14,016	0.0	13.3	6.4
USACE	1.7	9,186	0.0	2.6	0.1
State	1.2	6,359	0.0	10.3	0.2
Private	20.3	107,215	0.0	212.2	8.2
Total	25.9	136,776	0.0	238.3	14.9

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 3-2** provides a summary of temporary and permanent disturbance required for Project development. All disturbances, with the exception of the proposed Hawkeye Oil Facility, would be reclaimed following construction.

Table 3-2 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

Table 3-2 Temporary and Permanent Disturbance Required for Project Development

Project Component	Existing Facility Footprint (Acres)	New Temporary Disturbance (Acres)[1]	New Permanent Disturbance (Acres)
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, 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. Hess has committed to boring under all identified wetlands and streams in the construction corridor resulting in no surface disturbance impacts to wetland and streams. .

[2] Pig launchers/receivers, mainline valves (MLVs), and emergency shutdown (ESD) 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

4.0 Project Description

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, 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. The fiber optic lines would be used for communications for monitoring and controlling the pipelines.

The scope of the Project was developed based on the use of existing Hess pipelines and infrastructure. With the exception of slight modifications based on landowner requests and/or federal agency guidance, the Project 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.

4.1 DESCRIPTION OF PROPOSED 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, and American Standard for Testing and Materials.

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 land and water). Land ownership along the Project route is illustrated on **Figure 1-1**. Major components of the Project are discussed in further detail below.

4.1.1 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 two associated 24-strand fiber optic cables in a single trench from the proposed Hawkeye Oil Facility to the existing North Charlson Compressor Station (**Figure 4-1**). 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 two associated 24-strand fiber optic cables in a single trench (**Figure 4-1**).

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.

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 2014.

Hawkeye Pipeline System Project

Figure 4-1

Crude Oil Pipeline

0 0.5 1 2 Miles

The crude oil pipeline is designed for an initial flow rate of 60,000 barrels per day (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 helps 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 2.4 miles of existing pipeline across Lake Sakakawea proposed for repurposing to crude oil service is buried to a depth of 6 feet.

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 4-1**.

Table 4-1 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

4.1.2 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 2 associated fiber optic cables in the same trench with the proposed crude oil pipeline (**Figure 4-2**). 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 2 associated 24-strand fiber optic cables in the same trench as the proposed crude oil pipeline (**Figure 4-2**).

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.

A fraction of the pipe manufactured in the 1950s utilized low-frequency electrical resistance welding procedures along the longitudinal seam. This specific welding process with this generation of pipe has been associated with a higher incident frequency. However, the pipeline Hess has proposed to repurpose for natural gas is seamless, thus eliminating the threat of longitudinal seam failure.

The natural gas pipeline is designed for an initial flow rate of 70 million standard cubic feet per day (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. The 2.4 miles of existing pipeline across Lake Sakakawea proposed for repurposing to natural gas service is buried to a depth of 6 feet.

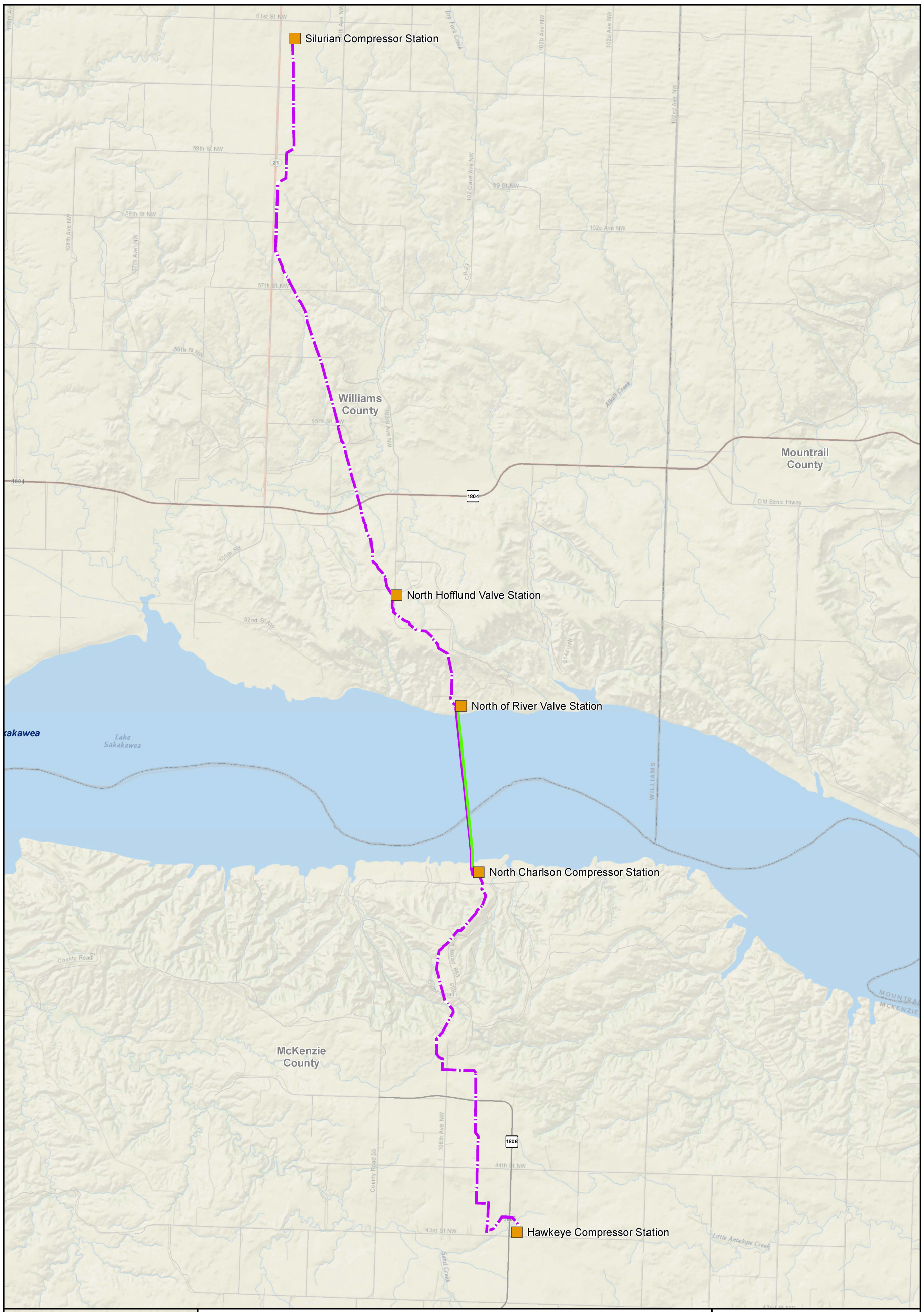
The pipe is designed for a MAOP of 1,250 psig. Typically, the natural gas pipeline would consist of API 5L – X52 steel pipe with a 12-inch OD and 0.375-inch WT except at boring locations that would be 0.500-inch WT, and at the Lake Sakakawea crossing where the existing pipe consists of API 5L Grade B 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 4-1**.

4.1.3 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 (**Figure 4-3**). 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 4-3**).

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



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

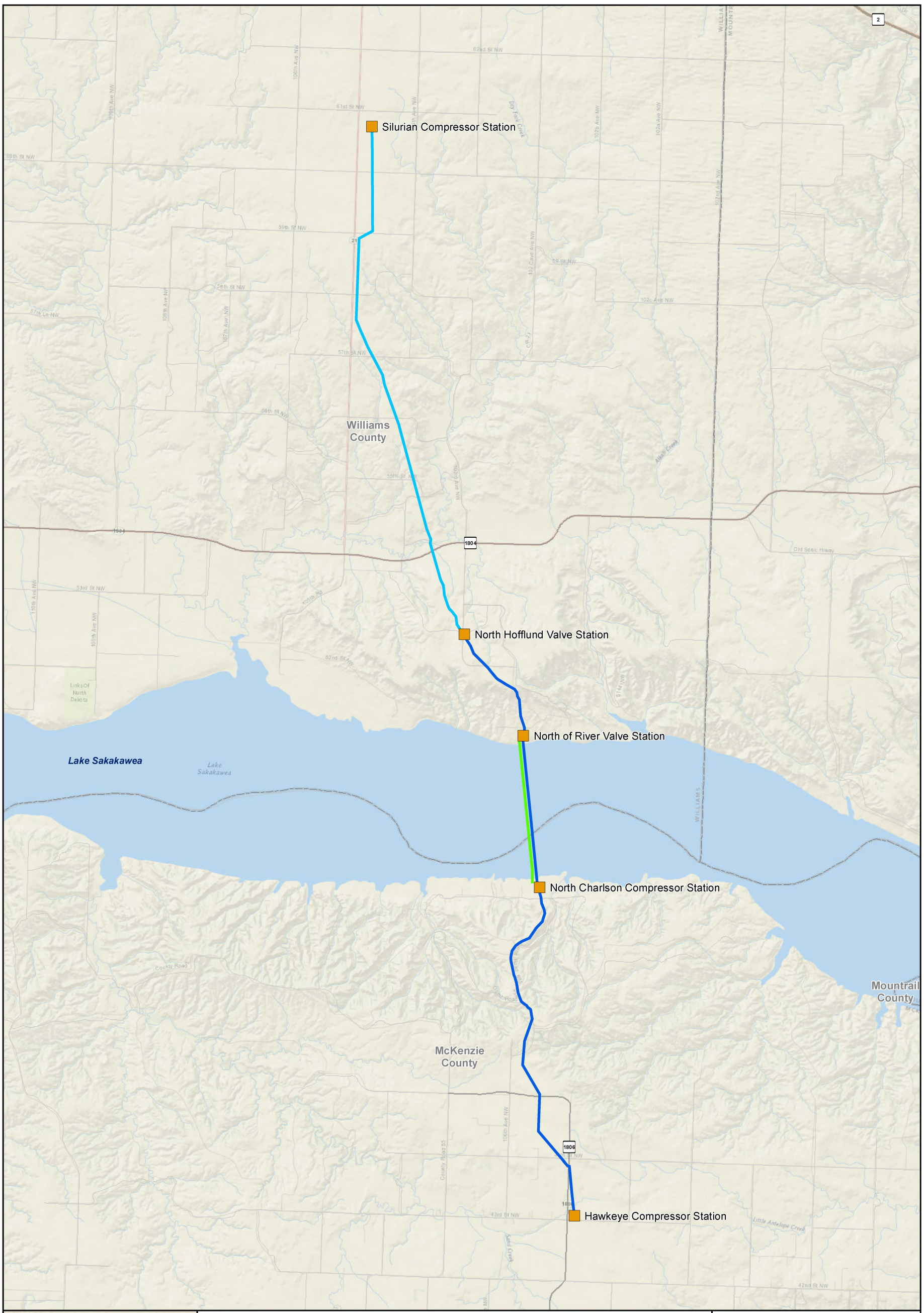
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 4-2

Natural Gas Pipeline

0 0.5 1 2 Miles



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 4-3

Repurposed Natural Gas Liquids Pipeline

0 0.5 1 2 Miles

the risk of outside force damage. The 2.4 miles of existing pipeline across Lake Sakakawea proposed for repurposing to NGL service is buried to a depth of 6 feet.

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 4-1**.

4.1.4 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 4-4**. Pig launcher and receivers are used as in-line tool insertion sites and these tools help clean and inspect the pipeline during operations. **Table 4-1** summarizes the MP locations for the receipt facilities, MLVs, pig launchers/receivers, and ESD valve locations.

4.1.5 Other Aboveground Facilities

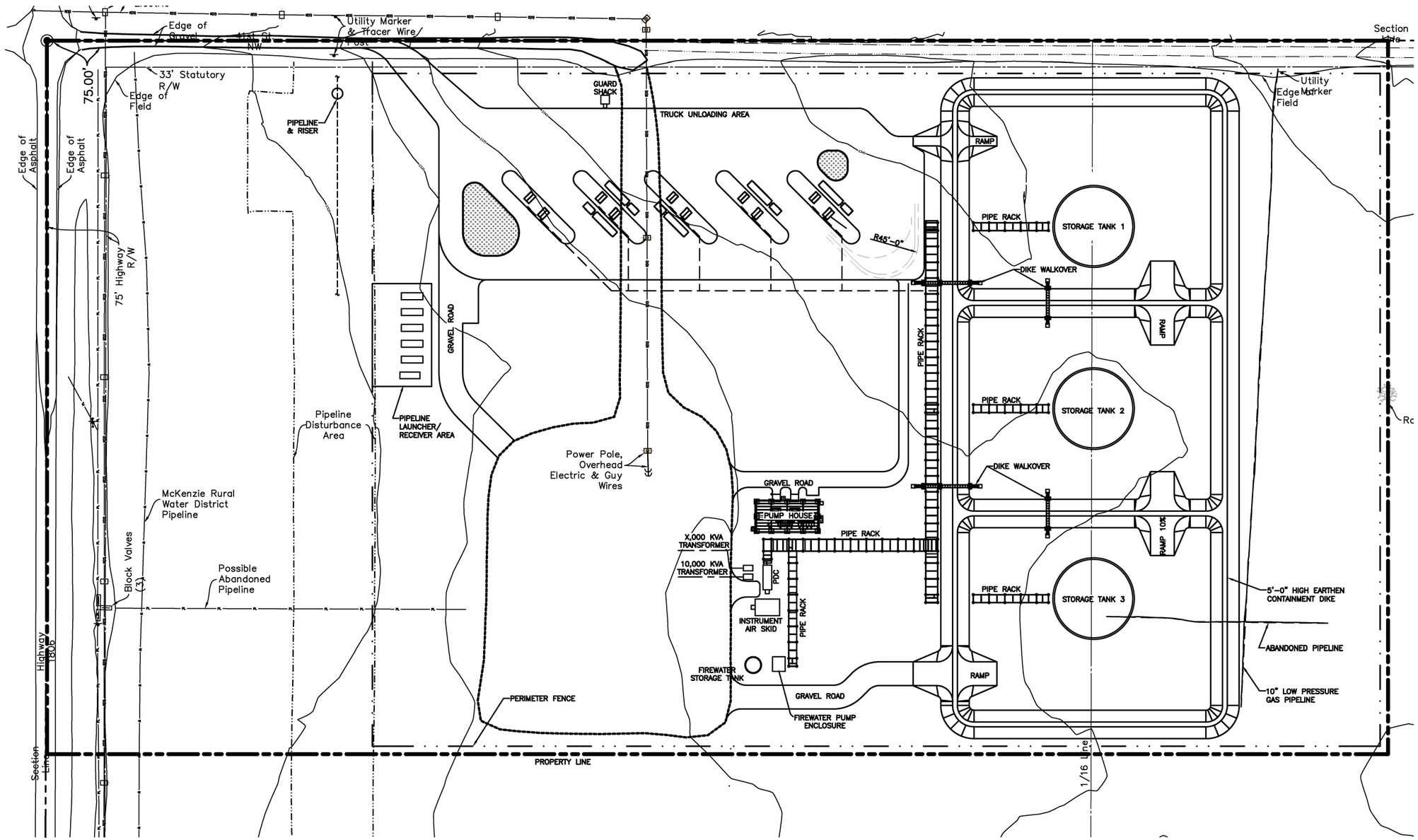
In order to meet or exceed the valve siting requirements (natural gas: 49 CFR 192.179; crude oil and NGL: 49 CFR 195.260), 5 MLVs would be spaced along the Project. For liquid pipelines, Hess has conducted an analysis to identify locations of HCAs near the Project, which helped to refine appropriate placement of the MLVs to minimize potential environmental impacts in the event of a rupture or leak. As a supplemental protection measure, Hess would install communications equipment 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 4-5** and **4-6**. MLV locations by MP are provided in **Table 4-1**.

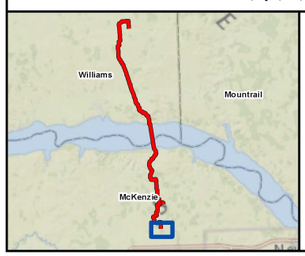
Additional aboveground facilities would be limited to pipeline markers. Pipeline markers are important tools to increase public awareness, help prevent outside force damage, and provide emergency contact information. Pipeline markers would be installed at line-of-sight intervals and at crossings of roads 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.

4.1.6 Storage, Staging, and Access

Hess plans to use clearly identified and approved ATWSs 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 office would be located at existing Hess facilities.





Location
McKenzie Co., ND

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

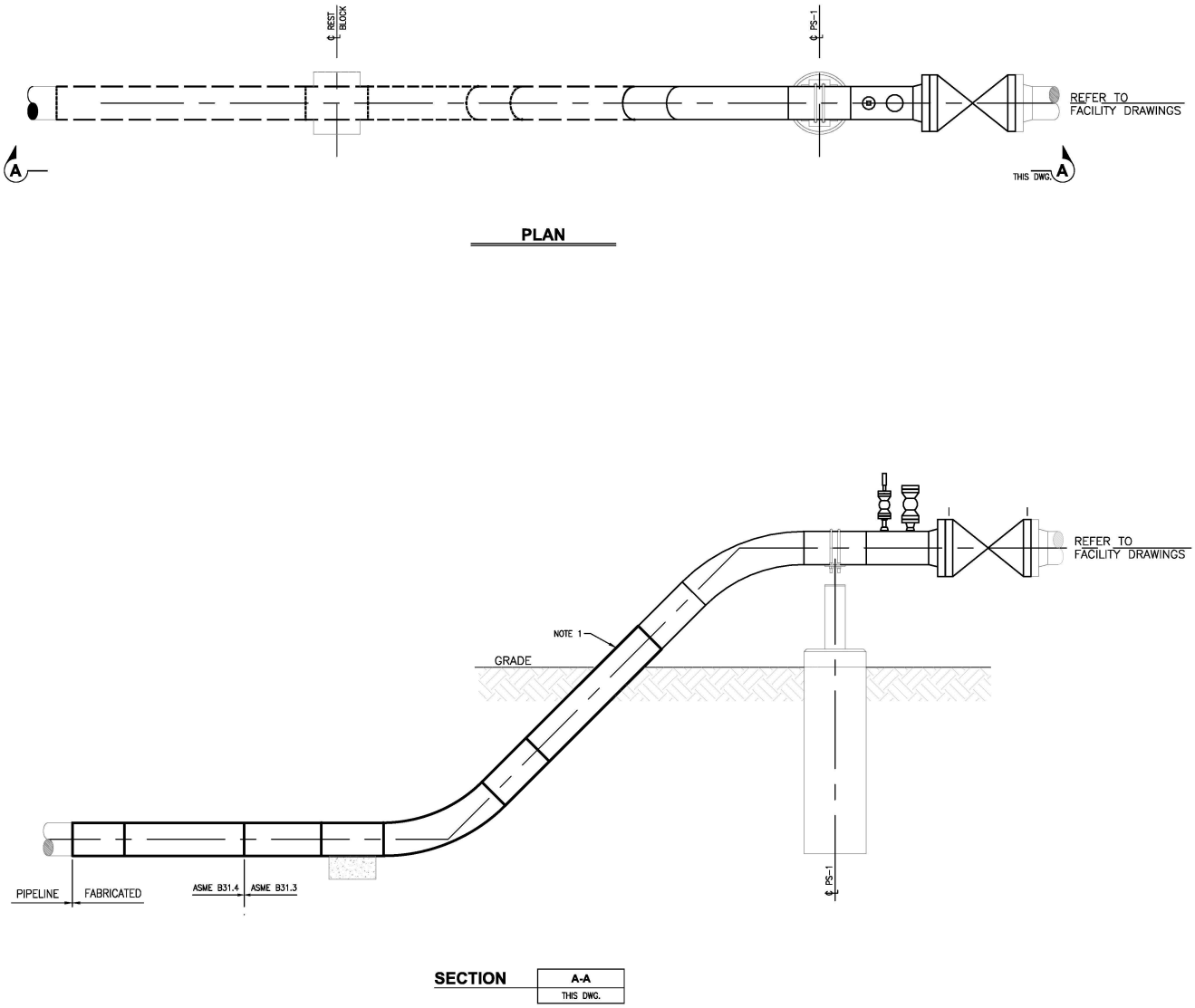
Note: Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 4-4

Hawkeye Oil Facility



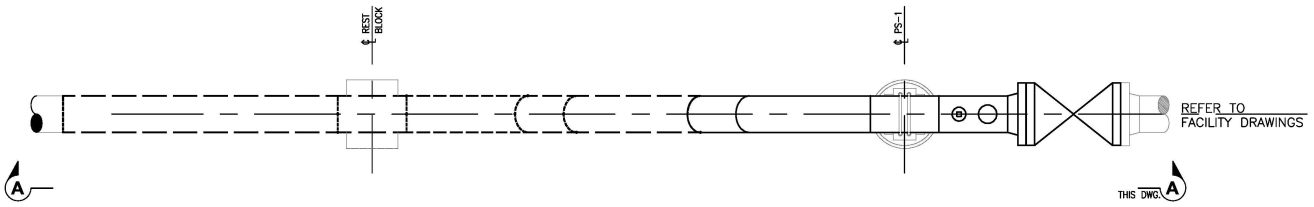
Not to Scale

Source: Hess 2014.

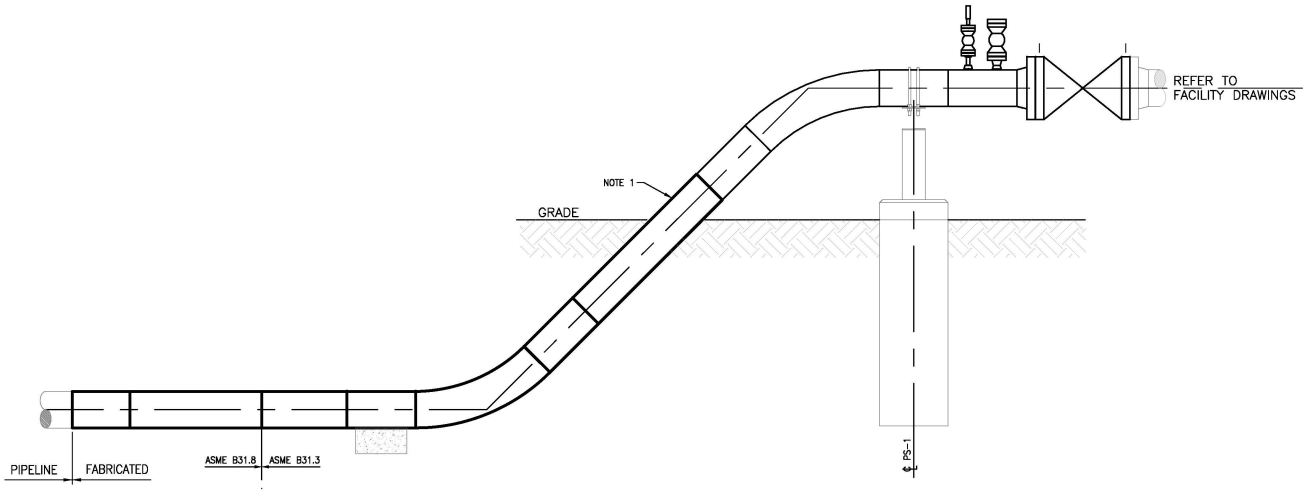
Hawkeye Pipeline System Project

Figure 4-5

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 2014.

Hawkeye Pipeline System Project

Figure 4-6

Mainline Valve Site Plan - Natural Gas Pipeline

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 (**Appendix A**). However, Hess has identified a total of 3 new access roads that would be needed to access the ROW (**Table 4-2**). There would be no improvements made to any USFS roads.

Table 4-2 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. 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.

4.1.7 Fiber Optic Control System

An existing gas line across the lake would be taken out of service and used to string four, 24-strand fiber optic cables (two associated with the proposed crude oil pipeline and two 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.

4.1.8 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. 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 (RP) 0169-2007. An impressed current CP system would be installed on the Project and maximum interference voltage with other structures would not exceed 20 millivolts. The impressed current CP would be utilized on the pipeline system including CP test points installed at 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. 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.

4.2 PROJECT SCHEDULE AND WORKFORCE

4.2.1 Construction Schedule

Hess currently plans to initiate construction of the Project in May of 2015 and complete it by October 2015. **Table 4-3** provides the personnel, equipment, and time requirements for construction of the pipelines and associated facilities.

Table 4-3 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Pipeline Construction (Crude Oil and Natural Gas Pipelines)[1]			
Site Preparation	32	Excavators , Dozers, Graders and Trucks	20 Days
Survey and Staking	8	Trucks and Survey stuff	14 Days
Clearing and Grading	27	Excavators , Dozers, Graders and Trucks	30 Days
Trenching	21	Excavators and Trucks	30 Days
Pipe Stringing, Bending, and Welding	90	Dozers, Bending machine, Welding units and Trucks	50 Days
Lowering-in, Padding and Backfilling	50	Dozers, Excavators and Trucks	40 Days
Hydrostatic Testing	22	Frac tanks, Test header and compressor	20 Days
Cleanup	18	Dozers, Farm tractors and Trucks	20 Days
Aboveground Facilities Construction (Crude Oil Pipeline)			
Proposed Hawkeye Oil Facility	90	Crane, Excavators, Welding units and Trucks	667 Days
Existing North Charlson Compressor Station			
1,12-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1, 12-inch diameter MLV	44	Crane, Excavators, Welding units and Trucks	2 Days
1,8-inch diameter prefabricated pig launcher skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,8-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
Existing North of River Valve Station			
1, 8-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,8-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
1,12-inch diameter prefabricated pig launcher skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1, 12-inch diameter MLV	44	Crane, Excavators, Welding units and Trucks	2 Days
Existing Ramberg Truck Facility			
1,12-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,12-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days

Table 4-3 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Aboveground Facilities Construction (Natural Gas Pipeline)			
Existing Hawkeye Compressor Station			
1,12-inch diameter prefabricated pig launcher skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,12-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
Existing North Charlson Compressor Station			
1,12-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1, 12-inch diameter MLV	44	Crane, Excavators, Welding units and Trucks	2 Days
1,8-inch diameter prefabricated pig launcher skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,8-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
Existing North of River Valve Station			
1, 8-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,8-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
1,12-inch diameter prefabricated pig launcher skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1, 12-inch diameter MLV	44	Crane, Excavators, Welding units and Trucks	2 Days
Existing Silurian Compressor Station			
1,12-inch diameter prefabricated pig receiver skid	44	Crane, Excavators, Welding units and Trucks	5 Days
1,12-inch diameter ESD Valve	44	Crane, Excavators, Welding units and Trucks	2 Days
HP Gas to NGL Conversion Line			
Cleaning Pig Runs and Hydrostatic test 8-inch pipeline – Hawkeye Compressor to North Hoffland	10	Hydrostatic Test Kit e.g. Manifolds, temp. Test Headers, Compressors, Frac tank, Test Trailers etc., crane, drying unit, N2 generator, volume of pigs	10 Days
Demolishment of existing facilities – North Charlson	12	Crane, Excavators, welding rig	7 Days
Demolishment of existing facilities – North of River	12	Crane, Excavators, welding rig	7 Days
Cleaning Pig Runs and Hydrostatic test 10-inch pipeline – North Hoffland to Silurian	10	Hydrostatic Test Kit e.g. Manifolds, temp. Test Headers, Compressors, Frac tank, Test Trailers etc., crane, drying unit, N2 generator, volume of pigs	10 Days
Install new ESD Valves 12-inch, 10-inch, and 8-inch	10	Crane, Excavators, Welding units and Trucks	20 Days

4.2.2 Project Workforce and Equipment

To construct the Project, Hess estimates that approximately 400 total construction personnel would be required. This includes laborers, foremen, inspectors, equipment operators, welders, and other skilled personnel. Hess plans to hire as many local personnel as possible, but most of the skilled labor would come from selected contractors. Hess anticipates using existing man camps in either Watford City and/or Tioga to house the workforce coming from outside the Project area.

Hess anticipates that construction would require four spreads; one for the north side of the lake, one for the south side of the lake, and two for the tie-ins on both sides of the lake and within all of the stations. How the construction spreads are mobilized would be determined by the selected contractor during the construction planning phase. Typical major equipment expected to be used per construction spread is listed in **Table 4-4**.

Table 4-4 Typical Construction Equipment per Spread

Number	Equipment Type
12	Bulldozers
15	Excavators
3	Backhoes/JCB
8	Sidebooms
4	Skid steers
10	Light trucks for personnel transport
4	Utility vehicles
4	HDD/Boring machines
10	Generators
28	Welding machines
3	Water Trucks
4	Fuel Trucks
4	Hydrovac Spreads
1	Hydrotest Spreads

4.3 HUMAN HEALTH AND SAFETY

4.3.1 Solid and Hazardous Waste Control

Construction sites along the ROW, access roads, and storage yards would be kept in an orderly condition throughout the construction phase. Refuse and trash would be removed from the site on a daily basis and disposed of in an approved manner at an approved site. No open burning of construction debris or trash would occur. No liquids or solid waste would be disposed of without a valid permit. Accidental spills of fuels or lubricants would be remediated immediately in accordance with Best Management Practices (BMPs).

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 waterbody or 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 the material. All fuel and service vehicles would be equipped with commercial absorbent material for cleaning up hazardous materials. Hess's Waste Management Plan for North Dakota operations can be found in **Appendix B**.

4.3.2 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 2 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 Integrity Management Plan, which would outline preventive maintenance, inspection, line patrol, leak detection systems, SCADA, and other pipeline integrity management procedures to be implemented during operation.

5.0 Pipeline Construction Process

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; U.S. 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 Construction, Mitigation, and Reclamation Plan (CMRP) (**Appendix C**). The following subsections provide a summary of the measures included in the plan.

5.1 SAFETY REQUIREMENTS AND ENVIRONMENTAL INSPECTION AND MONITORING

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; 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 construction sequence is shown in **Figure 5-1**.

5.2 GENERAL CONSTRUCTION DESCRIPTION

Pipeline construction is much like a moving assembly line. Construction of the pipeline involves several procedures that are summarized in the following sections. These operations include:

- Survey and staking;
- Clearing and grading;
- Trenching;
- Pipe stringing;
- Bending;
- Welding;
- Lowering in the pipeline;
- Padding and backfilling;
- Hydrostatic testing; and
- ROW cleanup and restoration.

Construction would proceed along the crude oil and natural gas pipelines in one continuous operation. Construction at any single point along the pipeline, from initial surveying and clearing to backfilling and finish grading, is anticipated to last about 6 to 10 weeks. Multiple segments may be constructed at the same time. The entire 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. Typical construction drawings can be found in **Appendix D**.

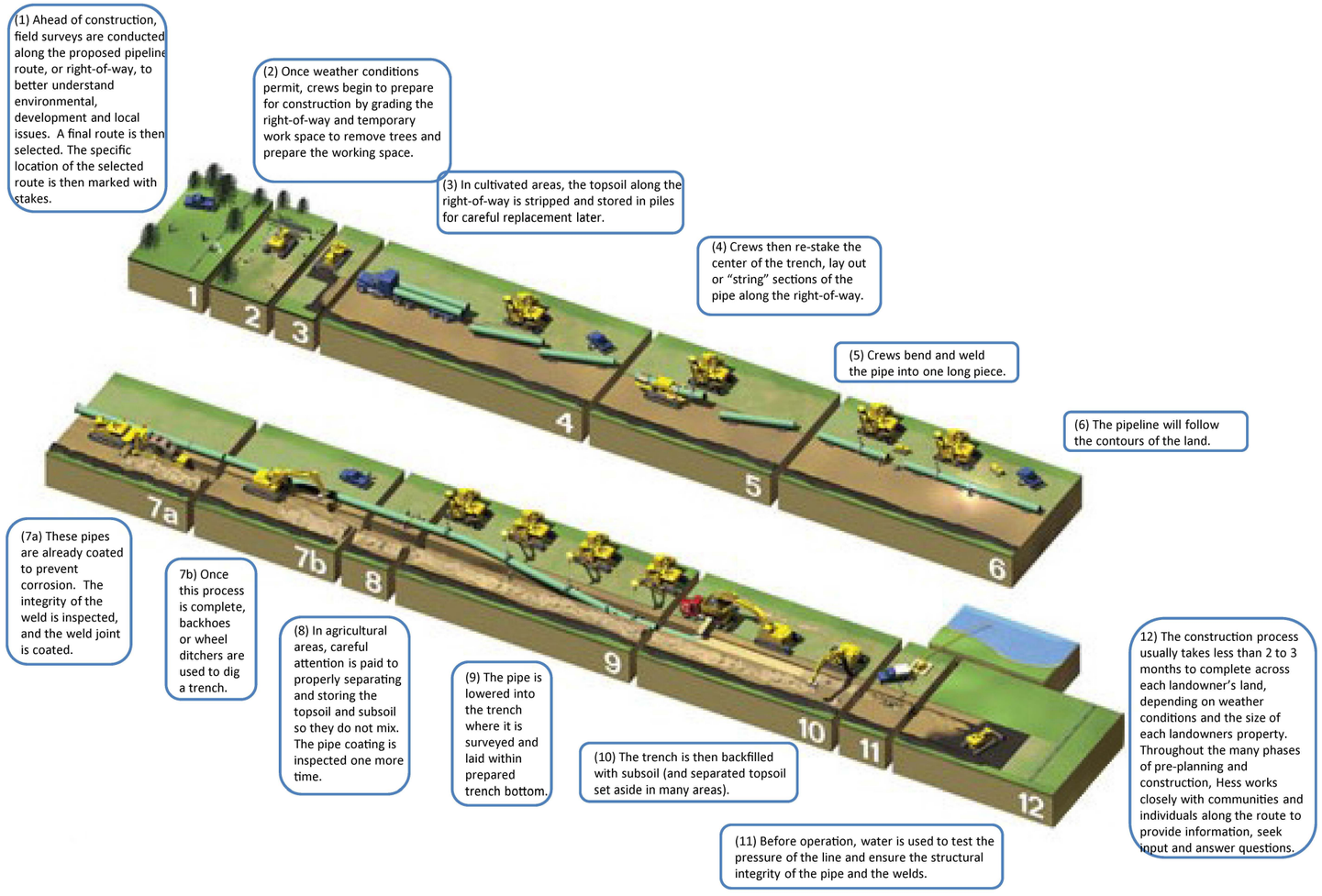
5.2.1 Survey and Staking

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 resource sites would be marked and flagged. Hess would notify landowners in advance of construction activities that could affect their property, business, or operations.

5.2.2 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 removed and segregated 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 **Appendix D**.



Location
McKenzie Co., ND

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

Note: Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 5-1

Typical Construction Sequence

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 for the portion of the Project ROW where topsoil was not stripped, 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. Silt fence would be installed along the ROW adjacent to wetlands and streams. Temporary erosion controls would be installed after initial disturbance of soils, where necessary, to minimize erosion. Erosion controls would be maintained throughout construction.

5.2.3 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. Additional depth is specified to allow 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 ramp 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.

5.2.4 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, mandrels, 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 a 5-diameter radius for bends. The pipe would be pre-coated at the mill with a 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.

5.2.5 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 the pipes and fiber optic cables. 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.

5.2.6 Hydrostatic Testing

The entire length of the three product pipelines would be hydrostatically tested per USDOT regulations at 49 CFR §195 and 49 CFR Section 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 four 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 5-1**.

Table 5-1 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

Table 5-1 Hydrostatic Test Segments and Estimated Water Volumes

Pipeline	Break Locations	Approximate MP		Length	Water Volume	Source[1]	Proposed Discharge Locations (Approximate MP)
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**.

5.2.7 Clean-up and Restoration

5.2.7.1 Clean-up

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 including, but not limited to, trench plugs, permanent slop breakers, erosion control, matting, and rip rap would be installed as necessary.

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. Private and public property (e.g., fences, gates, driveways, roads, etc.) that were disturbed by construction would be restored to their original or better condition, consistent with agreements with landowners, 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.

5.2.7.2 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 authorized officer 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.

Reclamation

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 mix for native prairie would be applied on federal lands. The USFS-approved seed mix would 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. 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 (**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 ongoing operations and maintenance (O&M) 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 would 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 at least 70 percent of the density and cover in adjacent undisturbed lands, or of the pre-construction vegetation mix. In grasslands identified as native and native-invaded 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 (**Appendix C**).

6.0 Special Construction Methods

6.1 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.

6.2 HORIZONTAL DIRECTIONAL DRILLING

HDD is a construction technique for installing pipelines beneath ground surface to avoid impacting sensitive areas (e.g., wetlands, steep topography, and roads). **Figure 6-1** 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 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 (**Appendix G**).

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 to construct 45 HDD and bore segments for the Project (**Table 6-1**) (**Figure 6-2**), with the vast majority of the HDD segments being constructed to avoid impacts to wetlands/streams and roads.

Table 6-1 Horizontal Directional Drill and Bore Locations

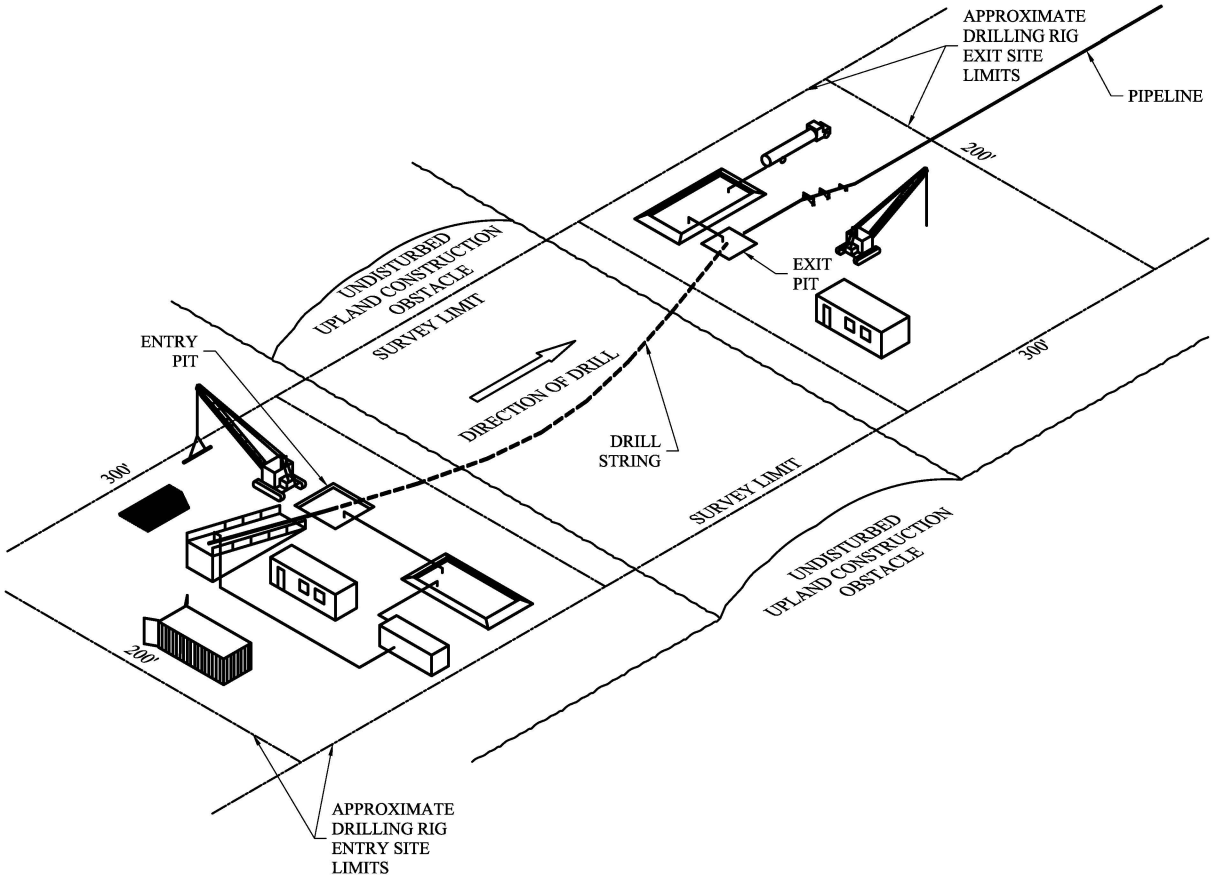
Segment Number	Enter Milepost	Exit Milepost	Feature Avoided[1]	Length (Feet)
001	0.12	0.14	Road	80
002	0.63	0.68	Road	280
003	0.76	0.94	Waterbody	939
004	1.86	1.91	Waterbody	244
005	2.00	2.05	Waterbody	240
006	2.16	2.17	Road	80
007	3.03	3.06	Road/Waterbody	187
008	3.40	3.43	Road	160

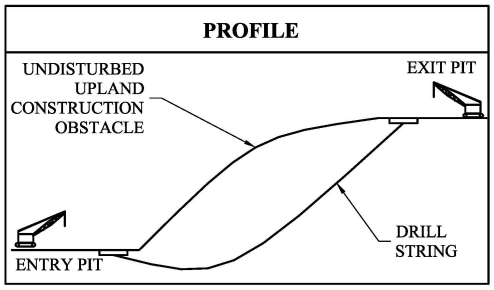
Table 6-1 Horizontal Directional Drill and Bore Locations

Segment Number	Enter Milepost	Exit Milepost	Feature Avoided[1]	Length (Feet)
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	1,921
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	1,836
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	1,302
031	16.74	16.75	Waterbody	80
032	17.42	17.44	Road	80
033	19.12	19.17	Waterbody	285
034	19.45	19.51	Sensitive Area/Construction Constraint	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/Waterbody	137
041	23.94	23.96	Road	80
042	24.34	24.36	Road	120
043	25.25	25.27	Road	114
Natural Gas 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 (**Appendix H**).

DIRECTIONAL DRILLING SITE TO SITE





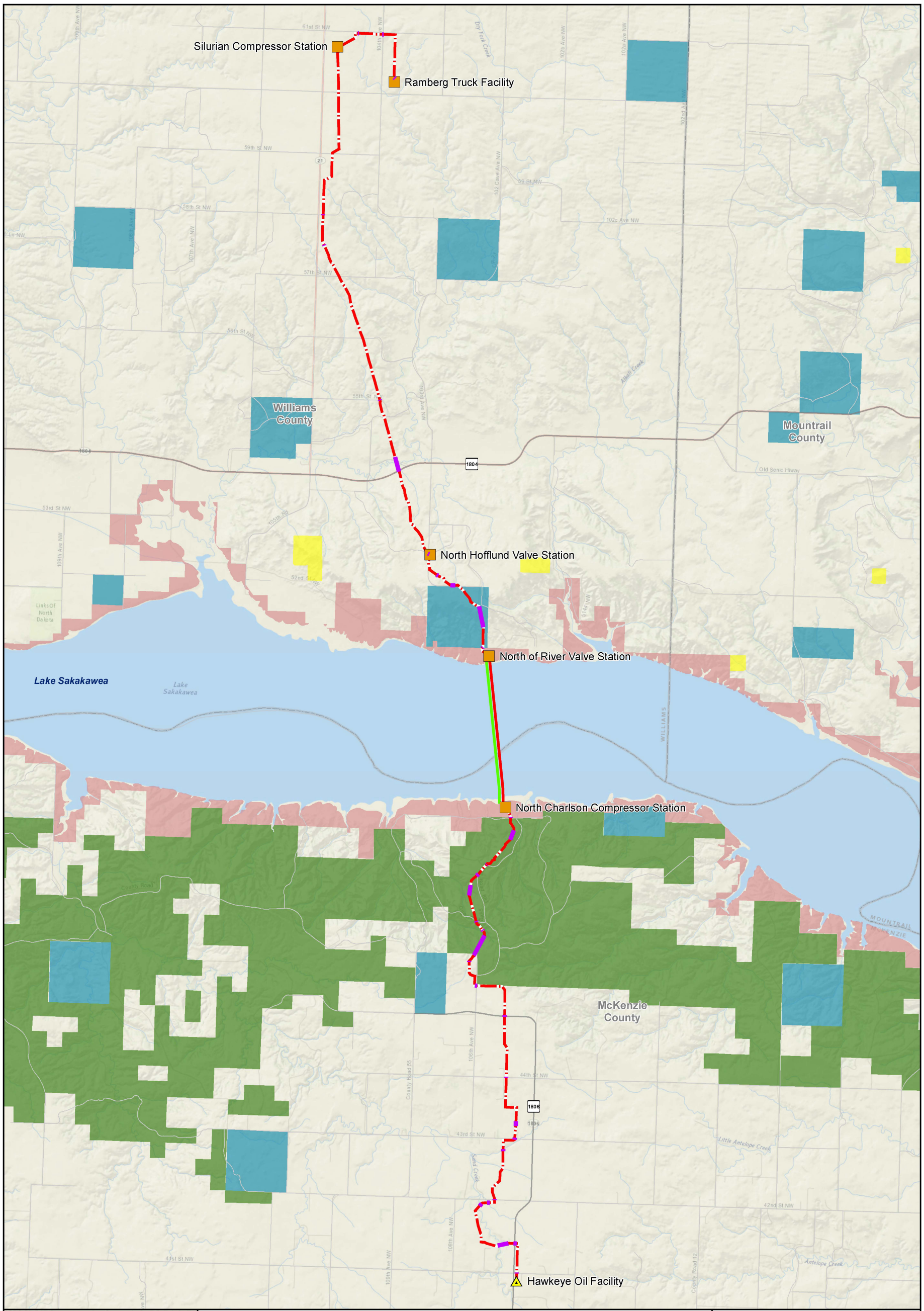
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 6-1

Typical Construction HDD - Upland Obstacle



Legend

- Proposed Facility
- Existing Facility
- HDD/Bore Segment
- 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

Land Ownership

- Bureau of Land Management
- U.S. Forest Service
- Army Corps of Engineers
- State Land

Source: ESRI 2004; Hess 2015.

Hawkeye Pipeline System Project

Figure 6-2

HDD/Bore Segments Overview

0 0.5 1 2 Miles

6.3 SPECIAL CONSTRUCTION AREAS

6.3.1 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 4-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.

6.3.2 Waterbody Crossings

Hess proposes to use the HDD method for 17 waterbody crossings (**Table 6-1**). Hess's CMRP and Stormwater Pollution Prevention Plan (SWPPP) (**Appendix I**) 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.

6.3.2.1 Lake Sakakawea Approach

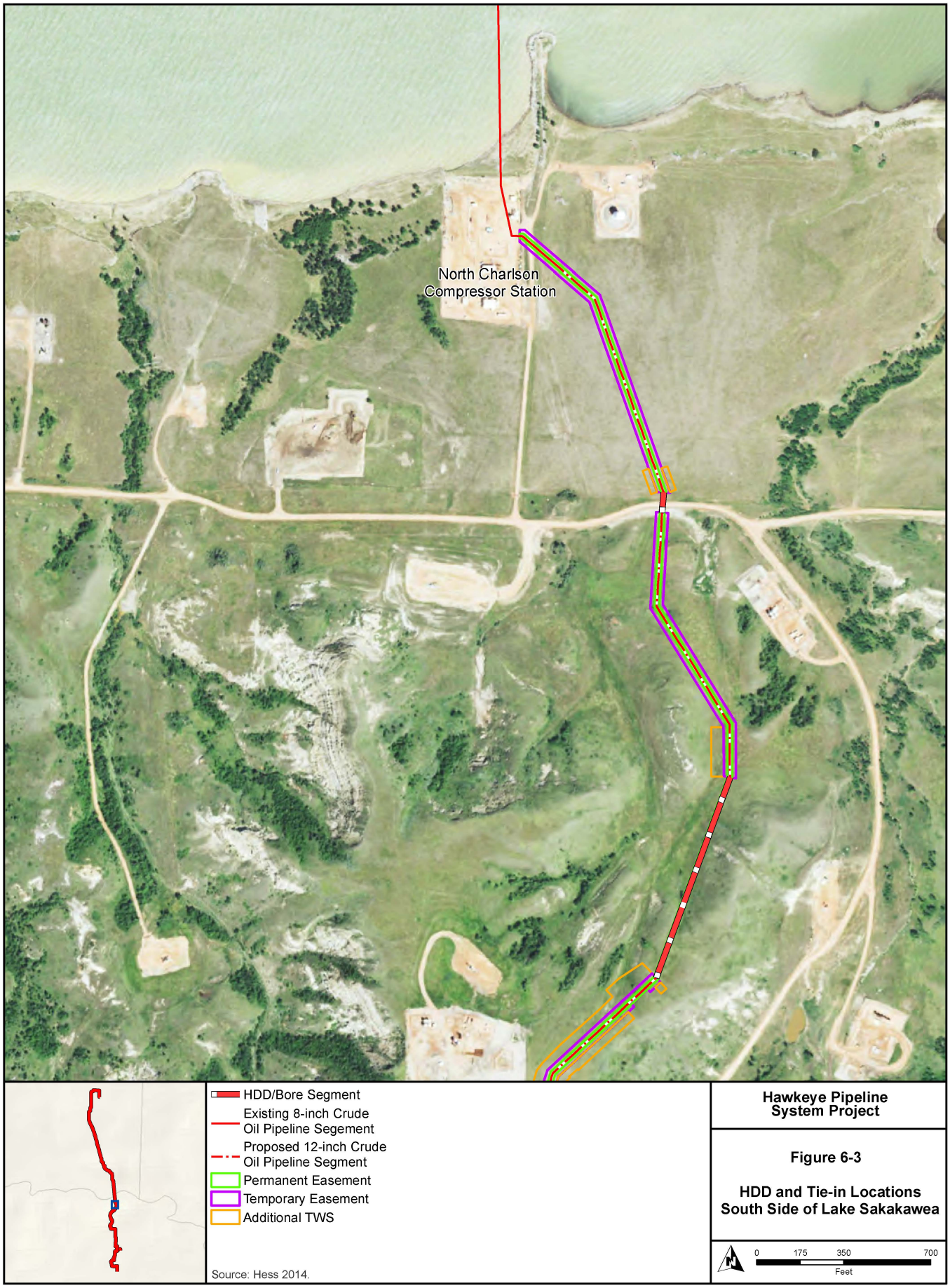
In order to avoid steep terrain and constructing in landslide-prone areas on either side of Lake Sakakawea, Hess would HDD these areas and tie into the existing pipelines at existing Hess facilities. **Figure 6-3** shows the proposed HDD of the bluff approaching the south side of Lake Sakakawea and the tie-ins to the existing pipelines. **Figure 6-4** shows the proposed HDD of the bluff approaching the north side of Lake Sakakawea and the tie-ins to the existing pipelines.

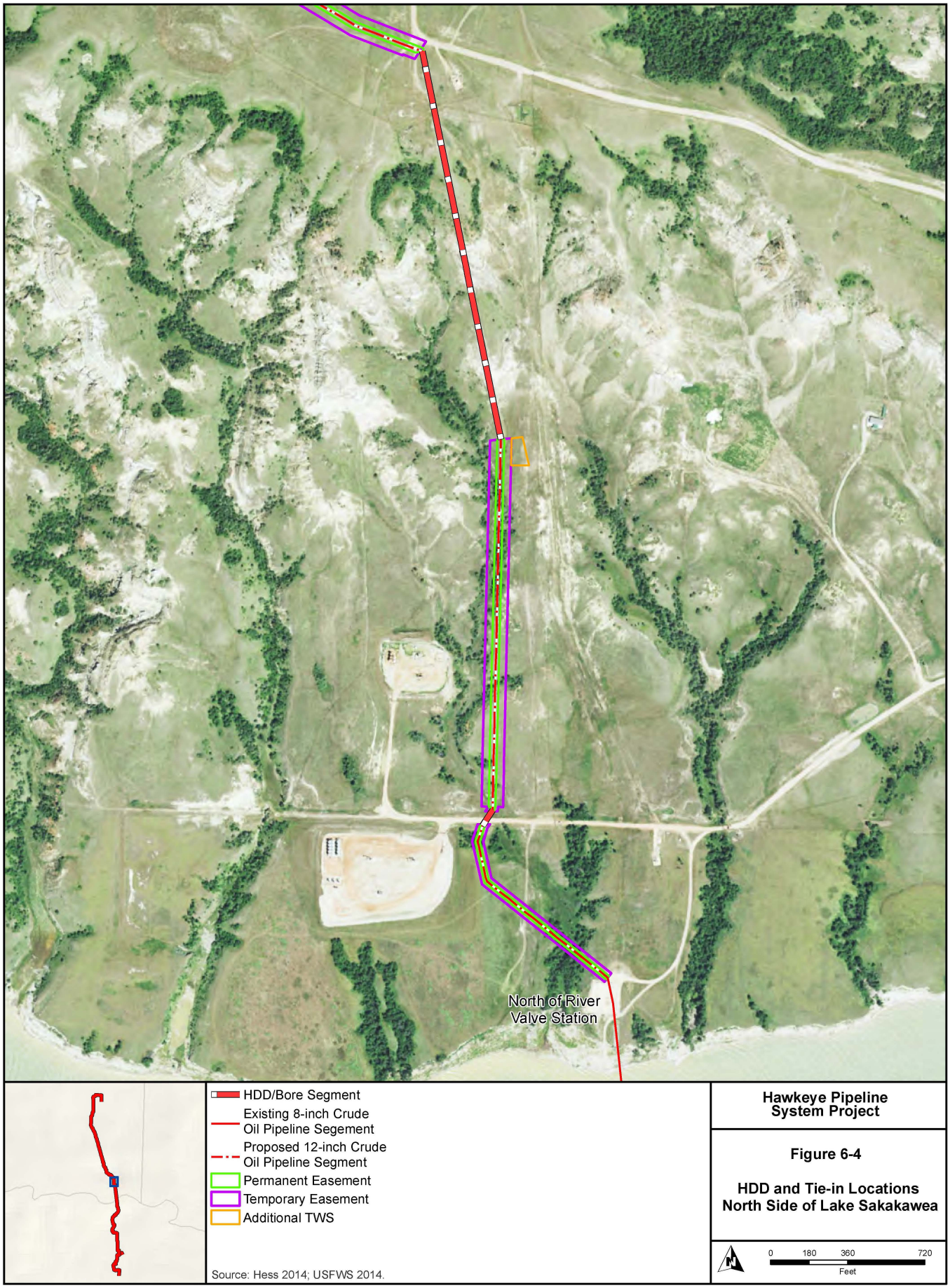
6.3.3 Wetland Crossings

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.

6.3.4 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 6-5** through **6-8** depict the side slope construction technique both within a 100-foot-wide construction ROW and a 50-foot-wide construction ROW, respectively.

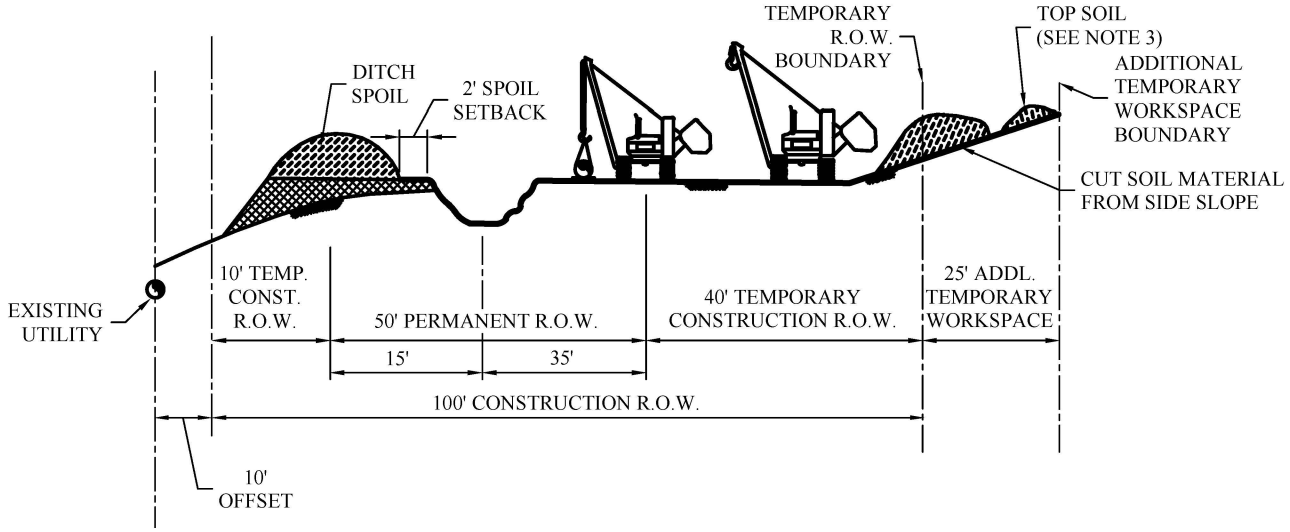

North Charlson
Compressor Station
HDD/Bore Segment
Existing 8-inch Crude
Oil Pipeline Segement
Proposed 12-inch Crude
Oil Pipeline Segment
Permanent Easement
Temporary Easement
Additional TWS
Source: Hess 2014.
Hawkeye Pipeline
System Project
Figure 6-3
HDD and Tie-in Locations
South Side of Lake Sakakawea
0
175
350
700
Feet



Hawkeye Pipeline System Project

Figure 6-4

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.

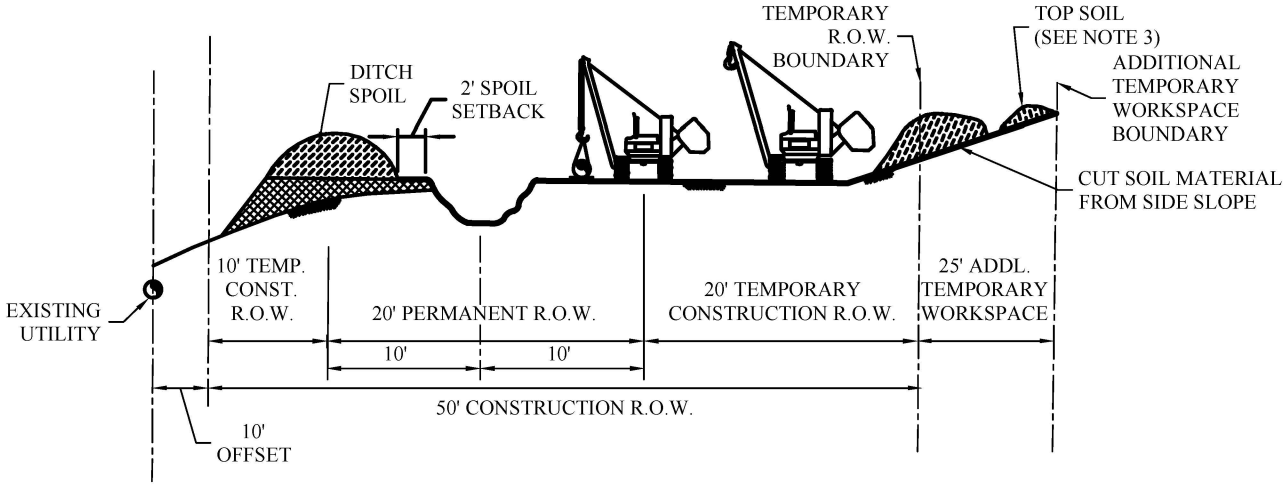
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 6-5

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).

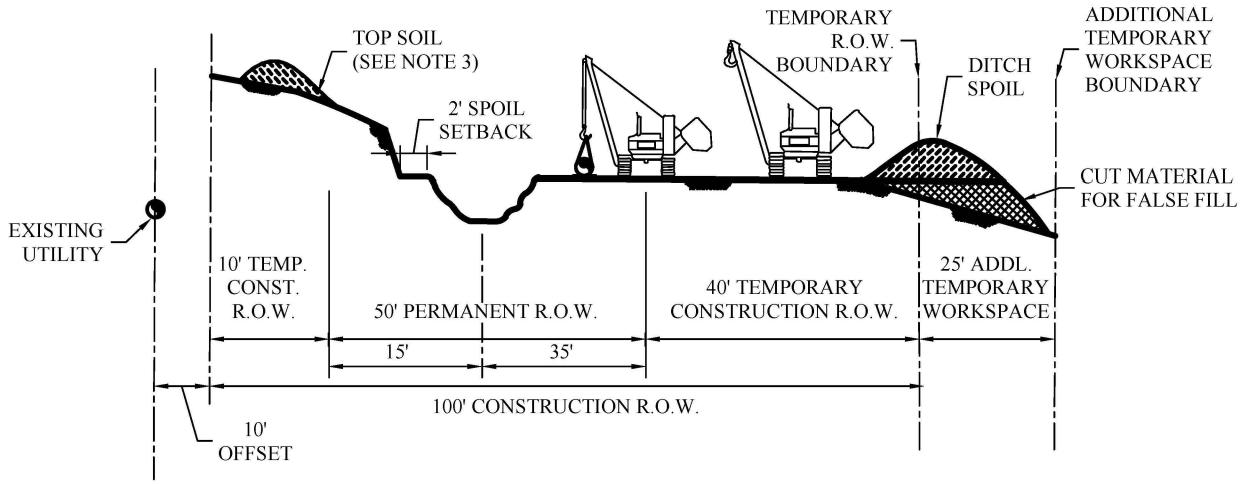
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 6-6

Construction ROW - Upward 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.

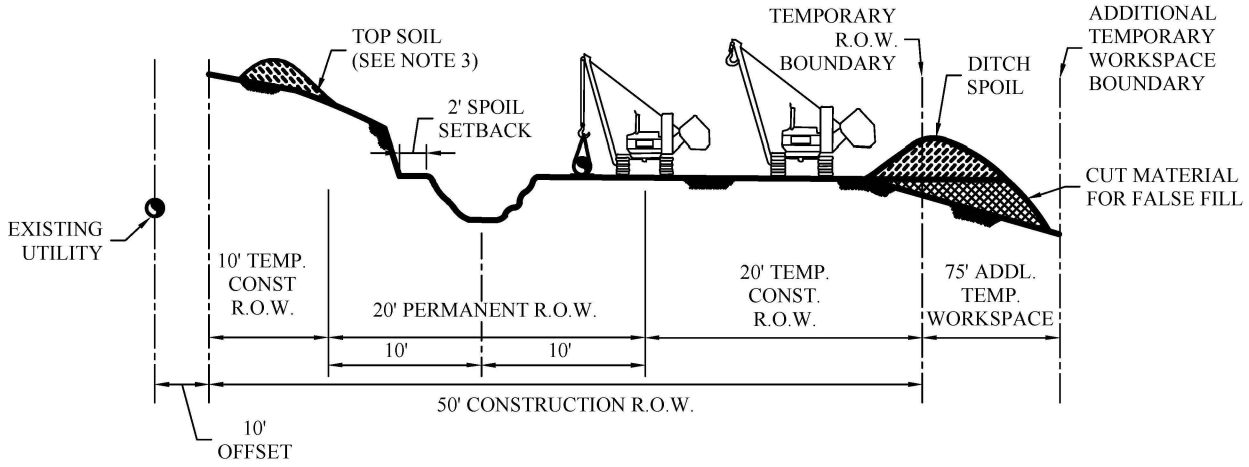
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 6-7

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 2014.

Hawkeye Pipeline System Project

Figure 6-8

Construction ROW - Down Side Slope on USFS Land

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 off of 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.

6.3.5 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;
- 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;
- 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.

6.3.6 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 Project 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.

6.4 FIRE PREVENTION AND SUPPRESSION

Hess contractors would comply with all federal, state, county, and local fire regulations and would implement procedures to prevent and suppress fires during construction. Contractors would maintain a contact list of local fire authorities and display potential fire hazard levels at the construction site. Hess's contractors would ensure that firefighting and suppression equipment are available on site in accordance with regulatory requirements. Fire equipment required on site could include fire extinguishers, hand tools, portable water pumps, and water trucks.

The Contractor would ensure that a sufficient number of fire extinguishers are available around activities that involve welding or other activities that could cause ignition. Flammable materials would be stored in approved containers away from ignition sources; flammable wastes would be removed on a regular basis. Smoking would not be allowed near flammable materials. In the event of an accidental fire resulting from construction activities, the Contractor would quickly respond to contain the fire. Local fire authorities would be notified immediately.

6.5 DUST CONTROL

During construction, particularly during high winds and/or low precipitation, there could be an increase in particulate matter with an aerodynamic diameter of 10 microns or less levels at the project site and along

access roads. The Contractor would at all times control airborne dust levels during construction activities. To reduce the wind-driven construction dust, Hess would have water trucks available and water would be applied to the construction area and access roads, as necessary. Revegetating disturbed areas upon completion of construction also would reduce increased levels of wind-blown dust during operation.

Dust would be strictly controlled where the construction work approaches dwellings, farm buildings, and other areas occupied by people and when the pipeline parallels an existing road or highway. This also would apply to access roads where dust raised by construction vehicles may irritate or inconvenience local residents. The speed of all Contractor vehicles would be controlled in these areas. 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.

The Contractor would take appropriate precautions to prevent fugitive emissions caused by sand blasting from reaching any residence or public building. The Contractor would place curtains of suitable material, as necessary, to prevent wind-blown particles from sand blasting operations from reaching any residence or public building. Additional measures may be required by state regulations or local ordinances. The Contractor would comply with all applicable state regulations and local ordinances with respect to truck transportation and fugitive dust emissions.

7.0 Environmental Resource Concerns

7.1 INTRODUCTION

Hess has committed to specific environmental protection measures as part of the Project design to minimize potential impacts to natural and human resources during construction and operation. These protection measures are summarized by resource in **Appendix J**. 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.

7.2 CULTURAL AND PALEONTOLOGICAL RESOURCES

Hess intends to avoid impacts to historic properties, unevaluated cultural resources and areas of tribal concern by routing around site boundaries, or, in some instances, by narrowing the construction ROW to remain outside of these areas. All avoidance and minimization efforts would be further supported by such actions as establishing temporary construction fencing to prevent construction activities from affecting known sites. Hess also plans to employ archaeological monitors to assure avoidance and protection of sensitive cultural and historic locations and artifacts during construction. Paleontological monitoring is required during ground-disturbing activities in areas identified with PFYC Class 4 bedrock. Additionally, Hess has prepared an Unanticipated Discoveries Plan for Cultural Resources (**Appendix K**), and an Unanticipated Discoveries Plan for Paleontological Resources (**Appendix L**), which provide guidance regarding the steps that need to be taken in the event that cultural materials, human remains, or fossils are unearthed during trenching.

7.3 WILDLIFE/SPECIAL STATUS SPECIES

Potential impacts to wildlife include the temporary and permanent reduction or loss of habitat. Temporary impacts arise from habitat removal and disturbance; these impacts would cease upon construction completion and completion of successful reclamation. Long-term, permanent impacts consist of changes to habitats and the wildlife populations that depend on those habitats, irrespective of reclamation success.

Direct impacts to wildlife populations may include limited direct mortalities from pipeline construction, habitat loss or alteration, incremental habitat fragmentation, and animal displacement. Indirect impacts could include increased noise, additional human presence, and the potential for increased vehicle-related mortalities. The degree of the impacts on terrestrial wildlife species and their upland habitats would depend on factors such as the sensitivity of the species, seasonal use patterns, type and timing of project activity, and physical parameters (e.g., topography, cover, forage, and climate).

To protect species protected under the BGEPA and the MBTA, mowing, clearing, and grubbing of the Project ROW would occur in the fall or late winter to discourage bird nesting. In the event mowing, clearing, and grubbing of the ROW is not possible prior to the nesting season (February 1 to July 15), nesting surveys for migratory birds, including raptors, would be conducted where suitable nesting habitat exists prior to construction. If active nests are encountered within or immediately adjacent to the ROW, the BLM and USFWS would be consulted for instructions on avoidance and/or mitigation measures. Consultation with the USFWS regarding nesting avian species would continue during construction activities.

Natural resource field surveys, including wildlife and threatened and endangered surveys, were conducted in October 2012 and July, August, and October 2014 and are discussed in the Natural Resources Report (**Appendix H**). In addition, a survey for raptor nests and migratory bird nest locations was conducted along

the ROW in May 2013. The methods and results of that survey are discussed in the letter report from SWCA Environmental Consultants to Hess dated May 14, 2013, and included in **Appendix M**.

Adverse impacts to special status species (i.e., federally-listed, proposed, candidate, or USFS sensitive) are not anticipated. If special status species are encountered during construction, construction would be halted and the USFS and USFWS would be notified and consulted for additional guidance on how to proceed. The Project ROW does not include any areas designated as Wildlife Management Areas (North Dakota Game and Fish 2015) or USFWS Waterfowl Production Areas.

7.4 NOXIOUS AND INVASIVE WEEDS

Noxious weed is a term used to describe a plant species that is not native to a given area, spreads rapidly, and has adverse ecological and economic impacts. These species may have high reproduction rates and usually are adapted to occupy a diverse range of habitats otherwise occupied by native species. Noxious weeds are opportunistic and often exotic (non-indigenous) plant species that readily invade disturbed areas, often producing monocultures and preventing native plant species from establishing communities. Noxious weeds also degrade agricultural productivity, soil and water, wildlife habitat, and recreational and wilderness values.

The NDCC §4.1-47-01(6) defines noxious weeds as any plant propagated by either seed or vegetative parts that is determined by the commissioner, a county weed board, or a city weed board, after consulting with the North Dakota State University Extension Service, to be injurious to public health, crops, livestock, land, or other property. Currently, there are 11 species or species groups (some include more than 1 species and/or cultivars) in North Dakota (North Dakota Administrative Code §7-06-01-02) that are considered noxious or invasive. Pursuant to NDCC 4.1-47, the control of noxious and invasive weeds is mandatory, and dissemination of noxious weeds must be prevented.

Surveys for noxious weeds were conducted during October 2012, May, July, and October 2013, and August and October 2014, within a 200-foot-wide survey corridor centered on the Project route to determine their occurrence along the proposed ROW. Noxious weed locations and the extent of localized populations were delineated and recorded using global positioning system equipment. Field staff observed and recorded the presence of Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), houndstongue (*Cynoglossum officinale*), halogeton (*Halogeton glomeratus*), and leafy spurge (*Euphorbia esula*) within the survey corridor. Canada thistle and leafy spurge are listed as noxious weeds in the state of North Dakota (NDCC 4.1-47-02). Houndstongue and halogeton are listed noxious weeds in McKenzie County, North Dakota. Field bindweed is a USFS designated species.

Aquatic nuisance species (ANS) have not been identified in any of the waterbodies or wetlands crossed by the Project. However, Hess would ensure that proper mitigation measures are implemented during construction to prevent the spread of ANS.

Hess would comply with State of North Dakota, county, and federal agency requirements to prevent the spread of noxious weeds and ANS. Hess would implement weed control measures in areas of the Project ROW where noxious weeds have been identified. The following guidelines would be followed during construction, reclamation, and maintenance stages of the Project to control the spread of noxious weeds.

- Construction equipment, materials, and vehicles would be stored at construction sites or at specified construction yards.
- All personal vehicles, sanitary facilities, and staging areas would be confined to a limited number of specified locations to decrease chances of incidental disturbance and spread of weeds.

- In areas with existing noxious weed infestations, vegetation, soils, and trench spoil material would be stockpiled adjacent to the removal point and, following construction, would be returned to its original locations to prevent spreading.
- Prompt re-establishment of the desired vegetation in disturbed areas is required. Seeding would occur during the frost-free periods after construction. Certified "noxious weed-free" seed would be used on all areas to be seeded.

Monitoring of noxious weeds would be conducted as part of ongoing operations and maintenance inspections. Hess would maintain ongoing communication with individual landowners, counties, and land management agencies regarding noxious weeds. These parties also would be supplied with Hess contact information to report noxious weeds along the ROW. Hess would maintain operations personnel trained in the identification of noxious weeds who would contribute to monitoring reports by documenting noxious weeds observed during the normal course of operations and maintenance. Known infestation sites would be monitored on an ongoing basis or until noxious weeds at the site are controlled. Monitoring also would include an evaluation of the prescribed control measures in their effectiveness of control. Hess's Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan can be found in **Appendix F**.

7.5 WATER RESOURCES

7.5.1 Surface Water

The surface water resources in the Project area would be managed and protected according to existing federal laws and policies regarding the use, storage, and disposal of the resource during the construction and operation of the Project. Surface water resource use and protection is administered under the following federal laws:

- Clean Water Act of 1972, as amended (33 U.S.C. 1251 et seq.)
- FLPMA (43 U.S.C. 1711–1712)
- NEPA (42 U.S.C. 4321)
- Safe Drinking Water Act of 1974, as amended (42 U.S.C. 300 et seq.)

Water quality is protected under the Federal Water Pollution Control Act (as amended), otherwise known as the CWA. The CWA has developed rules for regulating discharges of pollutants into waters of the U.S. and also regulates water quality standards for surface waters. The CWA also has made it unlawful to discharge any pollutant from a point source into any navigable waters of the U.S., unless a permit has been obtained from the NPDES program.

The Project would be designed and constructed so it would not impede the flow of any waterway. Pipeline crossings would be scheduled at times when there is as little rainfall as possible to minimize the risks of debris, stockpiled soil, and other sources of sediment from being washed into water bodies or wetlands. Temporary erosion and sediment control BMPs would be installed across the entire width of the construction ROW, upslope of and on both sides of each waterbody crossing, after clearing, and before ground surface disturbance. No silt-laden/turbid discharge water from trench dewatering operations would be allowed to enter any waterbody or wetland. The proposed 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 (**Appendix I**). The SWPPP would provide guidance on the location of dewatering structures, resulting in no deposition of sediments into water bodies (including wetlands and streams), 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 (**Appendix E**). Effects from dewatering would be localized, temporary, and generally insignificant.

7.5.2 Groundwater

Bedrock aquifers in the Project area include, from deepest to shallowest, the Cretaceous Fox Hills/Hell Creek Formation and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations. Glacial and alluvial aquifers include the Dry Fork Creek aquifer in Williams County and the alluvial aquifer associated with the Missouri River/Lake Sakakawea crossing area. The Dry Fork Creek aquifer is a glacial aquifer composed of sand, gravel and silt, and the Lake Sakakawea alluvial aquifer is composed of gravel and sand with layers of silt and clay. Both of these aquifers have shallow depths to groundwater, but groundwater is expected to be below the construction depth of the proposed pipeline. Groundwater in the bedrock aquifers is well below the planned construction depth of the proposed pipeline. If wells are needed for hydrostatic testing water, well completion methods would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers.

The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn and McKenzie counties. This aquifer meets the water quality standards of the North Dakota Department of Health (Croft 1985). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, 1976. 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.

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 small and temporary. Potential impacts on the 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.

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 has developed a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) and a SWPPP to 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. The SPCC Plan is included in **Appendix N**.

7.6 VEGETATION

The Project area occurs in the Northwestern Great Plains ecoregion III (Bryce et al. 1996). Species common to the Northwestern Great Plains Mixed-grass Prairie and confirmed during field surveys include smooth brome (*Bromus inermis*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), crested wheatgrass (*Agropyron cristatum*), wavyleaf thistle (*Cirsium undulatum*), intermediate wheatgrass (*Elytrigia intermedia*), stiff goldenrod (*Solidago rigida*), big bluestem (*Andropogon gerardii*), threadleaf sedge (*Carex filifolia*), slender wheatgrass (*Elymus trachycaulus*), green sagewort (*Artemisia campestris*), cudweed sagewort (*Artemisia ludoviciana*), Canada goldenrod (*Solidago canadensis*), sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), purple coneflower (*Echinacea angustifolia*), prairie sagewort (*Artemisia frigida*), American licorice (*Glycyrrhiza lepidota*), curlycup gumweed (*Grindelia squarrosa*), sweetclover (*Melilotus* spp.), Kentucky bluegrass (*Poa pratensis*), prairie coneflower (*Ratibida*

columnifera), common yarrow (*Achillea millefolium*), and little bluestem (*Schizachyrium scoparium*). The habitat types identified during the field surveys include grasslands, woodlands and shrubland, wetlands and riparian areas, barren areas, and agricultural fields.

Temporary impacts would occur along the Project route and where access is needed for construction activities. Wooded or forest areas within the Project ROW primarily are associated with streams and wind breaks found near current or former homesteads. Any trees along the route would be protected to the extent practicable and in a manner compatible with safe operation, maintenance, and inspection of the pipeline. The construction ROW would be reduced to 50 feet through areas where trees are established, which would help reduce the overall impact to forested areas. Trees would be allowed to re-grow within the permanent easement but not within 15 feet of either side of the pipeline.

Existing agricultural and grazing practices along the Project route have substantially altered the original vegetative landscape. Minimal impacts are expected to occur to native plant communities. Permanent vegetative impacts from pipeline construction are not anticipated. Temporarily disturbed areas that are normally cultivated would be available after Project construction. Areas not currently in agricultural use would be seeded with the approved USFS-native seed mix, or as otherwise negotiated with private landowners.

Hess would work closely with landowners to minimize adverse impacts to vegetation associated with construction of the pipeline. Surveys were conducted to document tree species and numbers that would be impacted by Project construction (**Appendix H**). Trees and shrubs would be replaced in accordance with the PSC's Tree and Shrub Mitigation Specifications (**Appendix O**); and as required by other governing agencies. Generally, Hess would conduct an inventory of trees and shrubs that would be removed during construction of the pipeline. Trees and shrubs would be replaced by the same species or similar species suitable for North Dakota growing conditions at a 2:1 replacement ratio. The replacement location(s) would be coordinated with the landowner(s). Documentation identifying the number, variety, type, location, and date of the replacement plantings would be filed with the PSC. Monitoring of the survival rate and overall condition of the plantings would be conducted for 3 years. If the survival rate is 75 percent or less, the PSC may require additional plantings.

7.7 SOILS

Soils in the Project area vary depending on the topography, slope orientation, and parent material from which the soil is derived. The Project area is located toward the center of the Williston Basin. The Greenhorn Formation, which consists of thin limestone and dark gray to black organic-rich shale, is found from the surface to a depth of approximately 4,000 feet. The Greenhorn is subdivided into lower and upper intervals of limestone and calcareous shale with a middle interval of shale. Near-surface sediment is of Recent, Pleistocene, or Tertiary age, and includes Sauk, Tippecanoe, Kaskaskia, Absaroka, Zuni, and Tejas sequences. Thirty-four soil types are found throughout the Project area. Each individual soil series may exist individually within the Project area or in combination with other soil types.

No permanent impacts to the soils in the Project area are anticipated as a result of pipeline installation or operation, except at those locations where new aboveground facilities are constructed, MLV sites are located, or pig receivers are placed. The majority of the soil disturbance along the Project route would be limited to the construction ROW, but temporary access, staging areas, and ATWSs may be needed at select locations.

In order to prevent effects on the soil due to compaction by construction operations, topsoil stripping and/or soil decompaction techniques would be used during clearing, grading, and restoration activities.

Topsoil stripping would occur above both the trench and spoil side of the trench within the Project ROW along the entire length of the pipeline, except across USFS land. Across USFS land, topsoil would be stripped above the entire Project ROW (i.e., spoil, trench, and working side). In locations where topsoil is not

stripped but significant compaction occurs, decompaction measures would be taken. Decompaction measures are further described in the CMRP (**Appendix C**).

Soil impacts may occur due to wind and water erosion on areas that are disturbed during construction. Wind erosion would be more of a hazard in those portions with coarse-textured soils. Erosion potential can be influenced by the size of area being disturbed at any given time. Because the length of the pipeline would be disturbed in segments during the construction phase, erosion potential would be minimized. Grading may be required in some places to ensure safe working platforms for equipment, as well as to improve access roads. Generally, these areas would be on steep slopes that are not agriculturally productive. Dust control measures also would be taken to minimize wind erosion.

Soils crossed by the Project would be susceptible to contamination from spills or leaks of liquids used during construction. Hess has developed a SPCC Plan (**Appendix N**) that would outline methods to reduce spills or leaks. Any contaminated soils would be excavated and removed from the Project area, and the appropriate agencies would be notified as required. Procedures for handling contaminated soil are further described in the SPCC Plan.

7.8 WETLANDS

On-the-ground wetland and waterbody delineations were conducted in October 2012, May, July, and October 2013, and August and October 2014 within a 200-foot-wide survey corridor centered along the Project route. Along the Project route, 20 Palustrine Emergent wetlands and 2 intermittent waterbody crossings were identified (**Appendix H**). Hess has committed to boring under all identified wetlands in the construction corridor resulting in no surface disturbance impacts to wetland and streams.

8.0 Operations and Maintenance

Hess periodically would use the permanent ROW to perform inspections, maintain equipment, and make repairs during the life of the proposed pipeline. Undesired vegetation that may interfere with the safe and reliable operations of the proposed 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 proposed 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 proposed pipeline would be monitored 24 hours a day, 365 days a year from the Operations Control Center (OCC) using a sophisticated SCADA system. 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 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 three-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 proposed pipeline also would be 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 would only 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.

9.0 Abandonment

BLM regulations at 43 CFR 2880, ROWs under the Mineral Leasing Act, 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 approved USFS native seed mixture to ensure that an acceptable stand of vegetation is established.

10.0 References

ATMOS Wave, 2012. Pipeline Leak Detection and Location Software. October 2012.

Bryce, S. A., J. M. Omernik, D. E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S. H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. (map poster). U.S. Geological Survey, Reston, Virginia. Scale 1:1,500,000.

Croft. M.G.1985.Groundwater Resources of McKenzie County North Dakota. North Dakota State Water Commission County Ground-water Studies 37, Parts II and III. North Dakota Geological Survey Bulletin 80-Part III.

North Dakota Game and Fish Department. 2015. Wildlife Management Area Guide. Internet website: http://gf.nd.gov/wma/listing. Accessed February 27, 2015.

Appendix A

Access Road Report

Table A-1 Potential Improvement of Existing Access Roads

Route	Station	Mile Post	Name	Type	County	State	Length (feet)	Surface	Condition	Improvement
Route 13	6+72	0.13	41st ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	35+02	0.66	Hwy ND-1806	Highway	McKenzie	North Dakota	N/A	Paved	Paved	None
Route 13	114+44	2.17	42nd ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	180+09	3.41	43rd ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	242+70	4.60	44th ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	296+36	5.61	Hwy ND-1806	Highway	McKenzie	North Dakota	N/A	Paved	Paved	None
Route 13	410+94	7.78	46th ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	454+51	8.61	104th Ave NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	457+84	8.67	104th Ave NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	466+29	8.83	104th Ave NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	517+80	9.81	48th ST NW	County Road	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	530+79	10.05	Unknown	Unknown	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	533+89	10.11	Unknown	Unknown	McKenzie	North Dakota	N/A	Gravel	Improved	None
Route 13	670+35	12.70	Unknown	Unknown	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	732+63	13.88	52nd ST NW	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	740+23	14.02	Unknown	Unknown	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	777+62	14.73	103rd Ave NW	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	856+97	16.23	Hwy ND-1804	Highway	Williams	North Dakota	N/A	Paved	Paved	None
Route 13	920+23	17.43	55th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	975+35	18.47	56th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1032+84	19.56	57th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1063+07	20.13	Unknown	Unknown	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1089+57	20.64	58th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1145+92	21.70	59th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1202+21	22.77	60th St Nw	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1236+31	23.42	Unknown	Unknown	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1286+18	24.36	104th Ave NW	County Road	Williams	North Dakota	N/A	Gravel	Improved	None
Route 13	1334+26	25.27	Unknown	Unknown	Williams	North Dakota	N/A	Gravel	Improved	None
Lateral	20+67	0.39	Hwy ND-1806	Highway	McKenzie	North Dakota	N/A	Paved	Paved	None

*Public domain data were used in the making of this table. The data may be incomplete and/or inaccurate due to the nature of public domain data. The information contained in this table should be used for planning purposes only.

Table A-2 New Access Roads

Route	Station	Mile Post	Name	Type	County	State	Length (feet)	Surface	Condition	Improvement
Route 13	102+50	1.94	New Access Easement	Unknown	McKenzie	North Dakota	278	Track	Unpaved	Blade, Gravel
Route 13	798+70	15.13	New Access Easement	Unknown	Williams	North Dakota	165	Gravel	Improved	Blade, Gravel
Route 13	906+15	17.16	New Access Easement	Unknown	Williams	North Dakota	375	Gravel	Improved	Blade, Gravel

Appendix B

Waste Management Plan

EXPLORATION AND PRODUCTION EHS&SR

NORTH DAKOTA WASTE MANAGEMENT PLAN

Document Number: Insert document #	
Revision: 10-17-2014	**Date Issued:**
Reference:	
Content Owner:	
Approval Authority:	Signature On File

UNCONTROLLED DOCUMENT

VALID ONLY AT TIME OF PRINTING

PRINT DATE: APRIL 21, 2015

TABLE OF CONTENTS

1.0 INTRODUCTION 7
1.1 Scope 8
1.2 References 8
1.3 Roles and Responsibilities 8
1.4 Document Control 10
2.0 HESS NORTH DAKOTA FACILITY WASTE MANAGEMENT PROFILES 11
3.0 WASTE CHARACTERIZATION 11
4.0 HESS WASTE STREAMS AND MANAGEMENT REQUIREMENTS 12
4.1 Currently or Potentially Generated Waste Streams 12
4.2 Other Waste Streams Not Specifically Listed in this Guidance 12
5.0 WASTE MANAGEMENT REQUIREMENTS 12
5.1 Hazardous Waste 13
5.1.1 Determination of RCRA Generator Status and Associated Waste Accumulation Timeframes 13
5.1.2 Notification of Hazardous Waste Activity 14
5.1.3 Container Management/Labeling/Inspections 14
5.1.4 Waste Accumulation 16
5.1.5 Off-site Shipment/Manifesting 16
5.1.6 Training 17
5.1.7 Recordkeeping/Reporting 17
5.2 Universal Wastes 18
5.2.1 Handler Classifications 18
5.2.2 Notification of Universal Waste Activity 18
5.2.3 Storage/Labeling 18
5.2.4 Universal Waste Accumulation Time Limit 20
5.2.5 Off-site Shipment/Manifesting 20
5.2.6 Training 20
5.2.7 Recordkeeping/Reporting 20
5.3 E&P Wastes 21
5.3.1 On-site Storage and Processing Considerations 22
5.3.2 Labeling/Inspection 26
5.3.3 Off-site Shipment/Manifesting 26
5.3.4 Training 26
5.3.5 Recordkeeping/Reporting 26

5.4 NORM/TENORM/Radioactive Wastes 27
5.4.1 Licensing Requirements 28
5.4.2 Storage/Labeling/Inspection 29
5.4.3 Off-site Shipment/Manifesting 30
5.4.4 Training 30
5.4.5 Recordkeeping/Reporting 30
5.5 PCB Wastes 30
5.5.1 Storage/Accumulation//Marking/Inspection 31
5.5.2 Off-site Shipment/Manifesting 32
5.5.3 Training 33
5.5.4 Recordkeeping/Reporting 33
5.6 Asbestos 34
5.6.1 Required Notifications 35
5.6.2 Storage/Accumulation/Labeling/Inspection 35
5.6.3 Off-site Shipment/Manifesting 36
5.6.4 Training 36
5.6.5 Recordkeeping/Reporting 36
5.7 Infectious Waste (Medical Waste) 37
5.7.1 Notification of Infectious Waste Activity 38
5.7.2 Storage/Labeling/Management 38
5.7.3 Infectious Waste Accumulation Time Limit 38
5.7.4 Off-site Shipment/Manifesting 38
5.7.5 Training 39
5.7.6 Recordkeeping/Reporting 39
6.0 HESS WASTE MANAGEMENT TRAINING REQUIREMENTS 39
7.0 WASTE CONTRACTORS 39
8.0 WASTE TRANSPORTERS 39
9.0 MANAGEMENT OF CONTRACTOR GENERATED WASTES 40
10.0 OTHER USEFUL REFERENCES AND TOOLS 41
10.1 State Guidance Document Links 41
10.2 Federal Guidance Document Links 41

LIST OF TABLES (Available Upon Request)

Table 1 Summary List of Wastes for Hess North Dakota Operations
Table 2 Summary of Waste Management Requirements by Waste Type
Table 3 Hazardous waste from Non-Specific Sources (F – Listed Waste Codes)
Table 4 Acute Hazardous Waste (P – Listed Waste Codes)
(Discarded Commercial Chemical Products, Off-Specification Products, Container Residues and Spill Residues Thereof)
Table 5 Toxic Wastes (U – Listed Waste Codes)
(Discarded Commercial Chemical Products, Off-Specification Products)
Table 6 Toxicity Characteristic – Maximum Concentration of Contaminants
Table 7 Summary of North Dakota Hazardous Waste Requirements by Generator Category
Table 8 Exempt E&P Wastes
Table 9 Non-exempt E&P Wastes
Table 10 Hess Waste Management Training Requirements

LIST OF FIGURES (Available Upon Request)

Figure 1 Hazardous Waste Characterization Flowchart

LIST OF APPENDICES (Available Upon Request)

Appendix A Definitions
Appendix B North Dakota Facility Profiles
Appendix C Waste Characterization Process
Appendix D Waste Management Instruction Sheets
Appendix E New Waste Stream Data Sheet
Appendix F North Dakota Notification of Hazardous Waste Activity Form, SFN 53681
Appendix G Sample Labels
- Hazardous Waste
- Non-hazardous Waste
- PCB
- Biohazard

Appendix H Sample Container Storage Area Inspection Form
Appendix I Sample Shipping Documents
- Uniform Hazardous Waste Manifest Form and Instructions, EPA Form 8700-22
- Non-hazardous Waste Manifest
- New Park Shipping Manifest
- Bill of Lading
- Asbestos Waste Manifest Form
- Asbestos-Containing Material Waste Shipment Record

Appendix J Tracer Test Guidelines
Appendix K Example NORM Inspection/Survey Form
Appendix L Asbestos Notification of Demolition and Renovation, SFN 17987
Appendix M Waste Management Plan Review/Revisions Log

1.0 INTRODUCTION

This Waste Management Plan (herein referred to as the "Plan") is to set Hess Corporation ("Hess") minimum expectations for the waste management procedures that will be conducted by Hess Exploration and Production (E&P) across all of the North Dakota operations (including the Tioga gas plant, drilling, completion and workover, and production operations). Waste management includes the proper handling, accumulation, storage, manifesting, transportation, and disposal/recycling of the waste generated. The need for practicing waste minimization has arisen as a result of environmental protection awareness and evolving regulatory requirements.

The basic principles of Waste Minimization are defined by the **Waste Management Hierarchy of Controls:**

- **Remove:** The complete elimination of the waste; also includes management measures that result in no direct impact to the terrestrial, marine or atmospheric environment
- **Reduce:** Generating less waste through more efficient practices or substitution of products. Reducing wastes means (1) Reducing the quantity of wastes generated, and (2) Substitution refers to selecting a product, that when used, is less hazardous than the formerly used product.
- **Reuse:** Using/reusing waste as a substitute for a commercial product. Reuse may involve reclaiming useful constituents out of waste material or removing contaminants from waste so that it can be reused.
- **Recycle:** Recycle refers to the process of taking old or used "wastes" and turning them into new "products," for example, paper, glass, used oil, batteries, aluminum cans, etc., can be processed into new usable products.
- **Recover:** Recovery refers to the extraction of certain usable material from a waste stream
- **Treatment**: Destroying, detoxifying or neutralizing waste by biological, thermal, chemical or physical methods, e.g., incineration
- **Disposal**: Releasing to the atmosphere, marine discharge or landfill of the waste

The waste management procedures outlined in this Plan are designed to provide guidance to the field and staff personnel regarding the proper management and minimization of wastes generated by Hess oil and gas operations. As developed and implemented, this Plan provides clear waste management guidance which:

- Facilitates the company-wide effort to protect the environment;
- Supports compliance with environmental laws and regulations regarding proper waste management;
- Provides a basis for training of staff and field personnel; and
- Provides a basis for monitoring and evaluating Hess waste management practices.

Definitions useful for understanding information presented in this plan are provided in Appendix A.

1.1 Scope

This plan applies to all Hess E&P operations and facilities located in North Dakota where Hess E&P is the operator or has operational control. The plan provides instructions for management of hazardous, non-hazardous, universal and special waste streams to ensure proper:

- Characterization,
- Registrations/Notifications/Licensing
- Handling/Storage,
- Labeling,
- Accumulation,
- Shipping/Manifesting
- Recordkeeping and Reporting;
- Best Management Practices, and
- Source Reduction.

For each waste stream that has been identified as being generated by Hess North Dakota Oil & Gas Operations, a Waste Management Information Sheet (WMIS) has been prepared. The WMIS sheets provide specific information/instructions on the proper management of each waste from its point of generation through final waste disposition.

In addition, this plan includes procedures and protocols for managing new and/or previously unidentified waste streams in accordance with state and federal regulations.

1.2 References

This plan supports the following internal Hess policies and procedures and/or standards:

- Hess Corporation Environment, Health and Safety Policy
- Hess Exploration and Production EHS&SR Waste Management Standard
- Hess Exploration and Production EHS Procedure – Naturally Occurring Radioactive Materials (NORM)
- Hess Contractor Handbook Environment, Health & Safety

1.3 Roles and Responsibilities

Operations and facility managers will be responsible for assigning a waste coordinator to each facility or, in the case of production, a waste coordinator will be assigned to each operating area

managed out of a central operating office. Waste coordinators will also be assigned to cover one or more drilling operations. Secondary support will be provided by the EHS Specialist - Environment for the Hess North Dakota E&P operations. As necessary, the North Dakota EHS Specialist may request support from the Hess Global EHS&SR personnel (environmental subject matter experts (SME)).

The waste management responsibilities for each of these positions are as follows:

North Dakota Operations Manager, Tioga Gas Plant Manager, Bakken Project Director, North Dakota Drilling and Facilities Manager

- Ensure provision of compliant waste management plans and procedures.
- Assign facility/operations specific waste coordinators as appropriate.

Global EHS&SR Personnel

- Develop and implement corporate policy, standards, and waste management protocols for Hess Corporation.
- Develop and manage corporate waste tracking/reporting database systems.
- Organize and lead teams to conduct periodic reviews and update the area Waste Management Plans.
- Develop and implement waste management training programs. Establish associated tracking system for employee EH&S training.
- Establish waste contractor and waste transporter minimum acceptance requirements.
- Establish and implement audit program for waste contractors and waste transporters.
- Establish and implement internal EH&S audit program for review of waste management compliance.

North Dakota EHS Specialist – Environment

- Develop and implement local waste management plans and procedures.
- Track and update area specific (State and local) waste management procedures and protocols. Distribute information and updates to Facility/Area Waste Coordinators and Hess Corporate EHS personnel.
- Conduct periodic reviews of waste management practices for assigned area.
- Provide waste management guidance and support to Facility/Area Waste Coordinators as needed.
- Support waste characterization and prepare waste management instructions for new waste streams.
- Review required agency reports and notifications prepared by Facility/Area Waste Coordinators prior to submittal.

- Manage audit program for waste contractors and waste transporters.
- Facilitate internal EH&S audit program for review of waste management compliance.

Facility/Area Waste Coordinator (Operations and/or a Maintenance Technician)

- Oversee all waste generation, storage, and shipping for facility or assigned area. Includes set-up, maintenance, and inspection of waste storage units.
- Identify and characterize new waste streams with assistance of EHS Specialist as necessary.
- Arrange for transportation and disposal/treatment of wastes generated by facility/area operations. Verify that transporters and disposal/treatment contractors used for waste management are set up in the Hess Corporate contract management system.
- Track waste generation and accumulation to verify generator status.
- Maintain waste records (notifications, generation/accumulation tracking, waste characterization, inspection, manifests, disposal/treatment certifications, tolling agreement contracts, etc.).
- Waste data entry for Hess Corporate waste tracking system.
- Prepare required agency notifications or reports for review and approval by EHS Specialist and/or Corporate EHS personnel.

Field/Operations Personnel

- Recognize common waste streams generated during course of routine oil & gas production activities and understand basic regulatory requirements for those waste streams.
- Appropriately manage generated wastes with respect to proper collection, containerization, labeling and storage requirements.
- Appropriately respond to spills or releases of wastes.

1.4 Document Control

This plan will be reviewed and updated on an annual basis. The review will be performed by a team consisting of the Environmental SMEs, the North Dakota EHS Specialist, Facility/Area Waste Coordinators representing the various operating functions, and the North Dakota Operations Manager.

2.0 HESS NORTH DAKOTA FACILITY WASTE MANAGEMENT PROFILES

The facilities covered by this plan include the following:

- Tioga Gas Plant (TGP)
- Tioga Production Operations
- Newberg Production Operations
- Fryburg Production Operations
- Keene Production Operations
- Killdeer Production Operations
- Drilling Operations

Facility profiles for each of the gas plant and production areas are provided in Appendix B. The profiles include location information, EPA/State ID#s, generator status, and contact information, and emergency contacts for each facility/operating area. Additionally, Appendix B includes a list of Waste Coordinator assignments for the drilling operations.

3.0 WASTE CHARACTERIZATION

Characterization of a waste is the first and most critical step in ensuring proper waste management. Wastes are categorized primarily based on their classification under the federal regulations administered under the Resource Conservation and Recovery Act (RCRA). RCRA regulation forms the basis for management requirements for most types of wastes generated in the United States. Under both federal and state hazardous waste rules, a person who generates a solid waste must determine if it is a hazardous waste (40 CFR 262.11). A secondary category or sub-category is given if the waste is further controlled by other agencies.

Under RCRA, certain wastes generated by the oil and gas exploration and production industry are given a special exempt status from stringent hazardous waste regulations. In 1988, EPA issued a regulatory determination that specifically exempted E&P wastes from regulation as hazardous wastes under Subtitle C of RCRA. Exempt wastes are typically limited to those that are intrinsically related to the production of oil or natural gas. Although certain E&P wastes are not subject to regulation as hazardous waste, they are not excluded from regulation under state regulations, the less stringent RCRA Subtitle D solid waste regulations, or under other federal regulations. Additionally, although E&P wastes have been exempted from regulation as hazardous wastes under RCRA, the exemption does not mean that the wastes could not potentially present a hazard to human health or the environment if not properly managed.

The waste categories potentially managed by Hess include hazardous waste, universal waste, non-hazardous (solid waste), and special wastes including E&P waste, naturally occurring radioactive material (NORM)/radioactive waste, polychlorinated biphenyls (PCBs), and asbestos.

Characterization of wastes is a multi-step process as presented in Figure 1 – Waste Characterization Flow Chart, and is described in detail in Appendix C. Criteria and thresholds for managing wastes under the special waste categories (E&P waste, NORM/Radioactive Waste, PCBs, Asbestos and non-hazardous waste) are presented in Section 5.0.

4.0 HESS WASTE STREAMS AND MANAGEMENT REQUIREMENTS

Hess has conducted a survey of their existing operations and identified specific waste streams either currently or potentially generated from their gas plant, drilling, completion and workover, and production operations.

4.1 Currently or Potentially Generated Waste Streams

Table 1 presents a list of waste streams that are currently or potentially generated from one or more of the Hess O&G production operations in North Dakota. The table identifies the operating area(s) where each waste stream is generated (e.g. gas plant, drilling, completion/workover, and production). A separate Waste Management Instruction Sheet (WMIS) has been developed for each of the waste streams identified. These instruction sheets are provided in Appendix D of this plan. The waste list and the WMISs will be reviewed and updated on a periodic basis.

4.2 Other Waste Streams Not Specifically Listed in this Guidance

Any waste stream that is not indicated in Table 1 must be properly reviewed by the facility/area Waste Coordinator and EHS Specialist for proper characterization and development of the specific waste management instructions. In the event a previously unidentified waste stream is generated by Hess O&G operations, the waste should be securely contained in an appropriate container (roll-off or drum) and be labeled “non-hazardous waste pending characterization.” The Hess Waste Data Collection Sheet for New or Previously Uncharacterized which is included as Appendix E should be completed within 24 hours of waste generation and should be submitted to the operating area Waste Coordinator for evaluation. Based on the information provided on the data sheet, the Waste Coordinator, with assistance from the EHS Specialist, will determine whether additional information, including laboratory analysis is required and provide guidance on waste management. As determined appropriate, this plan will be updated to include a WMIS for the new waste stream.

5.0 WASTE MANAGEMENT REQUIREMENTS

Waste management requirements are described by waste type in the following subsections and are summarized for quick reference in Table 2. As applicable, the information presented includes general program specific information regarding:

- Generator status determinations
- Notifications/Registrations/Licenses
- On-site storage and handling (including labeling, accumulation time limits, and inspection)
- Off-site shipping and manifesting
- Training, and
- Recordkeeping and reporting

There are two general rules that should be followed for management of all wastes. They are:

- Never mix non-hazardous waste (including exempt or excluded wastes) with hazardous waste.
- Never mix E&P exempt wastes with non-Exempt E&P wastes.

5.1 Hazardous Waste

The North Dakota Department of Health (NDDH), Environmental Health Section, Division of Waste Management, Hazardous Waste Program, regulates management of hazardous wastes in the state of North Dakota. The state hazardous waste regulations are codified at Title 33, Article 24, Chapters 01 through 08 of the North Dakota Administrative Code. The requirements for hazardous waste management generally follow the federal requirements with a few exceptions. North Dakota waste codes are the same as the Federal waste codes. Refer to Section 3.0, Figure 1, and Appendix C for instructions on hazardous waste characterization and waste code determinations. Table 3, Table 4 and Table 5 provide quick reference lists of hazardous waste codes. Table 6 provides the concentration thresholds for the toxicity characteristic waste codes.

The following subsections present requirements as reflected in the North Dakota state hazardous waste regulations.

5.1.1 Determination of RCRA Generator Status and Associated Waste Accumulation Timeframes

The amount of waste generated each month determines the facility's hazardous waste generator status and applicable requirements. The generator categories are:

Large Quantity Generator (LQG) –greater than 1,000 kg (2,200 lbs) of hazardous waste per month and/or greater than 1 kg (2.2 lbs) of acute hazardous waste per month.

Small Quantity Generator (SQG) – between 100 – 1,000 kg (220 – 2,200 lbs) and less than 1 kg (2.2 lbs) of acute hazardous waste per month. May not accumulate more than 6,000 kg (13,200 lbs) on site.

Conditionally Exempt Small Quantity Generator (CESQG) – less than 100 kg (220 lbs) hazardous waste per month and less than 1 kg (2.2 lbs) of acute hazardous waste per month. May not accumulate more than 1,000 kg (2,200 lbs) on site.

For liquid waste, 100 kg (220 lbs) equates to approximately ½ drum of waste.

Table 7 provides a summary of the North Dakota hazardous waste requirements for each of the generator categories.

Hess O&G operations in North Dakota operate as CESQGs. Therefore, the information presented in the remainder of this section focuses on the requirements specific to CESQGs although SQG and LQG requirements are discussed.

5.1.2 Notification of Hazardous Waste Activity

SQGs and LQGs are required to obtain State/EPA ID numbers. Although CESQGs are not required to have an ID number, some transporters and treatment, storage or disposal facilities may require the site to have an ID number. In North Dakota, Form SFN 53681 is used to file notification of hazardous waste activity (Appendix F).

State/EPA ID numbers are unique to a location. Therefore, if a company relocates or opens at a new location, a new notification is required. Renotification is required if there is a change in the company name or ownership. Renotification is also required if the facility generator status increases. If the company generator status decreases, renotification is not required, but it may be in the best interest of the company to renotify.

5.1.3 Container Management/Labeling/Inspections

Hazardous wastes generated by Hess O&G Operations will generally be placed in 55-gallon drums or smaller containers. Although CESQGs are not subject to the hazardous waste container management and labeling requirements while the waste is in storage the hazardous waste requirements for SQGs and LQGs will be followed including:

- Maintain containers so that they are in good condition (no severe rusting, leaks, apparent structural defects or deterioration), compatible with the contents; closed (except when adding or removing wastes); and properly labeled.
- Store all waste containers away from vehicular or process equipment to reduce potential for ruptures or leaks.
- Do not mix hazardous and non-hazardous waste in the same container.
- Store containers within secondary containment to prevent releases to the environment.
- Containers will be elevated or otherwise protected to prevent contact with liquids that may accumulate within a secondary containment system.

The secondary containment system will be:

- Designed with sufficient capacity to contain 10% of the total volume of liquid waste stored in the area or the volume of the largest container, whichever is larger.

- Free of gaps and cracks and sufficiently impervious to contain leaks, spills, and accumulated precipitation.
- Designed to prevent precipitation run-on.
- Sloped or designed and operated to remove leaks, spills, accumulated liquids.
- Accumulated precipitation will be removed in a timely manner to prevent overflow.

Labeling

While in storage, each container storing hazardous waste must be marked with the words **"Hazardous Waste"** and an accumulation start date. The accumulation start date is the date waste is placed in the container or, in the case of a satellite accumulation container, the date the container is filled and placed in storage. Sample labels are provided in Appendix G.

Prior to shipping, the container must be labeled in accordance with 40 CFR 172. Each container must be labeled and clearly marked with the following information:

- Proper shipping name and UN/NA number (found in 49 CFR 172.101)
- Generator Name and address
- Manifest document number
- Hazardous waste warning which states, "Hazardous Waste – Federal Law Prohibits Improper Disposal. If found, contact the nearest police, public safety authority or the U.S. EPA."
- Hazard labels. Hazard labels are 4" by 4" labels stating information such as FLAMMABLE, CORROSIVE, or OXIDIZER.

Inspections

SQGs and LQGs are required to inspect container storage areas **weekly** and document the inspections in an inspection log. There are no regulatory specified inspection requirements for CESQGs. However, Hess requires periodic inspections of waste storage areas as a best management practice. The container storage area inspections will cover the following:

- Leaks, structural integrity, container deterioration, and condition of the containment system.
- Proper labeling of containers
- Verify that containers are kept closed
- Presence of accumulated liquids in secondary containment
- Proper storage of containers on pallets or drum racks
- Adequate aisle space to allow inspection and movement of personnel and equipment in the event of an emergency.

If problems are identified during the inspection, immediate remedial action will be taken. All inspections will be documented. Inspection records will include the date of the inspection, the name of the inspector, observations and the date and nature of any problems, repairs and

remedial actions. A sample inspection form is provided in Appendix H. Facilities may use this or a similar form to document inspections.

5.1.4 Waste Accumulation

In addition to the limits for quantities of waste stored on-site, the regulations limit the storage timeframes for each waste category are as follows:

LQG – Waste must be shipped off-site within 90 days from the date the waste is placed in storage.

SQG – Waste must be shipped off-site within 180 days. Up to 270 days is allowed if the off-site treatment storage or disposal facility is located more than 200 miles away.

CESQG - No regulatory time limit for on-site storage as long as accumulation thresholds are not exceeded.

SQGs and LQGs are allowed to accumulate up to 55-gallons of hazardous waste and up to one quart of acute hazardous waste (P waste code) in containers at or near the point of generation. These provisions allow for longer accumulation times for waste streams which may accumulate slowly. These storage areas, referred to as “satellite accumulation,” must meet the following requirements:

- Waste is stored at or near the point of generation and is under the control of the operator of the process generating the waste.
- The container is marked with the words “hazardous waste” or other words that identify the contents of the container. DO NOT FILL IN THE ACCUMULATION START DATE UNTIL THE CONTAINER IS FULL.
- The container is in good condition and compatible with the contents of the container.
- The container is kept closed except when adding or removing waste,
- Once the container is full, it is marked with an accumulation start date and is placed in storage. For SQGs and LQGs the waste must be moved within 3 days after the container becomes full.

The facility may have more than one satellite accumulation site if waste is generated from more than one process.

5.1.5 Off-site Shipment/Manifesting

All transporters used for transportation of hazardous wastes must have a State/EPA ID number and a North Dakota Solid Waste Transporters License. Shipments of hazardous waste are to be manifested using the Uniform Hazardous Waste Manifest, EPA Form 8700-22. See Appendix I for a sample of the form. It should be noted that if hazardous waste is being shipped out-of-state, some states require use of a state specific manifest for all wastes going to a treatment, storage or disposal facility in that state.

One exception to the manifest requirement is if wastes are being shipped under a tolling agreement with a hazardous waste recycler. If wastes are shipped under a tolling agreement and a hazardous waste manifest is not used, the waste shipment should be accompanied by a bill of lading.

Land Disposal Restriction (LDR) may be required for wastes generated by SQGs or LQGs. LDRs are not required, but are recommended, for wastes generated by CESQGs.

5.1.6 Training

Although hazardous waste training is not specifically required for CESQGs, individuals responsible for waste generation, accumulation and storage, shipping or recordkeeping will be provided training in waste characterization and waste management. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.1.7 Recordkeeping/Reporting

The following hazardous waste records will be retained on-site:

- Records of waste analysis or waste characterization basis (minimum of three years from the date waste last shipped)
- Signed hazardous waste manifests or bills of lading (minimum of three years following waste shipment date);
- Contractual agreements related to tolling agreements for waste recycling (for a minimum of three years after termination or expiration of the contractual agreement);
- Land disposal restriction forms (minimum of three years after last shipment)
- Manifest exception reports (minimum three years)
- Copies of biennial reports (minimum of three years)
- Inspection records (minimum of three years)

NDDH requires SQGs and LQGs to complete biennial reports on hazardous waste generation, transportation and disposal. Reports are sent out on or about January 1 and are required to be completed and returned by March 1. CESQGs are not required to file biennial reports, however, the NDDH periodically send a hazardous waste reporting form to CESQGs to gather information for their database.

Hess requires that information on all hazardous waste treatment, storage and disposal be entered into the Hess Corporate waste tracking system.

5.2 Universal Wastes

North Dakota's universal waste regulations are codified at 33-24-05-710 et seq. North Dakota universal waste regulations generally follow the federal universal waste requirements. The purpose of the universal waste rules is to encourage recycling and proper disposal of certain common wastes. In North Dakota, universal wastes include batteries, pesticides, mercury-containing devices, and lamps.

5.2.1 Handler Classifications

Two classes of universal waste handlers have been established under the federal and North Dakota universal waste rules.

> **Small Quantity Handlers of Universal Waste** – accumulates less than 5,000 kg of universal waste at any one time.
>
> **Large Quantity Handler of Universal Waste** – accumulates a total of 5,000 kg at any time.

Hess facilities operate as small quantity handlers of universal waste.

5.2.2 Notification of Universal Waste Activity

Small quantity handlers of universal waste are not required to provide notification of their universal waste activity. Large quantity handlers must notify the state and obtain a State/EPA ID number. In North Dakota, Form SFN 53681 is used to file notification of hazardous and universal waste activity (Appendix F).

5.2.3 Storage/Labeling

Waste management standards are the same for both classes of handlers. The management requirements by waste type are:

<u>Batteries</u>

- Contain leaking or damaged batteries in a structurally sound, compatible, closed container that is capable of containing the damaged battery and associated leakage.
- Batteries that are in good condition with casing intact and closed are not required to be placed in a container, but should be stored in a manner such that they are protected from the elements and spills or releases would be contained.
- The batteries, or the containers holding them, must be clearly marked "Universal Waste – Battery(ies)."

- Label the battery or container with the date the waste battery was designated a waste. In the case of a container of batteries, label the container with the date the first waste battery placed into the container was designated a waste.

Batteries should not be disassembled or electrolytes removed without prior approval from the Hess operating area EHS Manager.

Pesticides

- Store waste pesticides in a container that is structurally sound, prevents leakage and release of contents, and is compatible with the pesticides to be stored.
- Keep container closed at all times except when adding or removing wastes.
- While in storage, the containers must be labeled with the original product label, a label that meets or the appropriate label required under the Department of Transportation regulation 49 CFR Part 172; or another label prescribed or designated by the waste pesticide collection program administered or recognized by a state.
- The container should also be clearly labeled or marked with the words “Universal Waste – Pesticide(s).”
- Label the container with the date that the pesticide was first designated a waste.

Mercury Containing Devices

- Contain leaking or damaged devices in a structurally sound, compatible, closed container that is capable of containing the damaged device and associated leakage.
- Mercury containing devices that are in good condition and not leaking are not required to be placed in a container, but should be stored in a manner such that they are protected from the elements and spills or releases would be contained.
- Each mercury containing device or container in which the mercury containing devices are stored must be labeled or clearly marked "Universal Waste - Mercury Containing Device(s)."
- Label each device with the date the device was first designated a waste. In the case of a container of mercury containing devices, label the container with the date the first device placed into the container was designated a waste.

Mercury containing ampules or other reservoirs will not be removed from the devices without prior approval from the Hess operating area EHS Manager.

Lamps

- Place universal waste lamps in containers or packages that are structurally sound, prevent breakage, and are compatible with the lamps. One option is to use the original packaging from new lamps.

- Broken or damaged lamps and any residues from clean-up of the broken lamps must be placed in container that is closed, structurally sound, and compatible with the waste.
- Containers storing lamps must be kept closed at all times except when adding or removing wastes.
- Each lamp or a container or package in which such lamps are contained must be labeled or clearly marked "Universal Waste - Lamp(s)."
- Label the container with the date the first lamp placed in the container was designated a waste.

5.2.4 Universal Waste Accumulation Time Limit

Universal wastes may be accumulated for up to one year. Longer accumulation timeframes may be allowed solely for purposes of accumulating sufficient quantities necessary to facilitate proper treatment, storage or disposal. The burden of demonstrating the need for additional accumulation timeframes lies with the handler.

The facility must be able to demonstrate the length of time the universal waste has been accumulated on site. Hess meets this requirement by marking the universal wastes and/or universal waste containers with the first date of accumulation as described in Section 4.2.3.

5.2.5 Off-site Shipment/Manifesting

Universal wastes must be shipped to another universal waste handler or a destination facility. Prior to off-site shipping, the handler should secure agreement from the destination facility to receive the shipment. Handlers are required to take back any rejected universal waste shipments. Although not required by the regulations, universal waste shipments should be tracked using a uniform hazardous waste manifest or bill of lading. Sample shipping documents are provided in Appendix I.

5.2.6 Training

Employees who handle or have responsibility for managing universal waste must be provided information on the proper handling, manifesting, and emergency procedures appropriate for the types of universal waste handled at the facility. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.2.7 Recordkeeping/Reporting

Although not required by the regulations, Hess requires that records, including copies of manifests or bills of lading for all universal waste shipments, be maintained for a period of three years and that the waste shipments be entered into the Corporate Hess waste tracking system.

5.3 E&P Wastes

Exploration and production wastes (E&P wastes) are wastes generated during the exploration, development and production of crude oil, natural gas, and geothermal energy and are categorized by EPA as "special waste." A subcategory of E&P wastes have characteristics that could potentially make them hazardous under the hazardous waste definitions. However, E&P wastes that would otherwise meet the definition of hazardous waste are exempt from hazardous waste regulation under 40 CFR 261.4(b)(5). NDDH accepts the federal definition of E&P exempt wastes.

Wastes that fall under this exemption include wastes which are intrinsically derived from primary field operations. For Hess operations, this includes certain wastes generated from the drilling, completion/workover, production, and gas plant operations. According to EPA's guidance document titled, "Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations," the exempt status of the wastes generated depends on how the material was used or generated as waste. The guidance specifies the following rule of thumb for determining whether a waste is exempt or non-exempt. If the answer to either of the following questions is yes, then the waste is likely considered exempt:

- Has the waste come from down-hole, i.e., was it brought to the surface during oil and gas E&P operations?
- Has the waste otherwise been generated by contact with oil and gas production streams during the removal of produced water or other contaminants from the product?

Table 8 and Table 9 provide lists of E&P exempt and non-exempt wastes as specifically listed in the guidance. However, it should be noted that these lists are not comprehensive. Also, that similar wastes generated by activities <u>other than E&P operations are not covered</u> by the exemption, even if specifically listed in the tables.

Note that wastes from clean-up of spills or releases of products or chemicals that have been in the process are considered exempt. Wastes from clean-up of spills or releases of process chemicals that occur during storage or handling <u>prior to the materials actually entering the production process</u> are <u>not exempt</u> and will need to be characterized to determine if they must be managed as hazardous wastes.

Although certain E&P wastes, that may otherwise be classified as hazardous, are exempt from the hazardous waste management requirements, <u>all</u> oil and gas exploration and production derived wastes are still subject to regulation as a "special waste" under the North Dakota Solid Waste Regulations and are regulated by the North Dakota Industrial Commission (NDIC), Oil and Gas Division (OGD) rules for oil and gas exploration and production and underground injection control rules. The North Dakota Solid Waste Rules are administered by the NDDH and can be found at NDAC Chapter 33-20-01 through 33-20-19. The NDIC/OGD rules for managing E&P wastes can be found at NDAC Chapter 43-02-03 and 43-02-05. The specific sections of the NDIC/OGD rules that are specifically applicable to waste management and disposal are:

- GENERAL RULES AND REGULATIONS - CHAPTER 43-02-03
    - 43-02-03-19. SITE CONSTRUCTION.

- 43-02-03-19.1. FENCING, SCREENING, AND NETTING OF DRILLING AND RESERVE PITS.
- 43-02-03-19.2 DISPOSAL OF WASTE MATERIAL.
- 43-02-03-19.3. EARTHEN PITS AND OPEN RECEPTACLES.
- 43-02-03-19.4. DRILLING PITS.
- 43-02-03-19.5. RESERVE PIT FOR DRILLING MUD AND DRILL CUTTINGS FROM SHALLOW WELLS.

o 43-02-03-53. SALTWATER HANDLING FACILITIES.

o 43-02-05 UNDERGROUND INJECTION CONTROL

5.3.1 On-site Storage and Processing Considerations

The NDIC/OGD conservation regulations require that all waste associated with exploration or production of oil and gas be properly disposed of in an authorized facility in accordance with applicable local, state, and federal laws and regulations. E&P wastes may be managed on site in reserve pits, tanks, or containers and/or may be disposed downhole or in an injection disposal wells. This section discusses the requirements to be considered for each management option.

<u>Pit Fencing Screening, Screening and Netting Requirements (43-02-03-19.1.)</u>

Open pits and ponds that contain salt water must be fenced. Open pits and ponds containing oil must be fenced, screened and netted. This requirement does not apply to a reserve pit that is closed within 90 days after completion of the operation.

<u>Earthen Pits and Open Receptacles (</u>43-02-03-19.3.)

No saltwater, drilling mud, crude oil, waste oil, or other waste shall be stored in earthen (unlined) pits or open receptacles except in an emergency with specific approval from the OGD. An earthen pit or open receptacle may be temporarily used to retain oil, water, cement, solids, or fluids generated in well completion, servicing or plugging operations if:

- The pit is sufficiently impermeable to provide adequate temporary containment of the oil, water, or fluids.
- The contents of the pit or receptacle are removed within seventy-two hours after operations have ceased and are disposed at an authorized facility.
- Within 30 days of after operations have ceased, the earthen pit is reclaimed and the open receptacle is removed.

The NDIC/OGD may permit earthen pits or open receptacles used solely for the purpose of flaring casinghead gas. A pit or receptacle used for this purpose must be:

- Sufficiently impermeable to provide adequate temporary containment of fluids;
- Approval contingent upon locating the pit not less than one hundred fifty feet from the vicinity of wells and tanks;
- Kept free of any saltwater, crude oil, waste oil, or other waste; and.

- Saltwater, drilling mud, crude oil, waste oil, or other waste must be removed from the pit or receptacle within twenty-four hours after being discovered and must be disposed of at an authorized facility.

Drilling Pits (43-02-03-19.4) and Reserve Pits (43-02-03-19.5)

Drill cuttings and solids generated during well drilling and completion operations may be buried in a pit if the pit is constructed used and reclaimed in a manner to prevent pollution of land surface and fresh waters. NDIC/OGD may prohibit construction of a cuttings pit or may require more stringent construction or reclamation requirements as part of the permitting process. Reserve and circulation of mud system through earthen pits are prohibited unless a waiver is granted by NDIC/OGD.

Requirements specific requirements to drill cuttings disposal pits include:

- NDIC requires that all drill cuttings pits be inspected by NDIC/OGD authorized representatives prior to lining or use.
- NDIC/OGD requires that drill cuttings and solids must be stabilized in a manner approved by the director prior to placement in a cuttings pit.
- Any accumulated liquid in the drill cuttings pit shall be promptly removed. The pit shall be diked in a manner to prevent surface water from running into the pit.

With specific authorization from NDIC/OGD, a small lined pit can be used for the temporary containment of incidental fluids such as trench water and rig wash, if emptied and covered prior to the rig leaving the site.

With NDIC approval, reserve pits or containers may be used to contain solids and fluids used and generated during well drilling and completion operations for wells drilled to a strata or formation, including lignite or coal strata or seam, located above the depth of five thousand feet [1524 meters] below the surface, or located more than five thousand feet [1524 meters] below the surface but above the top of the Rierdon formation providing the pit can be constructed, used and reclaimed in a manner that will prevent pollution of the land surface and freshwaters.

With special notice and hearing, the NDIC/OGD can approve reserve pits or containers for:

- wells drilled within a specified field and pool more than five thousand feet [1524 meters] below the surface and below the top of the Rierdon formation provided the proposed well or wells utilize a low sodium content water-based mud system, or
- wells drilled and completed, outside an established field which has defined the pool to include the Bakken or Three Forks formation, when separate reserve pits will be utilized to segregate each mud system and associated drill cuttings and any oil skim accumulated on any reserve pit utilized for a water-based mud system will be removed immediately after completion of drilling operations so as not to cause any significant delay in the reclamation of the reserve pit.

Specific requirement applicable to both Drill Cuttings Pits and Reserve Pits include:

- Pits must be constructed in accordance with the approved drilling permit requirements.
- Pits must be lined.

- NDIC enforces a strict prohibition against using pits for disposal, dumping, or storage of fluids, wastes, and debris other than drill cuttings, solids and fluids (reserve pits only) recovered while drilling and completing the well.
- Pits cannot be located in, or hazardously near, bodies of water. Also, pits cannot block natural drainages.
- Pits cannot be constructed in fill dirt unless approved by the director.
- In some cases, the NDIC/OGD may require that the pit be fenced.
- Pits must be reclaimed within one year of completion of the well.
- All pit water and oil on the pit must be removed prior to reclamation. Drilling waste should be encapsulated in the pit and covered with at least four feet of backfill and topsoil. The reclaimed pit should be surface sloped, when practicable, to promote surface drainage away from the reclaimed pit area.
- Prior to reclaiming the pit, Hess or Hess' agent shall file a sundry notice (Form 4) with the NDIC/OGD and obtain approval of a pit reclamation plan.

Tanks and Containers

Tanks and containers are typically used for the storage of produced water (salt water) and brines, fractionation liquids, various used drilling, production and workover fluids, and used oil and other equipment maintenance fluids. Basic sediment and water may accumulate in oil tanks.

The NDIC/OGD regulations contain specific requirements for tank storage of salt water and brines (43-02-03-53.) including:

- Tanks should be in good condition and devoid of leaks.
- Tanks should be constructed of materials resistant to the effects of produced saltwater liquids, brines, or chemicals that may be contained therein. The tank construction materials requirement may be waived by the NDIC/OGD for tanks presently in service and in good condition.
- Dikes must be erected and maintained around saltwater tanks at any saltwater handling facility built or rebuilt on or after July 1, 2000. Dikes must be erected around saltwater tanks at any new facility within thirty days after the well has been completed. Dikes must be erected and maintained around saltwater tanks at saltwater handling facilities built prior to July 1, 2000, when deemed necessary by the NDIC/OGD.
- The dikes as well as the base material under the dikes and within the diked area must be constructed of sufficiently impermeable material to provide emergency containment.
- Dikes must be of sufficient dimension to contain the total capacity of the largest tank plus one day's fluid production.
- Any releases of saltwater liquids or brines must be properly removed and may not be allowed to remain standing within or outside of any diked areas.
- Unused tanks and injection equipment must be removed from the site or placed into service, within a reasonable time period, not to exceed one year.

It is recommended that all waste storage tanks meet similar requirements to those specified for the salt water and brines except that secondary containment capacities may be more appropriately established as sufficient capacity to contain 10% of the total volume of liquid waste stored in the area or the volume of the largest container, whichever is larger.

Alternatively, secondary containment can be accomplished through the use of a double walled tank. Tanks storing oily wastes may also be subject to design and operating requirements under the Spill Prevention Control and Countermeasures (SPCC) Plan as applicable to the facility.

Containers

There are no specific regulatory requirements for the management of E&P wastes while stored on site. However, the following storage requirements are recommended as best management practices:

- Maintain containers so that they are in good condition (no severe rusting, leaks, apparent structural defects or deterioration), compatible with the contents; closed (except when adding or removing wastes); and properly labeled.
- Store all waste containers away from vehicular or process equipment to reduce potential for ruptures or leaks.
- Store containers of liquid wastes within secondary containment to prevent releases to the environment.
- Containers should be elevated or otherwise protected to prevent contact with liquids that may accumulate within a secondary containment system.

The secondary containment system should be:

- Designed with sufficient capacity to contain 10% of the total volume of liquid waste stored in the area or the volume of the largest container, whichever is larger.
- Free of gaps and cracks and sufficiently impervious to contain leaks, spills, and accumulated precipitation.
- Designed to prevent precipitation run-on.
- Sloped or designed and operated to remove leaks, spills, accumulated liquids.

Accumulated precipitation should be removed in a timely manner to prevent overflow.

Injection Wells (Chapter 43-02-05)

Underground injection wells for the disposal of E&P waste must be permitted through the NDIC/OGD. Injection wells may be used to dispose oil and gas fluids that are brought to the surface in connection with natural gas storage operations or conventional oil and gas production operations. Oil and gas liquid wastes may be commingled with wastewaters from gas plants, except that gas plant liquid wastes that do not qualify for the E&P waste exemption and are classified as hazardous waste may not be disposed in an injection well permitted under the authority of the NDIC/OGD.

All existing injection wells must demonstrate continual mechanical integrity and be tested at least once every five years using:

- Pressure test with liquid or gas,
- Monitoring of positive annulus pressure following a valid pressure test, or

- Radioactive tracer survey.

5.3.2 Labeling/Inspection

All tanks should be clearly labeled to indicate the tank contents. Each container should be clearly labeled as “Hazardous Waste” or “Non-hazardous Waste” along with an identification of the container contents in accordance with the WMIS for the waste being managed.

For any tanks or containers specifically subject to SPCC Plan requirements, conduct periodic inspections in accordance with the facility plan. There are no specific inspection requirements for non-SPCC regulated tanks and containers. However, it is recommended that tanks and containers be inspected on a periodic basis for condition, evidence of spills or leaks, and condition of secondary containment systems.

5.3.3 Off-site Shipment/Manifesting

E&P wastes must be shipped to a landfill or injection well facility approved to accept E&P wastes. E&P wastes shipments should be tracked using a non-hazardous waste manifest or bill of lading. Example shipping documents are provided in Appendix I.

5.3.4 Training

Although no specific training requirements are specified in the regulations, Hess employees who handle or have responsibility for managing E&P waste must be provided information on the proper handling, manifesting, and emergency procedures appropriate for the types of waste handled. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.3.5 Recordkeeping/Reporting

Hess requires that records of all waste shipments be maintained for a period of three years and that the waste shipments information be entered into the Corporate Hess waste tracking system.

Operators must report monthly produced water production for each well on Form 5. The reports must be filed on or before the first day of the second month following the month in which the production occurred.

Reporting specifically required by the NDIC/OGD regulations for injection wells includes:

- Monthly reporting of the volume and nature, i.e., produced water, makeup water, etc., of the fluid injected, the injection pressure, and such other information as the commission may require. Reports will be filed by the 5th of each month and will be on the forms furnished by the NDIC/OGD.

- Reports of any noncompliance with regulations or permit conditions must be made verbally to the NDIC/OGD within twenty-four hours followed by a written explanation within five days.
- Notification is required after the discontinuance of injection operations within ten days of the date of such discontinuance. The notification must include the reason injection operations were discontinued.
- Notify the NDIC/OGD within 30 days of any completion or recompletion of an injection well or the completion of any remedial work or attempted remedial work such as plugging back, deepening, acidizing, shooting, formation fracturing, squeezing operations, setting liner, perforating, reperforating, tubing repairs, packer repairs, casing repairs, or other similar operations. The report should be made on a form 4 sundry notice. The report shall present a detailed account of all work done including the reason for the work, the date of such work, the shots per foot and size and depth of perforations, the quantity of sand, crude, chemical, or other materials employed in the operation, the size and type of tubing, the type and location of packer, the result of the packer pressure test, and any other pertinent information or operations which affect the status of the well.

The operator shall retain all reports and supporting records for a minimum of six years.

5.4 NORM/TENORM/Radioactive Wastes

NORM is naturally occurring radioactive material. TENORM (technologically enhanced naturally occurring radioactive materials) is naturally occurring radionuclides whose concentrations are increased by or as a result of past or present human practices. NORM may be present in wastes generated during drilling, production and processing oil and natural gas. NORM can accumulate in piping associated with the gas plant and production operations over extended periods of time or can accumulate as a residue during water treatment. Once NORM is concentrated from its natural environment, it becomes TENORM.

By definition, NORM/TENORM is not subject to regulatory control under the Atomic Energy Act of 1954, or the Low Level Radioactive Waste Policy Act. There are currently no federal regulations covering disposal of NORM/TENORM. Because of these regulatory exclusions, NORM/TENORM is subject primarily only to individual state radiation control regulations.

The State of North Dakota, as an Agreement State, does regulate all aspects of radioactive material and NORM/TENORM is under the regulatory control of the Radiation Control Program of the North Dakota Department of Health - Division of Air Quality. Currently there are no regulations specific to the control of NORM/TENORM. NORM/TENORM is covered by the same regulations that apply to other radioactive material in the state.

Handling and Management of NORM/TENORM is also regulated under the Occupational Health and Safety Administration (OSHA). Transportation of NORM/TENORM containing wastes is subject to regulation by the U.S. Department of Transportation (DOT).

Material or equipment found to contain less than 5 picocuries of total radium per gram (pCi/gm) of material through Department-approved analytical method and procedures is not considered

NORM/TENORM, by definition, and may be disposed of in an approved industrial or special waste facility, or released for unrestricted use. Material or equipment found to be contaminated to levels at or above 5 pCi/gm are considered radioactive and must be handled, stored, transported and disposed of in accordance with the North Dakota Radiological Health Rules. According to the NDDH Guideline 42 – Oil Exploration and Production Associated Waste Activities, North Dakota requires the following wastes to be segregated from other wastes, be stored in secure containers, and be tested for NORM (specifically Ra-226 and Ra-228 concentrations and Lead-21) to determine the NORM content and associated disposal requirements:

- Accumulated materials: solids, scale, sediment, production sand, emulsion, sludges, and other tank bottoms from storage facilities, separators, heater-treaters, vessels, tanks, and production impoundments that hold product or exempt waste;
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from tubular goods, piping, casing, filters, filter bags, clean-out traps and other equipment;
- Pigging wastes from gathering lines;
- Filter socks and proppant from oilfield exploration, production and deep well injection activities; and
- Any other waste material suspected to contain TENORM or likely to have accumulated NORM or TENORM in concentrations equal to or greater than 5 picocuries/gram.

If the laboratory-measured Ra-226 plus Ra-228 or Lead 210 activities are equal to or greater than 5 pCi/gm, the waste will need to be shipped out of state to a facility permitted to receive NORM wastes as there is currently no facility in North Dakota permitted to accept NORM wastes. Note that North Dakota does not allow an adjustment for background or blending of material.

Wastes generated during tracer testing that contain radioactive components are subject to regulation under North Dakota's radiation control regulations. Hess uses subcontractors (including ProTechnics) to conduct tracer testing and manage the wastes until the tracer compounds decay below regulated levels. The subcontractors are responsible for obtaining the required licenses for the subcontracted services and for managing the wastes in accordance with regulatory requirements. The ProTechnics NDDH Authorization letter and Guidelines for Radioactive Tracers During Well Stimulations for North Dakota Operations is provided as Appendix J. This guideline provides instructions for management of tracer test wastes.

This section discusses the North Dakota requirements as the specifically relate to waste management. This section does not address all requirements that may be applicable to the facility under a radioactive materials license.

5.4.1 Licensing Requirements

The NDDH, Radiation Control Division does not consider the routine collection, accumulation, packaging, and storing of TENORM wastes prior to off-site shipment for disposal subject to radioactive material licensing requirements. Review of the licensing categories listed in the Appendices to NDAC 33-10-11, does not include a category for these activities as currently conducted by Hess for management of their own wastes. TENORM activities that may require

licensing include removing scale from piping or tanks and/or dewatering or processing of TENORM wastes prior to packaging for disposal.

5.4.2 Storage/Labeling/Inspection

In accordance with the Hess Exploration & Production EH&S Procedure #2.13 – Naturally Occurring Radioactive Materials (NORM), a NORM coordinator will be designated for each Plant and Production Field. Surveys have been conducted at each production facility and equipment to determine where NORM may be an issue.

Any NORM-contaminated scale, sludge, soil or other material generated from cleaning must be collected and placed in suitable containers such as 55-gallon drums. Plastic sheets should be used to collect NORM to prevent ground contamination.

When NORM-contaminated equipment is transferred to a licensee for repair, maintenance or cleaning, any NORM generated by the contractor shall be placed in suitable containers, labeled and returned to Hess for handling unless the contractor is specifically contracted and licensed to handle, store, and dispose of Hess' NORM.

NORM wastes will be stored at established segregated storage areas. The following guidelines should be followed for storage at the segregated areas:

- All materials stored should be placed on a concrete slab or other impervious material
- Contaminated equipment, tubulars, or drummed solids will be labeled as follows:
    - Above 50 µR/hr, but less than 5,000 µR/hr, label "CAUTION – NORM MATERIAL."
    - Over 5,000 µR/hr, label "CAUTION – RADIOACTIVE MATERIAL" and OSHA radiation symbol.
- NORM solids will be stored in sealed drums.
- The storage area should be locked and fenced or otherwise isolated to prevent unauthorized entry.
- The storage area should have warning signs posted at entrances as follows:
    - For storage of material measuring above 50 µR/hr, but less than 5,000 µR/hr, required sign is "CAUTION – NORM RESTRICTED AREA."
    - For storage of material measuring 5,000 µR/hr or higher, required sign is "CAUTION – RADIATION AREA" and OSHA radiation symbol.
- The storage area should be segregated according to radiation activity, with the "hotter" pieces of equipment in the center and lower levels at the perimeter. The perimeter should not measure above 50 µR/hr at the fence line.
- NORM storage areas should be surveyed every 6 months or when significant amounts of material are added to the area.
- In addition to the survey, NORM storage areas should be visually inspected every 6 months to ensure there are no leaking containers.

An example of the NORM inspection/survey form for completing inspections at NORM storage areas is provided as Appendix K.

5.4.3 Off-site Shipment/Manifesting

All NORM wastes should be shipped using a non-hazardous waste manifest. An example NORM manifest is provided in Appendix I. Transporters must have a valid radioactive materials license.

5.4.4 Training

Employees who work with or around NORM will be trained regarding the presence and potential hazards of NORM and protective measures to be taken. Any Hess employee signing manifests must be trained in DOT shipping requirements.

Contractors or other third parties must receive written notification prior to receiving, handling, or working with NORM contaminated equipment or materials.

5.4.5 Recordkeeping/Reporting

The following records will be retained on-site:

- Copy of Records of waste analysis or waste characterization basis (minimum of three years from the date waste last shipped)
- Signed manifests or bills of lading and DOT shipping papers (minimum of three years following waste shipment date);
- Inspection/Radiation survey records (minimum of three year).
- Other records required by the facility's Radiation Protection Program.

There are no reporting requirements specifically related to waste management

5.5 PCB Wastes

North Dakota has no state specific PCB regulations. Therefore, management of PCB wastes in North Dakota follows the federal TSCA regulations at 40 CFR 761. In North Dakota, PCB's are not considered to be a hazardous waste.

PCBs are regulated at concentrations greater than or equal to 50 ppm in liquid or solid. When insufficient material is available for analysis, a non-porous surface have a surface concentration of greater than 10 µg/100 cm^2 as measured by a standard wipe test as defined in 40 CFR 761.123 is regulated as PCB waste.

A PCB survey was conducted at the Tioga Gas Plant. Based on the survey, there are no known PCBs or PCB-containing equipment except for possible PCB light ballasts (ballasts containing

greater than 50 ppm PCBs). The status of PCBs or PCB containing equipment associated with the other North Dakota Hess O&G Operations is unknown. The most likely PCB wastes to be generated by Hess are PCB light ballasts. Light ballasts that do not contain PCBs are labeled "No PCBs." Other potential wastes include PCB contaminated electrical equipment (e.g. PCB transformers, PCB capacitors) that may be taken out of service and destined for disposal; PCB dielectric fluids; or PCB spill cleanup materials.

Due to the small quantity of PCB contained in light ballasts, the requirement for management and disposal are less stringent than those applicable to other PCB items. Light ballasts are regulated as PCB small capacitors.

5.5.1 Storage/Accumulation//Marking/Inspection

Storage/Accumulation

Any PCB waste shall be disposed of within one year from the date it was determined to be PCB waste and the decision was made to dispose of it. This date is the date of removal from service for disposal and the point at which the one year time frame for disposal begins.

Leaking PCB articles (including PCB light ballasts) or PCB equipment and contaminated rags or other materials generated during clean-up of spilled PCBs must be containerized. Sorbents such as sawdust, kitty litter, or vermiculite should be used to absorb liquids prior to containerizing.

The following PCB items can be stored for up to 30-days from the date of removal from service in a temporary storage area that does not meet the minimum PCB storage area design requirements:

- Non-leaking PCB articles and equipment;
- Leaking PCB articles and equipment that are placed in a non-leaking PCB-container with sorbents;
- PCB containers of non-liquid PCB contaminated soil, rags, and debris; and
- PCB containers containing liquid PCBs provided that a Spill, Control and Countermeasures Plan has been developed for the temporary storage facility.

While in temporary storage, the PCB items or containers must be marked with the date that the items were removed from service.

For PCB items stored for more than 30 days, the storage facility must meet the following criteria:

- Adequate roof and walls to prevent rain water from reaching stored PCBs.
- Adequate floor with continuous curbing that is a minimum of six inches in height.
- Floor and the curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB Article or PCB Container or 25% of the total internal volume of all PCB Articles or PCB Containers stored in the containment, whichever is greater.

- No drain valves, floor drains, expansion joints, sewer lines, or other openings that would allow liquids to flow from the curbed area.
- Floors and curbing constructed of continuous smooth and impervious materials to prevent or minimize PCB penetration; and
- Located above the 100-year flood water level.

Marking/Labeling

While in storage, PCB Items (includes PCB articles, PCB article containers, PCB containers, and PCB equipment) must be appropriately marked. An example of the required marking is provided in Appendix G.

- The marking letters and striping will be on a white or yellow background.
- The marking/label and shall be sufficiently durable to equal or exceed the life (including storage for disposal) of the PCB Article, PCB Equipment, or PCB Container.
- The size of the mark shall be at least 6 inches on each side. If the PCB Article or PCB Equipment is too small to accommodate this size, the mark may be reduced in size proportionately down to a minimum of 2 inches on each side.

No labeling is required for PCB light ballasts. However, it multiple ballasts are containerized, labeling is recommended.

Inspection

All PCB Items in storage shall be checked for leaks at least once every 30 days. Any leaking PCB Items and their contents shall be transferred immediately to properly marked non-leaking containers. Spilled or leaked materials must be immediately cleaned up and the materials and residues containing PCBs must be containerized and properly managed for disposal. Inspections will be documented on the waste storage inspection form (Appendix H) or similar form.

5.5.2 Off-site Shipment/Manifesting

Storage of liquid or non-liquid PCB waste shall be in containers that meet the requirements set forth in the DOT Hazardous Materials Regulations (HMR) at 49 CFR parts 171 through 180. PCB waste not subject to the HMR (i.e., PCB wastes at concentrations of <20 ppm or <1 pound of PCBs regardless of concentration) must be packaged in accordance with Packaging Group III, unless other hazards associated with the PCB waste cause it to require packaging in accordance with Packaging Groups I or II. For purposes of describing PCB waste not subject to DOT's HMR on a manifest, one may use the term "Non-DOT Regulated PCBs."

Although PCB wastes are not considered hazardous, 40 CFR 761.207 requires that all PCB wastes be shipped using a uniform hazardous waste manifest Form 8700-22 (Appendix I).

PCB disposal requirements by waste type are as follows:

- PCB Small Capacitors - municipal solid waste landfill
- PCB liquids –incinerator approved for PCB destruction
- PCB Articles – incinerator approved for PCB destruction or chemical waste landfill (PCB approved) provided that free flowing liquid has been removed and the article has been cleaned according to the requirements of 40 CFR 761. 60(b)(1)(i)(B).
- PCB large capacitors (> 50 ppm and <500 ppm) – disposal facility approved for PCB disposal
- PCB large capacitors (>500 ppm) – incinerator approved for PCB destruction
- PCB contaminated Electrical Equipment (except capacitors) – municipal or non-municipal solid waste disposal facility or a chemical waste landfill approved for PCB disposal.

5.5.3 Training

There is no regulatory required PCB training requirement. However, Hess will provide PCB awareness training along with hazardous and universal waste training. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.5.4 Recordkeeping/Reporting

The following records will be retained by the facility for at least three years:

- Signed manifests;
- Certificates of Disposal
- Records of inspections, maintenance, cleanup and disposal for storage areas

In addition, if the facility stores at any one time more than 45 kilograms (99.4 lbs) of PCBs contained in PCB containers, one or more PCB transformers, or 50 or more PCB large High or Low Voltage Capacitors, the facility will develop and maintain a written annual document log of the disposition of PCBs and PCB Items. The annual document log will include the following information:

- Name, address and EPA ID number of the facility and the calendar year covered by the log;
- Unique manifest number for every generated and the following manifest info:
- Bulk waste (tanker or truck) – weight (kg), date removed from service, date of transport, and disposal date (if known).
- PCB Article (transformer or capacitor) – serial number or unique identifier, weight of PCB waste in article, date removed from service, date of transport, and disposal date (if known).

- PCB Container or PCB Article Container – unique identifying number, description of contents and weight, date material first placed in PCB container (date each PCB Article was placed in PCB Article Container), date of transport, and disposal date (if known).
- Totals for all PCB Articles (items and weights), PCB Article containers (number and weight), CB Containers (number and weight) and total weight of bulk PCB waste placed in storage for disposal or disposed during the calendar year.
- Total number of PCB Transformers, Large High or Low Voltage PCB Capacitors, PCBs and PCB Items in PCB containers remaining in service at the end of the calendar year. Include total weight for each category.
- Record of each telephone call or other method of verification made to disposer to confirm receipt of PCB waste transported by an independent transporter.

5.6 Asbestos

The Asbestos Control Program in the Division of Air Quality enforces the Emission Standards for Asbestos under the North Dakota Air Pollution Control Rules at Chapter 33-15-13 of the North Dakota Administrative Code. These rules contain specific requirements for the management and disposal of waste asbestos. The Asbestos Control Program also licenses contractors and certifies workers for asbestos abatement activities and project monitoring. Hess utilizes qualified contractors for large-scale encapsulation and/or removal of regulated asbestos-containing material.

Asbestos material that is regulated is referred to as regulated asbestos-containing material (RACM). RACM includes the following types of asbestos:

- Friable asbestos material;
- Category I nonfriable asbestos-containing material that has become friable;
- Category I nonfriable asbestos-containing material that will be or has been subjected to sanding, grinding, cutting, or abrading; and
- Category II nonfriable asbestos-containing material that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces acting on or expected to act on the material in the course of demolition or renovation operations regulated by this section.

The requirements for asbestos waste management do not apply to category I nonfriable asbestos-containing material that is not or will not become regulated asbestos-containing material.

Hess contracts asbestos demolition and removal projects out to certified asbestos contractors. However, this section discusses those portions of the rule applicable to management and disposal of asbestos wastes so that Hess is familiar with the requirements and can monitor their contractors. Additional requirements may be applicable to asbestos removal and/or encapsulation operations that may occur at the Hess facilities.

5.6.1 Required Notifications

It is the responsibility of the facility to conduct a survey of asbestos-containing materials prior to any demolition and/or renovations. Notifications of demolition and renovation are required as follows:

- In a facility being **demolished,** a "Notification of Demolition and Renovation" form must be submitted to the NDDH at least ten (10) days prior to beginning any demolition activity. This is required whether or not the facility being demolished has ACM in it.
- In a facility being **renovated,** where more than 160 square feet of asbestos-containing surfacing material or more than 260 linear feet of asbestos-containing thermal system insulation on pipes will be disturbed, a "Notification of Intent" must be submitted to the NDDH at least ten (10) days prior to beginning the removal project.

A copy of the notification form SFN 17987 is provided in Appendix L.

5.6.2 Storage/Accumulation/Labeling/Inspection

<u>Storage/Accumulation</u>

Handling of regulated asbestos containing material must be performed by certified asbestos personnel.

Asbestos-containing material should be containerized or otherwise encased as soon as practical after removal. Friable asbestos waste must be wetted prior to shipping. After wetting, the asbestos-containing material should be placed in leaktight containers while still wet. If wastes will not fit into a container, the materials should be encased in leaktight wrapping.

The waste asbestos-containing material should be transferred as soon as practical to the designated disposal site. The maximum length of time allowed for temporary storage of an asbestos-containing waste material may not exceed one hundred eighty days. All facilities used for the temporary storage of asbestos-containing waste material must be controlled to restrict access.

<u>Labeling</u>

Containers and wrapped material should be labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

Asbestos-containing waste material that will be transported off the facility site (containers and wrapped material) must also be labeled with name of the waste generator and the location at which the waste was generated.

Entrances to temporary storage facilities must be posted with the warning sign as follows:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

Inspections

The temporary storage facility must be inspected at weekly to ensure that good structural integrity of the storage facility is maintained and that the facility remains secure.

5.6.3 Off-site Shipment/Manifesting

Asbestos-containing wastes must be disposed at either:

- An state or federal approved asbestos waste disposal facility, or
- A federally approved facility that converts regulated asbestos-containing material and asbestos-containing waste material into non-asbestos (asbestos free) material.

Asbestos wastes should be shipped using NDDH Asbestos Waste Manifest Form SFN 58174 12/05. A copy of the form is provided in Appendix I. A copy of the waste shipment record (Appendix I) must be provided to the disposal site owner or operator at the time that the waste is delivered to the disposal site. The disposal site is required to return a signed copy of the manifest to the generator.

5.6.4 Training

Asbestos certifications required for the asbestos abatement or removal work are administered by the NDDH. While Hess personnel will not be conducting asbestos abatement, personnel responsible for the oversite and management of asbestos abatement work and resulting wastes will be trained in the requirements applicable to management of asbestos wastes including accumulation time limits, labeling, inspections, and recordkeeping. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.6.5 Recordkeeping/Reporting

Hess will retain copies of the following:

- Copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least two years; and
- Copies of temporary asbestos storage area inspections.

A copy of the completed waste shipment record which includes the signature of the disposal facility must be submitted to the department no later than ten days after the completed waste shipment record is received from the landfill operator.

If Hess does not receive a copy of the returned manifest within 35 days of the date that the waste was accepted by the initial transporter, Hess should contact the transporter and/or the disposal facility to determine the status of the waste. If the signed returned copy of the manifest is not received within 45 days, Hess must make a written report to the NDDH. The report must include a copy of the original manifest that accompanied the waste shipment and along with a cover letter from Hess explaining their efforts to locate the missing shipment and the results of the efforts.

5.7 Infectious Waste (Medical Waste)

In 1988, Congress enacted the Medical Waste Tracking Act (MWTA). This Act required the Environmental Protection Agency (EPA) to create a two-year regulatory program known as the Medical Waste Demonstration Program which tracked transportation of medical waste from cradle-to-grave. The MWTA and the demonstration program served to focus attention on the medical waste issue and provided a model medical waste regulatory program. Many states and other federal agencies have used this model in developing their own medical waste programs. Based on information collected during the demonstration program, EPA concluded that medical waste presents more of an occupational concern than a generalized environmental concern. OSHA regulates occupational exposure to blood and certain other body fluids under 29 CFR 1910.1030 - Bloodborne Pathogens Rule. The bloodborne pathogens regulations contain specific requirements for management of related wastes. If a facility is subject to the bloodborne pathogens rule, management of wastes should be in accordance with the bloodborne pathogens program developed for the site. In North Dakota, infectious wastes are regulated by the NDDH Division of Waste Management. Applicable regulations are found in the North Dakota's Solid Waste Regulations at NDAC 33-20-12. Specific sections applicable to generators of infectious waste include:

- NDAC 33-20-12-01 – Definitions
- NDAC 33-20-12-02 – Management Standards

The purpose of the infectious waste rules is to encourage the proper disposal of certain infectious wastes. In North Dakota, "regulated infectious wastes" is defined as any waste that is included in one of the following categories:

- cultures and stocks of infectious agents and associated biologicals;
- human pathological waste;
- human blood and blood products;
- sharps (used and unused);
- animal waste; and
- isolation waste.

Medical or infectious wastes that may be generated at Hess facilities potentially include blood saturated medical supplies (e.g. dressings, bandages) and sharps (used or unused) associated with first aid stations or medical clinics operated at Hess facilities. Any material that is caked with dried blood that could potentially dislodge during handling would also be considered infectious waste. Dressings, band-aids and used gloves that are not saturated or dripping with blood can be disposed as solid wastes.

5.7.1 Notification of Infectious Waste Activity

There are no notification requirements for Infectious waste generators.

5.7.2 Storage/Labeling/Management

The special waste handling requirements that apply to infectious waste generators are as follows:

- Regulated infectious waste must be separated at the point of origin from other wastes;
- Infectious waste must be placed in distinctive containers that are leak proof, impervious, puncture resistant and tear resistant;
- Waste must be properly labeled with the red or orange universal biohazard symbol and the word “BIOHAZARD” (see sample label in Appendix G).
- Storage bags and containers must be tied, closed or sealed securely to prevent leakage;
- Blood and blood products can be discarded without incineration or disinfection through municipal sewage disposal systems that meet the requirements of article NDAC 33-16; and
- Wastes must be stored in a manner that maintains the integrity of the packaging and prevents contact with the general population, animals, water, precipitation, and wind. The waste should also be maintained in a non-putrescent state to prevent odors.

Special requirements apply to management of sharps including:

- Must be separated at the point of origin from other regulated infectious waste, disinfected onsite, rendered nonsharp onsite, and then disposed; or
- Placed in rigid and puncture-resistant biohazard containers.

5.7.3 Infectious Waste Accumulation Time Limit

Although North Dakota’s infectious waste regulations do not specify a time limit on storage for infectious waste generators, it is recommended that any infectious waste be sent for off-site treatment or disposal as soon as practical after generation. Also, in accordance with Hess policy, infectious wastes may only be accumulated for up to one year.

5.7.4 Off-site Shipment/Manifesting

Generators must ensure that their infectious wastes are transported by a company with a valid North Dakota Solid Waste Transporter permit. Although the regulation do not require generators to keep records of infectious waste shipments, Hess policy requires that infectious

wastes shipments should be tracked using a non-hazardous waste manifest or bill of lading. Example shipping documents are provided in Appendix I.

5.7.5 Training

Although no specific training requirements are specified in the regulations, Hess employees who handle or have responsibility for managing infectious waste must be provided information on the proper handling, manifesting, and emergency procedures appropriate for the types of waste handled. Any Hess employee signing manifests must be trained in DOT shipping requirements.

5.7.6 Recordkeeping/Reporting

Hess requires that records of all waste shipments be maintained for a period of three years and that the waste shipments entered into the Corporate Hess waste tracking system.

6.0 HESS WASTE MANAGEMENT TRAINING REQUIREMENTS

Hess has identified waste training requirements for personnel involved in the generation, handling, storage, and shipping activities. Training requirements vary by individual roles and responsibilities. A matrix showing the waste management training requirements for Hess personnel is provided as Table 10.

7.0 WASTE CONTRACTORS

All waste contractors will be pre-screened and monitored for suitability and compliance. Following initial pre-screening/review the contractors and facilities should be audited within one year of contract award. Thereafter, waste disposal sites should be audited every 3 years. Corporate EHS&SR maintains a list of contractors who have been pre-screened which can be accessed on the Global EHS SharePoint Site.

8.0 WASTE TRANSPORTERS

Transporters used for transportation of hazardous waste must have an EPA ID# and transporters used to transport NORM must have a radioactive materials license. Additionally, in North Dakota the NDDH requires a solid waste transporter permit for all waste transporters collecting from or delivering to a destination within North Dakota. Solid waste transporter permits are not required for:

- Transport of a facility's own waste to a solid waste management unit or facility;
- Transport of waste entirely on a facilities own property;

- Transport of a recyclable material other than used oil or scrap tires; or
- Pass-through transportation, that is, no pick-up or drop-off within North Dakota.

The requirements for waste transporters can be found at Chapter 33-20-02.1. The NDDH maintains a list of permitted transporters on their website at http://www.ndhealth.gov/wm/Publications/AllTransporters.pdf. All transporters must be approved through the ISNET system.

9.0 MANAGEMENT OF CONTRACTOR GENERATED WASTES

Contractors are responsible for the management of all wastes they generate in the course of providing services to Hess. E&P Exempt waste streams that are generated by contractor operations will be managed under the direction of Hess in accordance with this waste management plan. Non-E&P Exempt waste streams will be the sole responsibility of the Contractor. The Contractor is required to develop and implement a Waste Management Plan at the worksite that addresses, at a minimum, the collection, storage and disposal of non-E&P Exempt wastes in accordance with the Hess Waste Management Plan.

- Contractors shall ensure that all waste material is managed and disposed of in acceptable containers and in accordance with all environmental regulations.
- Contractor personnel must be trained, familiar with and experienced in the Hess Waste Management Plan requirements relating to their roles and responsibilities for completing the work.
- Contractors shall provide to Hess, when requested, documentation of environmental training program(s).
- Contractors shall use products, substances, equipment and materials which are designed for minimal environmental impact.
- Contractor will track and report to Hess the amount of waste generated and disposal details for each job.
- Contractor will immediately notify Hess of all incidents resulting in spills of any size or nature arising out of or during the course of completing the work, or of any situation where there is a risk of pollution or incidents of noncompliance.

10.0 OTHER USEFUL REFERENCES AND TOOLS

10.1 State Guidance Document Links

North Dakota Division of Waste Management Website Link
http://www.ndhealth.gov/WM/

North Dakota Hazardous Waste Compliance Guide
http://www.ndhealth.gov/wm/Publications/NorthDakotaHazardousWasteComplianceGuide.pdf

North Dakota Waste Management Publications/Guidance
http://www.ndhealth.gov/wm/Publications.htm

North Dakota Radiation Control Website Link
http://www.ndhealth.gov/AQ/RAD/

North Dakota PCB Website Link
http://www.ndhealth.gov/WM/PolyChlorinatedBiphenyls.htm

North Dakota Asbestos Control Program Website Link
http://www.ndhealth.gov/AQ/IAQ/ASB/

North Dakota Infectious Waste Website Link
http://www.ndhealth.gov/wm/InfectiousWaste/

Asbestos Notification of Demolition and Renovation
http://www.ndhealth.gov/AQ/IAQ/ASB/SFN%2017987%20Notification%20of%20Demolition.pdf

North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Division Homepage
https://www.dmr.nd.gov/oilgas/

North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Division rulebook
https://www.dmr.nd.gov/oilgas/rules/rulebook.pdf

10.2 Federal Guidance Document Links

EPA Hazardous Waste homepage
http://www.epa.gov/epawaste/hazard/index.htm

EPA PCB Homepage
http://www.epa.gov/epawaste/hazard/tsd/pcbs/index.htm

EPA Uniform Hazardous Waste Manifest and Instructions
http://www.epa.gov/osw/hazard/transportation/manifest/pdf/newform.pdf
http://www.epa.gov/osw/hazard/transportation/manifest/pdf/man-inst.pdf

Appendix C

Construction, Mitigation, and Reclamation Plan

Hawkeye Pipeline System Project

Construction, Mitigation, and Reclamation Plan

July 2015

Table of Contents

1.0 INTRODUCTION 1-1

2.0 GENERAL CONDITIONS 2-1

2.1 Training 2-1
2.2 Environmental Inspection 2-1
2.3 Advance Notice of Access to Property Prior to Construction 2-1
2.4 Other Notifications 2-2
2.5 Damages to Private Property 2-2
2.6 Appearance of Worksite 2-2
2.7 Access 2-2
2.8 Minimum Depth of Cover 2-3
2.9 Non-Hazardous Waste Disposal 2-3
2.10 Hazardous Wastes 2-4
2.11 Noise Control 2-4
2.12 Weed and Pest Control 2-4
2.13 Dust Control 2-5
2.14 Off Road Vehicle Control 2-5
2.15 Fire Prevention and Control 2-6
2.16 Road and Railroad Crossings 2-6
2.17 Adverse Weather 2-7
2.18 Cultural Resources 2-7

3.0 SPILL PREVENTION AND CONTAINMENT 3-1

3.1 Spill Prevention 3-1
3.1.1 Staging Areas 3-1
3.1.2 Construction Right-of-Way 3-2
3.2 Contingency Plans 3-3
3.3 Equipment 3-3
3.4 Emergency Notification 3-4
3.5 Spill Containment and Countermeasures 3-4

4.0 UPLANDS (AGRICULTURAL, FOREST, PASTURE, RANGE AND GRASS LANDS) 4-1

4.1 Interference with Irrigation Systems 4-1
4.2 Clearing 4-1

4.3 Topsoil Removal and Storage 4-1
4.4 Grading 4-2
4.5 Temporary Erosion and Sediment Control 4-3
4.5.1 General 4-3
4.5.2 Sediment Barriers 4-3
4.5.3 Trench Plugs 4-4
4.5.4 Temporary Slope Breakers (Water Bars) 4-4
4.5.5 Drainage Channels or Ditches 4-4
4.5.6 Temporary Mulching 4-5
4.5.7 Tackifier 4-5
4.6 Stringing 4-5
4.7 Trenching 4-5
4.7.1 Trench Dewatering/Well Points 4-6
4.8 Welding, Field Joint Coating, and Lowering In 4-6
4.9 Padding and Backfilling 4-6
4.10 Cleanup 4-7
4.11 Reclamation and Revegetation 4-8
4.11.1 Relieving Compaction 4-8
4.11.2 Rock Removal 4-9
4.11.3 Soil Additives 4-9
4.11.4 Seeding 4-9
4.11.5 Permanent Erosion and Sediment Control 4-10
4.11.6 Fences 4-12
4.11.7 Farm Terraces 4-12
4.11.8 Right-of-Way and Pipeline Markers 4-13
4.12 Pasture and Range Lands 4-13
4.13 Forested Lands 4-14
4.14 Residential and Commercial/Industrial Areas 4-15
4.14.1 Residential and Commercial Areas 4-15
4.14.2 Landowner Complaint Resolution Procedure 4-16
4.15 Operations and Maintenance 4-16

5.0 DRAIN TILE SYSTEMS 5-1
5.1 General 5-1
5.2 Identification and Classification of Drain Tile Systems 5-1
5.2.1 Publicly Owned Drain Tiles 5-1
5.2.2 Privately Owned Drain Tiles 5-1
5.3 Mitigation of Damage to Drain Tile Systems 5-1
5.3.1 Non-interference with Drain Tile 5-1
5.3.2 Non-disturbance of Drain Tile Mains 5-2
5.3.3 Relocation or Replacement of Existing Drain Tiles Prior to Construction 5-2
5.3.4 Future Drain Tiles/Systems 5-2

5.3.5 Other Mitigation Measures 5-2

5.4 Responsibility for Repair of Drain Tile Systems 5-2
5.4.1 Local Drain Tile Contractor Repair 5-3
5.4.2 Pipeline Contractor Repair 5-3
5.4.3 Landowner/Tenant Repair 5-3

5.5 Drain Tile Repairs 5-3
5.5.1 Temporary Repairs During Construction 5-3
5.5.2 Permanent Repairs 5-3

5.6 Inspection/Acceptance of Drain Tile Repairs 5-4

6.0 WETLAND CROSSINGS 6-1

6.1 General 6-1

6.2 Easement and Workspace 6-1

6.3 Vehicle Access and Equipment Crossing 6-1

6.4 Temporary Erosion and Sediment Control 6-1

6.5 Wetland Crossing Procedures 6-2

6.6 Restoration and Reclamation 6-2

7.0 WATERBODIES AND RIPARIAN AREAS 7-1

7.1 General 7-1

7.2 Easement and Work Space 7-1

7.3 Vehicle Access and Equipment Crossings 7-2

7.4 Waterbody Crossing Methods 7-2
7.4.1 Non-Horizontal Directional Drill Crossings/Horizontal Bore Crossings 7-2

7.5 Clearing 7-3

7.6 Grading 7-3

7.7 Temporary Erosion and Sediment Control 7-3

8.0 HYDROSTATIC TESTING 8-1

8.1 Testing Equipment Location 8-1

8.2 Test Water Source and Discharge Locations 8-1

8.3 Filling the Pipeline 8-1

8.4 Dewatering the Pipeline 8-1
8.4.1 Splash Pup 8-2
8.4.2 Splash Plate 8-2
8.4.3 Plastic Liner 8-2
8.4.4 Straw Bale Dewatering Structure 8-2

1.0 INTRODUCTION

The construction, mitigation, and reclamation requirements described in this Plan apply to work associated with construction, operation, and maintenance of the Hess Corporation (Hess) proposed Hawkeye Pipeline System (Project). Hess will implement the construction, mitigation, and reclamation actions contained in this Plan to the extent that they do not conflict with the requirements of any applicable federal, state, or local rules and regulations, or other permits or approvals that are applicable to the Project. Additionally, Hess may deviate from specific requirements of this Plan on specific private lands as agreed to by landowners or as required to suit actual site conditions as determined and directed by Hess. All work must be in compliance with federal, state, and local permits. The Project will be designed, constructed, operated, and maintained in a manner that meets or exceeds applicable industry standards and regulatory requirements.

2.0 GENERAL CONDITIONS

2.1 Training

Experienced, well-trained personnel are essential for the successful implementation of this Plan. Hess and its Contractors will undergo prevention and response, as well as safety training. The program shall be designed to improve awareness of safety requirements, pollution control laws and procedures, and proper operation and maintenance of equipment.

The construction contractor (Contractor), and all of his subcontractors shall ensure that persons engaged in Project construction are informed of the construction requirements and that they attend and receive training regarding these requirements as well as all laws, rules and regulations applicable to the work. Prior to construction, all Project personnel will be trained on environmental permit requirements and environmental specifications, including fuel handling and storage, cultural resource protection methods, stream and wetland crossing requirements, and sensitive species protection measures.

Contractor personnel shall attend a training session before the beginning of construction and during construction as environmental issues and incidents warrant. Additional training sessions shall be held for newly assigned personnel prior to commencing work on the Project.

All Contractor personnel shall attend the training session prior to entering the construction right-of-way (ROW). All Contractor personnel shall sign an acknowledgement of having attended the appropriate level of training. In order to ensure successful compliance, Contractor personnel shall attend repeat or supplemental training if compliance is not satisfactory or as new issues arise.

All visitors and any other personnel without specific work assignments shall be required to attend a safety and environmental awareness orientation prior to being granted access to any construction sites.

2.2 Environmental Inspection

Hess will use Environmental Inspectors on each construction spread. The Environmental Inspectors will review the Project activities daily for compliance with state, federal, and local regulatory requirements. The Environmental Inspectors will have the authority to stop specific tasks as approved by the Chief Inspector. They also can order corrective action in the event that construction activities violate the provisions of this Plan, landowner requirements, or any applicable permit requirements.

2.3 Advance Notice of Access to Property Prior to Construction

Prior to initially accessing landowners' property, Hess will provide the landowner or tenant with a minimum of 24 hours prior notice unless otherwise negotiated with the landowner and as described in the Project line list. Contractor shall give Hess 48 hours of prior notice regarding the need for access. Additionally, the landowner or tenant shall be provided with Hess contact information. Landowners may utilize contact information to inform Hess of any concerns related to construction.

Prior notice shall consist of a personal contact, a telephone contact, or delivery of written notice to the landowner to inform the landowner of whereby the landowner or tenant is informed of Hess's intent to initially access the land. The landowner or tenant need not acknowledge receipt of written notice before Hess can enter the landowner's property.

Hess will coordinate with managers of public lands to reduce conflicts between construction activities and recreational uses. Hess will consult with land managers on state and federal lands regarding any necessary construction and maintenance restrictions consistent with management and use of such lands. Damages from disruption of recreational uses of private lands will be the subject of compensation negotiations with individual landowners.

2.4 Other Notifications

The Contractor shall notify, in writing, both Hess and the authority having jurisdiction over any road, railroad, canal, drainage ditch, river, foreign pipeline, or other utility to be crossed by the pipeline at least 48 hours (excluding Saturdays, Sundays, and statutory holidays), or as specified on the applicable permit(s), prior to commencement of pipeline construction, in order that the said authority may appoint an inspector to ensure that the crossing is constructed in a satisfactory manner.

The Contractor shall notify Hess of any spill of a potentially hazardous substance in accordance with the Spill Prevention, Containment, and Countermeasure Plan (SPCC Plan). The Contractor shall notify Hess immediately of any spill of any substance to a wetland or waterbody.

The Contractor shall notify Hess of any existing soil contamination discovered during construction.

The Contractor shall immediately notify Hess of the discovery of previously unreported historic property, other significant cultural materials, or suspected human remains uncovered during pipeline construction.

The Contractor shall immediately notify Hess of a Project-related injury to or mortality of a threatened or endangered species.

2.5 Damages to Private Property

Pipeline construction activities shall be confined to the construction ROW, temporary work space, additional temporary work space, and approved access routes. Hess shall reasonably compensate landowners for any construction-related damages caused by Hess that occur on or off of the established pipeline construction ROW. Hess will reasonably compensate landowners for damages to private property caused by Hess beyond the initial construction and reclamation of the pipeline, to include those damages caused by Hess during future construction, operation, maintenance, and repairs relating to the pipeline.

2.6 Appearance of Worksite

The construction ROW shall be maintained in a clean, neat condition at all times. At no time shall litter be allowed to accumulate at any location on the construction ROW. The Contractor shall provide a daily garbage detail with each major construction crew to keep the construction ROW clear of trash, pipe banding and spacers, waste from coating products, welding rods, timber skids, defective materials and all construction and other debris immediately behind construction operations unless otherwise approved by Hess. Paper from wrapping or coating products or lightweight items shall not be permitted to be scattered by the wind.

The traveled surfaces of roads, streets, highways, etc. (and railroads when applicable) shall be cleaned free of mud, dirt, or any debris deposited by equipment traversing these roads or exiting from the construction ROW.

2.7 Access

Prior to the pipeline's installation, Hess and the landowner shall reach a mutually acceptable agreement on the route that shall be utilized by the Contractor for entering and exiting the pipeline construction ROW should access to the construction ROW not be practicable or feasible from adjacent segments of the pipeline construction ROW, public road, or railroad ROW.

All construction vehicles and equipment traffic shall be confined to the public roads, private roads acquired for use by Hess, and the construction ROW. If temporary private access roads are constructed, they shall be designed to maintain proper drainage and shall be built to minimize soil erosion.

Sufficiently sized gaps shall be left in all spoil and topsoil wind rows and a hard or soft plug shall be left in the trench at all temporary private access roads and obvious livestock or wildlife trails unless the landowner agrees prior to construction that these access points can be blocked during construction.

All construction-related access roads to the ROW shall be marked with signs. Any private roads not to be utilized during construction shall also be marked.

2.8 Minimum Depth of Cover

The pipeline shall be installed so that the top of the pipe and coating is a minimum depth of 5 feet below the bottom of waterbodies including rivers, creeks, streams, ditches, and drains. This depth shall normally be maintained over a distance of 15 feet on each side of the waterbody measured from the top of the defined stream channel. If concrete weights or concrete-coated pipe is utilized for negative buoyancy of the pipeline, the minimum depth of cover shall be measured from the top of the concrete to the original ground contour. **Table 2-1** indicates standard depths that would apply to pipeline construction.

Table 2-1 Standard Depths

Location	Excavation (inches)
Undeveloped Section Line crossing	72
Rangeland and cultivated lands	48
Industrial, commercial, and residential areas	48
Crossings of inland bodies of water with a width of at least 100 feet from high water mark to high water mark	60
Drainage ditches at public roads and railroads	60

Depth of cover requirements may be modified by Hess based on site-specific conditions. However, all depths shall be in compliance with all established codes.

2.9 Non-Hazardous Waste Disposal

Non-hazardous pipeline construction wastes include human waste, trash, pipe banding and spacers, waste from coating products, welding rods, timber skids, cleared vegetation, stumps, and rock. All waste that contains (or at any time contained) oil, grease, solvents, or other petroleum products falls within the scope of the oil and hazardous substances control, cleanup, and disposal procedures. This material shall be segregated for handling and disposal as hazardous wastes.

The Contractor shall be responsible for ensuring that human wastes are handled and disposed of exclusively by means of portable, self-contained toilets during all construction operations. Wastes from these units shall be collected by a licensed contractor for disposal only at licensed and approved facilities.

The Contractor shall remove all trash from the construction ROW on a daily basis unless otherwise approved or directed by Hess.

The Contractor shall dispose of horizontal direction drill (HDD) cuttings and drilling mud at an agency-approved location. Disposal options may include spreading over the construction ROW in an upland location approved by Hess, or hauling to an approved licensed landfill or other site approved by Hess.

The Contractor shall remove all extraneous vegetation, rock, and other natural debris from the construction ROW by the completion of cleanup. The Contractor shall remove all trash and wastes from Contractor yards, pipe yards, and staging areas when work is completed at each location.

The Contractor shall dispose of all waste materials at licensed waste disposal facilities. Wastes shall not be disposed of in any other fashion such as un-permitted burying or burning.

2.10 Hazardous Wastes

The Contractor shall ensure that all hazardous and potentially hazardous materials are transported, stored, and handled in accordance with all applicable regulations. Workers exposed to or required to handle dangerous materials shall be trained in accordance with the applicable regulations and the manufacturer's recommendations.

The Contractor shall dispose of all hazardous materials at licensed waste disposal facilities. Hazardous wastes shall not be disposed of in any other fashion such as un-permitted burying or burning.

All transporters of oil, hazardous substances, and hazardous wastes shall be licensed and certified according to the applicable state vehicle code. Incidents on public highways shall be reported to the appropriate agencies.

All hazardous wastes being transported off-site shall be manifested. The manifest shall conform to requirements of the appropriate state agency. The transporter shall be licensed and certified to handle hazardous wastes on the public highways. The vehicles as well as the drivers must conform to all applicable vehicle codes for transporting hazardous wastes. The manifest shall conform to 49 Code of Federal Regulations (CFR) 172.101, 172.202, and 172.203.

If toxic or hazardous waste materials or containers are encountered during construction, the Contractor shall stop work immediately to prevent disturbing or further disturbing the waste material and shall immediately notify Hess. The Contractor shall not restart work until clearance is granted by Hess.

2.11 Noise Control

The Contractor shall minimize noise during non-daylight hours and within 1 mile of residences or other noise-sensitive areas such as hospitals, motels, or campgrounds. Hess shall abide by all applicable noise regulations regarding noise near residential and commercial/industrial areas. The Contractor shall provide notice to Hess if noise levels are expected to exceed bylaws for a short duration.

The Contractor shall minimize noise in the immediate vicinity of herds of livestock or poultry operations, which may be particularly sensitive to noise.

2.12 Weed and Pest Control

The Contractor shall thoroughly clean all construction equipment, including timber mats, prior to moving the equipment to the job site to limit the potential for the spread of noxious weeds, insects, and soil-borne pests. The Contractor shall clean the equipment with high-pressure washing equipment.

Prior to construction, Hess will mark all areas of the ROW that contain infestations of noxious, invasive species or soil-borne pests. Such marking will clearly indicate the limits of the infestation along the ROW. During construction, the Contractor shall clean the tracks, tires, and blades of equipment by hand (track shovel) or compressed air to remove excess soil prior to movement of equipment out of weed or soil-borne pest infested areas or utilize cleaning stations to remove vegetative materials using water under high pressure.

The Contractor shall use mulch and straw or hay bales that are Certified Weed Free in the State of North Dakota for temporary erosion and sediment control.

The Contractor shall implement pre-construction treatments such as mowing prior to seed development or herbicide application to areas of noxious weed infestation prior to other clearing, grading, trenching, or other soil disturbing work at locations identified in the construction drawings.

Hess will implement Best Management Practices (BMPs) for conducting vegetation control where necessary before and after construction. Typical agricultural herbicides, developed in consultation with county or state regulatory agencies, will be used. Herbicide types will be determined based on the weed species requiring control. The Contractor shall apply herbicides, where required, within 1 week, or as deemed necessary for optimum mortality success, prior to disturbing the area by clearing, grading, trenching, or other soil disturbing work. Herbicides shall be applied by applicators appropriately licensed or certified by the state in which the work is conducted. All herbicides applied prior to construction shall be non-residual or shall have a significant residual effect no longer than 30 days. Herbicides applied during construction shall be non-residual. Hess will implement BMPs in the use of pesticides and herbicides along the pipeline corridor to reduce potential impacts to avian and wildlife species. The Contractor shall use herbicides as outlined in the Noxious Weed Management Plan.

After completion of pipeline construction, on any construction ROW over which Hess will retain control over the surface use of the land after construction (i.e., valve sites, metering stations, pump stations, etc.), Hess shall provide for weed control to limit the potential for the spread of weeds onto adjacent lands. Any weed control spraying performed by Hess shall be done by a state-licensed pesticide applicator.

Hess shall be responsible for reimbursing all reasonable costs incurred by owners of land adjacent to aboveground facilities when the landowners must control weeds on their land which can be reasonably determined to have spread from land occupied by Hess' aboveground facilities.

2.13 Dust Control

The Contractor shall at all times control airborne dust levels during construction activities. The Contractor shall employ water trucks, sprinklers, or other approved chemical applications as necessary to reduce dust to acceptable levels. Utilization of chemical applications is limited to roads.

Dust shall be strictly controlled where the construction work approaches dwellings, farm buildings, and other areas occupied by people and when the pipeline parallels an existing road or highway. This also shall apply to access roads where dust raised by construction vehicles may irritate or inconvenience local residents. The speed of all Contractor vehicles shall be controlled in these areas. Emissions from construction equipment combustion, open burning, and temporary fuel transfer systems and associated tanks will be controlled to the extent required by state and local agencies through the permit process.

The Contractor shall take appropriate precautions to prevent fugitive emissions caused by sand blasting from reaching any residence or public building. The Contractor shall place curtains of suitable material, as necessary, to prevent wind-blown particles from sand blasting operations reaching any residence or public building.

Additional measures may be required by state regulations or local ordinances. The Contractor will comply with all applicable state regulations and local ordinances with respect to truck transportation and fugitive dust emissions.

2.14 Off Road Vehicle Control

Hess shall offer to landowners or managers of forested lands to install and maintain measures to control unauthorized vehicle access to the construction ROW where appropriate. These measures may include the following unless otherwise approved or directed by Hess based on site-specific conditions or circumstances:

- Signs;
- Fences with locking gates;

- Slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; and
- Conifers or other appropriate trees or shrubs across the construction ROW.

2.15 Fire Prevention and Control

The Contractor shall comply with all federal, state, county, and local fire regulations pertaining to burning permits and the prevention of uncontrolled fires. The following mitigative measures shall be implemented to prevent fire hazards and control fires:

- A list of local fire authorities and their designated representative to contact shall be maintained on site by construction personnel.
- Adequate firefighting equipment shall be available on site in accordance with the applicable regulatory requirements.
- The level of fire hazard shall be posted at the construction office (where visible for workers) and workers shall be made aware of the hazard level and related implications.
- The Contractor shall provide equipment to handle any possible fire emergency. This shall include, although not be limited to, water trucks; portable water pumps; chemical fire extinguishers; hand tools such as shovels, axes, and chain saws; and heavy equipment adequate for the construction of fire breaks when needed.
- Specifically, the Contractor shall supply and maintain in working order an adequate supply of fire extinguishers for each crew engaged in potentially combustible work such as welding, cutting, grinding, and burning of brush or vegetative debris.
- In the event of a fire, Contractor shall immediately use resources necessary to contain the fire. Contractor shall simultaneously notify local emergency response personnel.
- All tree clearing activities shall be carried out in accordance with local rules and regulations for the prevention of forest fires.
- Burning shall be done in compliance with applicable state, county, or local regulations.
- Any burning will be done within the ROW. Only small piles shall be burned to avoid overheating or damage to trees or other structures along the ROW.
- Flammable wastes shall be removed from the construction site on a regular basis.
- Flammable materials kept on the construction site must be stored in approved containers away from ignition sources.
- Smoking shall be prohibited around flammable materials.
- Smoking shall be prohibited on the entire construction site when the fire hazard level is high.

2.16 Road and Railroad Crossings

Construction across paved roads, highways, and railroads will 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 will 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 will be pulled through the borehole. For long crossings, sections can be welded onto the pipe string just before being pulled through the borehole. Boring will result in minimal or no disruption to traffic at road or railroad crossings. Each boring will 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.

Most smaller, unpaved roads and driveways will be crossed using the open-cut method where permitted by local authorities or private owners. The open-cut method will require temporary closure of the road to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of traffic will be kept open, except during brief periods when it is essential to close the road to install the pipeline. Most open-cut road crossings can be finished and the road resurfaced in 1 or 2 days. The Contractor will take measures, such as posting signs at open-cut road crossings, to ensure safety and minimize traffic disruptions.

2.17 Adverse Weather

The Contractor shall restrict certain construction activities and work in excessively wet soil conditions to minimize rutting and soil compaction. In determining when or where construction activities should be restricted or suspended during wet conditions, the Contractor shall consider the following factors:

- The extent that rutting may cause mixing of topsoil with subsoil layers or damage to tile drains;
- Excessive buildup of mud on tires and cleats;
- Excessive ponding of water at the soil surface; and
- The potential for excessive soil compaction.

The Contractor shall implement mitigation measures as directed by Hess in order to minimize rutting and soil compaction in excessively wet soil conditions, which may include:

- Restricting work to areas on the spread where conditions allow;
- Using low ground weight, wide-track equipment, or other low impact construction techniques;
- Limiting work to areas that have adequately drained soils or have a cover of vegetation, such as sod, crops, or crop residues, sufficient to prevent mixing of topsoil with subsoil layers or damage to drain tiles; and
- Installing geotextile material or construction mats in problem areas.

“Stop work” authority will be designated to the Chief Inspector but will be implemented when recommended by the Environmental Inspector.

2.18 Cultural Resources

Hess intends to avoid cultural resources to the extent practicable by rerouting the pipeline corridor and related appurtenances, avoiding construction activities on properties listed in or eligible for listing in the National Register of Historic Places (NRHP) or those whose eligibility for listing have not been determined, as well as boring or using HDD through culturally sterile soils. Avoidance will be in accordance to guidance provided by the State Historical Society of North Dakota, the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS).

The preferred treatment of any historical property or culturally significant site is avoidance. Where necessary, Hess will monitor the construction spread using a cultural resource monitor working under the direction of a professional who meets or exceeds the standards of the *Professional Qualification Standards in Archaeology and Historic Preservation: Secretary of the Interior’s Standards and Guidelines* (48 Federal Register 44716, September 29, 1983).

Prior to commencing construction, Hess also will provide an appropriate level of training to all construction personnel so that the requirements of any unanticipated discovery plan are understood and unanticipated discoveries are quickly identified.

The Contractor shall implement the measures outlined in the Unanticipated Discovery Plan that has been adopted to minimize disturbance to cultural sites and shall take immediate action as outlined if any

unrecorded cultural resource is encountered during construction. In the event an unanticipated cultural discovery is made, the Contractor will immediately halt all construction activities within a 100-foot radius, including construction related traffic; notify Hess's consulting archaeologist; and implement interim measures to protect the discovery from looting or vandalism according to the Unanticipated Discovery Plan. The BLM, State Historic Preservation Officer, and local and tribal authorities, as appropriate, will be notified immediately upon encountering the discovery. Construction will not proceed within the 100-foot radius of discovery site until all consulting parties agree that the terms of the Unanticipated Discovery Plan are satisfied and Hess receives notification from the appropriate agencies. No work or activity within the 100-foot buffer area may take place until approvals are communicated at the spread level by the lead Environmental Inspector.

3.0 SPILL PREVENTION AND CONTAINMENT

Spill prevention and containment applies to the use and management of hazardous materials on the construction ROW and all ancillary areas during construction. This includes the refueling or servicing of all equipment with diesel fuel, gasoline, lubricating oils, grease, and hydraulic and other fluids during normal upland applications and special applications within 50 feet of perennial streams or wetlands.

Hess will prepare a project-specific SPCC Plan. The Contractor shall provide additional information to complete the SPCC Plan for each construction spread, and shall provide site-specific data that meets the requirements of 40 CFR Part 112 for every location used for staging fuel or oil storage tanks and for every location used for bulk fuel or oil transfer. Each SPCC Plan will be prepared prior to introducing the subject fuel, oil, or hazardous material to the subject location.

3.1 Spill Prevention

3.1.1 Staging Areas

Staging areas (including pipe yards) shall be established for the construction spreads. No bulk fuel and storage tanks shall be placed in the construction ROW. Hazardous materials at staging areas shall be stored in compliance with federal and state laws. The following spill prevention measures shall be implemented by the Contractor:

- Contractor fuel trucks shall be loaded at existing bulk fuel dealerships or from bulk tanks set up for that purpose at the staging area. In the former case, the bulk dealer will be responsible for preventing and controlling spills.
- The Environmental Inspector shall inspect the tank site for compliance with the 50-foot setback requirement and approve the tank site prior to installing bulk fuel or storage tanks on the contractor yard.
- Fuels and lubricants shall be stored only at designated staging areas.
- Storage of fuel and lubricants in the staging area shall be at least 50 feet away from the water's edge. Refueling and lubrication of equipment shall be restricted to upland areas at least 50 feet away from waterbodies and wetlands.
- Contractor shall be required to perform all routine equipment maintenance at the staging area and recover and dispose of wastes in an appropriate manner.
- Fixed fuel dispensing locations will be provided with secondary containment to capture fuel from leaks, drips, and overfills.
- Temporary liners, berms, or dikes (secondary containment) shall be constructed around the aboveground bulk tanks, providing 110 percent containment volume of the largest storage tank or trailer within the containment structure, so that potential spill materials shall be contained and collected in specified areas. Tanks shall not be placed in areas subject to periodic flooding or washout.
- Drivers of tank trucks are responsible for safety and spill prevention during tank truck unloading. Procedures for loading and unloading tank trucks shall meet the minimum requirements established by the U.S. Department of Transportation.
- Drivers of tank trucks are responsible for setting brakes and chocking wheels prior to off-loading. Warning signs requiring drivers to set brakes and chock wheels shall be displayed at all tanks. Proper grounding of equipment shall be undertaken during fuel transfer operations. Drivers shall observe and control the fueling operations at all times to prevent overfilling the temporary tank.

- Prior to departure of any tank truck, all vehicle outlets shall be examined closely by the driver for leakage, and tightened, adjusted, or replaced to prevent leakage while in transit.
- A supply of sorbent and barrier materials sufficient to allow the rapid containment and recovery of spills shall be maintained at each construction staging area. Sorbent and barrier materials also shall be utilized to contain runoff from contaminated areas.
- Shovels and drums shall be kept at each of the individual staging areas. In the event that small quantities of soil become contaminated, shovels shall be utilized to collect the soil and the material shall be stored in 55-gallon drums. Should contamination occur adjacent to staging areas as a result of runoff, shovels or heavy equipment shall be utilized to collect the contaminated material. Contaminated soil shall be disposed of in accordance with state and federal regulations.
- Temporary aboveground tanks shall be subject to visual inspection on a weekly basis and when the tank is refilled. Inspection records shall be maintained. Operators shall routinely keep tanks under close surveillance and potential leaks or spills shall be quickly detected.
- Visible fuel leaks shall be reported to the Contractor's designated representative and corrected as soon as conditions warrant. Hess's designated representative shall be informed.
- Drain valves on temporary tanks shall be locked to prevent accidental or unauthorized discharges from the tank.
- Oil and other hazardous materials stored in 350-gallon totes, 55-gallon drums, 5-gallon pails, smaller retail-size containers or other portable containers will be staged or stored in areas with a secondary temporary containment structure. Secondary containment structures may consist of temporary earthen berms with a chemical resistant liner, or a portable containment system constructed of steel, polyvinyl chloride, or other suitable material. The secondary containment structure will be capable of containing 110 percent of the volume of material stored in these areas.

Hess may allow modification of the above specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits.

3.1.2 Construction Right-of-Way

Contractor shall ensure that all equipment is free of leaks prior to use on the Project and prior to entering or working near waterbodies or wetlands. Throughout construction, the Contractor shall conduct regular maintenance and inspections of the equipment to reduce the potential for spills or leaks.

Rubber-tired vehicles (pickup trucks, buses) normally shall refuel at the construction staging areas or commercial gas stations. Tracked machinery (backhoes, bulldozers) may be refueled and lubricated on the construction ROW. Equipment maintenance shall be conducted in staging areas when practical. When impractical, repairs to equipment can be made on the construction ROW when approved by Hess's representative.

Each fuel truck that transports and dispenses fuel to construction equipment or Project vehicles along the construction ROW or within equipment staging and material areas shall carry a spill response kit and spill response equipment onboard at all times. In the event that response materials are depleted through use or their condition is deteriorated through age, the materials will be replenished prior to placing the fueling vehicle back into service.

The following preventive measures apply to refueling and lubricating activities on the construction ROW:

- Construction activities shall be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Each construction crew, including cleanup crews, shall have on hand sufficient tools and material to stop leaks and supplies of absorbent and barrier materials to allow rapid containment and recovery of spilled materials. Crew members must know and follow the procedure for reporting spills.
- Refueling and lubricating of construction equipment shall be restricted to upland areas at least 50 feet away from waterbodies and wetlands. Where this is not possible (e.g., trench dewatering pumps), the equipment shall be fueled by designated personnel with special training in refueling, spill containment, and cleanup. The Environmental Inspector shall ensure that signs are installed identifying restricted areas.
- No fuel, oil, or hazardous material storage, staging, or transfer other than refueling will occur within 100 feet of any storm drain, drop inlet, or high consequence area (HCA).
- Spent oils, lubricants, filters, etc. shall be collected and disposed of at an approved location in accordance with state and federal regulations.
- Equipment shall not be washed in streams.
- Stationary equipment will be placed within a secondary containment if it will be operated or require refueling within 50 feet of a wetland or waterbody boundary.

Hess may allow modification of the above specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits.

3.2 Contingency Plans

The Contractor shall develop emergency response procedures for all incidents (e.g., spills, leaks, fires) involving hazardous materials that could pose a threat to human health or the environment. The procedures shall address activities in all work areas, as well as during transport to and from the construction ROW and to any disposal or recycling facility.

3.3 Equipment

The Contractor shall retain emergency response equipment in all areas where hazardous materials are handled or stored. This equipment shall be readily available to respond to a hazardous material emergency. Such equipment shall include, but not be limited to, the following:

- First aid supplies;
- Phone or communications radio;
- Protective clothing (Tyvek suit, gloves, goggles, boots);
- Hand-held fire extinguisher;
- Absorbent material and storage containers;
- Non-sparking bung wrench and shovel; and
- Brooms and dust pan.

Hazardous material emergency equipment shall be carried in all mechanic and supervisor vehicles. This equipment shall include, at a minimum:

- First aid supplies;
- Phone or communications radio;

- 2 sets of protective clothing (Tyvek suit, gloves, goggles, boots);
- 1 non-sparking shovel;
- 6 plastic garbage bags (20 gallon);
- 10 absorbent socks and spill pads;
- Hand-held fire extinguisher;
- Barrier tape; and
- 2 orange reflector cones.

Fuel and service trucks shall carry a minimum of 20 pounds of suitable commercial sorbent material.

The Contractor shall inspect emergency equipment weekly, and service and maintain equipment regularly. Records shall be kept of all inspections and services.

3.4 Emergency Notification

Emergency notification procedures between the Contractor and Hess shall be established in the planning stages of construction. A Hess representative shall be identified to serve as contact in the event of a spill during construction activities. In the event of a spill meeting government reporting criteria, the Contractor shall notify the Hess representative immediately who, in turn, shall notify the appropriate regulatory agencies.

Any hazardous material released into water must be reported immediately to Hess. The Contractor is required to notify Hess immediately if there is any spill of hazardous materials that reaches a wetland or waterbody. Incidents on public highways shall be reported to Hess and the appropriate agencies by Hess.

If a spill occurs on navigable waters of the United States, Hess shall notify the National Response Center (NRC) at 1-800-424-8802. For spills that occur on public lands, into surface waters, or into sensitive areas, the appropriate governmental agency's district office also shall be notified.

3.5 Spill Containment and Countermeasures

In the event of a spill of hazardous material, Contractor personnel shall:

- Notify the appointed Hess representative;
- Identify the product hazards related to the spilled material and implement appropriate safety procedures, based on the nature of the hazard;
- Control danger to the public and personnel at the site;
- Implement spill contingency plans and mobilize appropriate resources and manpower;
- Isolate or shutdown the source of the spill;
- Block manholes or culverts to limit spill travel;
- Initiate containment procedures to limit the spill to as small an area as possible to prevent damage to property or areas of environment concern (e.g., watercourses); and
- Commence recovery of the spill and cleanup operations.

When notified of a spill, the Hess representative shall immediately ensure that:

- Action is taken to control danger to the public and personnel at the site.
- Spill contingency plans are implemented and necessary equipment and manpower are mobilized.

- Measures are taken to isolate or shutdown the source of the spill.
- All resources necessary to contain, recover and clean up the spill are available.
- Any resources requested by the Contractor from Hess are provided.
- The appropriate agencies are notified. For spills that occur on public lands, into surface waters or into sensitive areas, the appropriate federal or state managing office also shall be notified and involved in the incident.

For a spill on land, berms shall be constructed with available equipment to physically contain the spill. Personnel entry and travel on contaminated soils shall be minimized. Sorbent materials shall be applied or, if necessary, heavily contaminated soils shall be removed to an approved facility. Contaminated sorbent materials and vegetation shall also be disposed of at an approved facility.

For a spill threatening a waterbody, berms or trenches shall be constructed to contain the spill prior to entry into the waterbody. Deployment of booms, skimmers, and sorbent materials shall be necessary if the spill reaches the water. The spilled product shall be recovered and the contaminated area shall be cleaned up in consultation with spill response specialists and appropriate government agencies.

4.0 UPLANDS (AGRICULTURAL, FOREST, PASTURE, RANGE AND GRASS LANDS)

4.1 Interference with Irrigation Systems

If existing irrigation systems (flood irrigation, ditch irrigation, pivot, wheel, or other type of spray irrigation systems), irrigation ditches, or sheet flow irrigation could be impacted by the construction of the pipeline, the following mitigation measures shall be implemented unless otherwise approved or directed by Hess:

- If it is feasible and mutually acceptable to Hess and the landowner or landowner's designate, temporary measures shall be implemented to allow an irrigation system to continue to operate across land on which the pipeline is being constructed.
- If the pipeline or temporary work areas intersect an operational (or soon to be operational) pivot or other spray irrigation system, Hess shall establish with the landowner or landowner's designate an acceptable amount of time the irrigation system may be out of service. If an irrigation system interruption results in crop damages, either on the pipeline construction ROW or off the construction ROW, the landowner shall be compensated reasonably for all such crop damages.
- If the pipeline or temporary work areas intersect an operational sheet flow irrigation system, Hess shall establish with the landowner or landowner's designate an acceptable amount of time the irrigation system may be out of service. If an irrigation system interruption results in crop damages, either on the pipeline construction ROW or off the construction ROW, the landowner shall be compensated reasonably for all such crop damages.
- Irrigation ditches that are active at the time of construction shall not be stopped or obstructed except for the length of time to install the pipeline beneath the ditch (typically, one day or less) unless otherwise approved or directed by Hess.

4.2 Clearing

The objective of clearing is to provide a clear and unobstructed ROW for safe and efficient construction of the pipeline. The following mitigation measures shall be implemented:

- Construction traffic shall be restricted to the construction ROW, existing roads, and approved private roads.
- The working side of the ROW shall be maintained by the contractor so that rutting depths do not exceed 4 inches.
- Construction ROW boundaries, including pre-approved temporary workspace, shall be clearly staked to prevent disturbance to unauthorized areas.
- If crops are present, they shall be mowed or disced to ground level unless an agreement is made for the landowner to remove them.
- Burning shall be prohibited on cultivated land.
- Construction ROW at timber shelterbelts in agricultural areas shall be reduced to a maximum width of 50 feet to construct the pipeline.

4.3 Topsoil Removal and Storage

The objective of topsoil handling is to maintain topsoil capability by conserving topsoil for future replacement and reclamation and to minimize the degradation of topsoil from compaction, rutting, loss of organic matter, or soil mixing so that successful reclamation of the ROW can occur. The following mitigation measures shall be implemented during topsoil removal and storage unless otherwise approved or directed by Hess based

on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Topsoil segregate the areas over the pipeline trench and spoil side on all lands to a minimum depth of 6 inches and a maximum depth of 12 inches.
- Topsoil segregate the areas over the pipeline trench, spoil side and working side on all USFS grasslands.
- Stripped topsoil shall be stockpiled in a windrow along the edge of the ROW. The Contractor shall perform work in a manner to minimize the potential for subsoil and topsoil to be mixed.
- Under no circumstances shall the Contractor use topsoil to fill a low area.
- If required due to excessively windy conditions, topsoil piles shall be tackified using either water or a suitable tackifier (liquid mulch binder).
- Gaps in the rows of topsoil will be left in order to allow drainage and prevent ponding of water adjacent to or on the ROW.
- Topsoil shall not be utilized to construct ramps at road or waterbody crossings.

4.4 Grading

The objective of grading is to develop a ROW that allows the safe passage of equipment and meets the bending limitations of the pipe. The following mitigative measures shall be implemented during grading unless otherwise approved or directed by Hess based on site-specific conditions or circumstances. However, all work shall be conducted in accordance with applicable permits.

- All grading shall be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable.
- Agricultural areas that have terraces shall be surveyed to establish pre-construction contours to be utilized for restoration of the terraces after construction.
- On steep slopes, or wherever erosion potential is high, temporary erosion control measures shall be implemented.
- Bar ditches adjacent to existing roadways to be crossed during construction shall be adequately ramped with grade or ditch spoil to prevent damage to the road shoulder and ditch.
- Where the construction surface remains inadequate to support equipment travel, timber mats, timber riprap, or other method shall be used to stabilize surface conditions.

The Contractor shall limit the interruption of the surface drain network in the vicinity of the ROW using the appropriate methods:

- Providing gaps in the rows of subsoil and topsoil in order to prevent any accumulation of water on the land;
- Preventing obstructions in furrows, furrow drains, and ditches;
- Installing flumes and ramps in furrows, furrow drains, and ditches to facilitate water flow across the construction ROW and allow for construction equipment traffic; and
- Installing flumes over the trench for any watercourse where flow is continuous during construction.

4.5 Temporary Erosion and Sediment Control

4.5.1 General

Temporary erosion and sediment control measures shall be installed immediately after initial disturbance of the soil, maintained throughout construction (on a daily basis), and reinstalled as necessary until replaced by permanent erosion control structures or restoration of the construction ROW is complete.

Specifications and configurations for erosion and sediment control measures may be modified by Hess as necessary to suit actual site conditions. However, all work shall be conducted in accordance with applicable permits.

The Contractor shall inspect all temporary erosion control measures at least daily in areas of active construction or equipment operation, weekly in areas with no construction or equipment operation, and within 24 hours of each significant rainfall event of 0.5 inches or greater. The Contractor shall repair all ineffective temporary erosion control measures as expediently as practicable.

4.5.2 Sediment Barriers

Sediment barriers shall be constructed of silt fence, staked hay or straw bales (Certified Weed Free), compacted earth (e.g., drivable berms across travel lanes), sand bags, or other appropriate materials.

The Contractor shall install sediment barriers in accordance with Company specifications or as otherwise approved or directed by Hess. The Contractor is responsible for properly installing, maintaining, and replacing temporary and permanent erosion controls throughout construction and cleanup. Near wetland or riparian zones, the Contractor will install sediment control structures along the construction ROW edges prior to vegetation removal where practicable. The aforementioned sediment barriers may be used interchangeably or together depending on site-specific conditions. In most cases, silt fence shall be utilized where longer sediment barriers are required.

Sediment barriers shall be installed below disturbed areas where there is hazard of off-site sedimentation. These areas include:

- The base of slopes adjacent to road crossings;
- The edge of the construction ROW adjacent to and up-gradient of a roadway, flowing stream, spring, wetland, or impoundment;
- Trench or test water discharge locations where required;
- Where waterbodies or wetlands are adjacent to the construction ROW; (the Contractor shall install sediment barriers along the edge of the construction ROW as necessary to contain spoil and sediment within the construction ROW);
- Across the entire construction ROW at flowing waterbody crossings;
- ROW immediately upslope of the wetland boundary at all standard (saturated or standing water) wetland crossings as necessary to prevent sediment flow into the wetland; and
- Along the edge of the construction ROW within standard (saturated or standing water) wetland boundaries as necessary to contain spoil and sediment within the construction ROW.

Sediment barriers placed at the toe of a slope shall be set a sufficient distance from the toe of the slope, if possible, in order to increase ponding volume.

Sediment control barriers shall be placed so as not to hinder construction operations. If silt fence or straw bale sediment barriers (in lieu of driveable berms) are placed across the entire construction ROW at waterbodies, wetlands, or upslope of roads, a provision shall be made for temporary traffic flow through a

gap for vehicles and equipment to pass within the structure. Immediately following each day's shutdown of construction activities, a row of straw bales or a section of silt fence shall be placed across the up-gradient side of the gap with sufficient overlap at each end of the barrier gap to eliminate sediment bypass flow, followed by bales tightly fitted to fill the gap. Following completion of the equipment crossing, the gap shall be closed using silt fence or straw bale sediment barrier.

The Contractor shall maintain straw bale and silt fence sediment barriers by removing collected sediment and replacing damaged bales. Sediment shall be removed and placed where it shall not reenter the barrier when sediment loading is greater than 40 percent or if directed by Hess. If straw bale filters cannot be cleaned out due to access problems, the Contractor shall place a new row of sediment barriers upslope.

The Contractor shall use mulch and straw bales that are free of noxious weeds. Mulch or straw bales that contain evidence of noxious weeds or other undesirable species shall be rejected by the Contractor.

The Contractor shall remove sediment barriers, except those needed for permanent erosion and sediment control, during cleanup of the construction ROW.

4.5.3 Trench Plugs

The Contractor shall use trench plugs at the edge of flowing waterbody crossings and at the edge of wetlands with standing water to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs shall be of sufficient size to withstand upslope water pressure.

4.5.4 Temporary Slope Breakers (Water Bars)

The Contractor shall install temporary slope breakers on slopes greater than 5 percent on all disturbed lands at the following recommended spacing:

Slope (%)	Spacing (feet)
5 – 15	300
>15 – 30	200
>30	100

The gradient of each slope breaker shall be 2 to 4 percent.

If directed by the landowner, the Contractor may not install temporary slope breakers (water bars) in cultivated land.

Temporary slope breakers shall be constructed of soil, silt fence, staked straw bales, sand bags, or similar materials authorized by Hess.

The Contractor shall direct the outfall of each temporary slope breaker to a stable, well-vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction ROW. The outfall of each temporary slope breaker shall be installed to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

Specifications and configurations for temporary slope breakers may be modified by Hess as necessary to suit actual site conditions. However, all work shall be conducted in accordance with applicable permits.

4.5.5 Drainage Channels or Ditches

Drainage channels or ditches shall be used on a limited basis to provide drainage along the construction ROW and toe of cut slopes as well as to direct surface runoff across the construction ROW or away from disturbances and onto natural undisturbed ground. Channels or ditches shall be constructed by the

Contractor during grading operations. Where there is inadequate vegetation at the channel or ditch outlet, sediment barriers, check berms, or other appropriate measures shall be used to control erosion.

4.5.6 Temporary Mulching

Unless otherwise directed by Hess, the Contractor shall apply temporary seed and/or mulch on disturbed construction work areas that have been inactive for 1 month or are expected to be inactive for a month or more. The Contractor shall not apply temporary mulch in cultivated areas unless specifically requested by the landowner. The Contractor shall not apply mulch within wetland boundaries.

Temporary mulch of straw or equivalent applied on slopes shall be spread uniformly to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of straw or its equivalent. Mulch application on slopes within 100 feet of waterbodies and wetlands shall be increased to an approximate rate of 3 tons per acre.

4.5.7 Tackifier

When wetting topsoil piles with water does not prevent wind erosion, the Contractor shall temporarily suspend topsoil handling operations and apply a tackifier to topsoil stockpiles at the rate recommended by the manufacturer.

Should construction traffic, cattle grazing, heavy rains, or other related construction activity disturb the tackified topsoil piles and create a potential for wind erosion, additional tackifier shall be applied by the Contractor.

4.6 Stringing

The objective of stringing is to place the line pipe along the construction ROW for bending and welding in an expedient and efficient manner.

The Contractor shall utilize one or more of the following mitigation measures as applicable and when necessary to reduce compaction on the working side of the ROW or as directed by Hess. However, all work shall be conducted in accordance with applicable permits.

- Prohibiting access by certain vehicles;
- Using only machinery possessing low ground pressure (tracks or wide tires);
- Limiting access and thus minimizing the frequency of all vehicle traffic;
- Digging ditches to improve surface drainage;
- Using timber riprap, matting, or geotextile fabric overlain with soil; and
- Stopping construction for a period of time.

4.7 Trenching

The objective of trenching is to provide a ditch of sufficient depth and width with a bottom to continuously support the pipeline. During trenching operations, the following mitigation measures shall be implemented unless otherwise approved or directed by Hess based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Subsoil shall be segregated from topsoil in separate, distinct rows with a separation that shall limit any admixing of topsoil and subsoil during handling.
- Gaps must be left in the spoil piles that coincide with breaks in the strung pipe to facilitate natural drainage patterns and to allow the passage of livestock or wildlife.

- Trenching operations shall be followed as closely as practicable by lower-in and backfill operations to minimize the length of time the ditch is open.
- Construction debris (e.g., welding debris) and other garbage shall not be deposited in the ditch.

4.7.1 Trench Dewatering/Well Points

The Contractor shall make all reasonable efforts to discharge trench water in a manner that avoids damage to adjacent agricultural land, crops, and pasture. Damage includes, but is not limited to, the inundation of crops for more than 24 hours, deposition of sediment in ditches, and the deposition of gravel in fields or pastures.

If trench dewatering is necessary in an area where salt damage to adjacent crops is evident, the Environmental Inspector shall conduct a field conductivity test on the trench water before it is discharged. If the conductivity of the trench water is determined to potentially affect soil quality, it shall not be discharged to areas where salt damage to crops is evident, but shall be directed as feasible so that water flows over a well vegetated, non-cropland area or through an energy dissipater and sediment barrier, then directed to nearby ditches or brackish wetlands or waterbodies.

When pumping water from the trench for any reason, the Contractor shall ensure that adequate pumping capacity and sufficient hose is available to permit dewatering as follows:

- No heavily silt-laden trench water shall be allowed to enter a waterbody or wetland directly but shall instead be diverted through a well vegetated area, a geotextile filter bag, or a permeable berm (straw bale or Hess-approved equivalent).
- Trench water shall not be disposed of in a manner that could damage crops or interfere with the functioning of underground drainage systems.

The Contractor shall screen the intake hose and keep the hose either 1 foot off the bottom of the trench or in a container to minimize entrainment of sediment.

4.8 Welding, Field Joint Coating, and Lowering In

The objectives of welding, field joint coating, and lowering in are to provide continuous segments of pipeline, to provide corrosion protection to the weld areas of the pipeline, and to place the pipeline in the center of the trench, without stress, at the required depth of cover. The following mitigation measures shall be followed during pipe welding, field joint coating, and lowering in, unless otherwise specified by Hess in response to site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Shavings produced during beveling of the line pipe shall be removed immediately following this operation to ensure that livestock and wildlife do not ingest this material. When welding operations create a continuous line of pipe that may be left in the ROW for an extended period of time due to construction or weather constraints, a gap in the welded pipe shall be provided to allow for access at farm road crossings and for passage of livestock and wildlife.
- Prior to the application of epoxy powder, urethane epoxy, or other approved pipe coatings, a tarp shall be placed underneath the pipe to collect any overspray of epoxy powder and liquid drippings. Excess powder, liquid, or other hazardous materials (e.g., brushes, rollers, gloves) shall be continuously collected and removed from the construction ROW and disposed of in a manner appropriate for these materials.

4.9 Padding and Backfilling

The objective of padding and backfilling is to cover the pipe with material that is not detrimental to the pipeline and pipeline coating. The following mitigation measures shall be utilized during backfilling, unless

otherwise approved or directed by Hess based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Excessive water accumulated in the trench shall be eliminated prior to backfilling.
- In the event it becomes necessary to pump water from open trenches, the Contractor shall pump the water and discharge it in accordance with the requirements of the Stormwater Pollution Prevention Plan (SWPPP) in order to avoid damaging adjacent agricultural land, crops, and pasture.
- If it is impossible to avoid water-related damages (including inundation of crops for more than 24 hours, deposition of sediment in ditches and other water courses, and the deposition of gravel in fields, pastures, and any water courses), Hess shall reasonably compensate the landowners for the damage and/or shall correct the damage so as to restore the land, crops, pasture, water courses, etc., to their pre-construction condition.
- All pumping of water shall comply with existing drainage laws and local ordinances relating to such activities and provisions of the Clean Water Act.
- Prior to backfilling, all drain tile shall be permanently repaired, inspected, and the repair documented as described in Section 5.5, Drain Tile Repairs.
- Prior to backfilling, trench breakers shall be installed on slopes where necessary to minimize the potential for water movement down the ditch and potential subsequent erosion.
- During backfill, the stockpiled subsoil shall be placed back into the trench before replacing the topsoil.
- Topsoil shall not be utilized for padding the pipe.
- Backfill shall be compacted to a minimum of 90 percent of pre-existing conditions where the trench line crosses tracks of wheel irrigation systems (pivots).
- To reduce the potential for ditch line subsidence, spoil shall be replaced and compacted by backhoe bucket or by the wheels or tracks of equipment traversing down the trench.
- The lesser of 4 feet or the actual depth of topsoil cover, shall not be backfilled with soil containing rocks of any greater concentration or size than existed prior to pipeline construction in the pipeline trench, bore pits, or other excavations.

4.10 Cleanup

The objective of cleanup activities shall be to prepare the ROW and other disturbed areas to approximate pre-construction ground contours to the extent possible and to replace spoil and stockpiled material in a manner which preserves soil viability and quality to a degree reasonably equivalent to the original or that of representative undisturbed land. The following mitigation measures shall be utilized during cleanup, unless otherwise approved or directed by Hess based on specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Cleanup shall occur immediately following backfilling operations when weather or seasonal conditions allow.
- All garbage and construction debris (e.g., lathing, ribbon, welding rods, pipe bevel shavings, pipe spacer ropes, end caps, pipe skids) shall be collected and disposed of at approved disposal sites.
- The ROW shall be re-contoured with spoil material to approximate pre-construction contours and as necessary to limit erosion and subsidence. Loading of slopes with unconsolidated spoil material shall be avoided during slope re-contouring. Topsoil shall be replaced after re-contouring of the grade with subsoil. The topsoil shall be replaced on the subsoil storage area and over the trench so that after settling occurs, the topsoil's approximate original depth and contour (with an allowance for settling) shall be achieved.

- Subsoil shall not be placed on top of topsoil.
- Surface drainage shall be restored and re-contoured to conform to the adjacent land drainage system.
- Erosion control structures such as permanent slope breakers and cross ditches shall be installed on steep slopes where necessary to control erosion by diverting surface run-off from the ROW to stable and vegetated off-ROW areas.
- During cleanup, temporary sediment barriers such as silt fence and hay bale diversions shall be removed; accumulated sediment shall be re-contoured with the rest of the ROW; and permanent erosion controls shall be installed as necessary.
- After construction, all temporary access shall be returned to pre-construction conditions unless specifically agreed with the landowner or otherwise specified by Hess.
- Warning signs, aerial markers, and cathodic protection test leads shall be installed in locations that shall not impair farming operations and are acceptable to the landowner.
- All bridges, fences, and culverts existing prior to construction shall be restored to meet or exceed approximate pre-construction conditions. Caution shall be utilized when re-establishing culverts to ensure that drainage is not improved to a point that would be detrimental to existing waterbodies and wetlands.
- All temporary gates installed during construction shall be replaced with permanent fence unless otherwise requested by the landowner.

4.11 Reclamation and Revegetation

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.

The following mitigative measures will be utilized unless otherwise approved or directed by Hess based on site specific conditions or circumstances. However, all work shall be conducted in accordance with applicable permits.

4.11.1 Relieving Compaction

- The working side of the trench shall be de-compacted employing a paraplow or ripper with shanks or like equipment. The approximate depth of ripping shall be 12 inches (or a lesser depth if damage may occur to existing drain tile systems). After ripping, the subsoil surface shall be graded smooth and any subsoil clumps broken up (disc and harrow) in an effort to avoid topsoil mixing.
- The de-compacted working side of the construction ROW shall be tested by the Contractor at regular intervals for compaction in agricultural and residential areas. Tests shall be conducted on the same soil type under similar moisture conditions in undisturbed areas immediately adjacent to the ROW to approximate pre-construction conditions. Penetrometers or other appropriate devices shall be used to conduct tests
- If there is any dispute between the landowner and Hess as to what areas need to be ripped or chiseled, the depth at which compacted areas should be ripped or chiseled, or the necessity or rates of lime and fertilizer application, the county Natural Resource Conservation Service (NRCS) office shall be consulted by Hess and the landowner.

Plowing under of organic matter including wood chips and manure, or planting of a green crop such as alfalfa to decrease soil bulk density and improve soil structure or any other measures in consultation with the NCRS shall be considered if mechanical relief of compaction is deemed not satisfactory.

In the first year after construction, Hess will inspect the ROW to identify areas of erosion or settling. Subsequently, Hess will monitor erosion and settling in accordance with Hess's Integrity Management Plan, and through landowner reporting. Landowner reporting will be facilitated through use of Hess's toll-free telephone number, which will be made available to all landowners on the ROW. Landowner reporting also may be facilitated through contact with Hess's field offices.

Hess plans to minimize impacts on soil productivity that may result from construction activities, but recognizes that some short- to long-term decreases in agricultural productivity are possible. Hess recognizes its responsibility to restore agricultural productivity on the pipeline ROW and to compensate landowners for demonstrated decreases in productivity that may result from any degradation of agricultural soils along the ROW.

4.11.2 Rock Removal

- On agricultural land, rocks that are exposed on the surface due to construction activity shall be removed from the ROW prior to and after topsoil replacement. This effort will result in an equivalent quantity, size and distribution of rocks to that found on adjacent lands.
- Clearing of rocks may be carried out with a mechanical rock picker or by manual means, provided that preservation of topsoil is assured. Rock removed from the ROW shall be hauled off the landowner's premises or disposed of on the landowner's premises at a location that is mutually acceptable to the landowner and to Hess.

4.11.3 Soil Additives

If site-specific conditions warrant and if agreed to by the landowner, the Contractor shall apply amendments (fertilizer and soil pH modifier materials and formulations) commonly used for agricultural soils in the area and in accordance with written recommendations from the local soil conservation authority, land management agencies, or landowner. Amendments shall be incorporated into the normal plow layer as soon as possible after application.

4.11.4 Seeding

- 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.
- Seed not utilized within 12 months of seed testing shall be approved by Hess prior to use. Seeding shall follow cleanup and topsoil replacement as closely as possible. Seed shall be applied to all disturbed surfaces (except cultivated fields unless requested by the landowner).
- If mulch was applied prior to seeding for temporary erosion control, the Third Party Contractor shall remove and dispose of the excess mulch prior to seedbed preparation to ensure that seedbed preparation equipment and seed drills do not become plugged with excess mulch; and to support an adequate seedbed; and to ensure that seed incorporation or soil packing equipment can operate without becoming plugged with mulch.
- The Third Party Contractor may evenly re-apply and anchor (straw crimp) the removed temporary mulch on the construction ROW following seeding.
- Seed shall be applied at the rate recommended by the managing agency. Seeding rates shall be based on pure live seed.
- Weather conditions, construction ROW constraints, site access, and soil type shall influence the seeding method to be used (i.e., drill seeding versus broadcast seeding). All areas seeded by the

Third Party Contractor, except for temporary cover crops, shall be drill seeded unless the ROW is too steep to facilitate drill seeding. Temporary cover crop seed shall be broadcast.

- The Third Party Contractor shall delay seeding as necessary until the soil is in the appropriate condition for drill seeding.
- The Third Party Contractor shall use a Truax brand or equivalent-type drill seeder equipped with a cultipacker designed and equipped to apply grass and grass-legume seed mixtures with mechanisms such as seed box agitators to allow even distribution of all species in each seed mix, with an adjustable metering mechanism to accurately deliver the specified seeding rate and with a mechanism such as depth bands to accurately place the seed at the specified depth.
- The Third Party Contractor shall operate drill seeders at an appropriate speed so the specified seeding rate and depth is maintained.
- The Third Party Contractor shall calibrate drill seeders so that the specified seeding rate is planted. The row spacing on drill seeders shall not exceed 8 inches.
- The Third Party Contractor shall plant seed at depths consistent with the local or regional agricultural practices.
- Broadcast or hydro seeding, used in lieu of drilling, shall utilize double the recommended seeding rates. Where seed is broadcast, the Third Party Contractor shall use a harrow, cultipacker, or other equipment immediately following broadcasting to incorporate the seed to the specified depth and to firm the seedbed.
- The Third Party Contractor shall delay broadcast seeding during high wind conditions if even distribution of seed is impeded.
- The Third Party Contractor shall hand rake all areas that are too steep or otherwise cannot be safely harrowed or cultipacked in order to incorporate the broadcast seed to the specified depth.
- Hydro seeding may be used, on a limited basis, where the slope is too steep or soil conditions do not warrant conventional seeding methods. Fertilizer, where specified, may be included in the seed, virgin wood fiber, tackifier, and water mixture. When hydro-seeding, virgin wood fiber shall be applied at the rate of approximately 3,000 pounds per acre on an air-dry weight basis as necessary to provide at least 75 percent ground cover. Tackifier shall consist of biodegradable, vegetable-based material and shall be applied at the rate recommended by the manufacturer. The seed, mulch, and tackifier slurry shall be applied so that it forms a uniform, mat-like covering of the ground.
- Hess shall work with landowners to discourage intense livestock grazing of the construction ROW during the first growing season by utilization of temporary fencing or deferred grazing, or increased grazing rotation frequency.

4.11.5 Permanent Erosion and Sediment Control

The Contractor shall restore all existing landowner soil conservation improvements and structures disturbed by pipeline construction to the approximate pre-construction line and grade. Soil conservation improvements and structures include, but are not limited to, grassed waterways, toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.

4.11.5.1 Trench Plugs

The Contractor shall install trench plugs in steep terrain where necessary to limit the potential for trench line erosion and at the base of slopes adjacent to waterbodies and wetlands.

Trench plugs shall be constructed of materials such as sand bags, sand/cement bags, bentonite bags, or other suitable materials by the Contractor. The Contractor shall not use topsoil in trench Plugs.

4.11.5.2 Permanent Slope Breakers (Water Bars)

Permanent slope breakers (water bars) shall be constructed of soil or, in some instances, sand bags.

The Contractor shall construct permanent slope breakers on the construction ROW where necessary to limit erosion, except in cultivated and residential areas. Slope breakers shall divert surface runoff to adjacent stable vegetated areas or to energy-dissipating devices. In general, permanent slope breakers should be installed immediately downslope of all trench breakers. Permanent slope breakers shall be installed as specified on the construction drawings or generally with a minimum spacing as shown on the following table:

Slope (%)	Spacing (feet)
5 – 15	300
>15 – 30	200
>30	100

The gradient (fall) for each slope breaker shall be 2 percent to 4 percent unless otherwise approved by Hess based on site-specific conditions.

The Contractor shall construct slope breakers to divert surface flow to a stable, well-vegetated area. In the absence of a stable area, the Contractor shall construct appropriate energy-dissipating devices at the end of the slope breaker and beyond the area disturbed by construction.

4.11.5.3 Mulching

The Contractor shall apply mulch on all areas with high erosion potential and on slopes greater than 8 percent unless otherwise approved by Hess based on site-specific conditions or circumstances. The Contractor shall spread mulch uniformly over the area to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of straw or its equivalent. The Environmental Inspector may reduce the application rate or forego mulching an area altogether if there is an adequate cover of rock or organic debris to protect the slope from erosion.

Mulch application includes straw or grass hay mulch or hydro mulch and tackifier. The Contractor shall not apply mulch in cultivated areas unless deemed necessary by Hess.

The Contractor shall use mulch that is State of North Dakota certified, or by the state of origin, weed seed free.

The Contractor shall apply mulch immediately following seeding. The Contractor shall not apply mulch in wetlands.

If a mulch blower is used, the majority of strands of the mulching material shall not be shredded to less than 12 inches in length to allow anchoring. The Contractor shall anchor mulch immediately after application to minimize loss by wind and water.

When anchoring (straw crimping) by mechanical means, the Contractor shall use a tool specifically designed for mulch anchoring with flat, notched disks to properly crimp the mulch to a depth of 2 to 3 inches. A regular farm disk shall not be used to crimp mulch. The crimping of mulch shall be performed across the slope of the ground, not parallel to it. In addition, in areas of steep terrain, tracked vehicles may be used as a means of crimping mulch (equipment running up and down the hill to leave crimps perpendicular to the slope), provided they leave adequate coverage of mulch.

In soils possessing high erosion potential, the Contractor may be required to make two passes with the mulch-crimping tool; passes must be as perpendicular to the others as possible.

When anchoring with liquid mulch binders (tackifiers), the Contractor shall use a biodegradable tackifier derived from a vegetable-based, organic source. The Contractor shall apply mulch binders at rates recommended by the manufacturer.

The Contractor shall limit the use of tackifiers for anchoring straw and the use of hydromulch and tackifier to areas that are too steep or rocky to safely or effectively operate mechanical mulch-anchoring tools. No asphalt-based tackifiers shall be used on the Project.

4.11.5.4 Erosion Control Matting

Erosion control matting shall be applied in areas of high erosion potential. The Contractor shall anchor the erosion control matting with staples or other approved devices.

The Contractor shall use erosion control matting made of biodegradable, natural fiber such as straw or coir (coconut fiber).

The Contractor shall prepare the soil surface and install the erosion control matting to ensure it is stable and the matting makes uniform contact with the soil of the slope face or waterbody bank with no bridging of rills, gullies, or other low areas.

4.11.5.5 Riprap and Stream Bank Stabilization

Disturbed banks of streambeds and waterbodies shall be restored to their approximate original contours unless otherwise directed. Erosion protection shall be applied as specified in the construction drawings.

Most restored banks will be protected through the use of flexible channel liners.

If the original stream bank is excessively steep and unstable and/or flow conditions are severe, a more stable final contour may be specified and alternate stabilization measures may be installed.

Alternate stabilization measures may consist of rock riprap, bio-stabilization, or engineered structures such as brush layering, logwalls, cribwalls, or vegetated geo-grids.

Stream bank riprap structures shall consist of a layer of stone underlain with approved filter fabric or a gravel filter blanket. Riprap shall extend from the stabilized streambed to the top of the stream bank. Native rock shall be utilized wherever practicable.

4.11.6 Fences

Upon completion of all backfilling, cleanup, and restoration, including mulching and seeding of the construction ROW, permanent repairs shall be made to all fences by using either the original material or good quality new material similar to existing fences.

4.11.7 Farm Terraces

Hess will work with landowners and farm service agencies to ensure restoration of farm terraces to their pre-construction function. Hess may elect to negotiate a fair settlement with the landowner to employ a local land leveling contractor to restore the terrace.

Before any groundwork is performed in areas with farm terraces, Hess will conduct a civil survey and photograph each terrace from two to three perspectives to document the location and contours of each terrace. Both the channel contour and the terrace berm will be surveyed within the construction ROW and up to 100 feet on either side of the ROW boundaries. The pre-construction survey and photographs will provide a baseline to ensure the proper restoration of the terrace following construction.

The Contractor shall maintain the pre-disturbance drainage of water along the terrace channel and shall install temporary flume pipe for this purpose. As necessary, temporary erosion control measures such as water bars and sediment barriers shall be installed and maintained throughout construction to reduce the potential for soil erosion along or off the construction ROW.

Following installation of the pipe, the trench shall be backfilled, and the Contractor shall restore the terrace contours as agreed to with the landowner.

Should the landowner agree to have a local contractor restore the terraces, the Contractor shall backfill the trench and restore the terrace using typical compaction methods for pipeline construction with the understanding that the landowner's contractor will re-excavate the location and re-install the terrace utilizing land levelling equipment and special compaction methods.

Should the landowner desire the Contractor to restore the terraces, the pipeline contractor shall compact the trench before the terrace berm is replaced. Following restoration of the terraces, final contours and grades will be re-surveyed and documented with survey notes. Photographs will be taken from a minimum of two or three perspectives to document that the cross-section profile matches the adjacent undisturbed grades. Hess will perform post-construction monitoring and inspection with the landowner's concurrence. Should the terraces require further work, Hess will either compensate the landowner to perform the work or arrange for a local contractor to perform the work.

4.11.8 Right-of-Way and Pipeline Markers

Upon completion of all backfilling, cleanup and restoration, including mulching and seeding of the construction ROW, and during the time when the Contractor is making permanent repairs to fences, the Contractor shall install pipeline markers on each side of all roads, railroads, fence lines, stream crossings, and other areas where the pipeline markers do not conflict with intended land use.

4.12 Pasture and Range Lands

The following mitigation measures shall be implemented in addition to the requirements previously stated in Sections 4.1 thru 4.11 unless otherwise approved by Hess based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Access across the ROW during construction shall be provided at locations requested by landowners, if practicable.
- Shavings produced during pipe bevel operations shall be removed immediately to ensure that livestock and wildlife do not ingest this material.
- Litter and garbage shall be collected and removed from all construction sites at the end of the day's activities.
- Temporary gates shall be installed at fence lines for access to the construction ROW. These gates shall remain closed at all times. Upon completion of construction, the temporary gates shall be removed and the permanent fence replaced unless otherwise stated on the landowner line list.
- Feeding or harassment of livestock or wildlife is prohibited.
- Construction personnel shall not be permitted to have firearms or pets on any of the construction sites.
- All food and wastes shall be stored and secured in vehicles or appropriate facilities.
- Areas of disturbance in native range shall be seeded with the approved USFS native seed mix after topsoil replacement.
- Improved pasture shall be seeded with a seed mix approved by individual landowners.

4.13 Forested Lands

Mitigation measures are required to ensure that pipeline construction activities have a minimal impact on forested lands.

Clearing, grubbing, and grading of trees, brush, and stumps shall be performed in accordance with the following mitigation measures in addition to the requirements previously stated in Sections 4.1 thru 4.11 unless otherwise approved or directed by Hess based on site-specific conditions or circumstances. Hess will address mitigation, reclamation, and remediation measures with individual landowners and comply with any applicable state requirements. These measures include non-vegetative remediation to reverse impacts on windbreaks, shelterbelts, and living snow fences. Where the pipeline follows an existing ROW in forested areas, Hess attempted to route the pipeline as close as practical to the existing ROW. All work shall be conducted in accordance with applicable permits.

- Prior to the start of clearing activity, ROW boundaries, including pre-approved temporary workspaces, shall be clearly staked to prevent disturbance of unauthorized areas.
- If trees are to be removed from the construction ROW, Hess will consult with the landowner or landowner's designate to see if there are trees of commercial or other value to the landowner. Timber shall be salvaged as per landowner request.
- The ROW shall be reduced to a maximum width of 50 feet where the pipeline route crosses windbreaks, shelterbelts, and wooded areas.
- If there are trees of commercial or other value to the landowner, Hess will allow the landowner the right to retain ownership of the trees with the disposition of the trees to be negotiated prior to the commencement of land clearing and included in the easement agreement.
- If not performed by the landowner, the construction ROW Contractor may salvage all marketable timber from designated areas.
- Tree stumps shall be grubbed to a maximum of 5 feet on either side of the trench line and where necessary for grading a level surface for pipeline construction equipment to operate safely.
- Hess will follow the landowner's or landowner designee's desires as stated in the easement agreement regarding the disposal of trees, brush, and stumps of no value to the landowner by burning, burial, etc., or complete removal from any affected property.
- Timber salvage operations shall use cut-off-type saw equipment. Felling shall be undertaken in a manner that minimizes butt shatter, breakage, and off ROW disturbance. Skidders or alternate equipment shall be used to transport salvaged logs to stacking sites.
- Trees shall be felled to fall toward the center line of the ROW to avoid breaking trees and branches off ROW. Leaners (felled trees that inadvertently fall into adjacent undisturbed vegetation) shall be salvaged.
- Trees and slash falling outside the ROW shall be recovered and disposed.
- Salvaged logs shall be limbed and topped before removal from the construction ROW. Log decks (if required) shall be oriented to best facilitate loading by picker trucks and be located adjacent to the working side of the ROW, where possible.
- The Contractor shall not be allowed to dispose of woody debris in wooded areas along the pipeline ROW.
- Pruning of branches hanging over the ROW shall be done only when necessary for construction. Any branch that is broken or seriously damaged should be cut off near its fork and the collar of the branch preserved.
- All tree wastes, stumps, tree crowns, brushes, branches, and other forest debris shall be either burned, chipped (using a mobile chipper), or removed from the ROW according to Hess

instructions contained in the specific mitigation measures. Burial of this waste material on the site by the Contractor shall require the landowner's authorization. Chips must not be spread over cultivated land. However, they may be spread and incorporated with mineral soil over the forest floor at a density that shall not prevent revegetation of grass.

- Stump removal and brush clearing shall be done with bulldozers equipped with brush rakes to preserve organic matter.
- Log decking sites shall be established: 1) approximately 2,000 feet apart in timbered areas; 2) on sites located on approved temporary workspace in existing cleared areas; 3) in non-merchantable stands of timber; or 4) if no other options are available, in merchantable timber stands. Deck sites shall be appropriately sized to accommodate the loading equipment.
- If the landowner does not want the timber, the Contractor shall remove decked timber from the construction ROW and transport it to a designated all-weather access point or mill.
- Tree and shrub removal will be conducted in accordance with the Public Service Commission Tree and Shrub Mitigation Specifications.

4.14 Residential and Commercial/Industrial Areas

4.14.1 Residential and Commercial Areas

The principal measures that shall be used to mitigate impacts 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 shall be conducted in accordance with applicable permits.

- Notifying landowners prior to construction;
- Post warning signs as appropriate;
- Reduce 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;
- Remove 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;
- Fence 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;
- Limit the hours during which operations with high-decibel noise levels (i.e., drilling and boring) can be conducted;
- Limit dust impact through prearranged work hours and by utilizing dust minimization techniques;
- Ensure that construction proceeds quickly through such areas, thus minimizing exposure to nuisance effects such as noise and dust;
- Maintain access and traffic flow during construction activities, particularly for emergency vehicles;
- Clean up construction trash and debris daily;
- Fence 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 shall be done by personnel familiar with local horticultural and turf establishment practices.

4.14.2 Landowner Complaint Resolution Procedure

Hess will implement a landowner complaint procedure as follows:

- Landowners should first contact the construction spread office to express their concern over restoration or mitigation of environmental damages on their property. The Construction Manager or his designated representative shall respond to the landowner within 24 hours of receipt of the complaint.
- If the landowner has not received a response or is not satisfied with the response, he/she can contact Hess's representative Matt Carlson at 1-701-389-1093 and mcarlson@hess.com. The landowner should expect a response within 48 hours.

4.15 Operations and Maintenance

Operations and maintenance programs, such as vegetation management, pipeline maintenance, integrity surveys, and hydrostatic testing, may have an impact on the final reclamation of the ROW. To ensure the integrity of the facility and land surface reclamation of the ROW is maintained after completion of construction and that regulatory requirements are adhered to during operations, the following measures shall be implemented unless otherwise directed by Hess in response to site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Hess will monitor the pipeline ROW and all waterbody crossings for erosion or other potential problems that could affect the integrity of the pipeline. Any erosion identified will be reclaimed as expediently as practicable by Hess or by compensating the landowner to reclaim the area.
- Trench depressions on ditch line that may interfere with natural drainage, vegetation establishment, or land use will be repaired as expediently as practicable by Hess or by compensating the landowner to repair the area.
- Post-construction monitoring inspections will 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 revegetation is successful after the third growing season, no additional monitoring will be conducted. On USFS, state, and U.S. Army Corps of Engineers (USACE) managed lands, if revegetation is successful after the fifth growing season, 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.
- In grasslands identified as high and medium quality Dakota Skipper habitat, post-construction monitoring inspections would be conducted for 5 years after 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.
- 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, no more than 30 percent of the total vegetative cover can be non-native species.
- In non-agricultural areas, revegetation shall be considered successful if, upon visual survey, the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands.

- In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.
- Restoration shall 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.
- Weed control measures will be implemented as required by any applicable plan and in conjunction with the landowner.
- Hess will be responsible for correcting tile line or irrigation system repairs that fail, provided those repairs were made by Hess. Hess will not be responsible for tile line or irrigation system repairs for which Hess compensated the landowner to perform.
- When requested by owners in cultivated land, Hess will monitor the yield of land impacted by construction with the help of agricultural specialists. If yield deficiencies are indicated compared to yields on unaffected land, Hess will compensate the landowner for reduced yields and will implement procedures to return the land to equivalent capability.
- In residential areas, landowners may use the ROW provided they do not interfere with the rights granted to Hess. Trees, bushes, structures (including houses, tool sheds, garages, poles, guy wires, catch basins, swimming pools, trailers, leaching fields, and septic tanks), and any other objects not easily removable shall not be permitted on the permanent construction ROW without the written permission of Hess because they could impair access for maintenance of the pipeline.
- Hess will maintain communication with the landowner and tenant throughout the operating life of the pipeline to allow expedient communication of issues and problems as they occur. Hess will provide the landowner with corporate contact information for these purposes. Hess will work with landowners to prevent excessive erosion on lands disturbed by construction. Reasonable methods will be implemented to control erosion. These may not be implemented if the property across which the pipeline is constructed is bare cropland that the landowner intends to leave bare until the next crop is planted.
- If the landowner and Hess cannot agree upon a reasonable method to control erosion on the landowner's property, the recommendations of the appropriate NRCS office shall be considered by Hess and the landowner.

5.0 DRAIN TILE SYSTEMS

5.1 General

If underground drainage tile is damaged by the pipeline installation, it shall be repaired in a manner that ensures the tile line's proper operating condition at the point of repair. Hess may elect to negotiate a fair settlement with the affected county or landowner for repair of the damaged drain tile. In the event the landowner chooses to have the damaged tile repaired by Hess, the Contractor shall follow these guidelines and procedures to identify the location of drain tiles, to mitigate damages to drain tiles prior to and during construction, to repair drain tiles damaged during installation of the pipeline, to inspect the proper repair of drain tiles, and to provide post-construction monitoring to determine any impacts caused by repair of drain tiles. Since all public and private drain tile systems are unique (i.e., varying age, depth of cover, type of material, geometry on the land, etc.), it is not possible to develop a standard procedure for resolving each county's or landowner's drain tile issues. These guidelines provide a basis on which to develop site specific methodology to mitigate damage and to repair drain tiles affected by construction of the Project. Actual measures will be developed based on site-specific information unique to specific installations. However, all work shall be conducted in accordance with applicable permits.

5.2 Identification and Classification of Drain Tile Systems

Personnel shall attempt to identify and classify existing drain tile systems by meeting with local public officials and county engineers, and individual private landowners and tenants.

5.2.1 Publicly Owned Drain Tiles

Personnel shall identify and meet with the responsible county or local authority responsible for publicly owned drain tiles. Publicly owned drain tiles shall be identified and documented on the Project's 1" = 2000' U.S. Geological Survey quad strip maps and additional data collected for input into an electronic spreadsheet by county, township, range, and section; responsible agency; and size, type, and depth of cover (if known). This data shall be cross-referenced to the centerline survey to be completed by Hess. Additionally, any public records including maps or easement instruments on the drain tiles shall be acquired as well as any requirements of the local authority for installation of the pipeline.

5.2.2 Privately Owned Drain Tiles

ROW agents shall meet with landowners and tenants of privately owned land along the route. At a minimum, the ROW agents shall ascertain the data concerning drain tiles outlined in a landowner questionnaire. The questionnaire requests data concerning: type of drain tile system; size, type of material, and depth of cover; preference for repair of drain tiles; and identification of local drain tile contractors. These data shall be collected into an electronic spreadsheet for utilization by ROW personnel in negotiating payments for easements and damages and by engineering or construction personnel for inclusion in specifications for the construction Contractor.

5.3 Mitigation of Damage to Drain Tile Systems

Hess shall undertake mitigation measures to reduce damage to publicly and privately owned drain tile systems prior to and during installation of the pipeline.

5.3.1 Non-interference with Drain Tile

The Project shall 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. Where not practicable, Hess will pursue alternative mitigation measures mutually acceptable to the landowner and jurisdictional agencies. Typically, the pipeline will be installed below the elevation of drain tiles with a minimum clearance of 12 inches.

5.3.2 Non-disturbance of Drain Tile Mains

Publicly owned and privately owned drain tile mains will be identified through the processes identified in Section 5.2, Identification and Classification of Drain Tile Systems. Drain tile mains are essential to the overall drainage system of a land area and if disturbed, may require excessive pumping/dewatering of the pipe trench unless temporarily repaired and maintained until permanently repaired.

Hess will 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 will not be cut and repaired during mainline installation (a pipe section shall be left out and installed by a tie-in crew without damaging the drain tile main).

5.3.3 Relocation or Replacement of Existing Drain Tiles Prior to Construction

In many instances, drain tile systems that have been installed after the installation of adjacent existing pipelines were installed with “headers” parallel to the existing pipeline with periodic jumpovers. The distance of these headers from the existing pipeline may vary.

Some of these drain tile headers may be most effectively relocated and/or replaced to the east of the Project. The existing header will be capped and made into a single drain. This could reduce the number of drain tile crossings on a particular landowner’s property by a significant quantity, thereby reducing the risk that repairs will fail.

5.3.4 Future Drain Tiles/Systems

Hess will attempt to determine where public agencies and private landowners or tenants are proposing to install drain tile systems in the future. These locations will be input into an electronic spreadsheet by county, township, range, and section; landowner or responsible public agency; and proposed size and depth of cover. Hess will endeavor to construct the pipeline at a depth and elevation to accommodate the future installation of the proposed drain tile systems.

5.3.5 Other Mitigation Measures

Other mitigation measures that may be implemented during installation of the pipeline are as follows:

- Not removing topsoil from the working side of the construction ROW to prevent crushing of drain tile by heavy equipment;
- Spreading ditch and spoil side topsoil (not subsoil) over the working side to provide additional soil depth to protect existing drain tiles;
- Restricting the work of the pipe lowering crew if ground conditions are too wet to adequately support the heavy equipment;
- Limiting travel of heavy equipment on the working lane of the construction ROW where possible;
- Limiting travel of heavy equipment to one pass over the drain tile per work crew where possible; and
- Removing and replacing topsoil during drain tile replacement should tile be crushed on the working side of the ROW.

5.4 Responsibility for Repair of Drain Tile Systems

Temporary and permanent drain tile repairs shall be the responsibility of the Contractor. The physical repairs shall be made by qualified and experienced drain tile repair personnel.

5.4.1 Local Drain Tile Contractor Repair

Hess will identify and qualify local drain tile contractors in the geographical area of the pipeline route from interviews with local public officials, landowners, tenants, and drain tile contractors. The preferred responsibility for permanent repair of drain tiles shall be for the pipeline Contractor to subcontract the supervision and repair to local reputable drain tile contractors acceptable to the landowners and tenants.

5.4.2 Pipeline Contractor Repair

In the event local drain tile contractors are not available to subcontract the supervision and repair, permanent repair shall be made with the Contractor's supervision, equipment, and labor.

5.4.3 Landowner/Tenant Repair

The landowner or tenant may agree to take responsibility for the permanent repair of his drain tiles if not precluded by regulatory agency. The landowner or tenant shall be requested to ensure his ability to coordinate and complete the drain tile repair in a timely manner to allow the pipeline Contractor to completely backfill the damaged drain tile for repair by landowner/tenant in the immediate future. Hess shall require that its representative be present to ensure the permanent drain tile repairs are made in accordance with the minimum requirements of this manual.

5.5 Drain Tile Repairs

The Contractor will make every effort possible to locate all tile lines within the construction ROW prior to and during installation so repairs can be made if necessary.

5.5.1 Temporary Repairs During Construction

Drain tiles damaged or cut during the excavation of the trench shall be marked with a lath and ribbon in the spoil bank. Care shall be taken to locate markers where the chance of disturbance shall be minimized and a written record maintained of each drain tile crossing. A work crew following the pipeline trench crew shall complete a temporary repair to allow continuing flow. If a drain tile line is not temporarily repaired, the open ends of the drain tile shall be screened to prevent entry of foreign materials and small animals.

5.5.2 Permanent Repairs

Permanent repairs shall be made for all drain tiles damaged by installation of the pipeline.

5.5.2.1 Ditch Line Only Repairs

If water is flowing through a damaged tile line, the tile line shall be immediately and temporarily repaired until such time that permanent repairs can be made. If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within 7 days from the time damage occurred. The temporary repair shall be removed just prior to lowering in the pipeline.

Drain tiles must be permanently repaired before the pipeline trench is backfilled and within 14 days of construction completion, weather and soil conditions permitting. All tile lines shall be repaired with materials of the same or better quality as that which was damaged. The drain tile marker shall not be removed until the tile repairs have been inspected, approved, and accepted by Hess's inspectors, the county inspectors, where applicable, and the landowner or tenant.

5.5.2.2 Ditch Line and Temporary Work Space Repairs

Prior to making the permanent drain tile repair, the Contractor shall probe a segmented sewer rod with a plug that is not more than 15 percent smaller than the internal diameter of the drain tile to determine if additional damage has occurred to the drain tile. If the probe does not freely insert into the drain tile across

the temporary workspace of pipeline construction, the Contractor shall excavate, expose, and repair the damaged drain tile to its original or better condition.

5.6 Inspection/Acceptance of Drain Tile Repairs

Drain tile repairs will be inspected by Hess construction inspectors, county inspectors, as applicable, and the landowner or tenant or his representative.

Hess will designate inspector(s) for the sole purpose and responsibility for inspection of all repairs of drain tiles. These inspectors will be, if possible, employed from local drain tile installation contractors, local farmers with extensive drain tile experience, or previously employed or retired employees of local jurisdictions familiar with drain tile installation and repair. In the event that a sufficient number of inspectors from these sources is not available, Hess will conduct in-the-field training seminars on drain tile repair for additional inspection personnel.

Inspection personnel shall observe the permanent repair of all drain tiles to ensure that the replacement drain tile is: 1) the proper size and type; 2) installed at the proper grade; 3) properly supported and backfill beneath the drain tile is properly placed and compacted; and 4) properly tied into the existing drain tile. The inspection shall be documented on the Drain Tile Inspection Report Form.

A drain tile repair shall not be accepted until Hess's construction inspector and the landowner or tenant or designated representative approves the inspection form.

6.0 WETLAND CROSSINGS

6.1 General

Aboveground facilities shall not be located in a wetland, except where the location of such facilities outside of wetlands would preclude compliance with U.S. Department of Transportation pipeline safety regulations.

Wetland boundaries shall be clearly marked in the field with signs and/or highly visible flagging during construction.

A wetland environment typically has soils that are saturated and non-cohesive. In these wetland environment types, supplemental support in the form of timber riprap or prefabricated equipment mats may be required for construction equipment to cross, if necessary, safely and efficiently. Wetlands and streams have been delineated through field surveys conducted in 2012, 2013, and 2014.

Hess may allow modification of the following specifications as necessary to accommodate site-specific conditions or procedures. Any modifications must still comply with all applicable regulations and permits.

6.2 Easement and Workspace

The Contractor shall maintain wetland boundary markers during construction in all areas and until permanent seeding is complete in non-cultivated areas. The Contractor shall locate extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, where permitted by topographic conditions.

The Contractor shall limit clearing of vegetation between extra work areas and the edge of the wetland to the construction ROW and limit the size of extra work areas to the minimum needed to set up the HDD/bore crossing.

6.3 Vehicle Access and Equipment Crossing

The only access roads, other than the construction ROW that the Contractor shall use in wetlands, are those existing public roads and private roads acquired by Hess from the landowner as shown on the construction drawings.

To the extent practicable, the Contractor's construction equipment shall only cross wetlands to access portions of the line not accessible by any other access road or project route.

If equipment must drive across a wetland, the Contractor shall use the following methods for equipment crossing unless otherwise approved by Hess based on site-specific conditions:

- Wide-track or balloon-tire construction equipment; and
- Conventional equipment crossing on timber and slash (riprap) cleared from the ROW, timber mats, or prefabricated equipment mats.

6.4 Temporary Erosion and Sediment Control

The Contractor shall install sediment barriers across the entire construction ROW immediately upslope of the wetland boundary at all wetland crossings, as necessary, to prevent sediment flow into the wetland. Sediment barriers shall be properly maintained by the Contractor throughout construction and reinstalled as necessary. Removable sediment barriers can be removed during the construction day, but shall be re-installed after construction has stopped for the day or when heavy precipitation is imminent. The Contractor

shall maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.

Where wetlands are adjacent to the construction ROW, the Contractor shall install sediment barriers along the edge of the construction ROW as necessary to prevent a sediment flow into the wetland.

6.5 Wetland Crossing Procedures

Hess will bore all field delineated wetlands potentially impacted by construction of the project ROW. The following general mitigation procedures shall be followed by the Contractor in the vicinity of wetlands along the construction ROW unless otherwise approved or directed by Hess based on site-specific conditions. All work shall be conducted in accordance with applicable permits.

- Limit the duration of construction-related disturbance within the vicinity of wetlands to the extent practicable.
- If equipment needs to cross a wetland, the Contractor will use no more than two layers of timber riprap, and temporary flumes and culverts will be used to minimize disturbance.
- Dewater the trench in a manner to prevent erosion and heavily silt-laden flowing directly into any wetland or waterbody.
- Remove all timber riprap and prefabricated equipment mats upon completion of construction.
- Locate hydrostatic test manifolds outside wetlands and riparian areas.
- Prohibit storing hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating activities in a wetland, or within 100 feet of any wetland boundary.
- Perform all equipment maintenance and repairs in upland locations at least 100 feet from waterbodies and wetlands.
- Avoid parking equipment overnight within 100 feet of a watercourse or wetland.
- Prohibit washing equipment in waterbodies or wetlands.
- Attempt to refuel all construction equipment in an upland area at least 50 feet from a wetland boundary (otherwise follow the procedures outlined in Chapter 3.0, Spill Prevention and Containment).
- Avoid sand blasting in wetlands to the extent practicable. If sandblasting is performed within a wetland, the Contractor shall place a tarp or suitable material in such a way as to collect as much waste shot as possible and dispose of the collected waste. The Contractor shall clean up all visible deposits of wastes and dispose of the waste at an approved disposal facility.
- Installing sediment barriers across the entire ROW where the ROW enters and exits the wetland.

6.6 Restoration and Reclamation

All timber riprap, timber mats, and prefabricated equipment mats and other construction debris in the vicinity of wetlands and waterbodies shall be removed upon completion of construction. If appropriate, the Contractor shall replace topsoil and restore original contours. The Contractor shall stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and revegetation, as applicable, during final clean up.

If necessary, reclaim any disturbed areas in wetland and waterbody areas to pre-construction elevations and revegetate, as appropriate. The Contractor shall not use fertilizer, lime, or mulch in wetlands.

7.0 WATERBODIES AND RIPARIAN AREAS

7.1 General

The Contractor shall comply with requirements of all permits issued for the waterbody crossings by federal, state, or local agencies.

Waterbody includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:

- Minor Waterbody includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction.
- Intermediate Waterbody includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction.
- Major Waterbody includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.

The Contractor shall supply and install advisory signs in a readily visible location along the construction ROW at a distance of approximately 50 feet on each side of the crossing and on all roads that provide direct construction access to waterbody crossing sites. Signs shall be supplied, installed, maintained, and then removed upon completion of the Project. Additionally, signs shall be supplied and installed by the Contractor on all intermediate and major waterbodies accessible to recreational boaters warning boaters of pipeline construction operations.

The Contractor shall not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating within 100 feet of any waterbody. The Contractor shall not refuel construction equipment within 100 feet of any waterbody. If the Contractor must refuel construction equipment within 100 feet of a waterbody, it must be done in accordance with the requirements outlined in Chapter 3.0, Spill Prevention and Containment. All equipment maintenance and repairs shall be performed in upland locations at least 100 feet from waterbodies and wetlands. All equipment parked overnight shall be at least 100 feet from a watercourse or wetland, if possible. Equipment shall not be washed in waterbodies or wetlands.

Throughout construction, the Contractor shall maintain adequate flow rates to protect aquatic life and to prevent the interruption of existing downstream uses.

Hess may allow modification of the following specification, as necessary, to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits. Hess will complete site-specific crossing plans for certain waterbody crossings if required by the applicable regulatory agencies during federal or state permitting processes.

7.2 Easement and Work Space

The permanent easement, temporary work space, additional temporary work space, and any special restrictions will be depicted on the construction drawings. The work shall be contained within these areas and be limited in size to the minimum required to construct the waterbody crossing.

The Contractor shall locate all extra work areas (such as staging areas and additional spoil storage areas) at least 10 feet from the water's edge if practicable.

At all waterbody crossings, the Contractor shall install flagging across the construction ROW at least 10 feet from the water’s edge prior to clearing and ensure that riparian cover is maintained where practicable during construction.

7.3 Vehicle Access and Equipment Crossings

The Contractor shall inspect equipment for fluid leaks prior to entering or crossing over waterbodies.

Equipment crossings shall be perpendicular to drainage bottoms wherever possible.

Erosion and sediment control barriers shall be installed and maintained around vehicle access points, as necessary, to prevent sediment from reaching the waterway.

The Contractor shall be responsible for the installation, maintenance, and removal of all temporary access crossings including portable bridges, bridges made from timber or mats, flumes, culverts, sand bags, subsoil, coarse granular material, and riprap.

The Contractor shall ensure that culverts and flumes are sized and installed of sufficient diameter to accommodate the existing flow of water and those that potentially may be created by sudden runoffs. Flumes shall be installed with the inlet and outlet at natural grade, if possible.

Where bridges, culverts, or flumes are installed across the work area, the Contractor shall be responsible for maintaining them (e.g., preventing collapse, clogging, or tilting). All flumes and culverts shall be removed as soon as possible upon completion of construction.

The width of the temporary access road across culverts and flumes and the design of the approaches and ramps shall be adequate for the size of vehicle and equipment access required. The ramps shall be of sufficient depth and constructed to prevent collapse of the flumes, and the approaches on both sides of the flume shall be feathered.

Where culverts are installed for access, the culvert shall be of sufficient length to convey the stream flow through the construction zone.

The Contractor shall maintain equipment bridges to prevent soil from entering the waterbody.

7.4 Waterbody Crossing Methods

Construction methods pertinent to waterbody crossings are presented below. HDD/bore will be used at field delineated waterbodies crossings. In conjunction with the appropriate jurisdictional agency, Hess will develop specific crossing plans for major waterbodies that contain recreationally or commercially important fisheries, or are classified as special use. Hess will consult with state fisheries agencies with respect to applicable construction windows for each crossing and develop specific construction and crossing methods for open cuts in conjunction with USACE permitting and USFWS consultation.

7.4.1 Non-Horizontal Directional Drill Crossings/Horizontal Bore Crossings

The HDD/bore methods will be utilized for field delineated waterbodies. The Contractor shall construct each directional drill waterbody crossing in accordance with a site-specific plan as shown in the construction drawings.

Drilling fluids and additives utilized during implementation of a directional drill shall be non-toxic to the aquatic environment.

The Contractor shall develop a contingency plan to address a frac-out during a directional drill. The plan shall include instructions for monitoring during the directional drill and mitigation in the event that there is a release of drilling fluids. Additionally, the waterbody shall be monitored downstream by the Contractor for any signs of drilling fluid.

The Contractor shall dispose of all drill cuttings and drilling mud at a BLM-approved location. Disposal options may include spreading over the construction ROW in an upland location approved by Hess or hauling to an approved licensed landfill or other site approved by Hess.

Where required, the horizontal bore method will be used for crossing waterbodies. The Contractor shall construct each horizontal bore waterbody crossing in accordance with a site-specific plan as shown in the construction drawings.

7.5 Clearing

All staging areas for materials and equipment shall be located at least 50 feet from the waterbody edge. The Contractor shall preserve as much vegetation as possible along the waterbody banks while allowing for safe equipment operation.

Clearing and grubbing for temporary vehicle access and equipment crossings shall be carefully controlled to minimize sediment entering the waterbody from the construction ROW.

Plant debris or soil inadvertently deposited within the high water mark of waterbodies shall be promptly removed in a manner that minimizes disturbance of the waterbody bed and bank. Excess floatable debris shall be removed above the high water mark from areas immediately above crossings.

Vegetation adjacent to waterbody crossings by HDD or boring methods shall not be disturbed except by hand clearing as necessary for drilling operations.

7.6 Grading

The construction ROW adjacent to the waterbody shall be graded so that soil is pushed away from the waterbody rather than towards it whenever possible.

In order to minimize disturbance to woody riparian vegetation within extra workspaces adjacent to the construction ROW at waterbody crossings, the Contractor shall limit grading and grubbing to upland areas adjacent to waterbody banks.

7.7 Temporary Erosion and Sediment Control

The Contractor shall install and maintain sediment barriers across the entire construction ROW at all flowing waterbody crossings.

The Contractor shall install sediment barriers immediately after initial disturbance adjacent uplands. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.

Where waterbodies are adjacent to the construction ROW, the Contractor shall install and maintain sediment barriers along the edge of the construction ROW as necessary to contain spoil and sediment within the construction ROW.

8.0 HYDROSTATIC TESTING

8.1 Testing Equipment Location

The Contractor shall provide for the safety of all pipeline construction personnel and the general public during hydrostatic test operations by placing warning signs in populated areas. The Contractor shall locate hydrostatic test manifolds at least 50 feet outside wetlands and riparian areas to the maximum extent practicable.

8.2 Test Water Source and Discharge Locations

Hess is responsible for acquiring all permits required by federal, state, and local agencies for procurement of water and for the discharge of water used in the hydrostatic testing operation. Hess will obtain hydrostatic test water from an approved location or municipality to hydrostatically test the pipeline, and plans to dispose of all hydrostatic test water via a contracted trucking company, which will transport the water to a wastewater treatment facility for treatment prior to be discharged.

8.3 Filling the Pipeline

After final positioning of the pipe, the Contractor shall fill the pipe with water. Pipe ends shall not be restrained during the fill. The fill pump shall be set on a metal catch pan of sufficient dimensions to contain all leaking lubricants or fuel and prevent them from entering the water source. The suction inlet shall be placed in a screened enclosure located at a depth that shall not allow air to be drawn in with the water. The screened enclosure shall be such that the fill water is free of organic or particulate matter.

The Contractor shall provide a filter of the backflushing or cartridge type with a means of cleaning without disconnecting the piping. The filter shall have the specifications of 100 mesh screen. If the cartridge type is used, a sufficient quantity of cartridges shall be on hand at the filter location. The Contractor shall install the filter between the fill pump and the test header. The Contractor shall be responsible for keeping the backflush valve on the filter closed during the filling operation. The Contractor shall be responsible for the proper disposal of materials backflushed from the filter or filter cartridges. The Contractor shall not be allowed to backflush the filter into the stream or other water source.

8.4 Dewatering the Pipeline

The Contractor shall comply with state-issued North Dakota Pollution Discharge Elimination System permits for discharging test water.

The Contractor shall not discharge any water containing oil or other substances that are in sufficient amounts as to create a visible color film on the surface of the receiving water.

The Contractor shall not discharge into state-designated exceptional value waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission. To avoid impacts from introduced species, no inter-basin transfers (discharge) of hydrostatic test water shall occur.

Hess plans to dispose of all hydrostatic test water via a contracted trucking company, which will transport the water to a wastewater treatment facility for treatment prior to be discharged.

The Contractor shall regulate the pig velocity discharge rate (3,000 gallons per minute maximum), use energy dissipation devices, and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive stream flow. Water must be disposed of using good engineering judgment so that all federal, state, and local environmental standards are met. Dewatering lines

shall be of sufficient strength and be securely supported and tied down at the discharge end to prevent whipping during this operation.

To reduce the velocity of the discharge, the Contractor shall utilize an energy-dissipating device described as follows:

8.4.1 Splash Pup

A splash pup consists of a piece of large diameter pipe (usually over 20-inch outside diameter) of variable length with both ends partially blocked that is welded perpendicularly to the discharge pipe. As the discharge hits against the inside wall of the pup, the velocity is rapidly reduced and the water is allowed to flow out either end. A variation of the splash pup concept, commonly called a diffuser, incorporates the same design, but with capped ends and numerous holes punched in the pup to diffuse the energy.

8.4.2 Splash Plate

The splash plate is a quarter section of 36-inch pipe welded to a flat plate and attached to the end of a 6-inch discharge pipe. The velocity is reduced by directing the discharge stream into the air as it exits the pipe. This device also is effective for most overland discharge.

8.4.3 Plastic Liner

In areas where highly erodible soils exist or in any low flow drainage channel, it is a common practice to use layers of visqueen (or any of the new construction fabrics currently available) to line the receiving channel for a short distance. One anchoring method may consist of a small load of rocks to keep the fabric in place during the discharge. Additional BMPs, such as the use of plastic sheeting or other material to prevent scour, shall be used as necessary to prevent excessive sedimentation during dewatering.

8.4.4 Straw Bale Dewatering Structure

Straw bale dewatering structures are designed to dissipate and remove sediment from the water being discharged. Straw bale structures are used for on land discharge of wash water and hydrostatic test water and in combination with other energy dissipating devices for high volume discharges. A dewatering filter bags may be used as an alternative to straw bale dewatering structures.

Appendix D

Typical Construction Drawings

TYPICAL DETAIL DRAWINGS

HAWKEYE
TRUNKLINES PROJECT
BAKKEN DEVELOPMENT

WILLIAMS COUNTY & McKENZIE COUNTY, NORTH DAKOTA

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-40000.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS HAWKEYE
TRUNKLINES PROJECT
COVER SHEET

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-40000	0

UPI DWG. NO. 21036-505-TYP-40000

DRAWING INDEX

TYPICAL DETAIL DRAWINGS

DRAWING NO.	REV. NO.	TITLE
NDP-HBAK-PPL-DET-000-40000	0	COVER SHEET
NDP-HBAK-PPL-DET-000-40001	1	INDEX SHEET
NDP-HBAK-PPL-DET-000-41011	0	PIPELINE MARKER TYPE 1
NDP-HBAK-PPL-DET-000-41012	0	PIPELINE MARKER TYPE 2
NDP-HBAK-PPL-DET-000-41013	0	PIPELINE AERIAL MARKER
NDP-HBAK-PPL-DET-000-41031	0	SILT FENCE BARRIER INSTALLATION
NDP-HBAK-PPL-DET-000-41032	0	STRAW BALE INSTALLATION
NDP-HBAK-PPL-DET-000-41033	0	INTERCEPTOR DIKE INSTALLATION
NDP-HBAK-PPL-DET-000-41034	0	EROSION CONTROL BLANKET INSTALLATION
NDP-HBAK-PPL-DET-000-41037	0	RIP-RAP PLACEMENT
NDP-HBAK-PPL-DET-000-41051	1	EXCAVATION AND BACKFILL
NDP-HBAK-PPL-DET-000-41052	0	UTILITY CROSSING
~~NDP-HBAK-PPL-DET-000-41053~~	~~0~~	~~TOPSOIL SEGREGATION TECHNIQUES~~ DELETED
NDP-HBAK-PPL-DET-000-41054	0	FENCE WITH TEMPORARY GATE
NDP-HBAK-PPL-DET-000-41055	1	SECTION VIEWS
NDP-HBAK-PPL-DET-000-41056	0	TYPICAL CONSTRUCTION SINGLE PIPELINE
NDP-HBAK-PPL-DET-000-41057	0	TYPICAL CONSTRUCTION PRIVATE & STATE LAND
NDP-HBAK-PPL-DET-000-41058	0	TYPICAL CONSTRUCTION US FORESTRY SERVICE LAND
NDP-HBAK-PPL-DET-000-41060	1	R.O.W. U.S. FOREST SERVICE
NDP-HBAK-PPL-DET-000-41061	1	RIGHT-OF-WAY PRIVATE OWNERSHIP
NDP-HBAK-PPL-DET-000-41062	0	DOWNWARD SIDE SLOPE WORKSPACE WITHIN FOREST SERVICE
NDP-HBAK-PPL-DET-000-41063	0	DOWNWARD SIDE SLOPE WORKSPACE ON PRIVATE LAND
NDP-HBAK-PPL-DET-000-41064	0	UPWARD SIDE SLOPE WORKSPACE WITHIN FOREST SERVICE
NDP-HBAK-PPL-DET-000-41065	0	UPWARD SIDE SLOPE WORKSPACE WITHIN PRIVATE OWNERSHIP
NDP-HBAK-PPL-DET-000-41066	1	RIGHT-OF-WAY, RESTRICTED 35' WIDTH
NDP-HBAK-PPL-DET-000-41070	1	SINGLE BORE / HDD CROSSING - TYPE 1
NDP-HBAK-PPL-DET-000-41071	1	DOUBLE BORE / HDD CROSSING - TYPE 1
NDP-HBAK-PPL-DET-000-41075	0	SINGLE BORE / HDD CROSSING - TYPE 2
NDP-HBAK-PPL-DET-000-41076	1	DOUBLE BORE / HDD CROSSING - TYPE 2
NDP-HBAK-PPL-DET-000-41077	0	FOREIGN PIPELINE CROSSING
NDP-HBAK-PPL-DET-000-41078	0	TRENCH BREAKER
NDP-HBAK-PPL-DET-000-41131	0	CATHODIC PROTECTION TEST STATION TYPE #1
NDP-HBAK-PPL-DET-000-41133	0	CATHODIC PROTECTION TEST STATION AT FOREIGN PIPELINE CROSSING
NDP-HBAK-PPL-DET-000-41136	0	CATHODIC PROTECTION TEST STATION TYPE #2
NDP-HBAK-PPL-DET-000-41137	0	CATHODIC PROTECTION TEST STATION WITH ANODE

NO	REVISION	DATE	DRAWN	CHKD
1	UPDATED ISSUE	10/31/14	GI	JC
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL
6848 Loop Central Drive
Suite 157
Houston, Texas 77081
713.425.8000
1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT INDEX

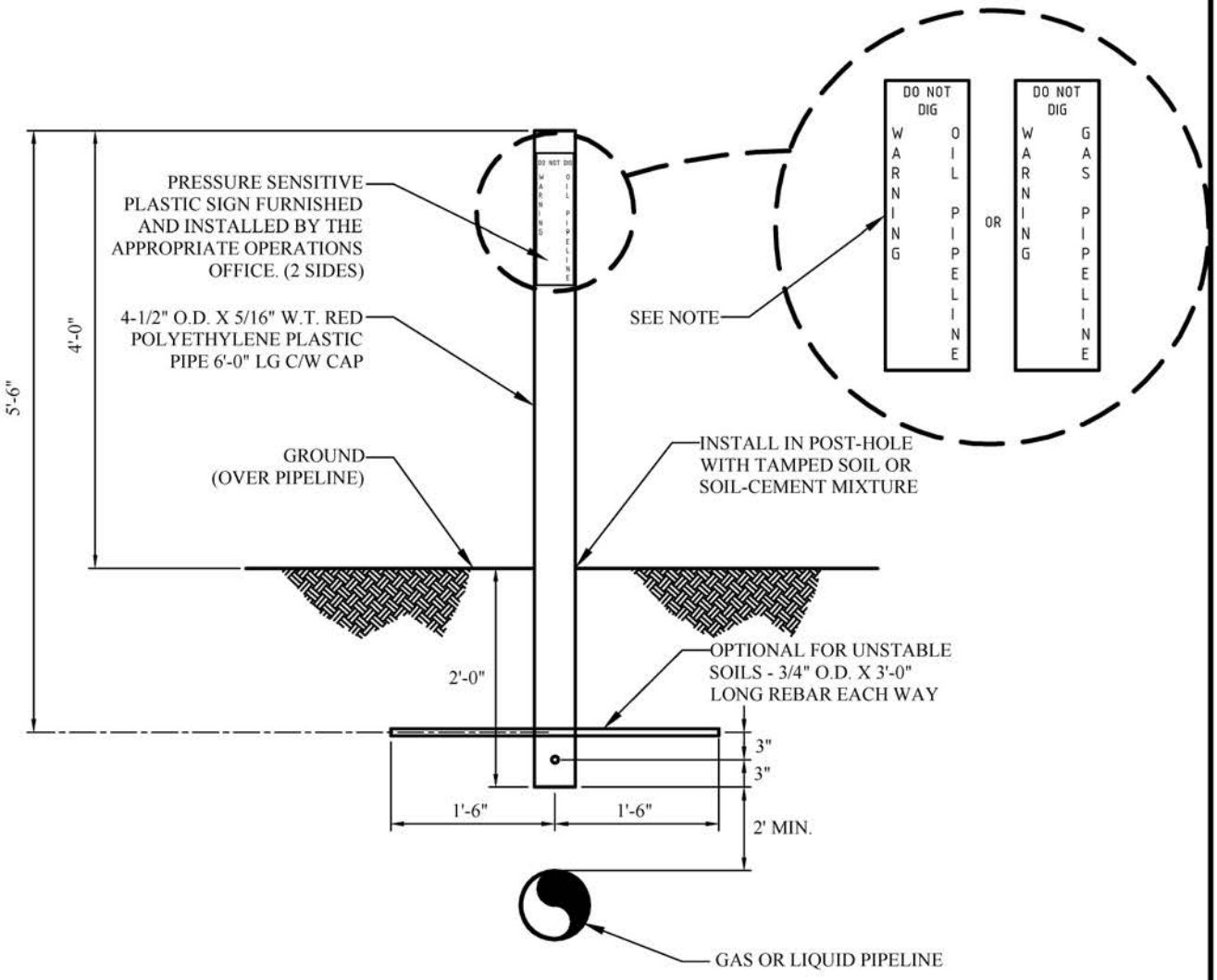
SCALE:

HESS DWG. NO. NDP-HBAK-PPL-DET-000-40001

REV. 1

UPI DWG. NO. 21036-505-TYP-40001

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-40001.DWG



NOTE:
PIPELINES SHALL BE MARKED AT EDGES OF FACILITIES AND CROSSING RIGHT-OF-WAY, ON BOTH SIDES, WITH THE SIZE, DEPTH, CONTENTS OF CARRIER LINE, AND OWNER INFORMATION. MAXIMUM DISTANCE BETWEEN MARKERS IS 1600'.

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

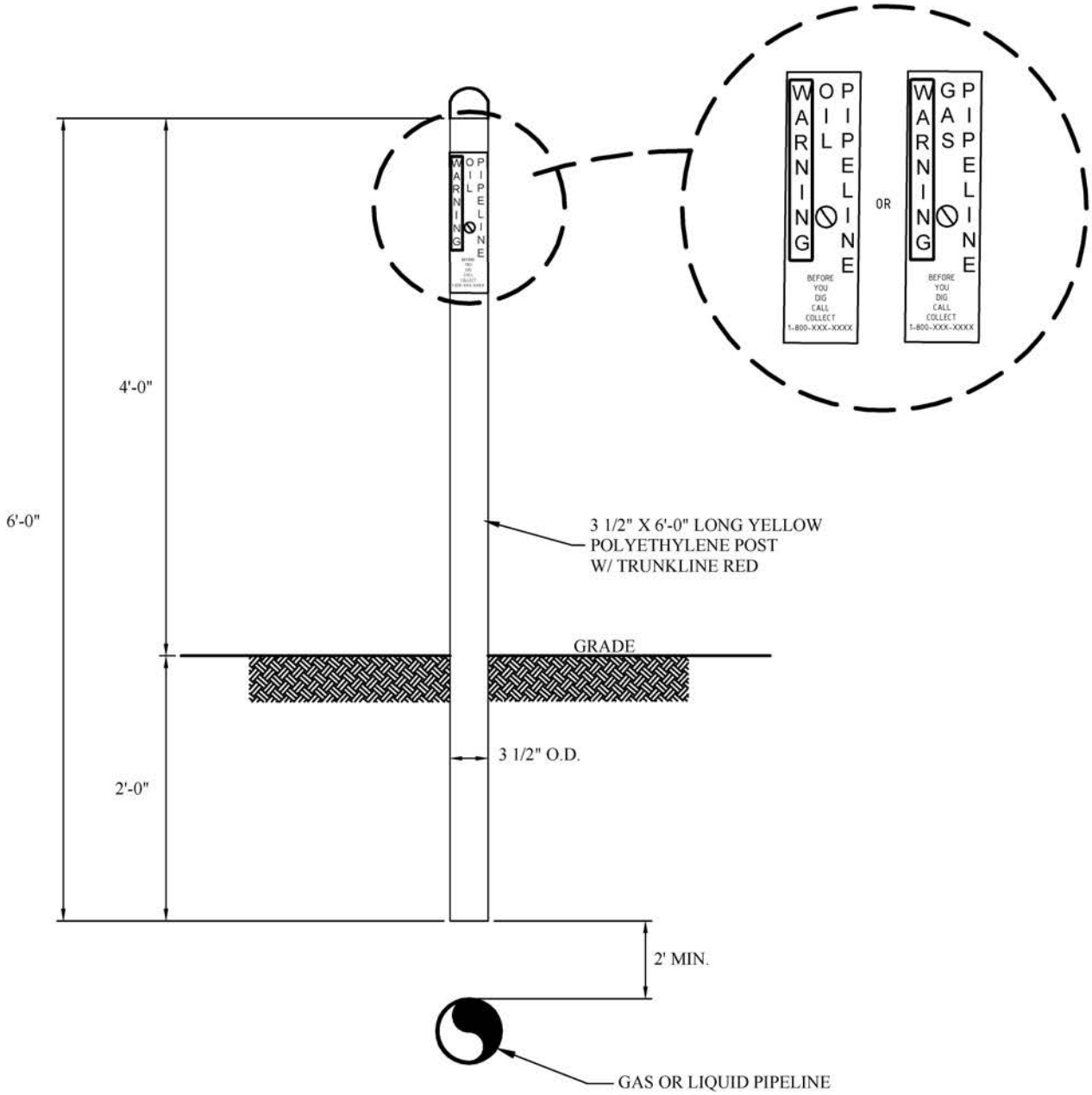
HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL CONSTRUCTION PIPELINE MARKER TYPE 1

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41011 | REV. 0

UPI DWG. NO. 21036-505-TYP-41011

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41011.DWG



NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION PIPELINE MARKER TYPE 2

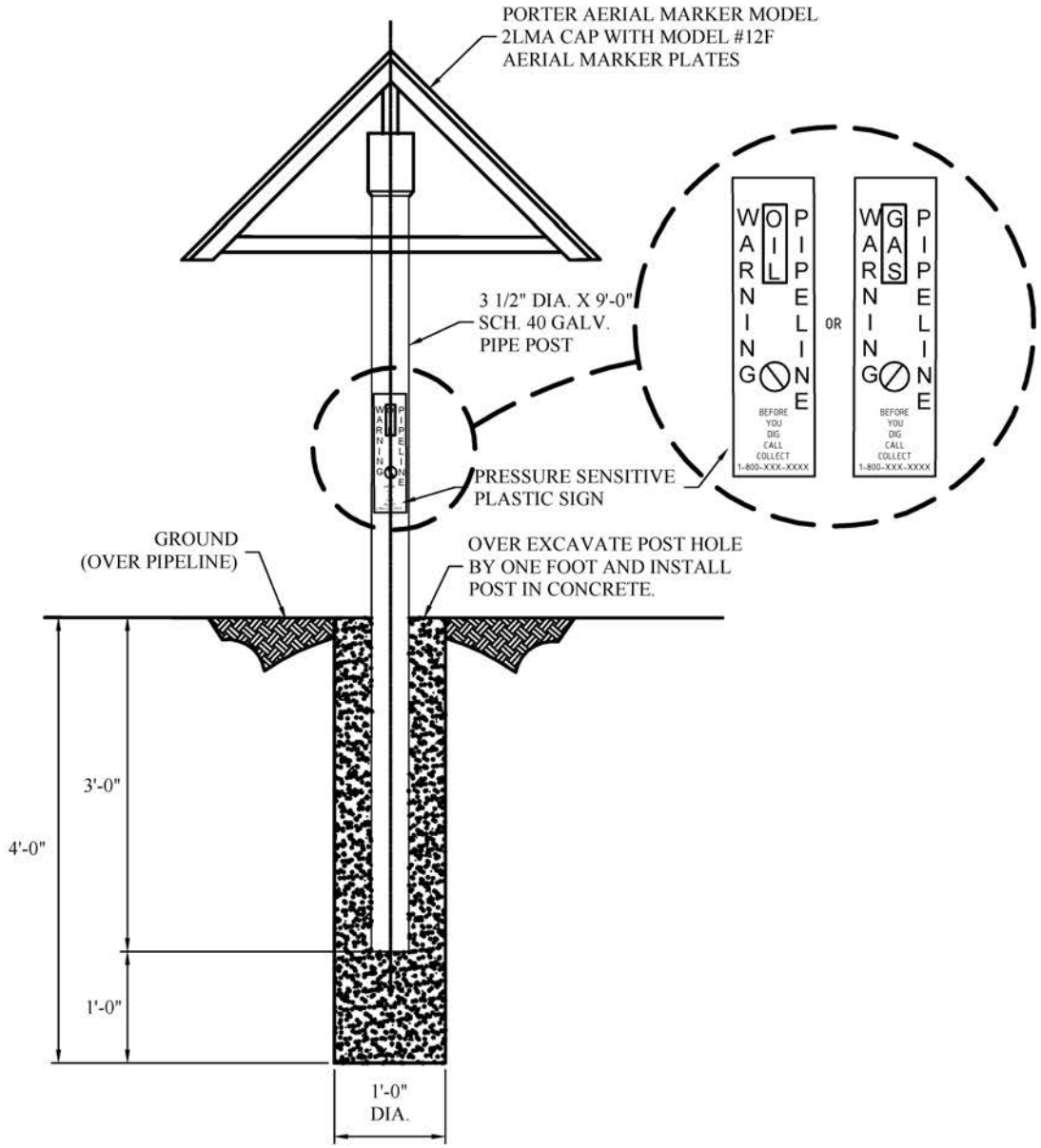
SCALE:

HESS DWG. NO. NDP-HBAK-PPL-DET-000-41012

REV. 0

UPI DWG. NO. 21036-505-TYP-41012

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41012.DWG



NOTE:

1. AERIAL MARKERS SHALL BE LOCATED AS DIRECTED BY INSPECTOR.
2. MINIMUM 2' CLEARANCE TO PIPELINE.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41013.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

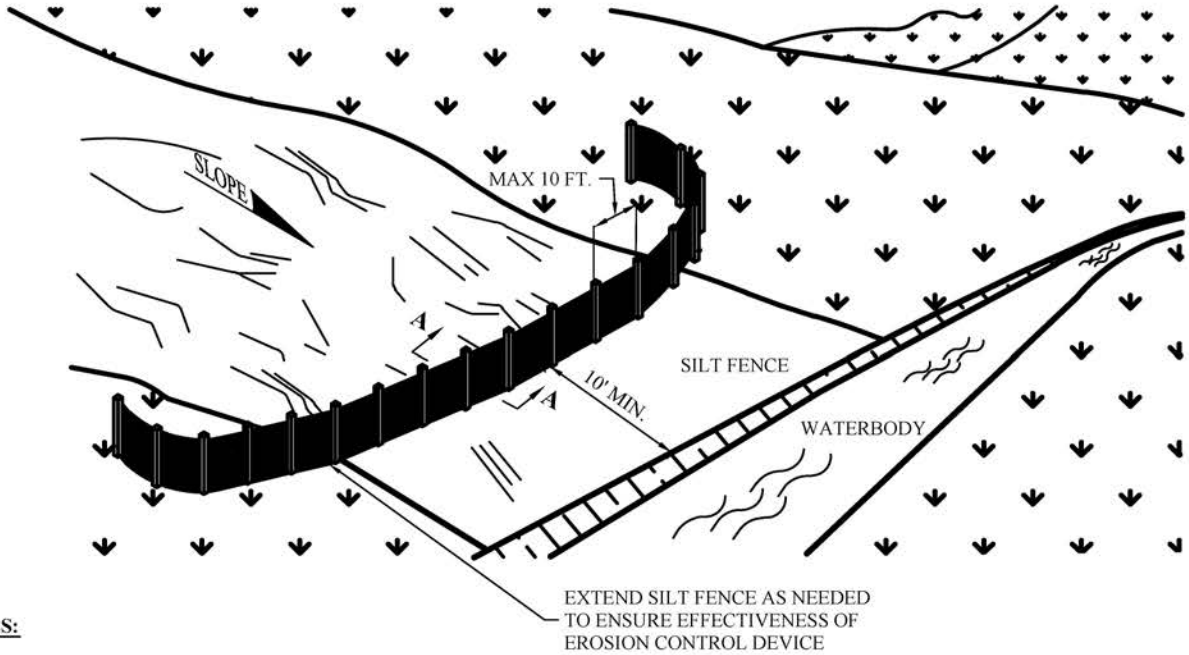
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION PIPELINE AERIAL MARKER

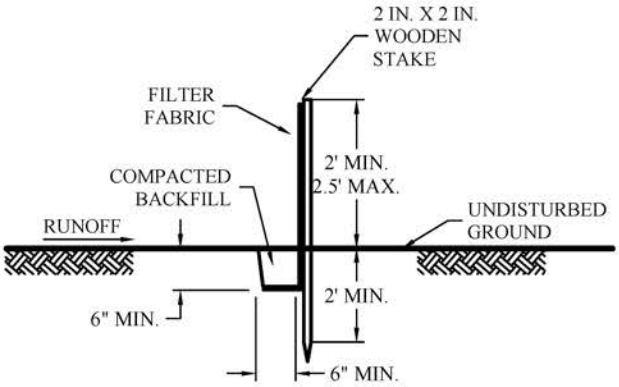
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41013 | REV. 0

UPI DWG. NO. 21036-505-TYP-41013



NOTES:

1. SILT FENCES ARE TO BE USED IN AREAS WHERE SHEET FLOW OR RELATIVELY SMALL VOLUMES OF WATER CAN BE EXPECTED TO OCCUR. FOR LARGER VOLUMES SUCH AS WITHIN A DEFINED CHANNEL, A CHECK DAM WILL BE REQUIRED.
2. STAKES ARE TO BE PLACED A MINIMUM OF TEN (10) FT. OR CLOSER AS CONDITIONS REQUIRE.
3. ATTACH FILTER FABRIC AT EACH POST AT A MINIMUM OF THREE (3) LOCATIONS.
4. THE FILTER FABRIC (MIN. OF 1 FT.) IS TO BE ANCHORED IN A 6 INCH X 6 INCH TRENCH WITH WELL COMPACTED BACKFILL OVER THE FABRIC TO PREVENT UNDERMINING.
5. TO ELIMINATE POSSIBLE END FLOW BOTH ENDS OF THE SILT FENCE SHALL BE TURNED AND EXTENDED UP SLOPE.
6. SILT FENCES ARE TO BE CHECKED AND MAINTAINED ON A REGULAR BASIS. REMOVE ANY BUILDUP OF SEDIMENT WHEN THE HEIGHT OF SEDIMENT EXCEEDS APPROXIMATELY 20% OF THE HEIGHT OF THE BARRIER.
7. MATERIAL SHOULD BE WOVEN GEOTEXTILE FABRIC SUCH AS EXXON GTF 180 OR MOBILE 600X, OR AN APPROVED EQUIVALENT. SECONDARY REINFORCEMENT SUCH AS A CONSTRUCTION BARRIER FENCE OR WIRE MESH CAN ALSO BE USED BEHIND THE FILTER FABRIC.
8. WHERE ANCHORING CONDITIONS FOR THE SILT FENCE ARE POOR. PLACE ANCHORED STRAW BALES ON DOWNSTREAM SIDE OF THE SILT FENCE.
9. MAINTENANCE REQUIREMENTS:
   INSPECT SILT FENCE:
   - DAILY IN AREAS OF ACTIVE CONSTRUCTION.
   - WEEKLY IN AREAS OF NO CONSTRUCTION.
   - WITHIN 24 HOURS FOLLOWING MAJOR RAIN EVENT.
   - REPAIR OR REPLACE SILT FENCE AS NEEDED.
   - REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA AS NEEDED.



SECTION A-A

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

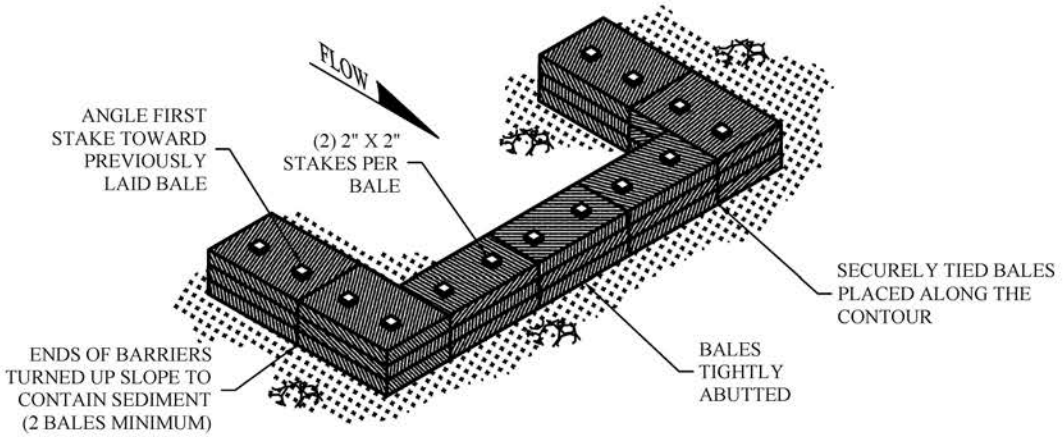
HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
SILT FENCE BARRIER INSTALLATION

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41031 | REV. 0

UPI DWG. NO. 21036-505-TYP-41031

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41031.DWG



PERSPECTIVE VIEW

INSTALLATION REQUIREMENTS :

WHEN USING STRAW BALES, PLACE THEM:

- WITH THEIR ENDS TIGHTLY ABUTTING AND EMBEDDED IN THE SOIL A MINIMUM OF 4 INCHES.
- BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS.
- AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATER BODIES, AND ROAD CROSSINGS.
- AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES.
- APPROXIMATELY 6 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT.

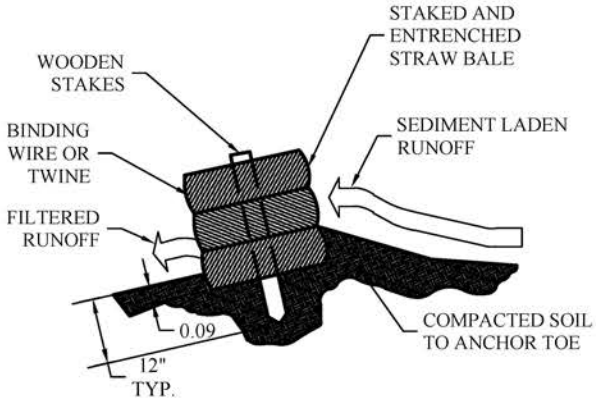
KEY IN THE BOTTOM OF THE BALE. IN AREAS WHERE IT IS NOT FEASIBLE TO TRENCH IT IN (LEDGES, ROCKY SOIL, LARGE TREE ROOTS, ETC.), USE NATIVE SOIL AS BACKFILL UP-SLOPE OF THE BALE.

IF USED IN CONJUNCTION WITH SILT FENCE, BALES ARE PLACED UP-SLOPE OF THE SILT FENCE AND DO NOT NEED TO BE TRENCHED IN.

MAINTENANCE REQUIREMENTS :

INSPECT BALES:

- DAILY IN AREAS OF ACTIVE CONSTRUCTION.
- WEEKLY IN AREAS WITH NO CONSTRUCTION.
- WITHIN 24 HOURS AFTER FOLLOWING EACH MAJOR STORM EVENT.
- REPAIR OR REPLACE BALES AS NEEDED.
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA AS NEEDED.



CROSS-SECTION

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41032.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

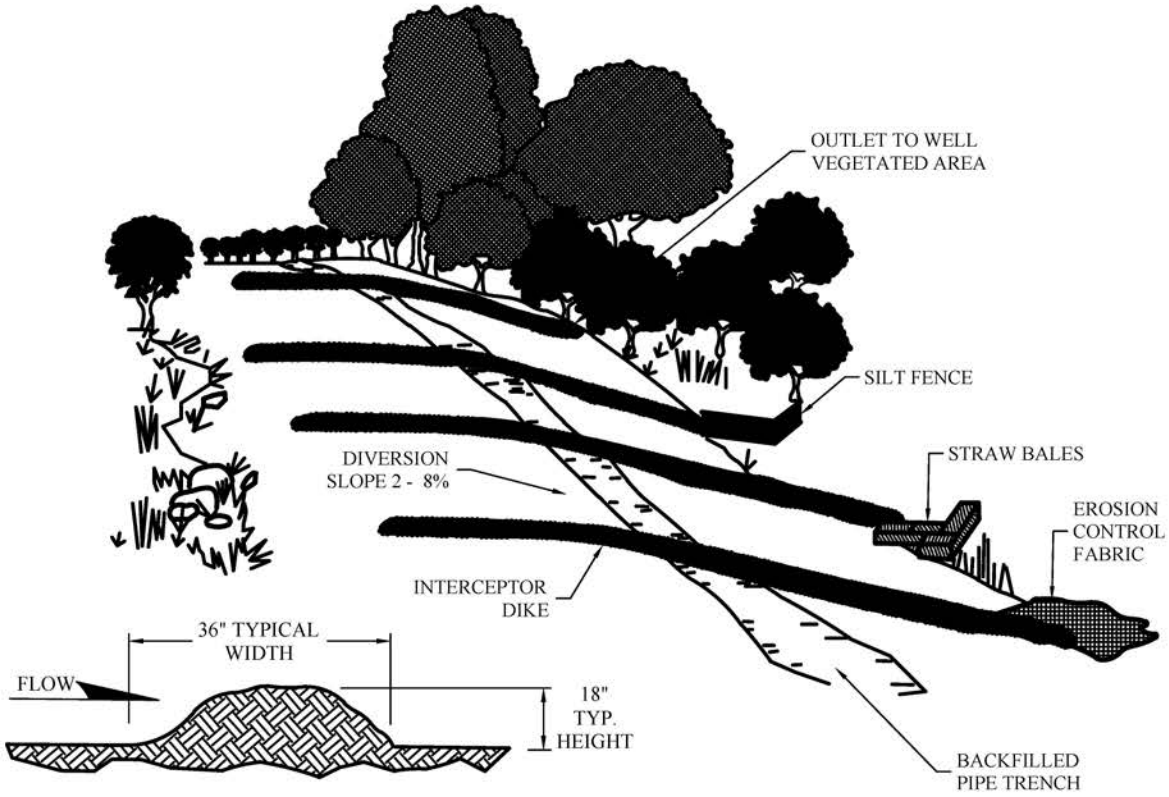
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION STRAW BALE INSTALLATION

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41032 | REV. 0

UPI DWG. NO. 21036-505-TYP-41032



CROSS-SECTION

PERSPECTIVE VIEW

INSTALLATION REQUIREMENTS :

- INSTALL PERMANENT INTERCEPTOR DIKES IN ALL AREAS EXCEPT RESIDENTIAL OR AGRICULTURAL AS NECESSARY TO AVOID EXCESSIVE EROSION (UNLESS AUTHORIZED BY LANDOWNER AND LAND MANAGING AGENCY IN AGRICULTURAL OR RESIDENTIAL AREA).
- MUST BE INSTALLED ON SLOPES GREATER THAN 5% WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATER BODY, WETLAND OR ROAD CROSSING AT THE FOLLOWING MINIMUM SPACING.

SLOPE (%)	SPACING (FT)
5 - 15	300
15 - 30	200
>30	100

- CONSTRUCT USING EARTH FILLED SACKS, STAKED STRAW BALES, SILT FENCE, OR SOIL FOR TEMPORARY OR COMPACTED EARTH AND ROCK TO PERMANENT.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS. WATER BODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC) AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.

MAINTENANCE REQUIREMENTS :

- INSPECT DURING AND FOLLOWING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.
- SEED AND MULCH PERMANENT INTERCEPTOR DIKES FOLLOWING CONSTRUCTION .

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

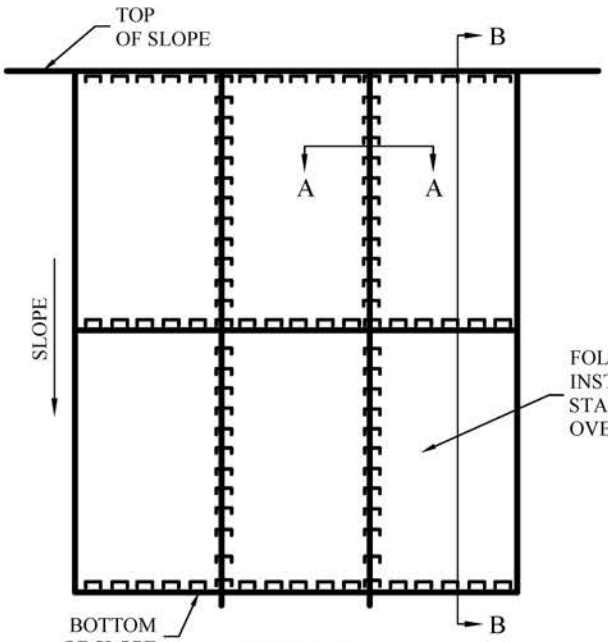
HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL CONSTRUCTION INTERCEPTOR DIKE INSTALLATION

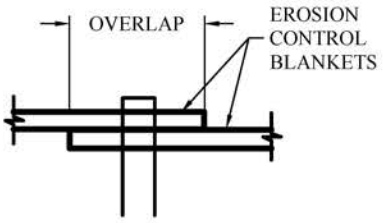
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41033 | REV. 0

UPI DWG. NO. 21036-505-TYP-41033

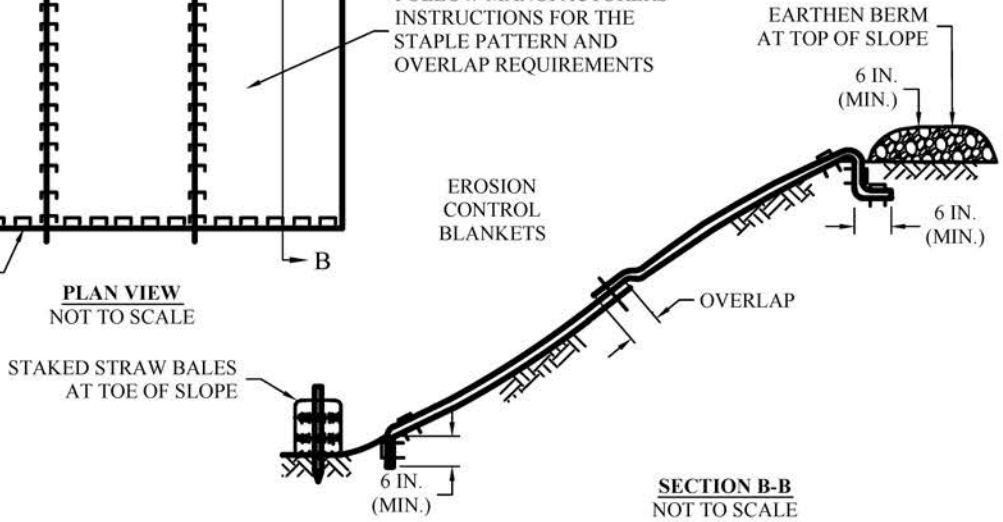
F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41033.DWG



PLAN VIEW
NOT TO SCALE



SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS. INCLUDE GRADING, REMOVE LARGE ROCKS AND DEBRIS AND APPLY SEED AND FERTILIZER.
2. EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN S 150 FOR SLOPES 3 TO 1 AND SC 150 FOR SLOPES 2 TO 1 OR APPROVED EQUALS.
3. INSTALL BLANKETS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
4. EROSION CONTROL BLANKETS SHALL EXTEND COMPLETELY ACROSS DISTURBED AREAS TO PROTECT ERODIBLE SURFACES.
5. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A MINIMUM OF SIX (6) INCHES WIDE AND SIX (6) INCHES DEEP TRENCH.
6. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
7. AS AN ALTERNATIVE TO STAPLES, WOODEN STAKES CAN BE USED.
8. ENSURE COMPLETE CONTACT BETWEEN THE BLANKETS AND THE SLOPE FACE. ADDITIONAL STAPLES CAN BE USED TO ELIMINATE GAPS.
9. EROSION CONTROL BLANKETS WILL BE INSTALLED AS REQUIRED BY LAND OWNER OR APPLICABLE PERMIT.

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

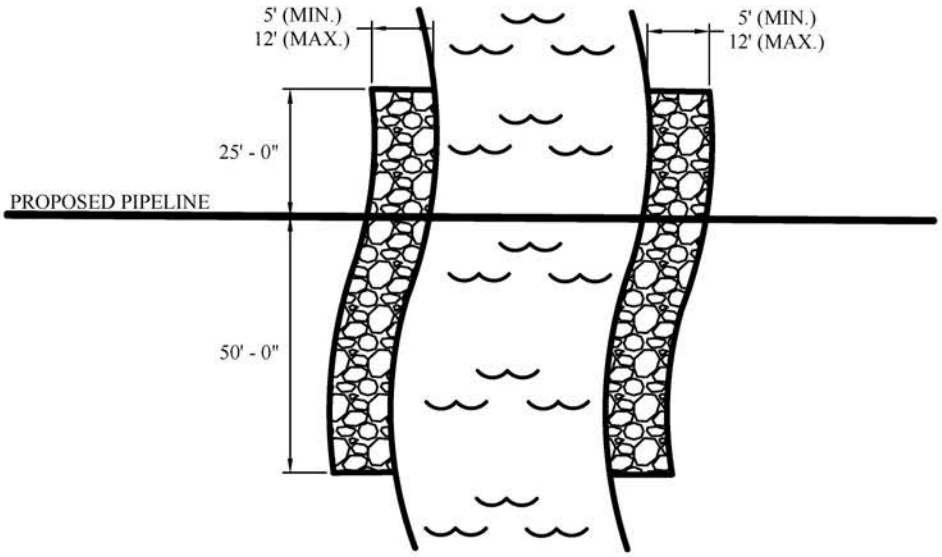
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
EROSION CONTROL BLANKET INSTALLATION

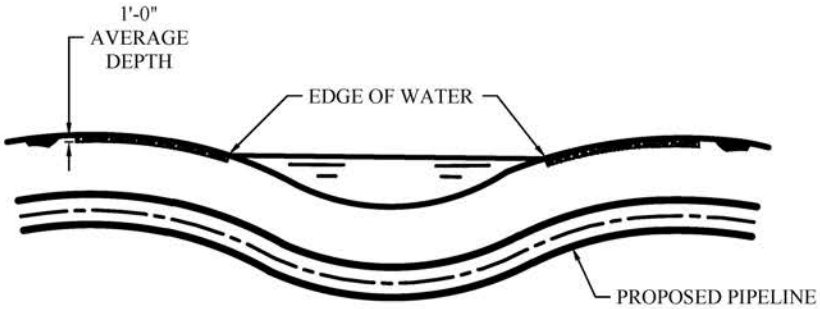
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41034 | REV. 0

UPI DWG. NO. 21036-505-TYP-41034

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41034.DWG



PLAN VIEW



CROSS-SECTION

NOTES:

1. RIP-RAP IS LESS THAN 500 FEET IN LENGTH.
2. RIP-RAP WILL NOT EXCEED AN AVERAGE OF ONE (1) CUBIC YARD PER RUNNING FOOT.
3. RIP-RAP INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE PERMITS.

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

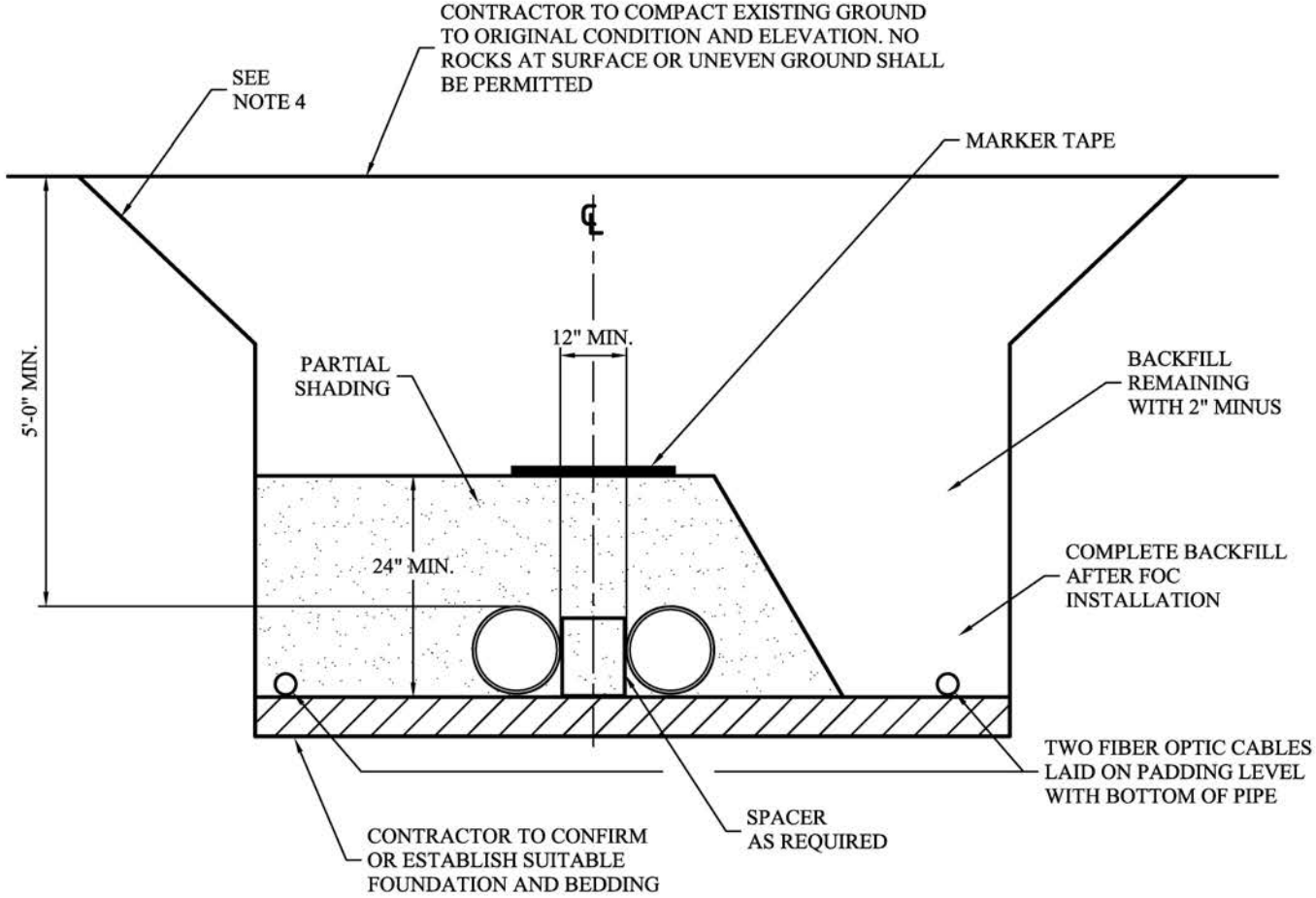
HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION RIP-RAP PLACEMENT

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41037 | REV. 0

UPI DWG. NO. 21036-505-TYP-41037

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41037.DWG



NOTES:

1. WHERE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH AS NECESSARY AND REPLACE WITH SUITABLE MATERIAL
2. MINIMUM COVER IS TO BE 5' FROM TOP PIPE TO GROUND SURFACE.
3. HEIGHT OF SELECTED BACKFILL MATERIAL PRIOR TO COMPACTION SHALL BE SUFFICIENT TO ENSURE THAT MINIMUM COMPACTED COVER OF 24 INCHES IS MAINTAINED AT ALL TIMES. ADDITIONAL BACKFILL SHALL BE PLACED IF THE COMPACTION WHEEL PENETRATES LOOSE FILL TO WITHIN LESS THAN 24 INCHES OF THE TOP OF PIPE.
4. SLOPE OF TRENCH WALL WILL BE CONSISTENT WITH SOIL NATURE
5. SELECTED BACKFILL SHALL BE FREE FROM STONES AND SHARP MATERIAL.

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS REQUESTED	10/15/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL
6868 Loop Central Drive Suite 137 Houston, Texas 77081 713.425.6000 1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

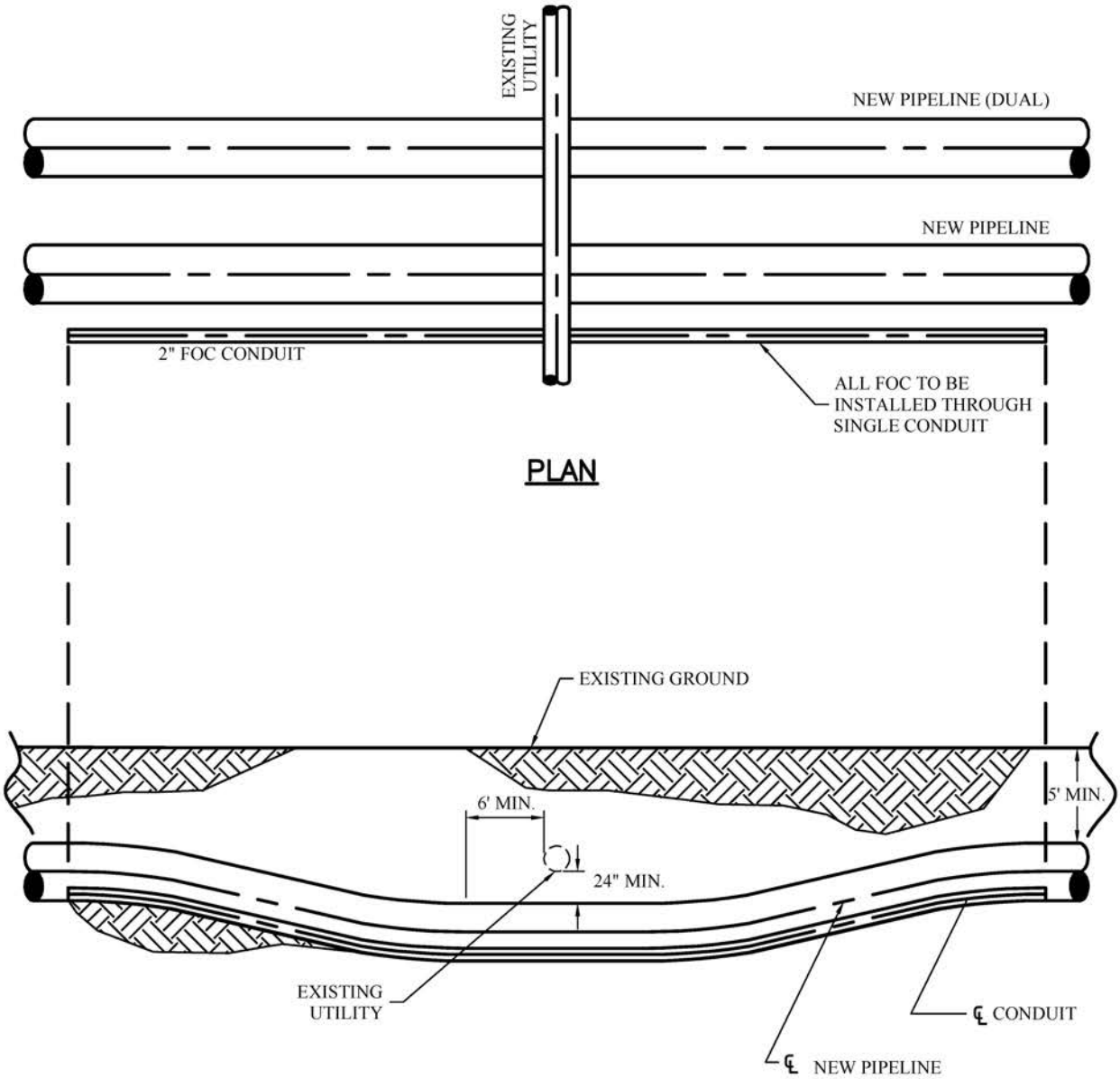
HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION EXCAVATION AND BACKFILL

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41051 | REV. 1

UPI DWG. NO. 21036–505–TYP–41051

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41051R1.DWG



NOTE:
1. IF SINGLE PIPELINE THEN LAY PIPE ALONG CENTERLINE.
2. IF DUAL PIPELINE THEN STRADDLE CENTERLINE.
3. CONDUIT ENDS TO EXTEND BEYOND BACKFILL REQUIREMENTS FOR EXISTING UTILITY.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41052.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

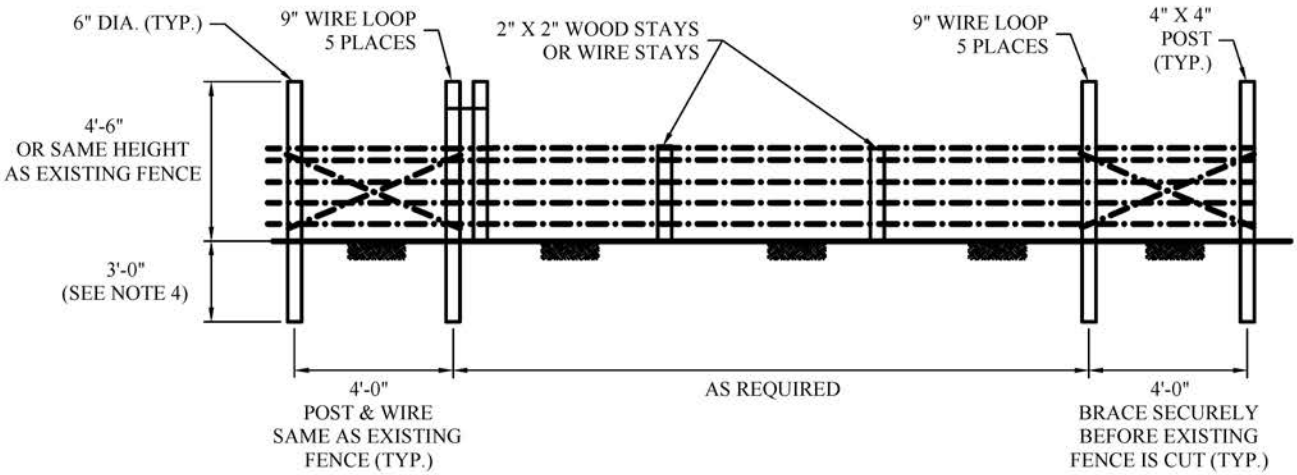
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION UTILITY CROSSING

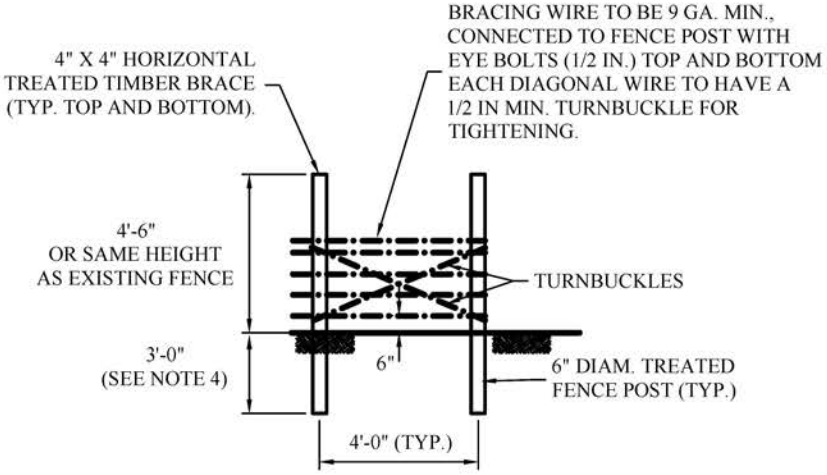
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41052 | REV. 0

UPI DWG. NO. 21036-505-TYP-41052



NOTES:

1. CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIAL TO CONSTRUCT FENCE GATE TO MATCH EXISTING FENCE.
2. POSTS, WIRE AND OTHER MATERIAL SHALL BE SAME AS OR EQUIVALENT MATERIAL TO MATCH EXISTING.
3. BRACE SPAN TO BE CONSTRUCTED ON EACH SIDE OF PIPELINE RIGHT-OF-WAY, PRIOR TO INITIAL DISMANTLING OF FENCE.
4. ACTUAL DEPTH REQUIRED TO BE SET BY WHAT IS REQUIRED TO ACHIEVE A STABLE SUPPORT POST.
5. OFFSET METHOD TO BE USED FOR GATE AT CUT.



NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION FENCE WITH TEMPORARY GATE

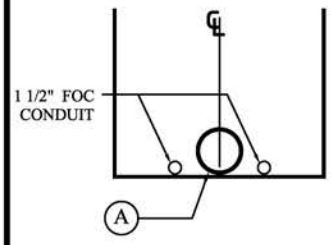
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41054 | REV. 0

UPI DWG. NO. 21036-505-TYP-41054

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41054.DWG

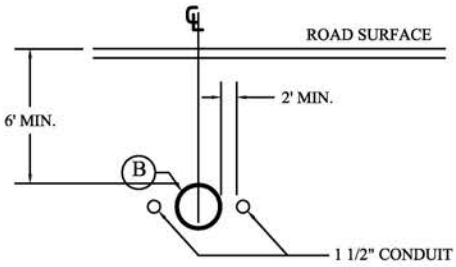
SINGLE LINE

TRENCH SECTION



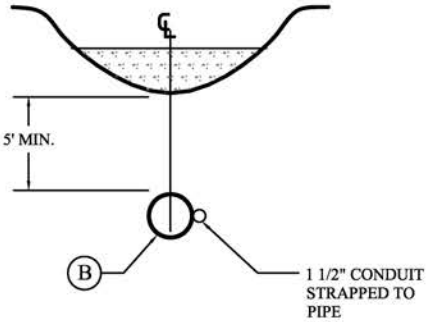
P L SECTION

BORE - TYPE 1



SECTION B1

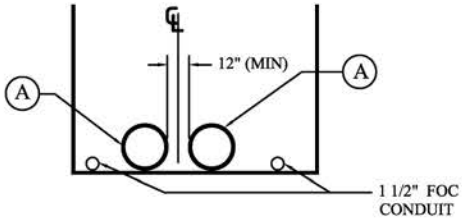
BORE/HDD - TYPE 2



SECTION C1

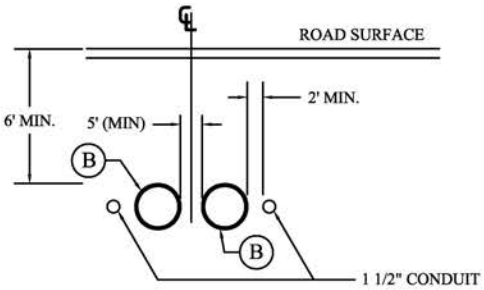
DUAL LINE

TRENCH SECTION



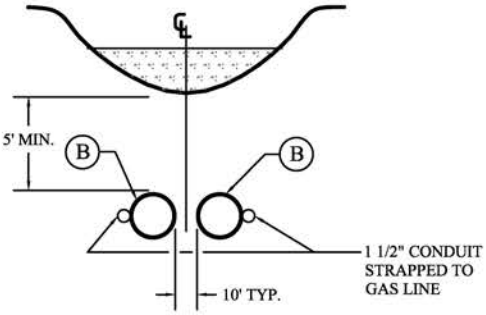
DUAL LINE

BORE - TYPE 1



SECTION B2

BORE/HDD - TYPE 2



SECTION C2

(A)	12.75" O.D. 0.375" W.T.
(B)	12.75" O.D. 0.500" W.T.

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS REQUESTED	10/15/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

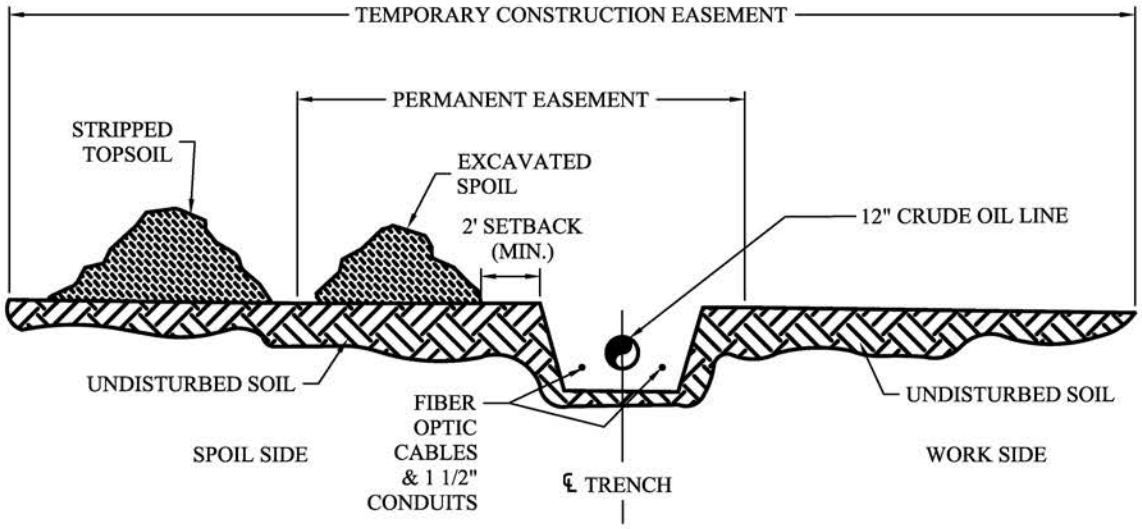
HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION SECTION VIEWS

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41055 | REV. 1

UPI DWG. NO. 21036-505-TYP-41055

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41055R1.DWG



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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41056.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	10/15/14	GI	JC

UniversalPegasus INTERNATIONAL
4848 Loop Central Drive Suite 137 Houston, Texas 77081 713.425.0000 1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

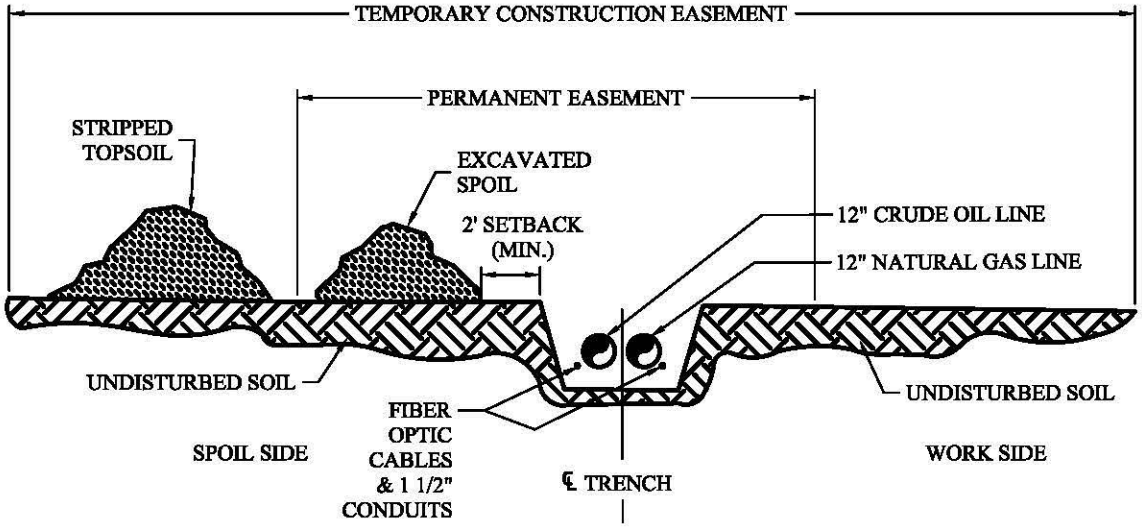
DRAWN	GI	DATE	10/15/14
CHECKED	AWM	DATE	10/15/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HAWKEYE OIL FACILITY
TO HAWKEYE COMPRESSOR STATION
SILURIAN TO RAMBERG TRUCK FAC.
TYPICAL CONSTR. OIL PIPELINE

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41056	0

UPI DWG. NO. 21036-505-TYP-41056



NOTES:

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

   STATE PROPERTY:
   100' TEMPORARY,
   33' 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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41057.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	10/15/14	GI	AWM

UniversalPegasus INTERNATIONAL

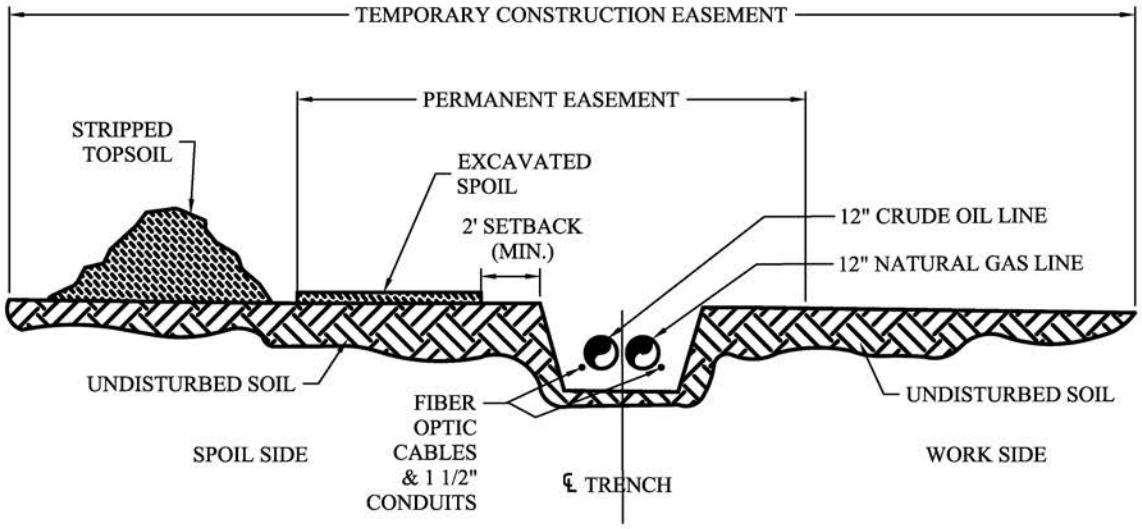
DRAWN	GI	DATE	10/15/14
CHECKED	AWM	DATE	10/15/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HAWKEYE COMPRESSOR STATION TO SILURIAN TYPICAL CONSTRUCTION PRIVATE & STATE LAND

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41057	0

UPI DWG. NO. 21036-505-TYP-41057



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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41058.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	10/15/14	GI	JC

UniversalPegasus INTERNATIONAL
4848 Loop Central Drive Suite 137 Houston, Texas 77081 713.425.0000 1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

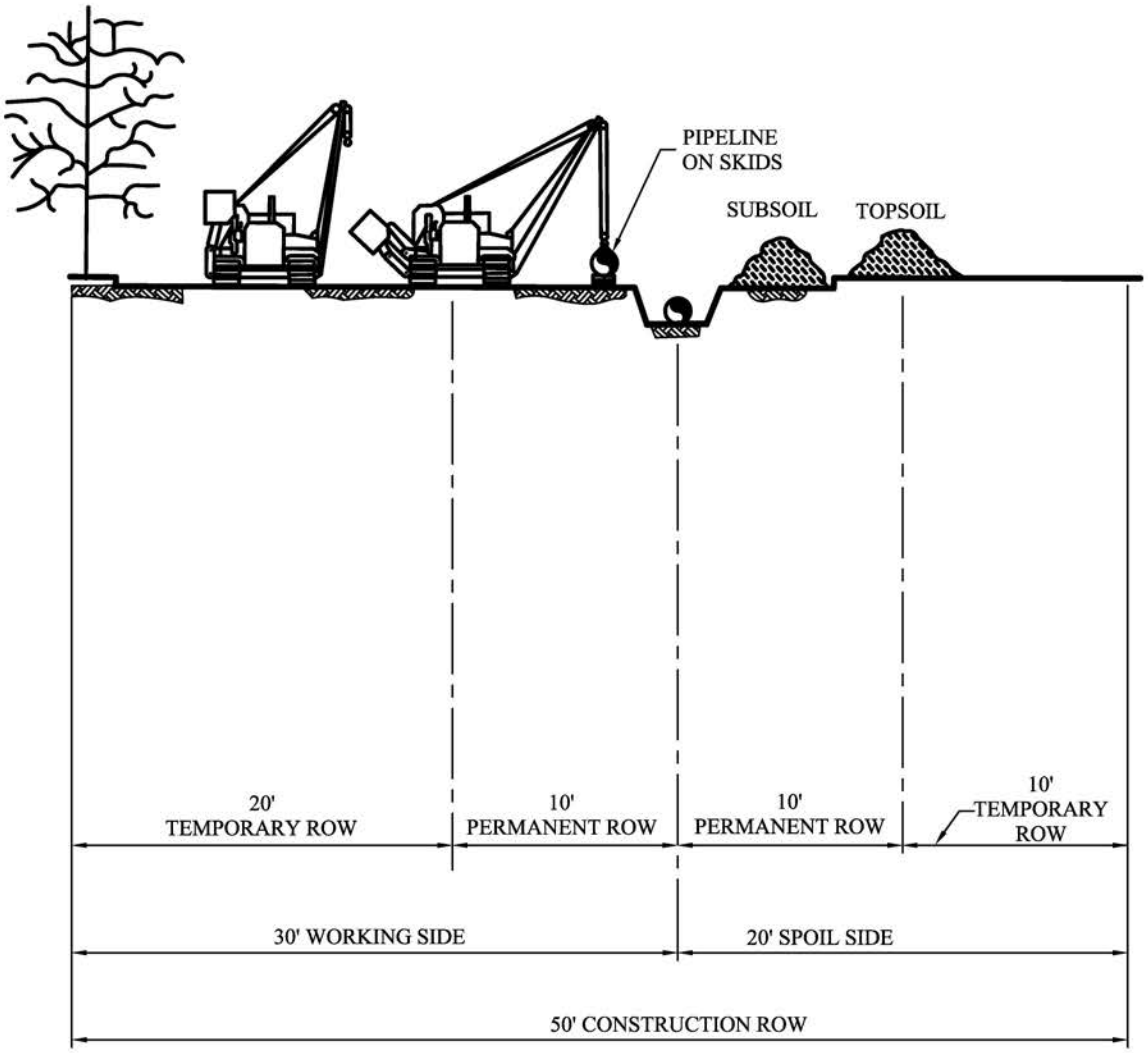
DRAWN	DMB	DATE	10/15/14
CHECKED	AWM	DATE	10/15/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT TYPICAL CONSTRUCTION US FOREST SERVICE LAND

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41058	0

UPI DWG. NO. 21036-505-TYP-41058



NOTES:

1. THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN.

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

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41060-NEW.DWG

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED DRAWING TITLE	10/31/14	GI	JC
0	ISSUED FOR CONSTRUCTION	10/15/14	GI	AWM

UniversalPegasus INTERNATIONAL
6868 Loop Central Drive
Suite 137
Houston, Texas 77081
713.425.6000
1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

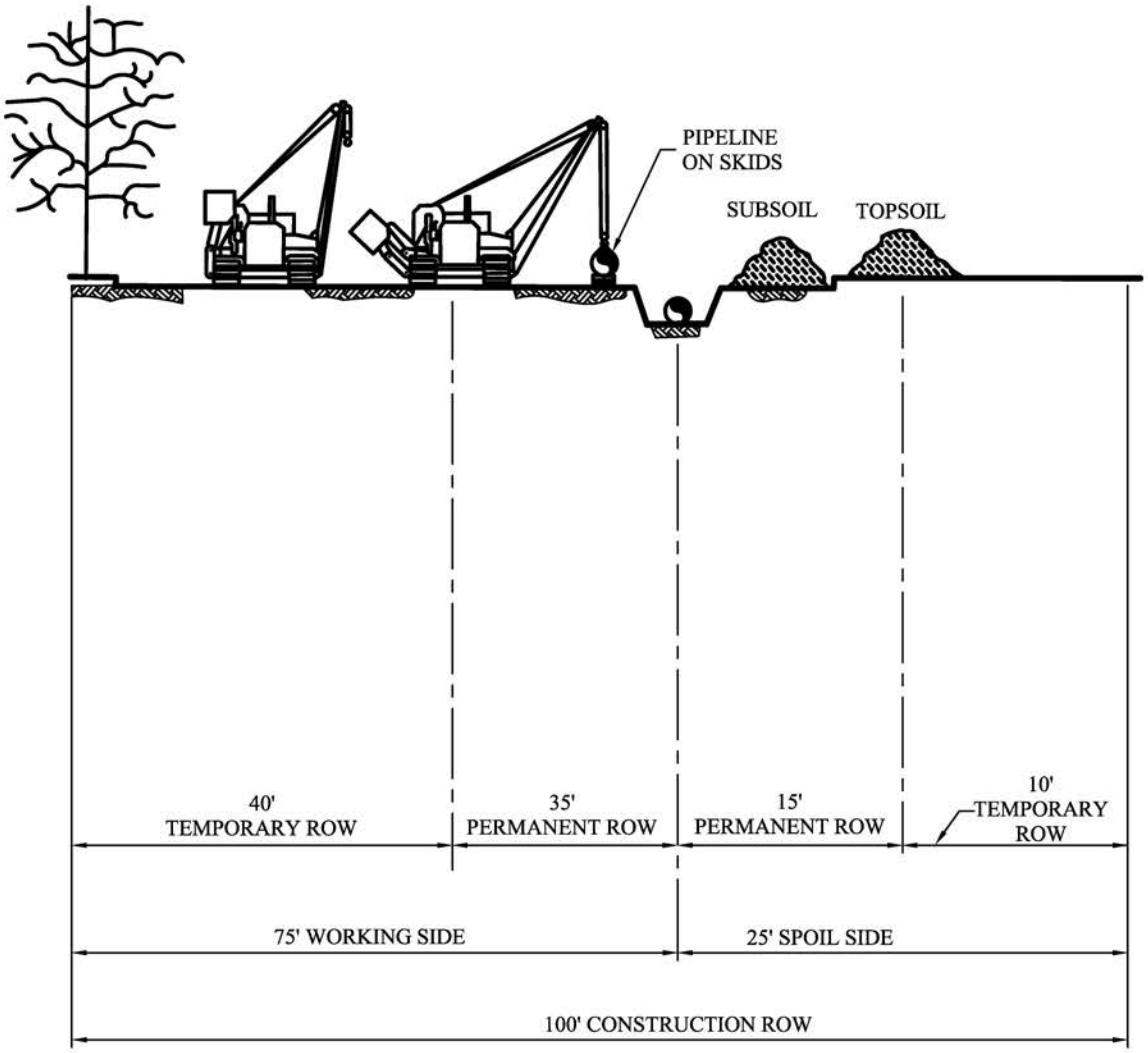
DRAWN	GI	DATE	10/15/14
CHECKED	AWM	DATE	10/15/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
RIGHT-OF-WAY, U.S. FOREST SERVICE

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41060	1

UPI DWG. NO. 21036-505-TYP-41060



NOTES:

1. THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN.

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

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41061-NEW.DWG

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED ISSUED	10/31/14	GI	JC
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL
6868 Loop Central Drive
Suite 137
Houston, Texas 77081
713.425.6000
1.800.968.1811
www.universalpegasus.com
Texas Registered Engineering Firm: F-1942

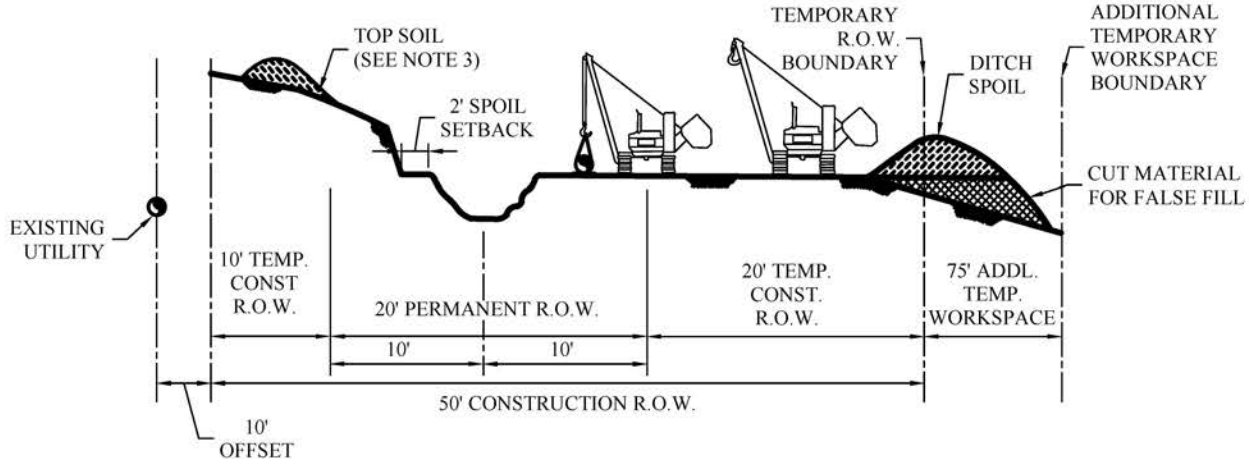
DRAWN	GI	DATE	10/15/14
CHECKED	AWM	DATE	10/15/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
RIGHT OF WAY, PRIVATE OWNERSHIP

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41061	1

UPI DWG. NO. 21036-505-TYP-41061



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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41062.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

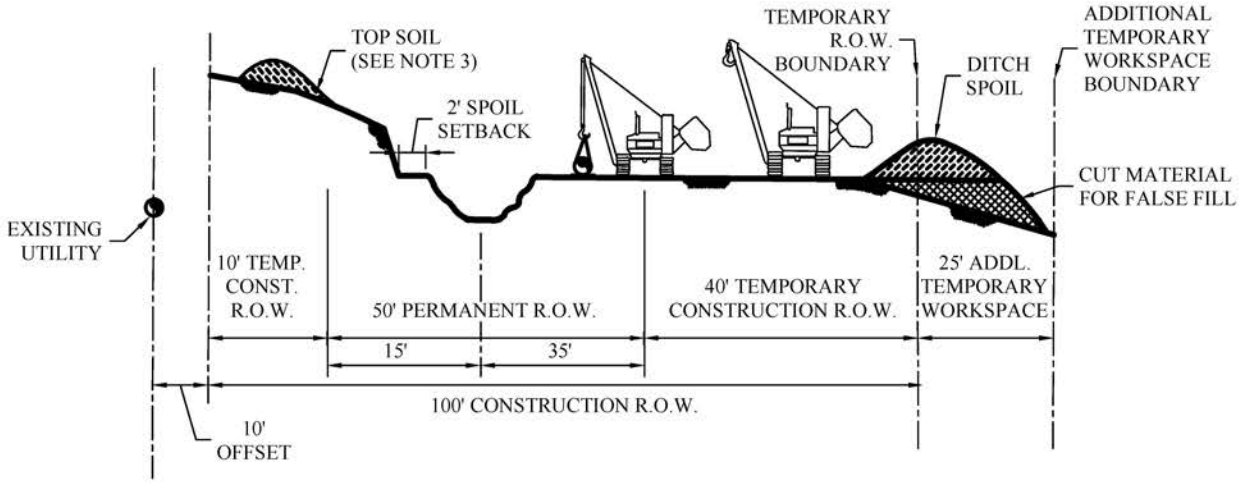
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE
TRUNKLINES PROJECT
DESIRED CONSTRUCTION DOWNWARD SIDE SLOPE WORKSPACE WITHIN FOREST SERVICE

SCALE:	HESS DWG. NO.	REV.
	NDP-HBAK-PPL-DET-000-41062	0

UPI DWG. NO. 21036-505-TYP-41062



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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41063.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

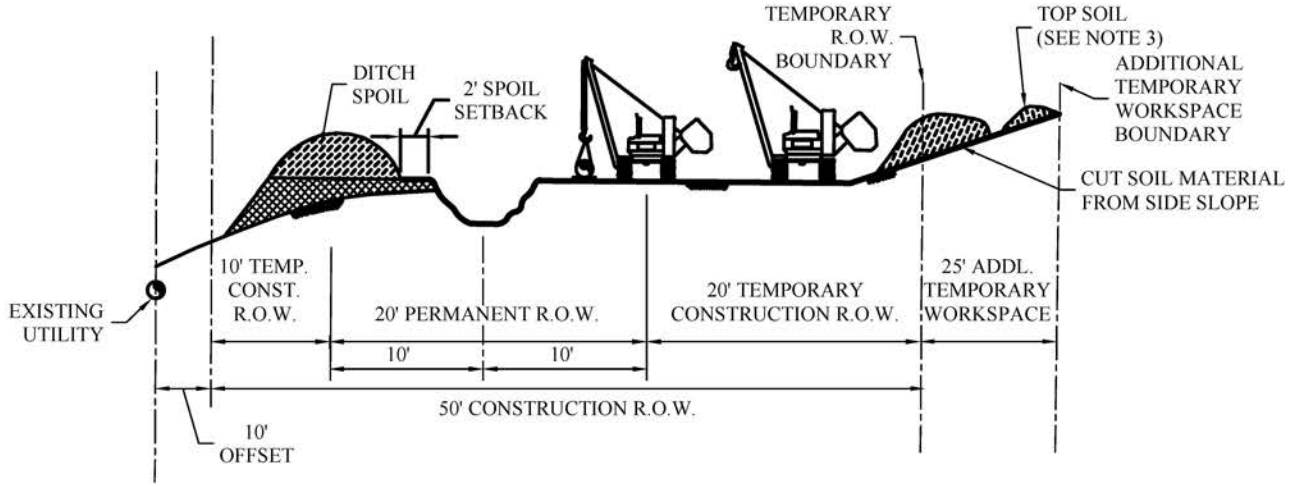
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
DOWNWARD SIDE SLOPE WORKSPACE ON PRIVATE LAND

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41063 | REV. 0

UPI DWG. NO. 21036-505-TYP-41063



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).

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41064.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

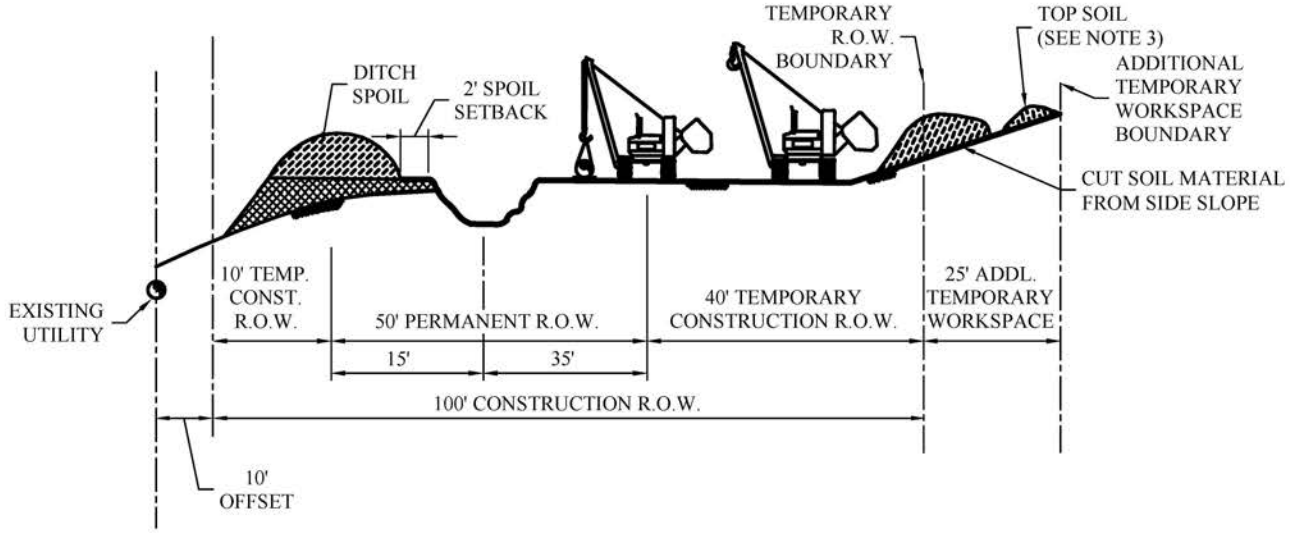
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL CONSTRUCTION UPWARD SIDE SLOPE WORKSPACE WITHIN FOREST SERVICE

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41064 | REV. 0

UPI DWG. NO. 21036-505-TYP-41064



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.

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41065.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

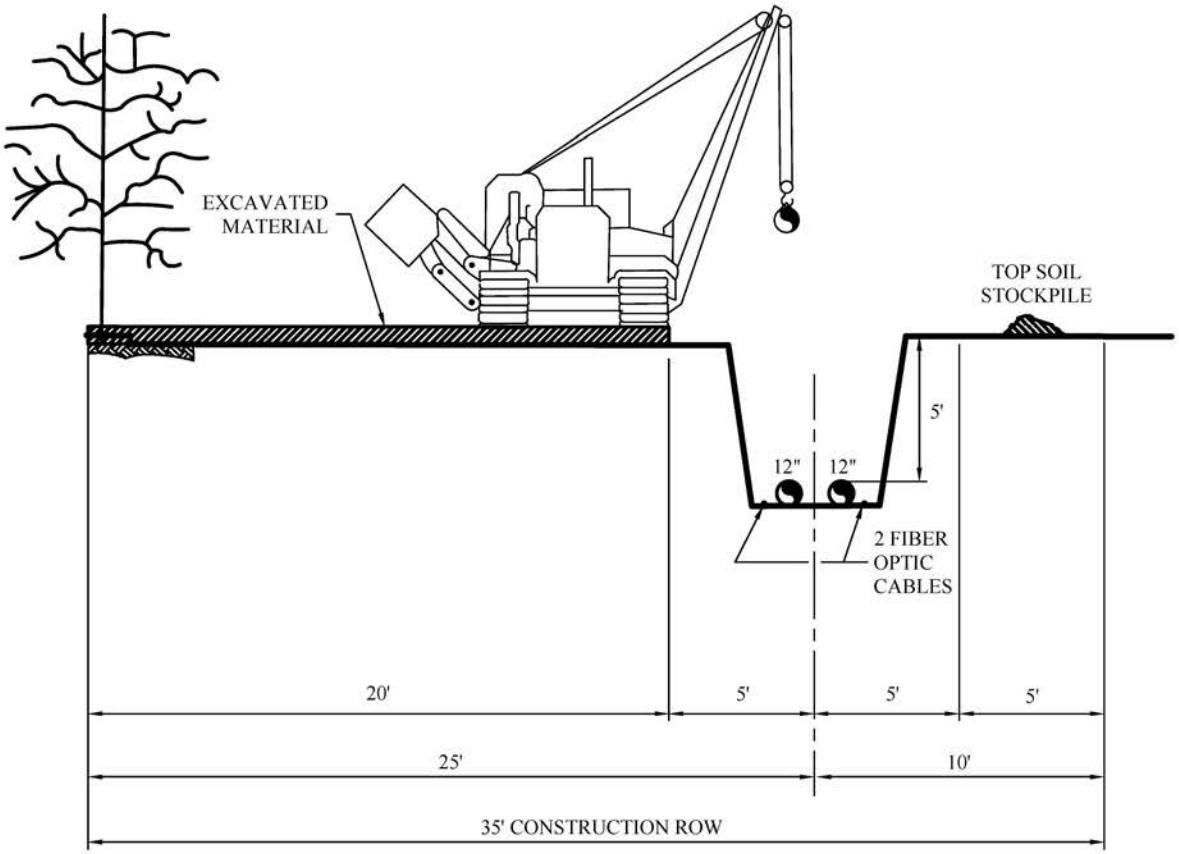
DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
UPWARD SIDE SLOPE WORKSPACE
WITHIN PRIVATE OWNERSHIP

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41065 | REV. 0

UPI DWG. NO. 21036-505-TYP-41065



NOTES:

1. THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN.

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

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41066R01.DWG

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS NOTED	10/15/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

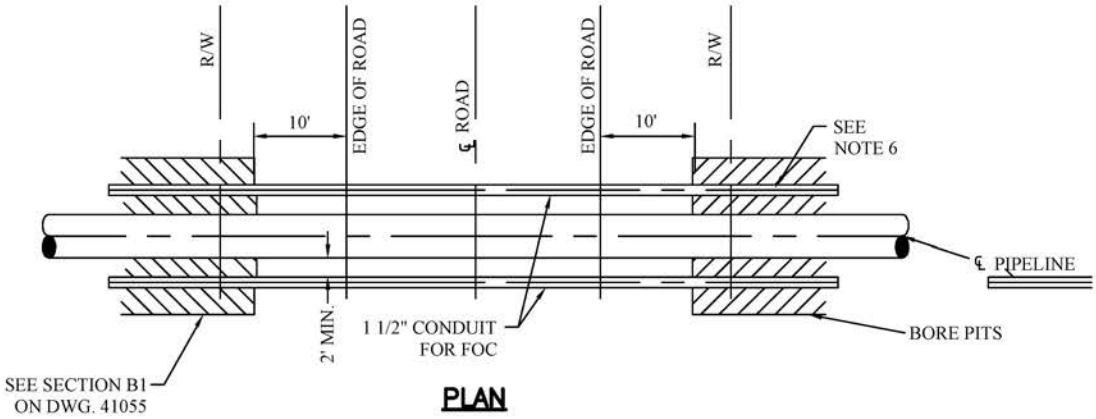
DRAWN	GI	DATE	02/25/14
CHECKED	AWM	DATE	02/25/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

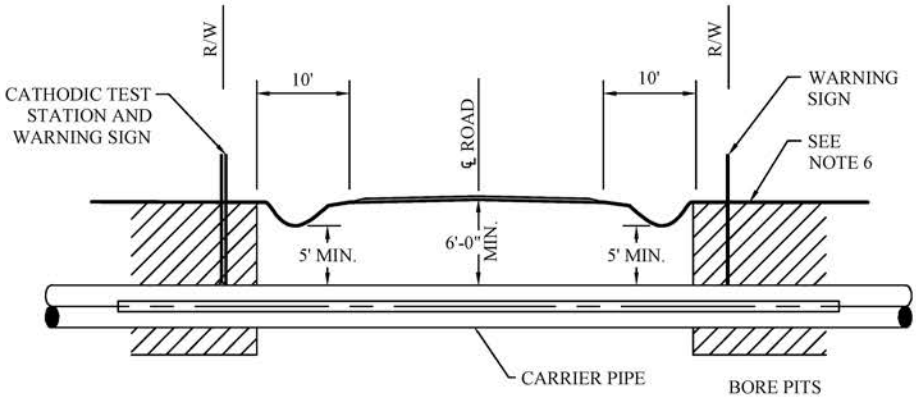
HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL CONSTRUCTION
RIGHT-OF-WAY, RESTRICTED 35' WIDTH

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41066 | REV. 1

UPI DWG. NO. 21036-505-TYP-41066



PLAN



PROFILE

NOTE:

1. CONTRACTOR TO "SLICKBORE" PIPELINE CROSSING OF ANY ROADS WITH A PROCEDURE SUBMITTED TO AND APPROVED BY COMPANY.
2. CARRIER PIPE TO BE FBE & ARO COATED. SEE ALIGNMENT SHEET TO DETERMINE LENGTH OF HEAVY WALL PIPE.
3. AUGER SHALL NOT EXCEED O.D. OF CARRIER PIPE BY MORE THAN 1 INCH. AUGER SHALL NOT EXTEND INTO CARRIER PIPE.
4. ANNULUS BETWEEN BORED HOLE AND CARRIER PIPE TO BE PRESSURE GROUTED WITH A PRODUCT APPROVED BY COMPANY.
5. COMPACTION OF BACKFILL WITHIN ROAD RIGHT OF WAY SHALL BE EQUAL TO THE PERCENT OF COMPACTION OF THE SURROUNDING SOIL.
6. ALL COMPATIBLE MATERIAL SHALL BE FREE OF ANY ORGANIC MATTER AND BE APPROVED BY THE APPROPRIATE AGENCY HAVING JURISDICTION OVER THE ROADWAY.
7. A TEN (10') FEET MIN. DISTANCE BETWEEN EDGE OF PAVEMENT AND FACE OF BORE PIT SHALL BE MAINTAINED ON ALL ROAD CROSSINGS.
8. INSTALLED PIPE & CONDUIT MUST BE COMPLETELY WITHIN PERMANENT ROW.

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS REQUESTED	10/15/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

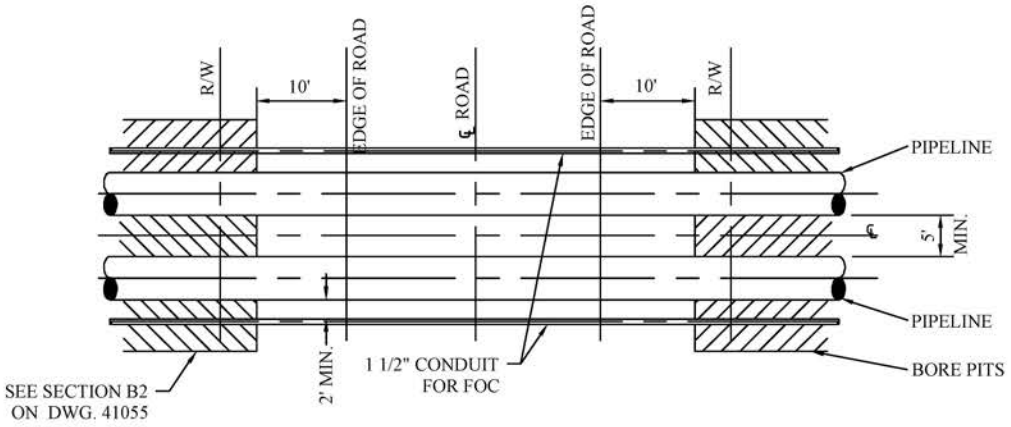
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
SINGLE BORE / HDD CROSSING
TYPE 1

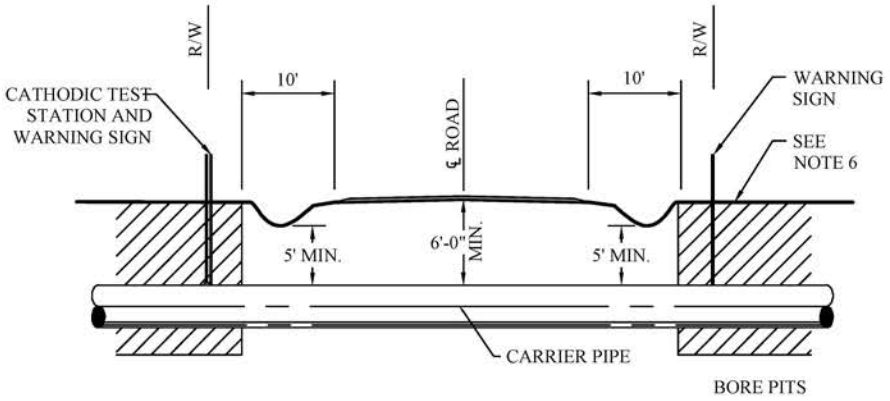
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41070 | REV. 1

UPI DWG. NO. 21036-505-TYP-41070

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41070R01.DWG



PLAN



PROFILE

NOTE:

1. CONTRACTOR TO "SLICKBORE" PIPELINE CROSSING OF ANY ROADS WITH A PROCEDURE SUBMITTED TO AND APPROVED BY COMPANY.
2. CARRIER PIPE TO BE FBE & ARO COATED. SEE ALIGNMENT SHEET TO DETERMINE LENGTH OF HEAVY WALL PIPE.
3. AUGER SHALL NOT EXCEED O.D. OF CARRIER PIPE BY MORE THAN 1 INCH. AUGER SHALL NOT EXTEND INTO CARRIER PIPE.
4. ANNULUS BETWEEN BORED HOLE AND CARRIER PIPE TO BE PRESSURE GROUTED WITH A PRODUCT APPROVED BY COMPANY.
5. COMPACTION OF BACKFILL WITHIN ROAD RIGHT OF WAY SHALL BE EQUAL TO THE PERCENT OF COMPACTION OF THE SURROUNDING SOIL.
6. ALL COMPATIBLE MATERIAL SHALL BE FREE OF ANY ORGANIC MATTER AND BE APPROVED BY THE APPROPRIATE AGENCY HAVING JURISDICTION OVER THE ROADWAY.
7. A TEN (10') FEET MIN. DISTANCE BETWEEN EDGE OF PAVEMENT AND FACE OF BORE PIT SHALL BE MAINTAINED ON ALL ROAD CROSSINGS.
8. INSTALLED PIPE & CONDUIT MUST BE COMPLETELY WITHIN PERMANENT ROW.

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS NOTED	10/15/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

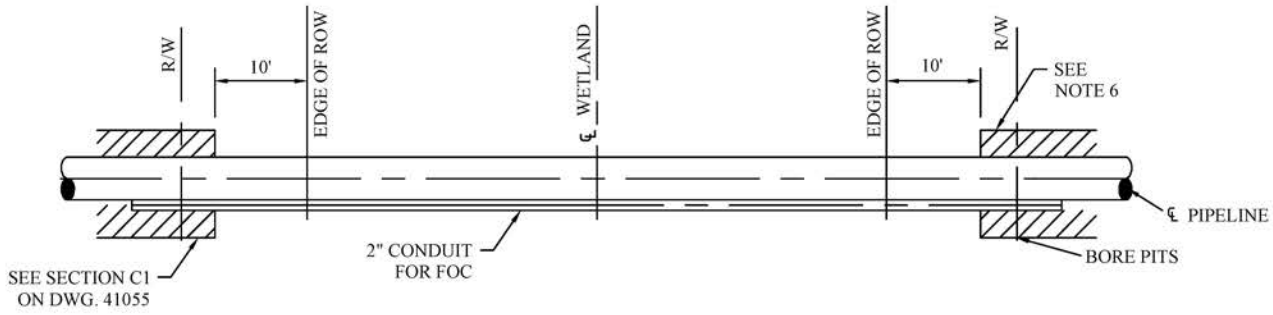
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
DOUBLE BORE / HDD CROSSING
TYPE 1

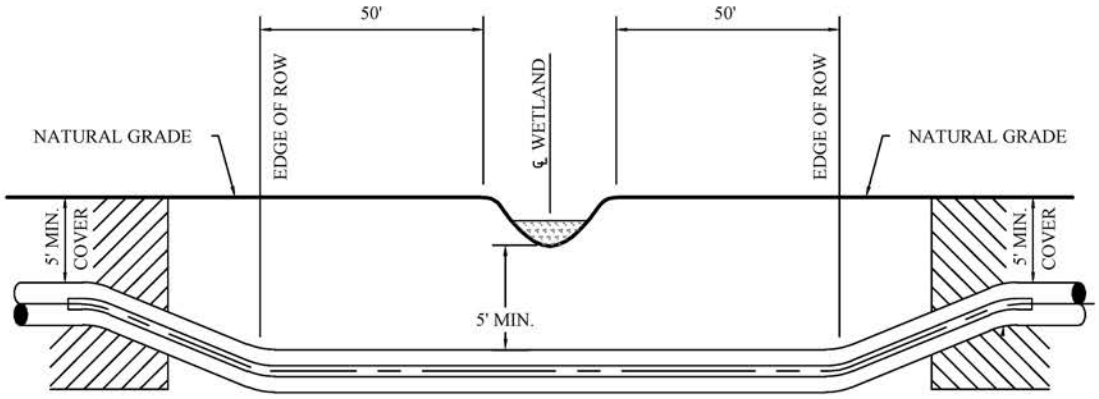
SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41071 | REV. 1

UPI DWG. NO. 21036-505-TYP-41071

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41071R01.DWG



PLAN



PROFILE

NOTE:

1. PIPE TO BE 5' MIN. DEPTH BELOW LOWEST POINT OF WETLAND THRU WETLAND ROW.
2. NORMAL FLOW OF DRAINAGE NOT TO BE OBSTRUCTED DURING PIPELINE CONSTRUCTION OPERATIONS.
3. FOC CONDUIT TO BE STRAPPED TO PIPE FOR INSTALLATION .

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41075.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

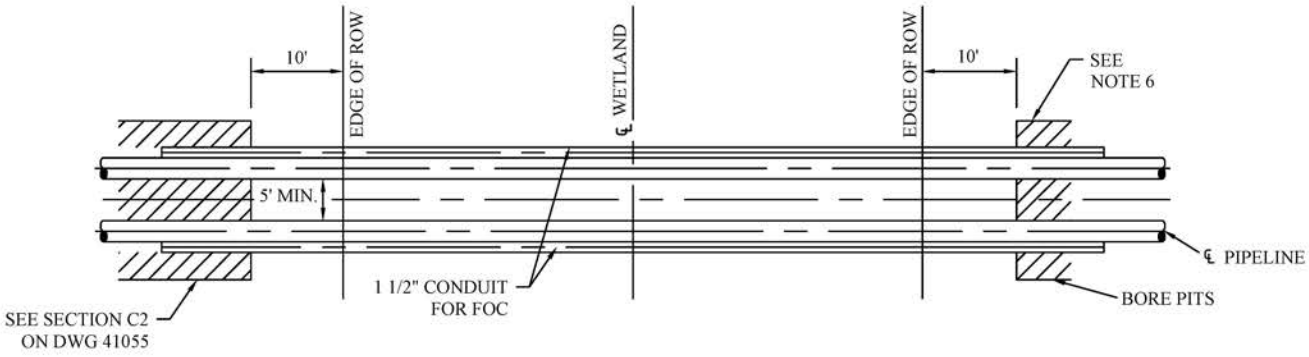
DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

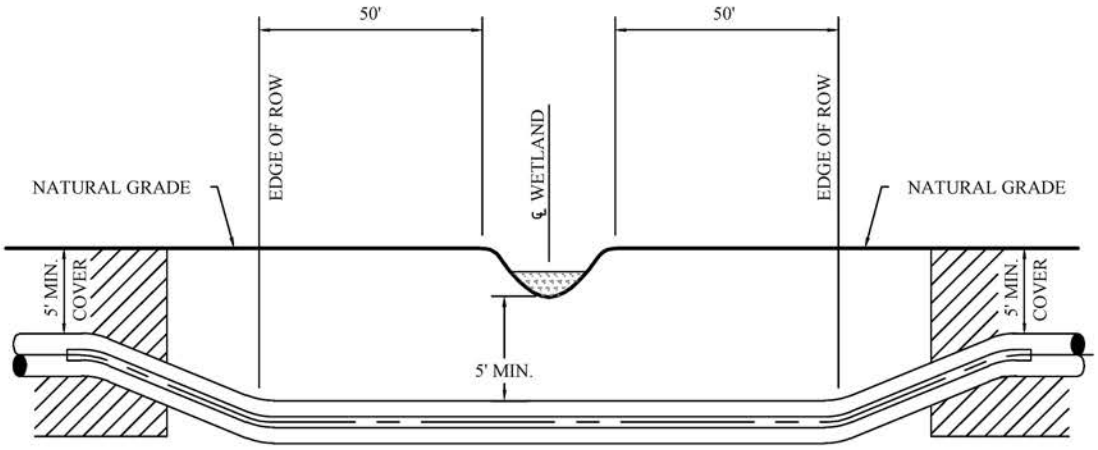
HESS HAWKEYE TRUNKLINES PROJECT SINGLE BORE / HDD CROSSING TYPE 2

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41075 | REV. 0

UPI DWG. NO. 21036-505-TYP-41075



PLAN



PROFILE

NOTE:

1. PIPE TO BE 5' MIN. DEPTH BELOW LOWEST POINT OF WETLAND THRU WETLAND ROW.
2. NORMAL FLOW OF DRAINAGE NOT TO BE OBSTRUCTED DURING PIPELINE CONSTRUCTION OPERATIONS.
3. FOC CONDUIT TO BE STRAPPED TO PIPE FOR INSTALLATION .

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41076R01.DWG

NO	REVISION	DATE	DRAWN	CHKD
1	REVISED AS NOTED	10/03/14	GI	AWM
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

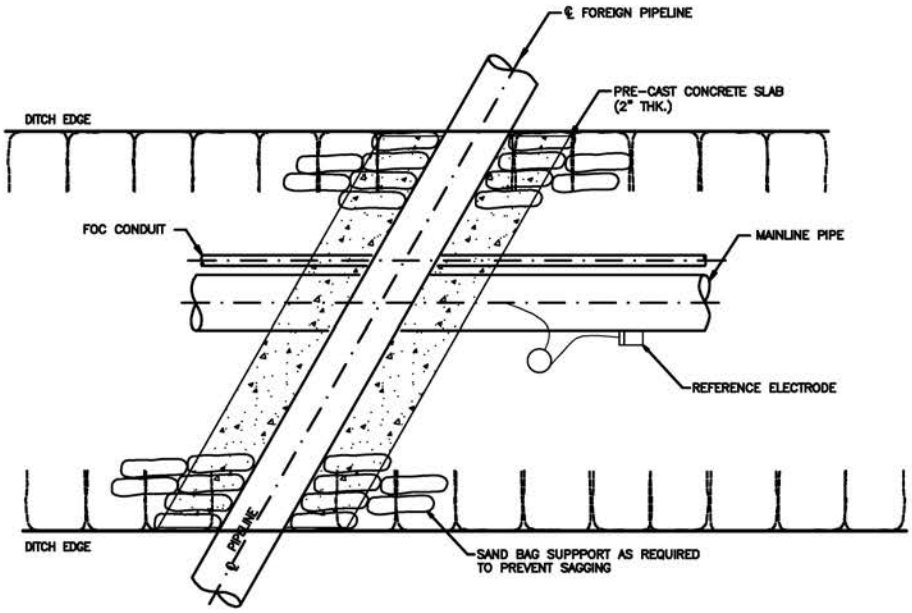
DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

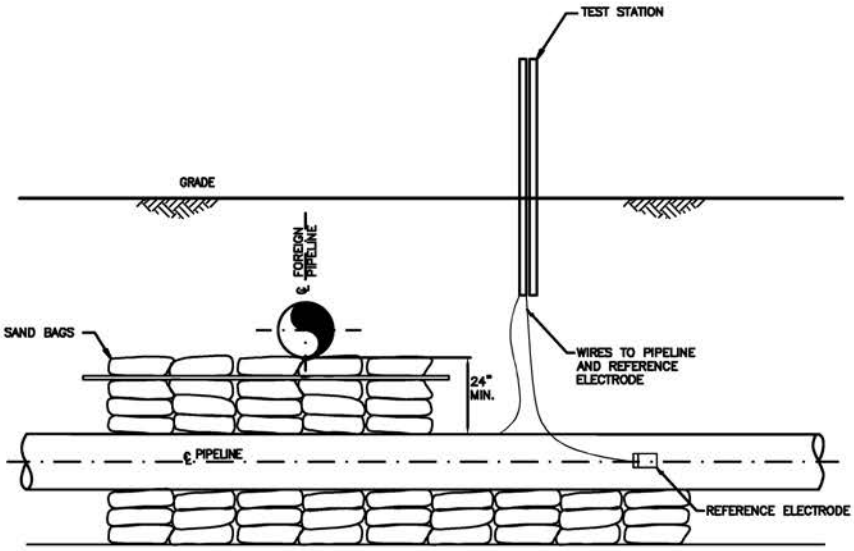
HESS HAWKEYE TRUNKLINES PROJECT DOUBLE BORE / HDD CROSSING TYPE 2

SCALE: | HESS DWG. NO. NDP-HBAK-PPL-DET-000-41076 | REV. 1

UPI DWG. NO. 21036-505-TYP-41076



PLAN



ELEVATION

TYPICAL SAND BAG TRENCH BREAKER TYPE 1

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41077.DWG

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

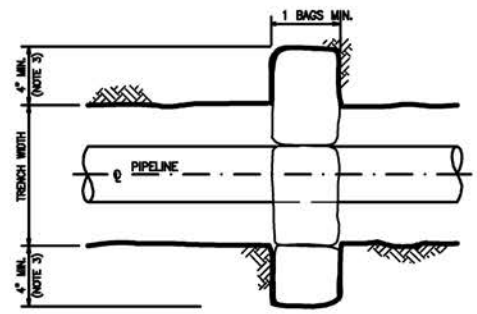
HESS HAWKEYE TRUNKLINES PROJECT TYPICAL FOREIGN PIPELINE CROSSING

SCALE:

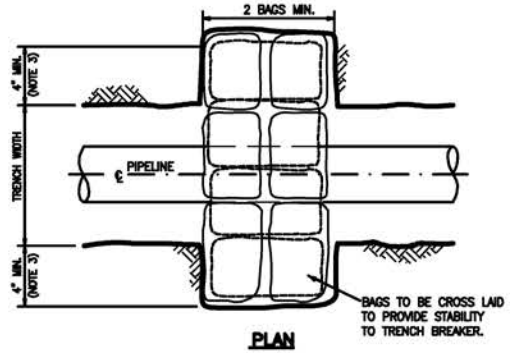
HESS DWG. NO. NDP-HBAK-PPL-DET-000-41077

REV. 0

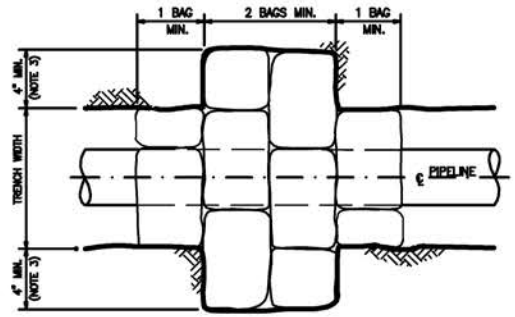
UPI DWG. NO. 21036-505-TYP-41077



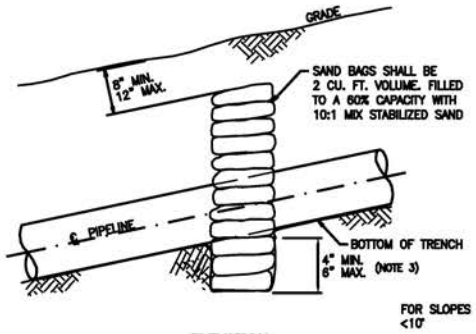
PLAN



PLAN

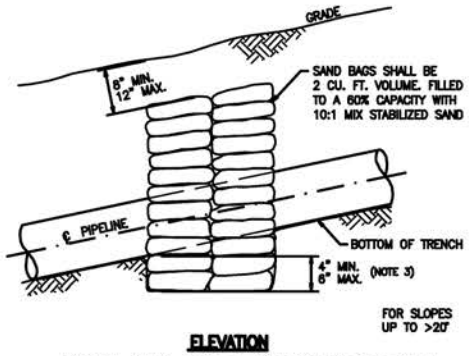


PLAN



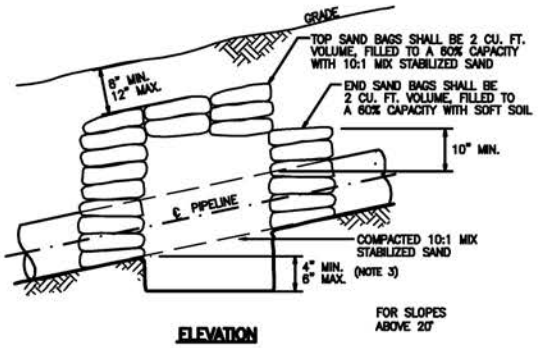
ELEVATION

TYPICAL SAND BAG TRENCH BREAKER TYPE 1



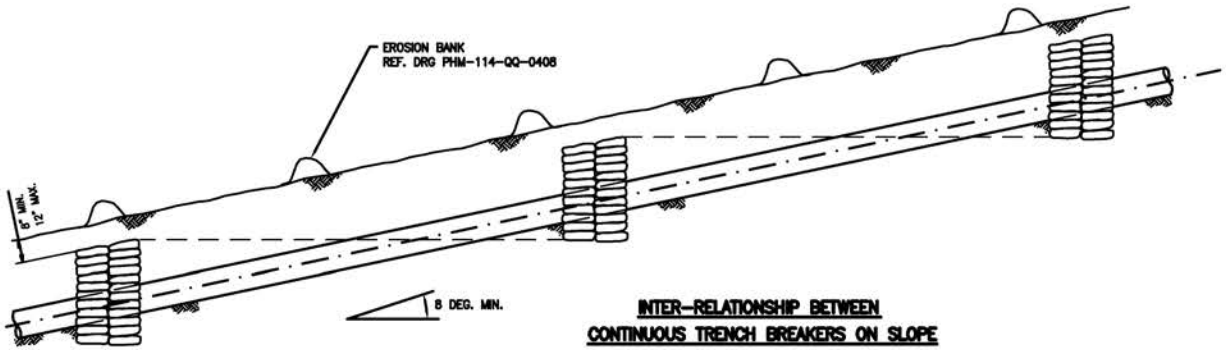
ELEVATION

TYPICAL SAND BAG TRENCH BREAKER TYPE 2



ELEVATION

TYPICAL SAND BAG TRENCH BREAKER TYPE 3



INTER-RELATIONSHIP BETWEEN CONTINUOUS TRENCH BREAKERS ON SLOPE

NOTES:

1. CONTRACTORS AND SITE REPRESENTATIVE TO DETERMINE THE EXTENT OF TRENCH BREAKERS REQUIRED.
2. TRENCH BREAKERS ARE TO BE KEYED INTO THE TRENCH WALL & FLOOR.

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL
4848 Loop Central Drive
Suite 187
Houston, Texas 77081
713.425.8000
1.800.966.1813
www.universalpegasus.com

DRAWN	GI	DATE	01/03/14
CHECKED	AWM	DATE	01/03/14
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

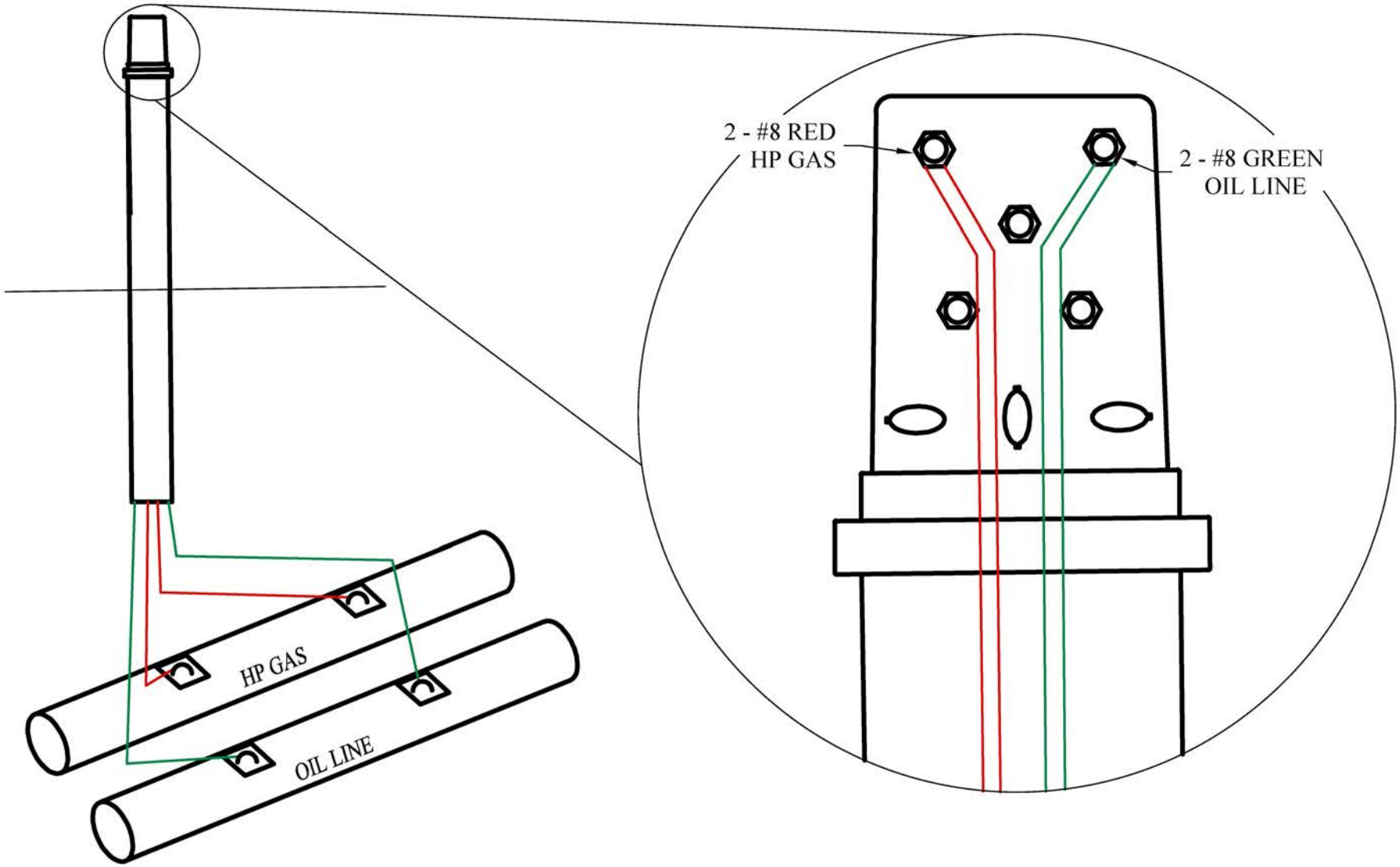
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL DRAWING
TYPICAL TRENCH BREAKER

SCALE:	HESS DWG. NO.	REV.
N.T.S.	NDP-HBAK-PPL-DET-000-41078	0

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41078.DWG

UPI DWG. NO. 21036-505-TYP-41078



NOTES:

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL
4848 Loop Central Drive
Suite 187
Houston, Texas 77081
T:713.425.8000
L:800.960.2813
www.universalpegasus.com
Texas Registered Engineering Firm: F-1902

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

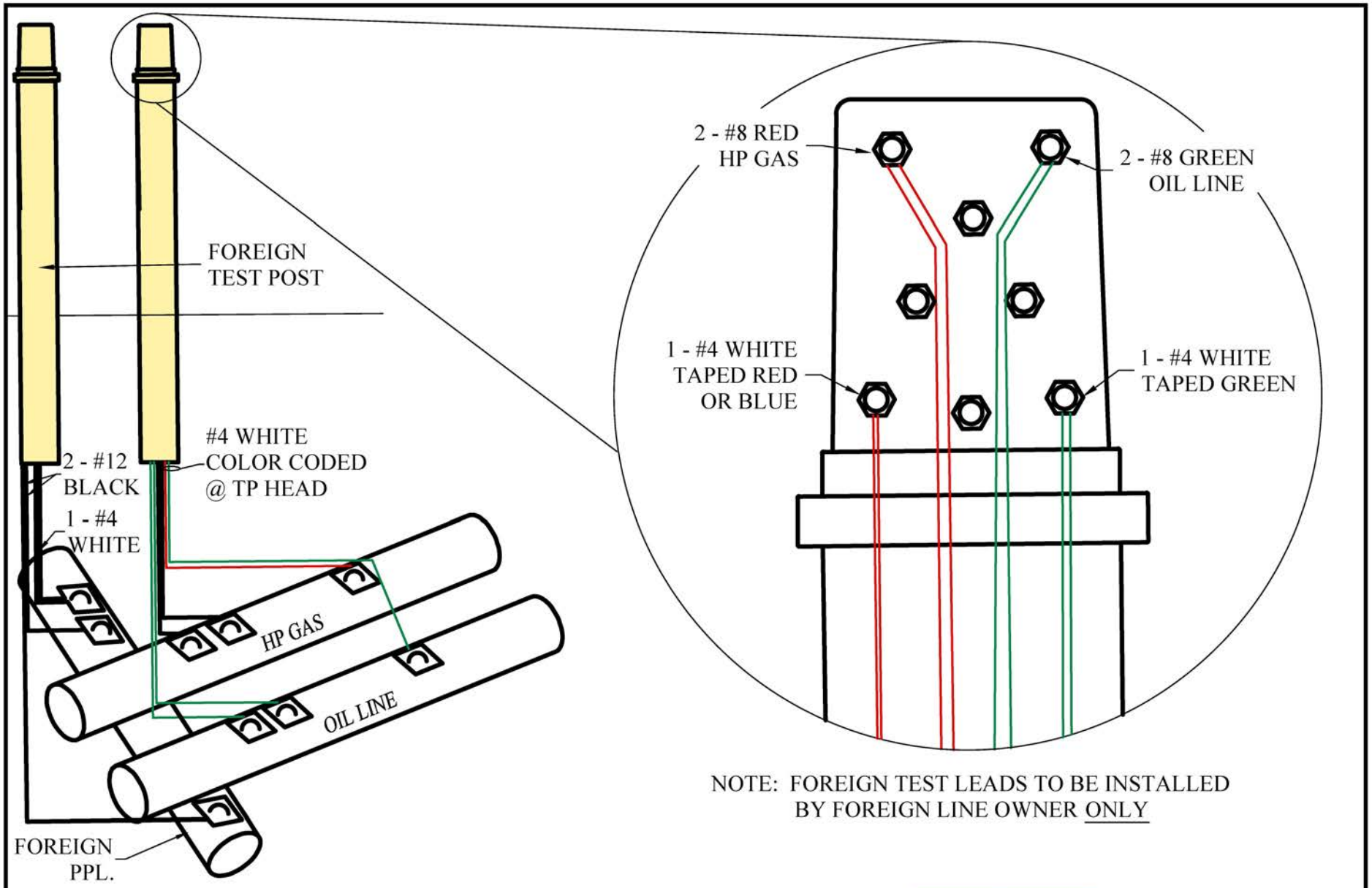
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL DRAWING
CATHODIC PROTECTION TEST STATION
TYPE #1

SCALE:	HESS DWG. NO.	REV.
N.T.S.	NDP-HBAK-PPL-DET-000-41131	0

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41131.DWG

UPI DWG. NO. 21036-505-TYP-41131



NOTE: FOREIGN TEST LEADS TO BE INSTALLED BY FOREIGN LINE OWNER ONLY

NOTES:

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

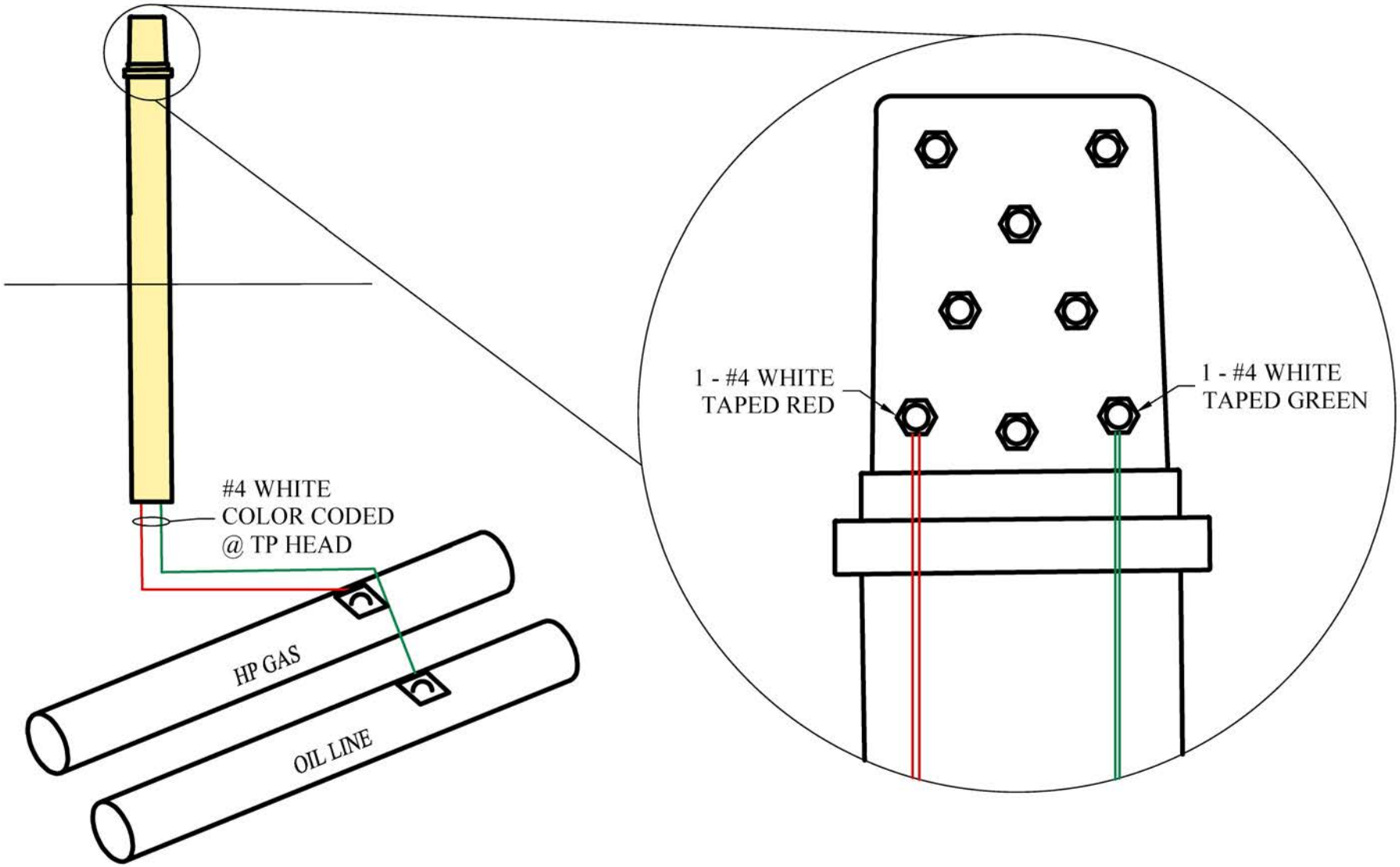
HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL DRAWING
CATHODIC PROTECTION, TEST STATION AT FOREIGN PIPELINE CROSSING

SCALE:	HESS DWG. NO.	REV.
N.T.S.	NDP-HBAK-PPL-DET-000-41133	0

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41133.DWG

UPI DWG. NO. 21036-505-TYP-41133



NOTES:

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

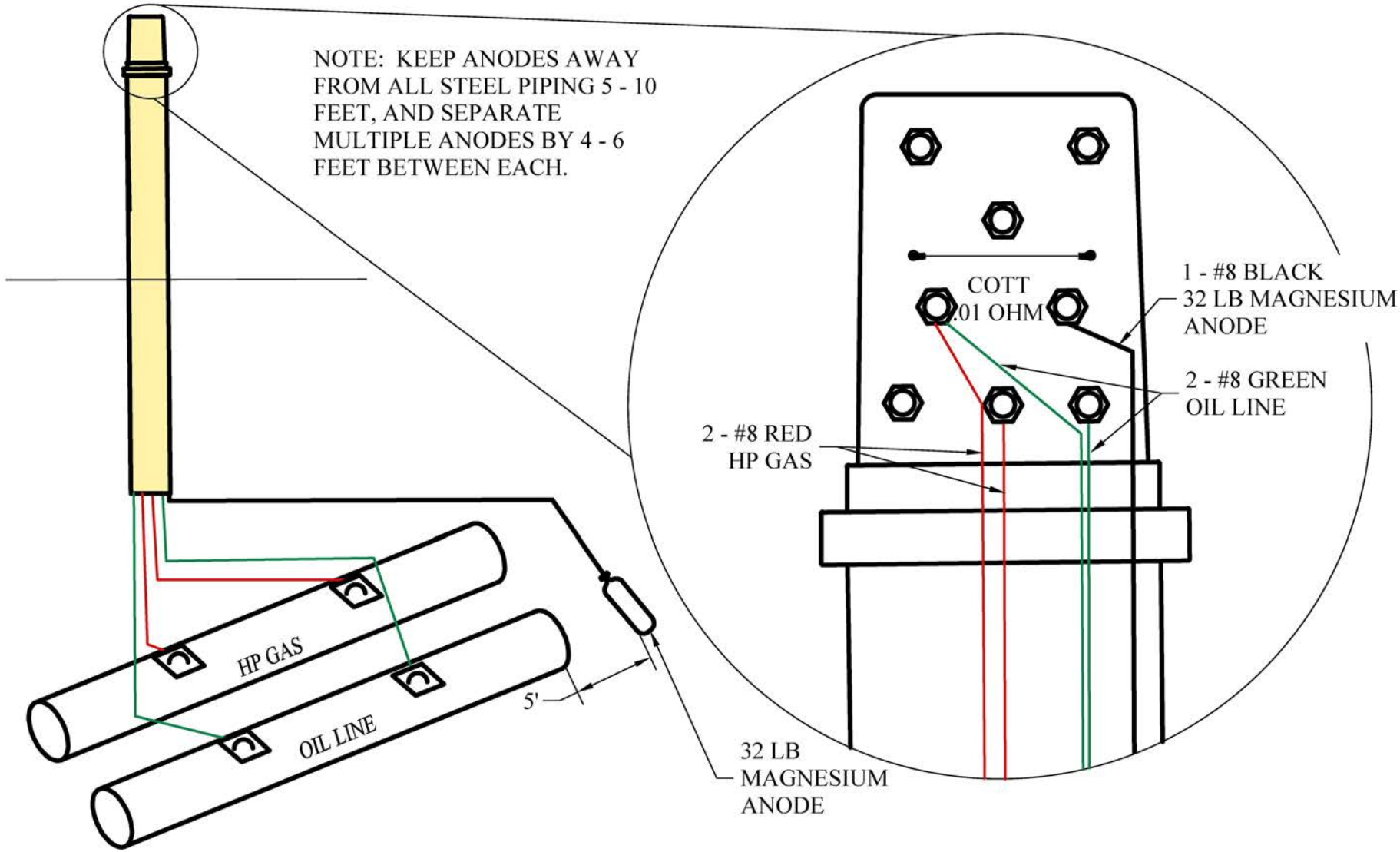
HESS

HESS HAWKEYE
TRUNKLINES PROJECT
TYPICAL DRAWING
CATHODIC PROTECTION, TEST STATION
TYPE #2

SCALE:	HESS DWG. NO.	REV.
N.T.S.	NDP-HBAK-PPL-DET-000-41136	0

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41136.DWG

UPI DWG. NO. 21036-505-TYP-41136



NOTES:

NO	REVISION	DATE	DRAWN	CHKD
0	ISSUED FOR CONSTRUCTION	03/04/14	GI	AWM

UniversalPegasus INTERNATIONAL

DRAWN	DMB	DATE	10/16/13
CHECKED	AWM	DATE	10/16/13
APPROVED		DATE	
SHEET			
JOB NO.	21036		
CLIENT	HESS CORPORATION		
CLIENT JOB NO.			

HESS

HESS HAWKEYE TRUNKLINES PROJECT
TYPICAL DRAWING
CATHODIC PROTECTION, TEST STATION WITH ANODE

SCALE:	HESS DWG. NO.	REV.
N.T.S.	NDP-HBAK-PPL-DET-000-41137	0

F:\HESS BAKKEN\500 ENGINEERING DESIGN\505 PIPELINE DRAWINGS\TYP TYPICALS\21036-505-TYP-41137.DWG

UPI DWG. NO. 21036-505-TYP-41137

Appendix E

Hydrostatic Test Plan

TECHNICAL SPECIFICATION
HYDROSTATIC TESTING

HAWKEYE TRUNKLINES PROJECT
WILLIAMS COUNTY & McKENZIE COUNTY
NORTH DAKOTA

- ☐ **ISSUE FOR INFORMATION**
- ☐ **DRAFT ISSUE FOR COMMENTS**
- ☐ **ISSUE FOR CLIENT REVIEW / COMMENT**
- ☐ **ISSUE FOR BID**
- ■ **ISSUE FOR CONSTRUCTION – Rev 0**
- ☐ **ISSUE AS REVISED DOCUMENT**

APPROVALS	
UPI – Lead Engineer	Date
Anthony Miller	02/24/2014
UPI – Project Manager	Date
Tom Del Prato	02/24/2014
HESS – Project Manager	Date

	By	Date
Initiator	AWM	8/27/2013
Process		
Mechanical		
Civil		
Electrical		
Instrumentation		
Project Eng.		
Project Eng.		
Project Mgr.		

Revisions:

Rev	Date	By	Approval
0	02/24/2014	WR	AWM

This document is solely for the use of the contractual Company and vendors of Universal Pegasus International, Inc. (UPI). UPI assumes no liability to any other party for any representations contained in this document.

TABLE OF CONTENTS

1. DOCUMENT SCOPE 1

1.1. PROJECT OVERVIEW 1

2. GLOSSARY 1

3. CODES AND STANDARDS 2

3.1. REFERENCE SPECIFICATIONS 2

3.1.1. American Petroleum Institute (API) 2

3.2. DESIGN RESTRICTIONS 2

3.3. APPROVALS & PERMITS 2

3.4. CONFLICTS 2

3.5. GENERAL REQUIREMENTS 2

4. DESIGN REQUIREMENTS 3

4.1. GENERAL TEST REQUIREMENTS 3

4.2. CONTRACTORS TEST PROCEDURE 3

4.3. TESTING PLAN 3

5. TEST INSTRUMENTATION 4

5.1. CALIBRATION AND CERTIFICATION 4

6. TEST MEDIUM 5

6.1. WATER SOURCE APPROVAL 5

6.2. TEST WATER TREATMENT 5

6.2.1. Treatment for Steel Corrosion 6

6.2.2. Freeze Protection 6

6.3. TEST WATER PIPING 6

7. TESTING MATERIALS AND EQUIPMENT 7

7.1. MATERIALS 7

7.2. TEST HEADS 7

7.3. FIELD TEST FACILITIES 7

8. LINE FILLING 8

9. HYDROSTATIC TESTING REQUIREMENTS 9

9.1. GENERAL 9

9.2. TEMPERATURE SENSOR PLACEMENT AND STABILIZATION 9

9.3. TEST PREPARATION 9

9.4. PRESSURIZATION 9

9.5. HYDROSTATIC PRE-TESTING 10

9.6. SPARE PIPE/PRE-TESTED PIPE 11

9.7. STRENGTH TEST 11

9.8. LEAK TEST 12

9.9. LEAKS AND FAILURES 12

9.10. DEPRESSURIZING AND DEWATERING 12

9.11. PIPE MARKING 13

10. TEST ACCEPTANCE 13

10.1. STRENGTH TEST 13

10.2. LEAK TEST 13

11. TEST RECORDS 14

12. PIPELINE FINAL CLEANING AND DRYING 15

12.1. CLEANING 15
12.2. DRYING 15
12.3. SEALING 15

13. TIE-IN, PURGE AND FINAL GAUGING 16

13.1. FINAL GAUGING TOOL SURVEY 16
13.2. GAUGING 16

14. SAFETY PROCEDURES 17

1. DOCUMENT SCOPE

This specification covers the general procedures to be followed for the hydrostatic testing of pipelines in the Bakken Development.

The pipeline test sections shall be specified by Company in the Hydrostatic Test Plan. Refer to HESS document NDP-HBAK-PPL-PLN-000-10001.

1.1. PROJECT OVERVIEW

Hess Corporation will install a new 12” oil line, 12” High Pressure Gas (HPG) line and two 24-strand fiber optic cables (FOC) from Williams County to McKenzie County, North Dakota. The oil pipeline will connect the proposed Hawkeye Central facility to the expanded Ramberg Truck Facility (RTF). The new 12” HPG pipeline will connect the proposed Hawkeye Compressor facility expansion to the Silurian Compressor facility. The existing 8” gas pipeline will be converted to transport Natural Gas Liquids (NGL) from Hawkeye Compressor to Silurian via Hoffland valve station. Each of the pipelines will connect to one of the existing 8” pipelines that cross Lake Sakakawea from North Charlson to North River Crossing (NRC). New launchers/receivers, remotely operated shut down valves, monitoring and control systems will be installed as required along the route.

Reference the latest revision of Project Scope of Work for a complete project description: HESS Document NDP-HBAK-PPL-SOW-000-10002.

2. GLOSSARY

API	American Petroleum Institute
Company	Hess Corporation
Contractor	Pipeline Contractor
EIA	Environmental Impact Assessment
HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
MAOP	Maximum Allowable Operating Pressure
MAWP	Maximum Allowable Working Pressure
MOP	Maximum Operating Pressure
NDT	Non Destructive Test
PPM	Parts per Million
SMYS	Specified Minimum Yield Strength

3. CODES AND STANDARDS

The latest version of the following general codes and standards as specifically listed shall be used in the Detail Design engineering of the Hawkeye Pipeline system. The precedent codes for this project shall be ASME B31.4 or B31.8 as applicable.

3.1. REFERENCE SPECIFICATIONS

3.1.1. AMERICAN PETROLEUM INSTITUTE (API)

API 5L: Specification for Line Pipe

API 1104: Welding of Pipelines and Related Facilities

API RP 1110: Recommended Practice for Pressure Testing of Liquid Petroleum Pipelines

3.1.2 Code of Federal Regulation (CFR)

49 CFR Part 192 Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

49 CFR Part 195 Transportation of Hazardous Liquids by Pipeline

3.2. DESIGN RESTRICTIONS

All designs and drawings shall be approved by HESS Project Lead prior to construction.

Construction crews shall only use IFC approved drawings.

3.3. APPROVALS & PERMITS

The Project will adhere to the regulations and permits of applicable agencies.

Construction contractors shall procure all other necessary permits required in performance of constructing the pipeline system.

3.4. CONFLICTS

In the event of conflict or contradiction with this specification and the codes, Contractor shall seek clarification from Company and obtain resolution of the conflict before proceeding. In general, the more stringent rule shall apply.

3.5. GENERAL REQUIREMENTS

The Contractor shall submit procedures and work method statements for Company approval in all aspects of work to nationally accepted standards and in full compliance with Company specifications, referenced codes and standards, as well as regulatory authority requirements and permit conditions. All work shall be executed in accordance with Company approved work procedures and work method statements. Contractor is responsible to be fully informed of prerequisites for work permits from various Authorities and the possibilities of requiring permit applications.

4. DESIGN REQUIREMENTS

4.1. GENERAL TEST REQUIREMENTS

The pipeline strength test will have a minimum strength test pressure requirement of 1.25 times the MAOP. At no time shall the strength test pressure exceed 90% of SMYS for the lowest yield pipe in the tested pipeline system.

Hydrostatic testing process may be witnessed by representative of Company and/or local authority who shall be notified of time of test.

4.2. CONTRACTORS TEST PROCEDURE

Contractor shall submit a written testing procedure and schedule for Company's approval thirty (30) days prior to commencement of testing. This shall be in sufficient detail for Company to review for compliance with this specification and applicable authority regulations. Additional details as required by authorities shall be provided as necessary to gain their approval. Updates to the schedule shall be provided during the course of the testing program.

The general test procedure shall include the following;

- Safety procedures, communication procedures during the test period, and government/authority/community emergency contacts
- Description of water sources, withdrawal rates and water disposal procedure
- Planned test sections, test data and test acceptance criteria
- Test equipment
- The method of leak detection, repair procedures in case of leak, and a list of repair equipment and their location
- A list of test personnel and supervisor(s) including their testing qualifications and positions

4.3. TESTING PLAN

No test or filling for testing shall commence unless approved and witnessed by Company. Contractor shall submit a detailed written testing plan for each test section to Company for approval at least fourteen (14) days prior to commencement of testing the section. This plan shall contain all procedures, equipment and manpower proposed for use in testing of the pipeline, including but not limited to the following:

- A description of the source of water for the test section(s), water withdrawal rates and water disposal procedure
- Detailed description of pipeline test section(s) construction records, pipe tally, (pipe numbers, lengths and heat numbers) NDT records, joint coating records
- Punch list of outstanding work for completion of the section(s), including assessment of completion methods and schedule
- A detailed schedule for pre-cleaning and gauging, filling, testing, dewatering, post-test cleaning and drying

- A schematic diagram of the test equipment set-up with
  - sizes
  - capacities
  - numbers and locations of equipment
  - chemical additive injection if required
- List of testing equipment, spares and copies of calibration or certification documentation
- Details of test headers with design, construction records and history of use
- Types and number of pigs to be utilized for filling, dewatering and drying
- Method and location(s) of water disposal and discharge rates and to comply with USA local regulatory agencies

The Contractor will apply for permits for supply and disposal of hydrostatic test water, and shall obtain and dispose of all water in accordance with these permits and in a manner satisfactory to any jurisdictional authority, the Landowners affected by this operation and Company.

5. TEST INSTRUMENTATION

5.1. CALIBRATION AND CERTIFICATION

All instruments shall have been calibrated a maximum of 6 months prior to their use. Calibration reports shall include the model, serial number, certificate of calibrated accuracy and/or Uncertainty of Measurement value at confidence level, date of certification and shall be carried out by an accredited calibration service provider. Calibration certificates shall be kept at the test site. Company reserves the right to request the Contractor to replace any instrumentation that is not satisfactorily calibrated.

6. TEST MEDIUM

Water shall be used as the primary test medium. An alternate test medium shall require prior approval by the Company.

The withdrawal rate of water shall be in accordance with the water withdrawal permits and the local regulations.

6.1. WATER SOURCE APPROVAL

Wherever possible, clean, fresh water shall be used. Brackish water shall not be used unless specifically authorized by the Company.

Water source, sampling and analysis shall be specified and approved. Water sources containing silt or suspended material shall not be used unless it can be treated satisfactorily by filtration or settlement. Usage of polluted or corrosive water in piping is strictly forbidden. Only water from approved sources shall be used following submission of test results and/or proposed treatment.

The Contractor shall provide Company with two (2) source water samples of the water body from which any water is withdrawn. One sample shall be taken a minimum of one (1) week prior to testing and another sample shall be taken at the time of water withdrawal for testing. Prior testing done to gain the source approval shall not be used to meet this requirement.

Water sample shall be analyzed by an independent testing laboratory or otherwise approved by Company. The water analyses, together with recommendations on water treatment, shall be submitted to The Company for approval.

The Contractor shall obtain samples of all water to be used for testing, and shall provide the Company with a copy of the certified analyses of these samples.

The quantity must be adequate to fill and test the piping. To preclude attack on stainless steel components (e.g. pipe, valve trim, etc.) the test water must contain less than 50 ppm of chlorides.

6.2. TEST WATER TREATMENT

Treating hydrostatic test water with chemicals (biocide, corrosion inhibitor, or oxygen scavenger) must be approved by Company. Corrosion inhibitors, if required, shall be selected on the basis of lesser environmental impact. Contractor will comply with local regulations when disposing of any treated water.

Should it be necessary to treat water for testing either before or after the test, as determined by laboratory tests, the Contractor shall submit details of water treatment for the approval of Company.

Chemical treatment is required if the test water will be transferred between sections or is planned to be in the pipeline longer than 10 days. Where the water is not intended to be in the pipeline longer than 10 days, chemical treatment may not be required, subject to water quality tests.

The Hydrostatic test water shall not be allowed to remain in the test section(s) for over sixty (60) calendar days.

Disposal methods of biocides and flocculates must be approved by Company.

Filtration shall be through an approved screen.

6.2.1. Treatment for Steel Corrosion

The water used for hydrostatic testing shall be chemically treated as required to limit corrosion of steel, and shall minimize the formation of calcareous deposits originating from water hardness. Tests shall also be conducted to determine presence of any sulphate reducing bacteria.

6.2.2. Freeze Protection

Freeze protection during the hydrostatic test shall be provided as necessary.

The preferred method is to use a 20-40% methanol/water mixture supplied by the pipeline service contractor during winter testing. The mixture must be recovered in tanks after testing and returned for recycling.

Note: Any spills must be promptly cleaned up since an adverse effect of antifreezes is an increase in chemical oxygen demand for aquatic life.

6.3. Test Water Piping

The Contractor shall obtain licenses to extract water and gain permission to use a temporary right-of-way for laying water pipes between the test water source and the pipeline section which is to be tested.

The Contractor shall provide and install temporary pipelines and equipment for obtaining the test water, and any necessary filtration and/or treatment as required.

7. TESTING MATERIALS AND EQUIPMENT

7.1. MATERIALS

Contractor shall supply all materials, including pipe for test headers.

Contractor shall supply all pipe, end caps, hose, flanges, blinds, plugs, fittings, connectors, instruments, pumps, break tanks, compressors, chemical injection equipment, water treatment analyses and chemicals, facilities for testing personnel, and any item of equipment essential for the conduct of tests to this specification

7.2. TEST HEADS

The Contractor shall supply all test heads. These shall have a design pressure equal to maximum test pressure, and constructed in accordance with ASME B31.4/ASME B31.8 Heads shall be provided with lifting lugs and support brackets.

Prior to testing, all welds joining test heads to the test section must be radiographed.

The headers shall be pre-tested to the maximum test pressure or 1.5 time design pressure for the pipeline sections for not less than 4 hours. Valves shall be sufficient for a filling connection and for pig launch/receipt and test connections. Reducers or adaptors may be used to suit smaller test fitting connections.

Contractor shall supply test header design documentation to Company for Approval. NDT shall comply with the same standards as for the permanent construction.

The test heads and adjoining pipe must be adequately supported.

7.3. FIELD TEST FACILITIES

The Contractor shall provide a well lit, temperature controlled test enclosure of sufficient size to house the test personnel, testing instrumentation and in which the test record analysis and evaluation shall be performed, and shall include as a minimum:

Sufficient work table(s) to complete test record analysis including computer terminals and printers/plotters for direct recording of data, and production of test reports and graphs

Sufficient work table(s) to support dead weight testers, flow meter display, and pressure and temperature recorders gauges located in mobile container

Supply stable and reliable electric power for computer equipment

Separate communication facilities from the mainline construction crews, capable of communicating with each ends of the test section

Testing facility shall be of adequate design to prevent instrument hoses from freezing

Hoses should be equipped with quick connect self sealing couplings and be oil filled

8. LINE FILLING

It is not intended that line block valves, check valves, densitometer assemblies or scraper stations are installed in the pipeline at the time of testing. All such assemblies shall be pre tested, cleaned and dried prior to final tie in to the pipeline, after completion of all pipeline cleaning and drying.

If there are any adjacent water bodies near the test area, fill pumps and associated fuel tanks shall be placed within an impermeable enclosure to contain any equipment oil leaks. Any leaks or spills shall be cleaned up and disposed of before the enclosure is removed and the site restored.

Contractor shall ensure the water supply is sufficient to permit a continuous fill without interruption. The actual fill rate used at any location shall be satisfactory to Company and any authority having jurisdiction. The water intake shall be located at a depth that will not permit air to be drawn in with the water and shall be screened in accordance with the requirements of any authority having jurisdiction.

Nominal Filling pump rate shall be sufficient to give an average fill pig speed and have sufficient total head to overcome line friction plus pig driving pressure, as well as sufficient shut in head to produce pressure at the high point of the section most distant from the filling point. Actual shut in fill pressure is subject to directing of filling - uphill or downhill.

The fill pump system shall include a water flow meter for estimating the location of the fill pig and the total volume of fill water used. A check valve shall be installed at the point where the fill pump discharge piping is tied into the pipeline. The filling operations shall be continuous until a section is filled.

At Least 2 bi-directional filling pigs shall be run in each test section. Each shall be a steel bodied type with replaceable polyurethane guide and seal discs. Pig types shall be nominated in the Contractors test Procedure and shall be approved.

On receipt of the fill pigs, flush water and slug water will be discharged in an approved manner and to an approved location. If applicable, slug water may be transferred into an adjacent test section as flush water. Water behind the 2nd pig shall continue to discharge until clear and the section shut in.

Final section pressure may be the maximum shut in pressure developed by the fill pump.

Filling of a sequence of test sections may be carried out using appropriately rated temporary transfer piping, arranged to prevent transfer of loads or stresses to the test head valves.

In cases where the terrain is such that filling will take place on a substantial decline, an adequate backpressure of air shall be maintained on the pig to prevent it from running away from the water behind it.

The Contractor shall provide Company with 48 hours advance notice prior to commencing filling operations.

9. HYDROSTATIC TESTING REQUIREMENTS

9.1. GENERAL

Pressurizing to test pressure shall be carried out in daylight hours unless otherwise approved by Company.

Pressurizing shall be continuous by positive displacement pressure pump. The Contractor shall ensure that the pressure pump is adequately sized for the length and diameter of the section to be tested.

Water volume added shall be measured by flow meter with remote digital indication of cumulative volume and incremental volume of sufficient size and range to measure total added volumes during pressurizing for the test section.

9.2. TEMPERATURE SENSOR PLACEMENT AND STABILIZATION

The installation method and number of temperature sensors for each test section shall be determined by the Hydrostatic Test Engineer and shall be stated in the Test Procedure Document for Company Approval.

Pipe and soil temperature shall be measured and recorded at each end of the test section and at as many intermediate locations along the test section as necessary to measure the average test section temperature to the accuracy required for a definitive leak test.

For short sections a minimum of three locations shall be used to measure pipe and soil temperatures.

Pipe temperature sensors shall be installed with the sensing head or tip directly on the pipe coating and covered with insulating materials. Soil temperature sensors shall be buried at pipe centerline depth and laterally from the pipe.

All temperature sensors shall be installed and back-filled to full trench height at least 24 hours prior to the start of pressurizing.

9.3. TEST PREPARATION

Prior to starting the test, all fittings shall be checked for tightness. Bull plugs and blind flanges shall be installed except where gauges, recorders, or pumps are to be connected. The pressure pump and connections must be checked before the test commences to ensure that they are capable of withstanding the pressure to which they shall be subjected. A check valve shall be installed between the test head and the piping from the pressure pump.

Pressure recorders shall be verified against the deadweight tester prior to commencement of test. Chart will be marked at 0, 25%, 50%, 75%, 100% test pressure range.

Pressure gauges shall be installed on each test head prior to starting the testing operation.

A pressure bleed valve rated for and capable of operation at the maximum Test Pressure shall be provided on the test point test head.

9.4. PRESSURIZATION

Pressurization and associated monitoring for the pipeline section shall meet the minimum requirements of the hydrostatic test plan.

Volume and pressure readings shall be recorded at intervals no greater than 15 minutes. A pressure/volume plot shall be made. Simultaneous plotting of pressure versus volume added must be carried out during the pressurizing to determine yielding or departure from linear slope is within the permitted offset volume.

Pressure and temperatures, including ambient, shall be recorded every 3 hours during the stabilization period.

The water shall undergo a minimum 24 hour thermal stabilization period before commencing the pressure test.

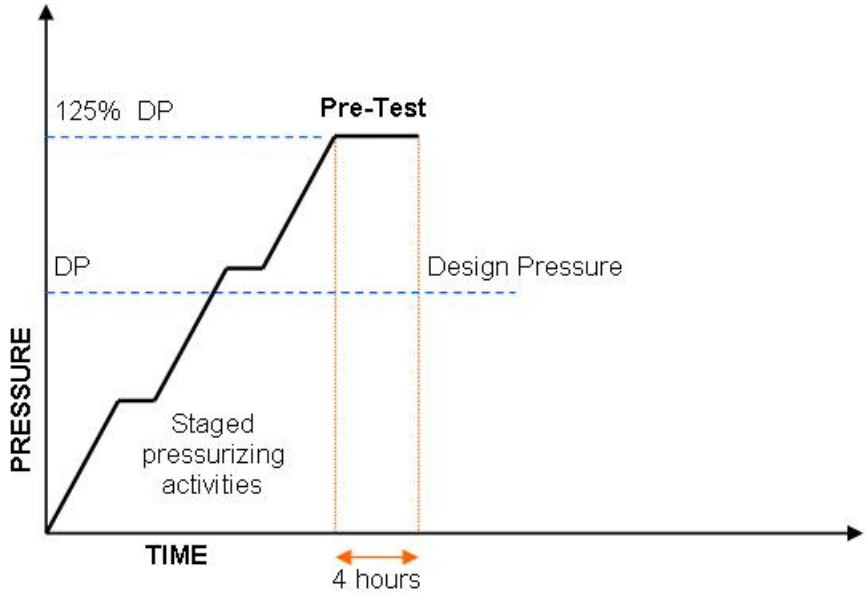
9.5. HYDROSTATIC PRE-TESTING

Stringed piping for HDDs or bored crossings shall be pre-tested. Test duration for these sections shall be a minimum of four (4) hour at no less than 125% design pressure with visual check.

In general, such crossing pipe to be tested will be that which is installed in bores, casings, HDD drill holes or are otherwise prevented from access in service or impractical to locate or repair a leak in its final installed location.

Crossings will be subsequently included and retested in situ with the adjoining pipeline test section.

Refer to figure for Pre-Test Sequence of Pressurization.



9.6. Spare Pipe/Pre-tested Pipe

Sufficient length of pipes shall be pre-tested for use only as replacement pipe after caliper run (if any) including standard and heavy wall.

The test pressure shall be calculated and shall be maintained for a continuous period of 4 hours. Pipe shall be visually inspected during the test to confirm the absence of leakage.

Following testing these pipes shall be dewatered and dried and then cut and the ends re-beveled in accordance with Specification requirements. The following data shall be stenciled in paint on each pipe:

- Pre-Tested Pipe
- Test date: DD/MMM/YYYY
- Test pressure in psig

The tested pipe shall be protected against internal corrosion and degradation of the external coating and stored at a location to be specified by the Company. The proposed protection method must be approved by Company.

9.7. Strength Test

The strength test shall be not less than 1.25 times design pressure, stabilized, and held for 8 hours.

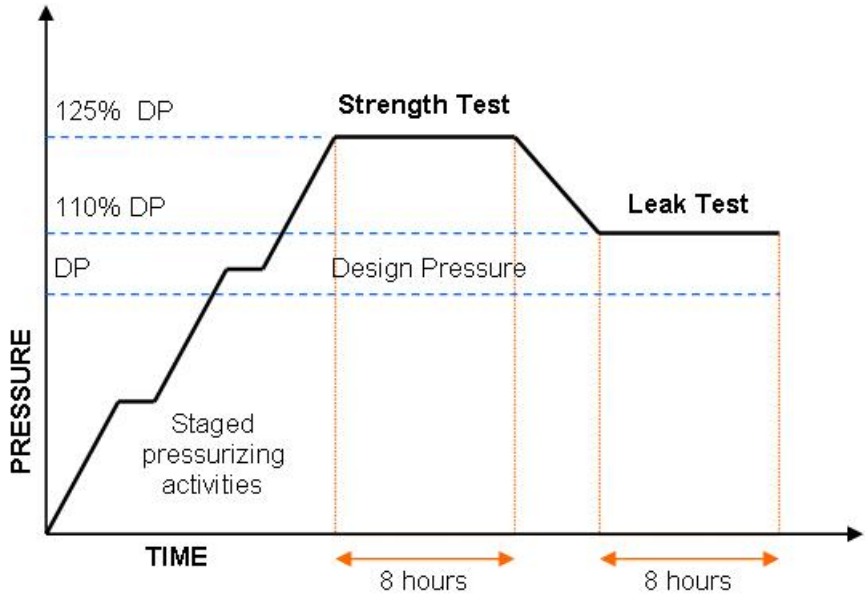
Test pressure shall be maintained within pressure limits of ±1% of test pressure by adding or bleeding of test water. The contractor shall record:

- Volume
- Time of water transfer
- Pressure readings before and after water transfer

Pressure readings and ambient temperature readings shall be recorded at 15 minute intervals.

The strength test shall be accepted if structural integrity is maintained and the pressure variation does not exceed ±1% of the test end-point pressure during the test period.

Following any re-pressuring in excess of ±1% during the strength test or the leak test, the test section shall then be allowed to stabilize and the test restarted.



9.8. Leak Test

Following the strength test, the test section is to be prepared for the leak test. The pressure shall be reduced by approximately 10% of the strength test pressure, but not less than 110% MAOP and the section isolated and secured. All hoses shall be removed and plugs and blinds fitted and secured.

The leak test shall be not less than 1.1 times the design pressure and held for 8 hours.

In conjunction with the final test plot, individual soil, pipe and ambient temperatures shall be plotted separately to verify the continuity and trending of all temperatures during the test period. This will verify the accuracy of the data collection and recording process.

The test and the recording of data shall be continued until the correlation calculations are completed and the test meets the acceptance criteria to the approval of the Company. Only after this, shall the contractor be permitted to release the pressure in the test section.

If a leak is suspected the pressure shall be reduced to less than 80% of test pressure before carrying out a visual examination. No work shall be carried out to repair leaks until the pressure has been reduced to a safe pressure.

9.9. Leaks and Failures

The Company shall be notified of any leaks or failures and shall be given the opportunity to inspect the faulty pipe or component prior to commencing the repair.

The Contractor shall be responsible for locating and repairing the faulty pipe or component.

All leaks and failures in the mainline pipe shall be located and repaired or replaced.

All repair welds shall be inspected by full NDT prior to re-filling and re-testing.

On completion of repair of a failed pipe or component, testing shall be repeated until all requirements for both strength and leak tests are achieved.

The test need not be repeated if a pipe leak was controlled or temporarily repaired such that a conclusive test was completed and the faulty pipe is repaired by replacing with pre-tested pipe.

The edge of the leak or failure shall not be cut or damaged. If the pipes fail in the longitudinal weld the complete longitudinal pipe joint length shall be removed including the butt welds and their heat affected zone.

The piece(s) removed shall be marked for orientation with respect to the position in the pipeline and with the mile post location of the failure and the pipe number(s) recorded.

Failed pipe shall be transported to an area nominated by the Company. If the failed portion is too long for transportation or handling, it shall be cut at right angles to the failure edge. The location of each cut shall be approved by the Company. All failed portions shall be retained and protected against corrosion and damage.

9.10. Depressurizing and Dewatering

Dewatering shall be completed according to the requirements of local regulation, water license, and authorities.

Immediately after the test has been completed, the pressure shall be slowly released from the section to a nominal pressure. Any fittings and valves used for depressurizing shall have a pressure rating equal to or greater than the test head pressure rating. Depressurizing devices or hoses shall not be attached to the bleed valve, unless adequately secured. Pressurized test water shall be discharged per the Contractor's hydrostatic test procedure as approved by Company.

Prior to dewatering, all drain lines and the test heads to which they are attached shall be firmly secured. Dewatering shall be carried out by propelling bi-directional pigs with compressed air.

Wherever possible, water from previous pressure test shall used for next section to minimize the quantity of water disposed. Water disposal sites shall be selected to prevent inter-basin transfer of water. Dewatering shall not be on to open areas, unless approved by Company. Dewatering shall not cause erosion or have detrimental environmental effects over the discharge area.

Contractor shall provide Company with three water samples from each test water discharge, the samples to be taken during the first 15 minutes, midway through the discharge, and near the end of the discharge. Drying and Cleaning of the pipeline sections shall be completed in accordance with the Project Construction Specifications and to the satisfaction of Company.

9.11. Pipe Marking

After each successful test, the test number and the test completion date shall be indelibly marked on the outside of the pipe at each end of the test section.

10. TEST ACCEPTANCE

The Contractor is responsible for holding the test for the specified test periods and until Company agrees that the test is acceptable. To be declared acceptable, the following conditions must be met during the test:

10.1. Strength Test

There shall be no loss of structural integrity, and the test pressure shall have been maintained within ±1% of nominated test pressure for the test duration.

10.2. Leak Test

There shall be no visible leaks and all changes in test pressure shall be correlated to temperature, with the pressure difference between actual and calculated values being within the Allowed Unaccountable Pressure Change value.

Allowed Unaccountable Pressure Change is evaluated as follows;

Temperature Effects of exposed pipe shall be evaluated by prorating the pressure change due to exposed pipe wall temperature change by the % of exposed pipe to total pipe length.

All variables and correlations shall be evaluated at the average pipe wall test temperature.

11. TEST RECORDS

Legible and orderly documentation of each test shall be generated by the Contractor in format required by the Company, and shall include all pressure test records and drawings of API RP 1110, section 6. Test records shall include the activities and details for cleaning, gauging, filling and stabilization of the line.

Test Record and Report format shall be included in the Contractors approved Hydrostatic Test Procedure and approved by the Company.

It is recommended that field test data be both manually recorded and directly input into a computer, programmed to simultaneously generate the pressure volume plot, the strength test plot and the leak test plot as the data is collected and loaded.

Provision of printers or plotters is required for ready production of test reports at the test site.

Contractor's testing supervisor shall sign and handover original test records for approval on completion of each section test, and maintain complete record copies for final handover documentation.

All field reports, charts and data sheets are to be countersigned by the Company or their representative at the time of the test.

Draft Final Reports will be completed by the Contractor within 7 days of the field test date and submitted to the Company for review and approval. Copy of final report shall be given to the Company. Originals of all test data and reports shall be returned to the contractor for final documentation handover to the Company.

12. PIPELINE FINAL CLEANING AND DRYING

The Contractor shall propose the procedure for final pipeline cleaning and drying for Company's approval.

Contractor shall supply and install headers suitable for on-line launching of drying and cleaning pigs.

Receiving headers shall be constructed and equipped for controlled receipt of drying and cleaning pigs, including control of expelled dry dust, particularly in the urban areas.

12.1. CLEANING

The Company representative shall determine when the cleaning operation is adequate. This shall be determined by the amount and particle size of material discharged to be distributed and the degree of dust penetration in the final dust removal pigs. The material amount shall be specified by Company.

Cleaning pigs shall consist of hardened steel bristle impregnated poly pigs or approved equivalent, and include a magnetic scraper pig, and sufficient soft foam pigs for dust removal.

Pigs shall be described in The Contractor's Hydrostatic Test Procedure and subject to the approval of the Company.

Cleaning pigs shall be run until the Company is satisfied that the cleaning operation is adequate.

Air Compressor capacity should be adequate to propel bristle type cleaning pigs at a sufficient speed to ensure a cleaning action. Bi-directional or cup pigs should not exceed speeds greater than 3.1 mile/hr.

12.2. DRYING

Drying plant shall be heatless regenerative type and have the capacity and ability to produce dry air to 0°F dew point.

An alternative vacuum drying plant may be used.

Minimum criteria for cleaning and drying are the following:

Pipeline drying shall be carried out by propelling foam pigs with compressed air. The foam pig shall be clean and dry to Company's satisfaction.

Drying pigs shall be open cell soft foam type.

The Contractor may propose an alternative drying procedure for Company's consideration. The Contractor must satisfy Company that any alternative procedure will achieve the same level of pipeline dryness.

12.3. SEALING

Immediately after pipeline drying and cleaning runs have been completed, the Contractor shall tie in to dry sections or install watertight caps with bleed valves on the ends of the test section.

13. TIE-IN, PURGE AND FINAL GAUGING

On completion of each section test, cleaning and drying, tying in of sections shall be carried out. Where unavoidable and the test section ends could not be overlapped, pre-tested pipe may be used. The pipe shall be welded per the Construction & Welding Specifications.

Subject to the availability of fabricated pipeline assemblies, block valves, check valves, density meter assemblies, and pump station terminations, the pipeline shall be connected in continuous lengths corresponding to the inlet and outlet terminal points or pump station locations.

The pipeline shall be purged with dry air to a 0°F discharge dew point and packed to a nominal pressure and sealed.

13.1. FINAL GAUGING TOOL SURVEY

Following completion of the tie-ins, the pipeline shall be gauged using an approved gauging tool capable of demonstrating that the internal diameter complies with the ovality and dent criteria nominated in ASME B31.4/ASME B31.8 and this specification. The tool specification and the provider capability shall be approved by the Company.

The gauging run shall be witnessed and the survey results made available to the Company in conjunction with the Contractor within 3 days of the survey. The Company shall be able to view the complete survey data. The Contractor shall provide a complete set of data and associated viewing software to the Company.

Any non-compliant dents, ovality, or other defects shall be located, the cause of the defect shall be removed, and the defect repaired.

Repair shall be by cut out and replacement with pre-tested pipe.

The completed pipeline shall be purged with dehydrated air while all facility piping ends are blanked using temporary fittings and all station valves and line break valves are fully open. Once purging is complete, the pipe shall be packed to a normal pressure and the pipeline isolated. Isolation valves at terminal scraper traps may be used if they are installed. Alternatively a temporary closure and valve shall be welded to the pipe end.

13.2. GAUGING

Prior to filling a test section, the section shall be pigged with a gauging plate or caliper pig run to determine the presence of dents, buckles of ovality in the pipeline.

The sections or subsection length for the purpose of cleaning and gauging shall be confirmed prior to commencement of cleaning activities.

Lengths of sections for gauging should be ensuring effective cleaning. The cleaning and preliminary gauging pigs shall be driven by compressed air.

Pig Location devices will be used to determine location of dents and obstructions during the pre-cleaning process.

If the preliminary gauging plate shows any signs of damage following the gauging run then:

- Remove all obstructions and debris
- Repair any dents or buckles by replacement with new pipe

A gauging pig must be rerun resulting in no signs of damage prior to filling a test section .

14. SAFETY PROCEDURES

Contractor shall obtain necessary permits from Contractor HSE and verified by Company. Contractor shall erect warning signs at all access points to the Right-of- Way, at all public crossing, and at all points where there is exposed pipe or appurtenances.

Contractor shall perform regular patrol of all public crossings for the duration of the entire test period.

All pumps, pressure recorders, deadweight testers and test buildings shall be located at least 33 feet away from the test section, and out of the trench. Instruments located along the pipeline shall be made secure and protected against weather, 3rd Party interference, vandalism, and theft.

Contractor shall ensure that continuous two-way radio communication is available during the full test period over the entire length of the test section.

Adequate lighting of testing work areas shall be provided by the Contractor during hours of darkness.

High pressure steel reinforced type flexible hoses may be used for connections between the pump and the test assembly and shall be fitted with safety restraints at the connection points. Pressure rating shall be appropriate for the pipeline tests.

The Contractor's testing supervisor shall be responsible for direct supervision and the performance of the testing.

Unless otherwise authorized in writing by Company, the Contractor shall supply a minimum of 4 experienced employees at each test site during the pressuring stage of the test, including but not limited to:

- Contractor's Testing Supervisor
- Contractor's Test Engineer
- Pump Operator
- Fitter

Unless otherwise authorized in writing by Company, the Contractor shall supply sufficient, competent and responsible employees (minimum of 2) per test section to be on site during the entire test period to assist in recording the necessary test readings and periodically examine test heads and valves for leaks. Additional personnel shall be made available for safety patrol as necessary for the test location.

Company testing supervisor shall witness all pressurizing operations.

Appendix F

Noxious Weed and Invasive Weeds and Aquatic Invasive Species Control Plan

Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan

Hawkeye Pipeline System Project

MCKENZIE AND WILLIAMS COUNTIES, NORTH DAKOTA

January 2015

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Plan Purpose/Objectives 1

2.0 Noxious Weeds and ANS 2
2.1 Noxious Weeds 2
2.2 ANS 2

3.0 Best Management Practices 3
3.1 Construction Methods 3
3.2 Treatment Methods 3
3.3 USFS-Specific Requirements 4
3.4 Reclamation Methods 4
3.5 Post-Reclamation Methods 4
3.6 ANS Provision 5

4.0 Herbicide Application, Handling, Spills, and Cleanup 6
4.1 Herbicide Application and Handling 6
4.2 Herbicide Spills and Cleanup 6
4.3 Spill Reporting 7

5.0 Monitoring 8

APPENDICES

Appendix A Identification and Control of Invasive and Troublesome Weeds in North Dakota
Appendix B North Dakota ANS Management Plan
Appendix C USFS Stipulations for Herbicide
Approved Herbicides for Oil and Gas Use on the Little Missouri National Grasslands
Noxious Weed Seed Viability Quick Reference Chart
Pesticide Use Proposal (Form FS-2100-2)
Pesticide Use Proposal Attachment A, Supplemental Information (DPG-2100-2A)
Pesticide Application Records/Year End Report

1.0 Introduction

Hess Corporation (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 proposed Hawkeye Pipeline System Project (Project) would transport subsurface 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 the existing Silurian Compressor Station (natural gas and NGL) near Tioga, North Dakota

The spread of noxious weeds can be a significant issue in construction projects involving land disturbance. Measures must be taken to prevent the spread of noxious weeds during construction and operation and maintenance (O&M). Earth moving activities and the use of contaminated fill, seed, or erosion control products contribute to the spread of weeds.

Likewise, the spread of aquatic nuisance species (ANS) is potentially significant from construction in and through multiple water bodies and watersheds. ANS may be spread by using equipment used on/in other water bodies where ANS may attach themselves to the equipment. The pipeline and materials themselves are not a concern, as they will be new materials, manufactured specifically for this Project.

Surveys conducted in October 2012; May, July, and October 2013; and August and October 2014 observed and recorded the presence of 39 noxious weed populations consisting of Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), houndstongue (*Cynoglossum officinale*), halogeton (*Halogeton glomeratus*), and leafy spurge (*Euphorbia esula*) within the 200-foot-wide survey corridor. Canada thistle and leafy spurge are listed as noxious weeds in the state of North Dakota (North Dakota Century Code [NDCC] 4.1-47-02). Houndstongue and halogeton are listed noxious weeds in McKenzie County, North Dakota. Field bindweed is a United States (U.S.) Forest Service (USFS) designated species. Canada thistle was found in 24 locations in the Project area, leafy spurge in 9 locations, and houndstongue in 1 population. Halogeton and field bindweed were found throughout the survey corridor.

Disturbance from construction could introduce new noxious weed species or facilitate the spread of existing populations. It is important to note that much of the area where construction would occur is adjacent to pasture and agricultural lands that are already disturbed from grazing and agricultural land use practices. Disturbed pastures and barren, fallow agricultural fields provide abundant habitat for spreading noxious weed populations.

Hess recognizes that prevention is the most cost-effective approach to noxious weed and ANS management. Hess would assist federal, state, and local agency weed control efforts, comply with preventative requirements, and implement control measures on areas of the Project identified to be of special concern.

1.1 Plan Purpose/Objectives

This Noxious Weed Control Plan (Plan) is intended to address methods to prevent, mitigate, and control the spread of noxious weeds and ANS during construction and O&M of the Project. Hess and its contractors will be responsible for implementing the methods described in this Plan.

Hess will comply with State of North Dakota, county, and federal agency requirements implemented to prevent the spread of noxious weeds and ANS. Hess will implement weed control measures in areas of the Project right-of-way (ROW) where noxious weeds have been identified. Monitoring during construction and O&M will include the identification of areas along the ROW where noxious weeds are present. Monitoring also will include an evaluation of the prescribed control measures in their effectiveness of control.

2.0 Noxious Weeds and ANS

2.1 Noxious Weeds

Noxious weeds are opportunistic and often exotic (non-indigenous) plant species that readily invade disturbed areas, often producing monocultures and preventing native plant species from establishing communities. Noxious weeds also degrade agricultural productivity, soil and water, wildlife habitat, and recreational and wilderness values.

The NDCC §4.1-47-01(6) defines noxious weeds as any plant propagated by either seed or vegetative parts that is determined by the commissioner, a county weed board, or a city weed board, after consulting with the North Dakota State University Extension Service, to be injurious to public health, crops, livestock, land, or other property. Currently, there are 11 species or species groups (some include more than 1 species and/or cultivars) in North Dakota (North Dakota Administrative Code [NDAC] §7-06-01-02). Pursuant to NDCC 4.1-47, the control and the spread of noxious and invasive weeds is mandatory, and dissemination of noxious weeds must be prevented.

North Dakota's noxious weed list (see description below) includes:

- Absinth wormwood
- Canada thistle
- Diffuse knapweed
- Leafy spurge
- Musk thistle
- Purple loosestrife
- Russian knapweed
- Spotted knapweed
- Yellow toadflax
- Dalmatian toadflax
- Saltcedar

An identification guide to these and other potentially harmful weeds is included in Appendix A. Additionally, McKenzie County includes some additional species as warranting control. These species include: black henbane, common burdock, houndstongue, halogeton, and baby's breath. The USFS also lists an additional 14 species that are considered invasive species on USFS lands: crested wheatgrass (*Agropyron cristatum*), tall wheatgrass (*Thinopyrum ponticum*), intermediate wheatgrass (*Thinopyrum intermedium*), quackgrass (*Elymus repens*), smooth brome (*Bromus inermis*), Japanese brome (*Bromus arvensis*), downy brome (*Bromus tectorum*), spiny plumeless thistle (*Carduus acanthoides*), yellow starthistle (*Centaurea solstitialis*), field bindweed (*Convolvulus arvensis*), sweet clover (*Melilotus* spp.), Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*Poa compressa*), and sow thistle (*Sonchus* spp.).

2.2 ANS

ANS are aquatic and terrestrial organisms introduced into new habitats throughout the U.S. and other areas of the world that produce harmful impacts on aquatic natural resources in these ecosystems and on the human use of these resources. Control of the spread of ANS is delegated under the noxious weed control laws in North Dakota to the North Dakota Game and Fish Department, which regulations are written in Chapter 30-03 of the NDAC. The North Dakota ANS Management Plan is incorporated into this plan by reference and included as Appendix B. Prescribed measures identified in the North Dakota ANS Management Plan for cleaning equipment being transported to the site, and working in or travelling through wetlands and waterbodies, should be followed to prevent the spread of ANS species.

3.0 Best Management Practices

Hess will implement Best Management Practices (BMPs) for conducting noxious weeds and vegetation control where necessary before and after construction. Generally, these include:

- Hess will conduct awareness training to Project personnel regarding identification, prevention, and control methods. No personnel will be allowed to enter the ROW before training.
- Treat or contain weed populations that may be impacted or disturbed by construction activity.
- Use only certified weed-free straw/hay or use fiber roll logs for sediment control.
- Use only certified weed-free straw/hay for mulch.
- Clean all equipment of dirt and vegetation. The contractor will pressure wash all construction equipment prior to mobilizing/demobilizing from the Project. This includes timber mats, cars, transporting trailers and trucks, and recreational equipment brought on-site.
- Wash, or using an air compressor, blow clean all vehicles (including tires and undercarriage) before leaving weed-infested areas.
- The Contractor will implement pre-construction treatments such as mowing prior to seed development or herbicide application to areas of noxious weed infestation prior to other clearing, grading, trenching, or other soil disturbing work at locations identified in the construction drawings.
- Minimize ground disturbance and vegetation removal as much as possible or practical. Further discussion of specific BMPs is included in the following sections.

3.1 Construction Methods

Prior to construction, Hess will mark all areas of the ROW, which contain infestations of noxious, invasive species, or soil-borne pests. Such markings will clearly indicate the limits of the infestation along the ROW. During construction, the Contractor will clean the tracks, tires, and blades of equipment by hand (track shovel) or compressed air to remove excess soil prior to movement of equipment out of weed or soil-borne pest infested areas or utilize cleaning stations to remove vegetative materials using water under high pressure.

In areas where infestations are identified in the field, the Contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they were stripped. Gaps in the topsoil stockpile will be maintained to keep stockpiled topsoil separate from topsoil where infestations are not present. The Contractor will return topsoil and vegetative material from infested sites to the areas from which they were stripped. The Contractor will not be permitted to move soil and vegetative matter outside of the identified area of infestation.

Off-ROW areas related to the Project (construction/storage yards) will be kept weed free. Inspection will be conducted on a regular basis to confirm weeds are not present. Weeds at off- ROW areas will be treated in the same manner as ROW locations.

3.2 Treatment Methods

Noxious weed control measures will be implemented in accordance with existing regulations and jurisdictional land management agencies or landowner agreements. Treatment methods will be based on species-specific and area-specific conditions (e.g., proximity to water, wetlands, riparian areas or agricultural area) and time of year. Most noxious weeds identified along the ROW may be treated by herbicide application. Mechanical methods of weed control including mowing; discing; and hand pulling of small, localized, and/or isolated infestations of noxious weeds. Mechanical methods may be selected in lieu of herbicide treatment for select locations. Discing will not be applied in native habitat areas.

3.3 USFS-Specific Requirements

The USFS has specific requirements for noxious weed control on USFS managed land. Guidelines provided by the USFS as they pertain to the Project are included in Appendix C. These guidelines include:

- USFS Stipulations for Herbicide;
- Approved Herbicides for Oil and Gas Used on the Little Missouri National Grasslands;
- Noxious Weed Seed Viability Quick Reference Chart;
- Pesticide Use Proposal (Form FS-2100-2);
- Pesticide Use Proposal Attachment A, Supplemental Information (DPG-2100-2A); and
- Pesticide Application Records/Year End Report.

The location of noxious weeds within the pipeline ROW will be reported to the managing USFS field office. The appropriate weed control procedures, including target species, timing of control, method of control, and obtaining the appropriate authorizations will be determined in consultation with USFS personnel.

When treating for noxious weeds or USFS invasive species (e.g., smooth brome, crested wheatgrass, Kentucky bluegrass) inside USFS recreation sites, Hess or their Contractor will provide public notice at least 24 hours in advance of treatment. Hess will notify USFS and post notice on recreation location bulletin boards with information on the product being used, dates of spraying, and contact numbers.

3.4 Reclamation Methods

Reclamation specific BMPs include:

- Revegetate disturbed areas as soon as possible. Revegetation includes topsoil replacement, planting, seeding, fertilizing, and weed-free mulching as necessary.
- Seeding will be conducted on disturbed areas that have reached final grade or that will remain undisturbed for 30 days.
- Use seed and other plant materials that have been certified as weed free. Seed mixes will conform to the managing land agency specification(s).
- Use native materials where appropriate and feasible.
- Treat weeds adjacent to newly seeded areas prior to planting and treat planted areas for weeds in the first growing season.

Monitoring will be conducted to assess ROW stability, revegetation progress, and percentage of vegetative cover. Monitoring will assess whether applied treatment methods are effective in controlling weeds and make recommendations for further treatment.

3.5 Post-reclamation Methods

Post-reclamation specific BMPs include:

- Re-vegetate or otherwise prevent the establishment of weeds in the Project area and documenting all ground-disturbing operations in noxious weed infested areas.
- Herbicide applications to noxious weed infestation areas after grass species are established.
- Treatment methods other than herbicide application, such as mowing and biological methods, will be considered during the post-reclamation process.

After pipeline construction, on any construction ROW over which Hess will retain control over the surface use of the land after construction (i.e., valve sites, metering stations, pump stations, etc.), Hess will provide

for weed control to limit the potential for the spread of weeds onto adjacent lands. Any weed control spraying performed by Hess will be done by a state-licensed pesticide applicator.

3.6 ANS Provisions

Any equipment, including recreational, to be used in water must follow precautions to avoid the introduction of ANS. The Contractor will implement the provisions of the North Dakota ANS Management Plan (Appendix B). The provisions include, but are not limited to:

- Remove all plants, animals, or fragments of plant or animals.
- Drain all water from motors, pumps, bilges, or other containers. If the equipment has been drained for less than 7 days prior to arrival on site, a chemical or hot water treatment sufficient to kill ANS organisms will be utilized.
- Visually inspect to detect any presence of ANS.
- Equipment to be cleaned and inspected includes transporting trailers and trucks.

4.0 Herbicide Application, Handling, Spills, and Cleanup

4.1 Herbicide Application and Handling

Herbicide treatment of selected areas along the ROW will be carried out where noxious weed species are problematic and form a significant portion of the vegetation community in comparison to adjacent areas. In areas where the occurrence of noxious weeds adjacent to the ROW makes eradication impossible, no herbicide treatment will be applied; however, other weed control methods will be employed.

Only herbicides approved for use within treated lands will be used (permitted by the relevant land management agency). The selected herbicide and application method will be adapted to target only noxious weeds and therefore preserve and retain native plants. If weeds are found near sensitive sites, proper buffers will be used to prevent the spread of herbicides to these areas. The Contractor will not use herbicides in or within 100 feet of a wetland or water body, unless the herbicide is approved for such application. No treatments will occur without prior coordination with and approval of the land managing agency and landowner.

All herbicide applicators will be licensed in the State of North Dakota. Application of herbicides will be suspended during any of the following conditions:

- Wind velocity exceeds 10 miles per hour (mph) during application of liquids or 15 mph during application of granular herbicides;
- Snow or ice covers the foliage of noxious weeds; or
- During precipitation events or when precipitation is expected within 24 hours.

Herbicides will be applied using vehicle-mounted sprayers (e.g., handgun, boom, and broadjet nozzle injector) mainly in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack sprayer) that target individual plants will be used to treat small or scattered weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically during that use to ensure that proper application rates are achieved.

Herbicides will be transported to the Project site daily with the following provisions:

- Only the quantity needed for that day's work will be transported;
- All herbicides will be transported in the original container, in a manner that prevents tipping or spilling, and in a compartment isolated from food, clothing, and safety equipment;
- Mixing will be done at equipment/storage yards and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive areas. No herbicide will be applied at these areas unless authorized by appropriate regulatory agencies; and
- All herbicide equipment and containers will be inspected for leaks daily.

4.2 Herbicide Spills and Cleanup

All reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate. Contractors will follow the provisions in the Spill Prevention Containment and Countermeasure (SPCC) Plan developed for this Project (POD, Appendix N, SPCC Plan). Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. Items to keep in the spill kit(s) are:

- Protective clothing and gloves;
- A minimum of 20 pounds of suitable commercial adsorbent and barrier materials;
- Plastic bags and bucket:

- Shovel;
- Fiber brush and screw-in handle;
- Dust Pan;
- Caution tape; and
- Detergent.

Response to an herbicide spill will vary depending on the material spilled and the size and location of the spill. The order of priorities after discovering a spill are to protect the safety of personnel and the public, minimize damage to the environment, and conduct cleanup and remediation activities.

4.3 Spill Reporting

All personnel applying herbicides will have readily available copies of the appropriate material safety data sheets and the herbicide label(s) for the herbicides being used. All herbicide spills will be reported in accordance with applicable laws and requirements. Further information regarding spill response and reporting can be found in the SPCC Plan (POD, Appendix N).

5.0 Monitoring

Monitoring of noxious weeds will be conducted as part of on-going O&M inspections. Hess will maintain ongoing communication with individual landowners, counties, and land management agencies regarding noxious weeds. These parties also will be supplied with Hess contact information to report noxious weeds along the ROW. Hess will maintain operations personnel trained in the identification of noxious weeds, and who will contribute to monitoring reports by documenting noxious weeds observed during the normal course of O&M.

Monitoring will continue for a period of 3 years after any ground disturbance takes place. Monitoring will be conducted on a biannual basis, or as needed following a report of an infestation. Known infestation sites will be monitored on an ongoing basis or until noxious weeds at the site are controlled. Hess will be responsible for reimbursing all reasonable costs incurred by owners of land adjacent to aboveground facilities when the landowners must control weeds on their land that can be reasonably determined to have spread from land occupied by Hess' aboveground facilities.

Monitoring records will:

- Identify and evaluate noxious weed conditions in the first and second growing season, with particular attention given to any infestations occurring in previously unaffected areas;
- Identify and evaluate locations where additional remedial action or treatment may be required and recommended treatment actions; and
- Record noxious weed control treatments carried out in the reporting period.

Appendix A

Identification and Control of Invasive and Troublesome Weeds in North Dakota

(Available Upon Request)

Appendix B

North Dakota ANS Management Plan

(Available Upon Request)

Appendix C

USFS Stipulations for Herbicide
Approved Herbicides for Oil and Gas Use on the Little Missouri National Grasslands
Noxious Weed Seed Viability Quick Reference Chart
Pesticide Use Proposal (Form FS-2100-2)
Pesticide Use Proposal Attachment A, Supplemental Information (DPG-2100-2A)
Pesticide Application Records/Year End Report

USFS Stipulations for Herbicide

Noxious Weed Prevention & Control

The following are prescribed prevention and control measures which, when used in conjunction with other measures, will help the Operator or Holder meet their responsibilities in preventing and controlling noxious weeds and/or invasive plants as identified by the North Dakota State Department of Agriculture, individual Counties, and within the 2007 Dakota Prairie Grasslands Noxious Weed Management Project.

Integrated Pest Management Program

The Operator or Holder must annually coordinate their noxious weed prevention and control plans with state or county management agencies. The plans may include biological, mechanical, and/or chemical treatments or a combination of all three.

Existing Weeds

Annual treatment is required if noxious weed species are present.

Construction & Drilling Equipment

Remove all mud, dirt, and plant parts from all off-road construction and drilling equipment before moving into the project area. If this equipment was recently used on a weed infested site, it should be thoroughly cleaned with a pressure washer. Cleaning must occur off National Forest System Lands. This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area. Likewise, all equipment must be cleaned prior to leaving the project site if operating within infested areas.

New Construction and/or Reconstruction

- Areas infested with noxious weeds, which will be disturbed during the construction process, should be chemically treated during the normal growing season with herbicides a year prior to disturbance. If this is not possible, the infestations should be treated at least two to four weeks prior to disturbance.
- Excavated topsoil infested with noxious weeds will be stored separately from other topsoil and periodically treated with herbicides if sprouting of either is detected.
- Keep construction sites closed to vehicles not involved with the construction until construction and revegetation is complete.
- If straw is used for road stabilization and erosion control, it must be certified weed free.

Borrow Materials (Scoria, Gravel, Dirt, Manure, & Topsoil)

- It is the Operator's or Holder's responsibility to obtain borrow materials from pits or sites that have been inspected and certified as weed free sites, and approved by the Forest Service prior to use.
- Certification will be in writing and will include the quarter/quarter, section, township, and range, and the name and address of the surface owner. If the Operator or Holder is in doubt as to whether a site has been inspected and certified, the Operator or Holder may request the individual County Weed Board or the Forest Service to inspect and certify the site.
- Borrow material will not be used if the weeds present at the borrow site are not found at the site of intended use. If weeds are present, they must be treated before transport and use.
- The borrow site may not be used if new invader species are found at the borrow site.
- It is in the Operator's or Holder's best interest to help maintain regularly used sites as weed free.

Road Maintenance

- Do not blade roads or pull ditches where new invaders are found.
- Coordinate road maintenance activities with herbicide application to maximize efficiency.

Road Obliteration
Chemically treat infested roads prior to obliteration and reclamation.

Plugged and Abandoned Sites
Noxious weeds and exotics should be sprayed prior to reclamation of the site and during the monitoring of the site until released. Use caution not to use herbicides that will have a detrimental effect to any seeding requirements.

Chemical Treatment
Reference Vegetative Control, Application of Herbicides, for the guidelines regarding the application of approved herbicides.

Monitoring
The Forest Service will perform annual inspections to monitor the effectiveness of treatments. The Forest Service will also take the lead in identifying any new noxious weed occurrences in cooperation with the local County Weed Boards and the Operator or Holder.

Vegetative Control, Application of Herbicides

NOTE: Herbicides used for vegetative control are generally pre-emergence short-term (less than one year duration) herbicides that will kill all vegetation including grasses and forbs. Therefore, it is extremely important that these herbicides not be used to control noxious weeds and/or invasive species within those areas of the pad or road where native vegetative cover is being established under interim or final reclamation.

Chemical Treatment

The following mitigation measures will apply to the ground application of all herbicides:

General

All chemical treatments must be approved in writing by the Forest Service prior to any surface application. A copy of the approval must be present on the site being treated. Failure to produce a copy of the approval may result in immediate shut down of operations.

Applications, Forms, Monitoring

Companies using herbicides for vegetative control or for control of noxious weeds and/or invasive species must annually complete, submit, and have approved prior to use the following documents:

a. Pesticide-Use Proposal (Form FS-2100-2).

b. Pesticide-Use Proposal Attachment A, Supplemental Information (Form DPG-2100-2A).

c. Spill Incident Response Plan for transporting herbicides.

A current and blank copy of forms 2100-2 and 2100-2A can be obtained from the Forest Service District Office upon request.

Do not combine vegetative control use with control of noxious weeds and/or invasive species use on the same forms. Separate forms must be submitted for each.

Herbicides

Only approved herbicides as specified within the 2007 Dakota Prairie Grasslands Noxious Weed Management Project can be used for chemical treatment. Since this listing may change from year to year, it is the Operator's or Holder's responsibility to request and submit use for the most current listing of approved herbicides. An approved current listing of vegetative control herbicides can be obtained from the Forest Service District Office upon request.

Ground Application

- General use herbicides must be applied by or under the direct supervision of a certified herbicide applicator in accordance with the laws of the State of North Dakota.
- Restricted use herbicides must be applied by a certified herbicide applicator in accordance with the laws of the State of North Dakota.
- Herbicide application must adhere to label instructions and restrictions. Tank mixes will be managed according to the most restrictive of the combined chemicals.
- No herbicide will be applied directly to surface water or where surface water from treated areas can run into live water sources.
    a. A buffer of at least one hundred (100) feet from bodies of water must be maintained.
    b. The buffer width will be determined based on soil, slope, etc.
- No spraying of liquid formulations will be done if temperatures exceed eighty (80) degrees.

- No spraying of liquid formulations will be done if the wind velocity exceeds ten (10) mph or per herbicide labeling directions.
- If boom spraying is done, boom pressure will not exceed forty (40) psi to minimize drift.
- Herbicide use will be permitted only within the areas identified within the applications.
- A sign saying the area has been treated with herbicides will be posted in areas receiving treatments at least one full day (unless the herbicide label says longer) after the treatment.

Monitoring

- The Forest Service will monitor the herbicide use in the form of random compliance inspections.
- All monitoring will be done under the direction of a Forest Service employee who is a licensed Commercial Pesticide Applicator.

Year End Report

When you have completed your herbicide treatment for the season and prior to October 1 of each year, you must submit the following information for each site treated and for each herbicide applied on National Forest System lands:

- Date of application
- Name of the treated site
- Legal description of treated site including quarter/quarter, section, township, range and county
- Chemical formulation and trade name of chemicals applied
- EPA registration number and manufacturer
- Rate of application of active ingredient, including pounds of active ingredient applied to the site
- Amount of diluted material applied and total acres treated on the site
- Time of day, temperature, and wind speed and direction at time of application
- Type of equipment used for application

In the case of a combination of herbicides being used, you will need to submit the information for each herbicide in the mixture.

DPG form 2100-2-B or a comparable form should be used to report the season's activities. An electronic version of the form can be obtained from the Forest Service District Office upon request.

Failure to submit the reports will delay the permitting of the following year's Pesticide Use Proposal.

Plugged and Abandoned Sites

- Noxious weeds should be sprayed prior to reclamation of the site and during the monitoring of the site until released. Use caution not to use herbicides that will have a detrimental effect to any seeding requirements.

NOXIOUS WEEDS REQUIRED TO BE TREATED

Common Name	Scientific Name	Noxious Weed List	Treatment Priority
Absinth wormwood	*Artemisia absinthium*	ND, SD	High
Canada thistle	*Cirsium arvense*	ND, SD, MT, MN	High
Diffuse knapweed	*Centaurea diffusa*	ND, MT	High
Field bindweed	*Convolvulus arvensis*	ND, SD, MT, MN	Low
Leafy spurge	*Euphorbia esula*	ND, SD, MT, MN	High
Purple loosestrife	*Lythrum salicaria*	ND, SD, MT, MN	High
Russian knapweed	*Centaurea repens*	ND, SD, MT	High
Spotted knapweed	*Centaurea maculosa*	ND, MT	High
Yellow starthistle	*Centaurea solstititialis*	ND, MT	High
Perennial sow thistle	*Sonchus arvensis*	SD, MN	Low
Black henbane	*Hyoscyamus niger*	Billings Co., ND	High
Dalmation toadflax	*Linaria dalmatica*	ND, MT	High
Hoary cress	*Cardaria draba*	SD, MT	Low
St. Johnswort	*Hypericum perforatum*	MT	High
Saltcedar	*Tamarix ramosissima*	ND, MT, SD	High
Yellow toadflax	*Linaria vulgaris*	McKenzie Co., ND, MT	High
Bull thistle	*Cirsium vulgare*	MN	Low
Musk thistle	*Cardus nutans*	ND, MN, SD	High
Plumeless thistle	*Caruus acanthoides*	MN, SD	Low
Houndstongue	*Cynoglossum officinale*	MT	Low
Hemp	*Cannabis sativa*	MN	High
Buckthorn	*Rhamnus cathartica*	MN	High
Common Burdock	*Arctium minus*	Billings Co, ND	Low
Crested wheatgrass	*Agropyron cristatum*	USFS	Low
Tall wheatgrass	*Thinopyrum ponticum*	USFS	Low
Intermediate wheatgrass	*Thinopyrum intermedium*	USFS	Low
Quackgrass	*Elymus repens*	USFS	Low
Smooth brome	*Bromus inermis*	USFS	Low
Japanese brome	*Bromus arvensis*	USFS	Low
Downy brome	*Bromus tectorum*	USFS	Low
Spiny plumeless thistle	*Carduus acanthoides*	USFS	Low
Yellow starthistle	*Centaurea solstitialis*	USFS	Low
Field bindweed	*Convolvulus arvensis*	USFS	Low
Sweet clover	*Melilotus spp.*	USFS	Low
Kentucky bluegrass	*Poa pratensis*	USFS	Low
Canada bluegrass	*Poa compressa*	USFS	Low
Sowthistle	*Sonchus spp.*	USFS	Low

Chemical Name[1]	Residual[2]	Mobility[3]	Vegetation Controlled
imazapic	Moderate	Low	See label
chlorsulfuron	Moderate	High	All
glyphosate	Moderate	Low	All
imazapyr	Long	Variable	All
sulfometuron methyl	Moderate	Low	All
aminopyralid	Moderate	Low	Broadleaf, woody
clopyralid	Moderate	High	Broadleaf
dicamba	Short	High	Broadleaf
metsulfuron methyl	Moderate	High	Broadleaf
picloram	Moderate	Moderate	Broadleaf
2,4-D amine (dichlorophenoxyacetic)	Short	Moderate	Broadleaf
triclopyr	Moderate	Moderate	Broadleaf

[1] **CHEMICAL NAME**: Names the active ingredient in the herbicide formulation. Trade names and manufacturer do not matter as long as the active ingredients are on the approved list.

[2] **RESIDUAL**: Short = Remains active in soil for a short time - usually less than 30 days.
Moderate = Remains active in soil more than two weeks but generally less one year. Long = Could potentially remain active in the soil for more than one year.
None = Does not remain active in the soil.
Note: The residual effects of a herbicide formulation may be highly variable based on soil pH, soil type, soil temperature, water content, presence of microbes, and other site-specific factors.)

[3] **MOBILITY**: The ability of the active ingredient to move through the soil.

The herbicides named in the above table may be used in combinations as long as all combined chemicals are included in the list. When chemicals are combined, they must be managed based on the most restrictive of the combined chemicals.

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
absinth wormwood *(Artemisia absinthium)*	long-lived perennial that grows back each year from a woody base	3-4 years	no evidence of vegetative reproduction but may regenerate from root stock; prolific seed producer; one stem can produce between 674-1468 flower heads with 35-38 seeds per head (over 51,000 seeds/plant)	July – September; seeds mature in early fall; seedlings emerge early spring to August or whenever moisture and warmth are available	easily controlled by herbicides and vigorous competition from grasses; picloram; clopyralid; dicamba; 2,4-D; glyphosate; aminopyralid; clopyralid plus triclopyr;	treat when plant is at least 12" tall and actively growing (late June to mid August); refer to individual label instructions for best timing of each herbicide
Canada thistle *(Cirsium arvense)*	creeping perennial	up to 22 years; deep burial (more than 8") promotes survival longevity	adventitious creeping root buds; root fragments as short as 0.2" if vegetative material is moved on equipment or in the soil; also reproduces by seed; up to 40,000 seeds per stem	June through August; seeds mature in as few as ten days after flowering	persistent treatment is imperative to continually stress plant and exhaust root nutrient stores; treatment must be followed through for several years to be successful; picloram; aminopyralid; clopyralid; dicamba; chlorsulfuron; glyphosate; imazapyr;	bud, rosette, and bolt stages; early spring or fall; refer to individual label instructions for best timing of each herbicide
knapweeds diffuse knapweed *(Centaurea diffusa)* spotted knapweed *(Centaurea maculosa)*	annual, biennial or perennial; individual spotted knapweed plants can live up to 9 years	5-8 years	plants regrow from buds on the root crown but reproduction is primarily by seed; seed production varies widely with site conditions; avg 680 – 25,260 seeds/plant;	flowers July through September; mature seeds usually formed by mid- August, followed by the death of the plant; dead plants break off at ground level and tumble with the wind to spread seed	although knapweeds are easily killed by herbicide application, a careful follow-up program is essential to control missed plants and seedlings; picloram; dicamba; dicamba plus 2,4-D; clopyralid plus 2,4-D; 2,4-D; triclopyr; aminopyralid	spring rosette to bloom stage or fall rosette; refer to individual label instructions for best timing of each herbicide
Russian knapweed *(Centaurea repens)*	creeping perennial	2-3 years; once established very difficult to control	seed and vegetative root buds; roots can grow as deep as 6' below surface after 1 years growth and 23' after 2 years; 1200 seeds per plant	June - September	2,4-D; dicamba; picloram; clopyralid; clopyralid plus 2,4-D; clopyralid plus triclopyr; metsulfuron plus 2,4-D; imazapic	generally in the fall following several hard frosts; metsulfuron plus 2,4-D can also be effective in bud to early bloom stage; refer to individual label instructions for best timing of each herbicide

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
field bindweed *(Convolvulus arvensis)*	long-lived perennial; life span unknown but believed to be up to 30 years	20 years or more; seed that is 60 years old has been found to be alive! once established very difficult to control	roots can reach depth of 20'; shoots capable of budding have been found at 14' depth; rhizomes develop from root buds and emerge as new plants; root fragments may generate new plants; 25-300 seeds per plant	June through fall frost	dicamba; glyphosate; picloram; 2,4-D; triclopyr; dicamba plus 2,4-D; metsulfuron	during periods of active growth and stems at least 12" long; bud to full-bloom; spring or fall depending on herbicide; refer to individual label instructions for best timing of each herbicide
leafy spurge *(Euphorbia esula)*	persistent, long-lived, deep rooted perennial; unknown life span	8 years or more	regenerates from very small root fragments, vegetative root buds, and by seed; average 140 seeds per plant; first year plants do not produce seeds	yellow-green bracts develop May – early June and true flowers develop a few weeks later; flowering is usually complete by mid- July; seeds mature about 30 days after pollination	picloram; dicamba; imazapic; 2,4-D; glyphosate	true flower growth stage and seed development or during fall re-growth; refer to individual label instructions for best timing of each herbicide
purple loosestrife *(Lythrum salicaria)*	yes; individual plants may live up to 22 years	3+ years	primarily by seed but also vegetatively by cuttings; estimated 2.7 million seeds per plant	early June – mid September	glyphosate if labeled for aquatic use; triclopyr if labeled for use in wetland sites; 2,4-D if labeled for use near water	July – early September; refer to individual label instructions for best timing of each herbicide
yellow starthistle *(Centaurea solstititialis)*	winter annual or rarely biennial or short-lived perennial	10+ years	reproduces by seed only; up to 80,000 seeds per plant	early July through September	clopyralid plus 2,4-D; clopyralid plus triclopyr; dicamba; picloram; imazapic; aminopyralid; use surfactants to improve herbicide performance	refer to individual label instructions for best timing of each herbicide
perennial sow thistle *(Sonchus arvensis)*	creeping perennial	1-5 years	vegetative root buds; rhizomes develop as deep as 10' below surface; average 30 seeds per flower with numerous flowers per plant; known to produce up to 9750 seeds on a single plant	blooms June & July; seeds mature July & August	clopyralid; aminopyralid; glyphosate; 2,4-D; dicamba; picloram	spring pre-bud or bud stage or fall; refer to individual label instructions for best timing of each herbicide
black henbane *(Hyoscyamus niger)*	annual or biennial	up to 5 years	reproduces by seed only; a single plant can produce up to a half million seeds	flowers June – August; seed production July - October	2,4-D; dicamba; picloram; glyphosate; metsulfuron; metsulfuron plus chlorsulfuron	rosette stage to early bolting; when the plant is actively growing; refer to individual label instructions for best timing of each herbicide

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
dalmation toadflax *(Linaria dalmatica)* yellow toadflax *(Linaria vulgaris)*	deep-rooted, short-lived perennials; individual plants live 3 – 5 years	up to 10 years	seed reproduction, vegetative buds on creeping roots, and by root fragments; a single plant can produce over 500,000 seeds	late June through August; seed production July through October	picloram for both; imazapic or chlorsulfuron for dalmation toadflax; glyphosate; dicamba	although slow to establish, this weed is difficult to control once it takes root because many herbicides are ineffective; requires repeated treatments at high rates; apply pre-bloom to flowering or in the fall; refer to individual label instructions for best timing of each herbicide
hoary cress *Cardaria draba)*	deep-rooted perennial with spreading root system from which many aerial shoots are produced; individual plants can live up to 8 years	about 3 years	vegetatively by persistent, adventitious roots and by seed production; a single plant produces between 1200 – 4800 seeds	flowers May – June; seed production by July; if conditions are favorable, hoary cress can produce a second crop of seeds by fall	metsulfuron; chlorsulfuron; dicamba; glyphosate; 2,4-D; dicamba plus 2,4-D; use surfactants to improve herbicide performance	up to 76% of this plant's biomass is below ground; May or June, bud or flowering stage; refer to individual label instructions for best timing of each herbicide
St Johnswort *(Hypericum perforatum)*	yes; individual plants can live up to 8 years	6-10 years	vegetatively by short creeping stems and by seed production; a single plant can produce up to 100,000 seeds; average seed production is 15,000 – 30,000	flowers May – September;	repeated applications of 2,4-D during seedling and pre-bloom stages; metsulfuron with a surfactant post- emergent; picloram; aminopyralid; glyphosate;	extensive root system makes it hard to eradicate; refer to individual label instructions for best timing of each herbicide
saltcedar *(Tamarix ramosissima)*	yes; long-lived; in New Mexico, plants up to 100 years old show no signs of deteriorating from age	less than 6 months especially if subject to desiccation	vegetatively by adventitious roots or by seed production; a single mature plant can produce >500,000 seeds per season	early to mid-April through July; seeds are shed throughout the growing season	imazapyr for green leaved plants; triclopyr for cut-stump control	refer to individual label instructions for best timing of each herbicide
bull thistle *(Cirsium vulgare)*	biennial or sometimes monocarpic perennial (flowers and fruits only once, then dies)	up to 3 years if buried at least 5" deep; seeds on the surface usually don't remain viable for longer than a year	by seed only; a single mature, healthy plant can produce up from 5000 to 50,000 seeds	July - September	picloram; dicamba; glyphosate; clopyralid; clopyralid plus triclopyr; 2,4-D; metsulfuron; chlorsulfuron; imazapic; imazapic plus glyphosate; aminopyralid	late fall or early spring; seedling to rosette stage; bolting to bud stage; refer to individual label instructions for best timing of each herbicide

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
musk thistle *(Carduus nutans)* musk thistle (Cont) *(Carduus nutans)*	herbaceous tap rooted biennial; spring annual; occasionally a winter annual	about 10 years	by seed only; a single plant produces about 10,000 seeds	May or early June through August;	picloram; dicamba; glyphosate; clopyralid; clopyralid plus triclopyr; 2,4-D; metsulfuron; chlorsulfuron; imazapic; imazapic plus glyphosate; aminopyralid	late fall or early spring; seedling to rosette stage; refer to individual label instructions for best timing of each herbicide
plumeless thistle *(Carduus acanthoides)*	winter annual or biennial	10 years or more	by seed only; up to 9000 seeds per plant	May to August; seeds are dispersed 1-3 weeks after flowering	picloram; dicamba; glyphosate; clopyralid; clopyralid plus triclopyr; 2,4-D; metsulfuron; chlorsulfuron; imazapic; imazapic plus glyphosate; aminopyralid	late fall or early spring; seedling to rosette stage; refer to individual label instructions for best timing of each herbicide
houndstongue *(Cynoglossum officinale)*	biennial or short lived perennial	2-3 years unless buried; then only about a year	average 300-675 seeds per plant but single plants can produce over 2000 seeds	flowering May through July; seeds mature July through August	picloram; dicamba; chlorsulfuron; 2,4-D; metsulfuron; use surfactants to improve herbicide performance	1st year rosettes in spring, summer or fall; early spring before bloom for second year rosettes; when plant is actively growing; refer to individual label instructions for best timing of each herbicide
hemp *(Cannabis sativa)*	annual		by seed only;	flowering July to September; seed production August until frost	2,4-D; sulfometuron;	refer to individual label instructions for best timing of each herbicide
buckthorn *(Rhamnus cathartica)*	perennial	up to 5 years	reproduces by seed or by stump sprouting	flowers May – June; berries ripen during August and September	triclopyr for cut-stump method within 2 hours of cutting; glyphosate	late summer and throughout the fall; refer to individual label instructions for best timing of each herbicide
common burdock *(Arctium minus)*	biennial	2-10 years	by seed only; each plant produces 15,000 – 60,000 seeds	flowers July – frost; seeds mature by September and are shed continuously throughout the fall, winter, and following spring	2,4-D; picloram; dicamba; glyphosate; clopyralid; clopyralid plus triclopyr; aminopyralid; metsulfuron	herbicides are most effective when applied to first-year rosettes and before bloom stage; refer to individual label instructions for best timing of each herbicide
halogeton *Halogeton glomeratus*	winter annual; plants can germinate in fall, winter, or spring depending on soil moisture	black seeds have no dormancy and are viable for up to 1 year; brown seeds have a dormancy and are viable for up to 10 years	by seed only; a single large plant can produce 100,000 seeds	flowers July – August; seed maturity August - October	halogeton alters soil properties, making it difficult to establish desirable plants, so it's best not to allow this plant to establish; metsulfuron; imazapyr; chlorsulfuron; 2,4-D; imazapic; aminopyralid; sulfometuron;	apply when actively growing or very early in spring prior to flowering; refer to individual label instructions for best timing of each herbicide

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
Downy brome *Bromus tectorum*	Annual, winter annual	Seeds can remain viable for over 2 years when near soil surface	Spread by livestock, and other wildlife, cars, trains,	Flowering occurs from April to mid June depending on climate and location.	Non-selective herbicides are presently the primary chemical available for control of cheatgrass, The chemical fluazifop has been shown to prevent seed formation in cheatgrass	Herbicides are most successful when applied early in the reproductive phase
Spiny plumeless thistle *Carduus acanthoides*	Annual, winter annual, or biennial	10 years or more	By seed	Flowering occurs continuously from June until October; seed maturation and dispersal occurs 1-3 weeks after flowering.	Picloram; dicamba; 2,4-D; 2,4-D amine; 2-4-D ester	Just prior to flowering to reduce seed production; spring or fall for control of existing plants.
Yellow starthistle *Centaurea solstitialis*	Winter annual, biennial, or short lived perennial forb	Up to 10 years	By seed, pollinator-dependent; up to 75,000 seeds per plant	Flowerheads are produced from early summer to late summer or fall; flowering continues until newly developing buds are killed by frost	Picloram; clopyralid, 2,4-D, dicamba, triclopyr, chlorsulfuron, and glyphosate	Refer to WRIC website for proper timing of herbicide application
Field bindweed *Convolvulus arvensis*	perennial	20 years or more	By seed	Flowering begins in late June and continues into the fall as long as conditions are favorable.	Glyphosate; 2, 4-D or dicamba	Glyphosate applied pre-crop emergence at four to five quarts of a three pound acid equivalent per gallon formulation will reduce field bindweed during the growing season.
Sweet clover *Melilotus* spp.	Annual, Biennial, Perennial	40 or more years	By seed, various pollinators	Flowering occurs in May to June with seed set in June through July	2,4-D will kill existing plants	Always read label and safety instructions for each control method
Kentucky bluegrass *Poa pratensis*	Perennial	can persist for 2 years	By seed, each flower capable of producing between 100-200 seeds	autumn	residues of trifluralin herbicides,(Advance 10G, Rival, Treflan), imazapic + glyphosate	Spring applications are most effective
Canada bluegrass *Poa compressa*	Perennial	Can persist up to 4 years	Flowerhead can produce up to 200 seeds,	April to July	glyphosate or atrazine	Applications of broadleaf herbicides should not be made until plants have reached the four to six leaf stage
Sowthistle *Sonchus* spp.	Perennial, Annual	Half-life for seeds is 1 year, can be up to 2 or 3 years	By seed, between 4,000 and 13,000 seeds per plant, dispersed by wind, animal hair and birds	Flowering occurs in June to October, when yellow, tight, dandelion-like flower heads develop at the tips of the branches	Auxin-type herbicides such as 2,4-D, 2,4-DB, and MCPA are most effective in controlling perennial sowthistle	Herbicides are most effective during the seedling stage

Species common *(and scientific)* name	Perennial	Seed viability	Reproduction/ seed production	Flowers/seed maturity	Treatment (ALWAYS refer to herbicide label for correct application)	Timing (ALWAYS refer to label for correct timing)
baby's breath *Gypsophila paniculata*	herbaceous perennial;	2 years	new shoots can grow from the crown, but not the root; reproduces by seed only; a single plant can produce up to 14,000 seeds	flowers late June to late August;	hard to get good coverage with herbicides because of sparse foliage; picloram; dicamba, 2,4- D; glyphosate;	bolting to pre-flower; refer to individual label instructions for best timing of each herbicide
Crested wheatgrass *Agropyron cristatum*	perennial	5 years	By seed only.	Flowers mid-June	Recommend spot spraying, or wicking to avoid impacting native species. Several years of spot spaying will be required. glyphosate;	During growing season, prior to seed formation.
Tall wheatgrass *Thinopyrum ponticum*	perennial	Declines steeply after 2 years	By seed only.	Early summer	Little information on management exists, but could presumably be managed using herbicides as indicated for congeners	Little information on management exists, but could presumably be managed using herbicides as indicated for congeners
Intermediate wheatgrass *Thinopyrum intermedium*	Perennial	Seed yields drop significantly after about 4 years of production	Spreads slowly but effectively via its rhizomatous root system, spread by seed is limited by size and weight of seed.	mid autumn	Is not typically considered a "weedy" or invasive species, but can spread into adjoining vegetative communities under ideal climatic and environmental conditions. Research indicates that most seedings do not spread from original planting sites. It is known to coexist with native plants. On favorable sites where it is best adapted, it can maintain dominance and exist as a monoculture.	Application of 2,4-D should not be made until plants have reached the 4 to 6 leaf stage
Quackgrass *Elymus repens*	Perennial	Seeds may remain dormant in soil for 2 to 3 years.	By seed and extensively creeping rhizomes	June to July	Till in spring and fall if possible; general use herbicides such as glyphosate	Spring or fall
Smooth brome *Bromus inermis*	Perennial	Seed has remained viable or 2 to over 14 years	By seed and rhizomes	Early to late June	Atrazine; glyphosate; fluazifop; imazapic; imazapyr, sulfometuron; sulfosulfuron	Postemergence in spring
Japanese brome *Bromus arvensis*	Annual	The long-term viability of Japanese brome seeds is unknown, but seeds remain viable for at least several years	By seed only	early May	Picloram, dicamba, glyphosate, and imazapic	Pre-emergence, or very early post-emergence when weeds have three or fewer leaves.

PESTICIDE - USE PROPOSAL (Reference FSM 2150)	DEPARTMENT / AGENCY	CONTACT/PHONE NO.	
	USDA / FS DPG / District 7	**Minerals/Lands Dept. (701) 227-7819**	
	REGION	FOREST	DATE SUBMITTED
	01	**18**	

1) OBJECTIVE a) Project No. b) Specific Target Pest c) Purpose	
2) PESTICIDE a) Common Name b) Formulation c) % AI,AE,or lb / Gal. d) Registration No.	
3) a) Form Applied b) Use Strength (%) or Dilution Rate c) Diluent	
4) lbs. AI Per Acre or Other Rate	
5) APPLICATION a) Method b) Equipment	
6) a) Acres or Other Unit to be Treated b) Number of Applications c) Number of Sites d) Specific Description of Sites	
7) a) Month(s) of Year b) States	
8) SENSITIVE AREAS a) Areas to be Avoided b) Areas to be Treated with Caution	
9) REMARKS a) Precautions to be Taken b) Use of Trained / Certified Personnel c) State and Local Coordination d) Other Pesticides Being Applied to Same Site e) Monitoring f) Other	

Approval (Signature of USFS Approving Official)	Date (mm/dd/yy):

PESTICIDE - USE PROPOSAL (Reference FSM 2150)	DEPARTMENT/ AGENCY	CONTACT/PHONE NO.	
	USDA / FS DPG / District 7	**Minerals/Lands Dept. (701) 227-7819**	
	REGION	FOREST	DATE SUBMITTED
	01	**18**	**mm / dd / yy**

1) OBJECTIVE a) Project No. b) Specific Target Pest c) Purpose	a) Big-Crude Oil Co., Big Wind Field, FY-2010 b) Emergent and pre-emergent vegetation/weeds c) Control vegetation/weeds on and around well sites/pump stations
2) PESTICIDE a) Common Name b) Formulation c) % AI, AE, or lb / Gal. d) Registration No.	And/Or / And/Or a) Glyphosate / a) Dicamba / a) Tebuthiazapic b) Water-soluble / b) Water-soluble / b) Water dispersible granules c) 41%-3 lbs. per gal. / c) 48.2%-4 lbs. per gal. / c) 80% active ingredients d) EPA # 524-475 / d) EPA # 524-537- / d) EPA # 535-392
3) a) Form Applied b) Use Strength (%) or Dilution Rate c) Diluent	a) Solution b) 1½ gal. glyphosate to 100 gal. water, 1 qt. dicamba to 300 gal. water c) Water
4) lbs. Applied Per Acre or Other Rate	1.5 pounds per acre
5) APPLICATION a) Method b) Equipment	a) Ground b) Hand gun sprayer
6) a) Acres or Other Units to be Treated b) Number of Applications c) Number of Sites d) Specific Description of Sites	a) One acre per site. Total of six acres b) One initial treatment and spot treatments as needed. c) Six d) Area of operations for well site(s) noted on attachment A, block 3
7) a) Month(s) of Year b) States	a) May and June b) North Dakota, Billings County
8) SENSITIVE AREAS a) Areas to be Avoided b) Areas to be Treated with Caution	a) Trees, drainages/waterways/surface water. b) Areas adjacent to waterways, sloped areas. Other Areas - None
9) REMARKS a) Precautions to be Taken b) Use of Trained / Certified Personnel c) State and Local Coordination d) Other Pesticides Being Applied to Same Site e) Monitoring f) Other	a) Will follow recommended standards within F.S. COA's 2308 & 2319 and COA's Other 3715 and 3732B. PPE will be worn by applicator(s). Signs will be posted warning that the area has been treated with herbicides . b) Note attachment A, block #1 c) Local d) None e) Operations will be monitored by company representative and/or contractor foreman. f) Additional herbicide applications may be needed at a later date depending on effectiveness of initial application.

Example

ATTACHMENT A **Supplemental Information for Pesticide Use Proposal** **Form FS-2100-2**	USDA Forest Service, Region One Dakota Prairie Grasslands Medora Ranger District	**Check One** (____) Noxious Weed Control (____) Vegetative Control
	Minerals / Lands Department	FS Contact – **Carmen Waldo** Phone Number - (701) 227-7819

Company, Proposal Submitted For	**Contractor**	**Date Submitted**

1) Applicator Information a) Applicators Name(s) b) N.D. State License or Certificate # c) Expiration Date	a) b) c)
2) Delegation of Authority (If applicable) a) Delegation Statement b) Company Officials Signature	a) b)
NOTE:	If a contracting herbicide applicator is going to submit the Pesticide Use Proposal Form for a company, the FS will need written notification from the company, designating said contractor to represent the company. The company is responsible for making sure that the form is complete and accurate.
3) Specific Site Description a) Name and/or number of well pads, central tank batteries, stations or other sites. b) Legal descriptions: quarter/quarter, section, township, range, and county.	**Well / Station** **Legal Description**
4) Remarks a) End of Year Report	

Approval Signature of Company Official or Representative	**Date (mm/dd/yy):**
Approval Signature of USFS Official	**Date (mm/dd/yy):**

ATTACHMENT A **Supplemental Information for Pesticide Use Proposal Form FS-2100-2**	USDA Forest Service, Region One Dakota Prairie Grasslands Medora Ranger District	**Check One** (____) Noxious Weed Control (____) Vegetative Control
	Minerals / Lands Department	FS Contact – **Carmen Waldo** Phone Number - (701) 227-7819

Company, Proposal Submitted For	**Contractor**	**Date Submitted**
Big-Crude Oil Co. Weed Wackers Inc for Big-Crude Oil	Weed Wackers Inc	04/15/10

1) Applicator Information a) Applicators Name(s) b) N.D. State License or Certificate # c) Expiration	a) Reed Wacker b) Certificate # 10101 c) 12/31/
2) Delegation of Authority (If applicable) a) Delegation Document b) Company Officials Signature	a) Reed Wacker of Weed Wackers Inc is hereby authorized to represent Big-Crude Oil Co. in matters pertaining to the submission of the Forest Service Pesticide Use Proposal Forms, FS –2100-2 and DPG 2100-2-A. He and/or his designate (being a North Dakota licensed applicator) is also authorized to oversee the application of the pesticides/herbicides on Big-Crude Oil sites indicated within Attachment A, Part 3, below. b) *I. M. Big* I. M. Big, Big-Crude Oil Co.

3) Specific Site Description a) Name and/or number of well pad, central tank battery, station or other site. b) Legal description: quarter/quarter, section, township, range, and county.	**Well/Station**	**Legal Description**
	Big # 1	NWNW, Sec. 1, T140N, R100W, Billings Co., ND
	Big # 2	NWNE, Sec. 2, T140N, R100W, Billings Co., ND
	Big # 3	SWNW, Sec. 3, T140N, R100W, Billings Co., ND
	Big # 4	SWSE, Sec. 4, T140N, R100W, Billings Co., ND
	Big # 5	NENE, Sec. 5, T140N, R100W, Billings Co., ND
	Big-X Central Battery	NWSW, Sec. 3, T140N, R100W, Billings Co., ND
	Note attached list of specific site descriptions.	
4) Remarks a) End of Year Report	A report, pertaining to the herbicide treated sites will be submitted to the Forest Service prior to October 1, 2010, regarding the information requested within the F.S. letter dated April 13, 2010.	

Approval Signature of Company Official or Representative	**Date (mm/dd/yy):**
Reed Wacker	04/15/10
Approval Signature of USFS Official	**Date (mm/dd/yy):**

Example

Pesticide Application Records / Year End Report

Customer/Company : _____ Contractor : _____ License/Certification # : _____

Applicators Name : _____

Specific Target Pest : _____

Application Information	Site	Site	Site	Site
Site Name or Number				
Legals: ¼¼ / Sec / Twn / Rng, County				
Application Date				
Start Time / Stop Time				
Pesticide Chemical Name				
Pesticide Trade Name				
Pesticide Registrant / Mfr.				
EPA Registration Number				
Wind Direction				
Wind Velocity				
Temperature – ^{o}F				
Pesticide Rate (per acre, sq. ft., etc.)				
Diluted Material (per acre/1000 sq. ft., etc.)				
Total Acres or Sq. Ft. Treated				
Equipment Used				
Applicators Signature				

Field Notes:

Pesticide Application Records / Year End Report

Customer/Company : Big Crude Oil Co. **Contractor :** Weed Wackers Inc.

Applicators Name : Reed Wacker **License/Certification # :** 101010

Specific Target Pest : Control vegetation / weeds on and around well pads / pump stations

Application Information	Site	Site	Site	Site
Site Name or Number	Big #1			
Legals: ¼¼ / Sec / Twn / Rng, County	NWNW, Sec. 1/ 140 / 100 Billings Co.			
Application Date	06 / 15/ 10			
Start Time / Stop Time	8:00 am / 9:00 am			
Pesticide Chemical Name	Glyphosate			
Pesticide Trade Name	Roundup			
Pesticide Registrant / Mfr.	Monsanto			
EPA Registration Number	524-475			
Wind Direction	NNW			
Wind Velocity	2 MPH			
Temperature				
Pesticide Rate (per acre, sq. ft., etc.)	1.5 [illegible]ds per [illegible]re			
Diluted Material (per acre/1000 sq. ft., etc.)	1½ gal. t[illegible] gal. water			
Total Acres or Sq. Ft. Treated	2.2 [illegible]			
Equipment Used	Hand gun			
Applicators Signature	*Reed Wacker*			

Field Notes:

Example

Appendix G

Inadvertent Returns Contingency Plan

HAWKEYE SOUTH OF RIVER OIL & GAS PIPELINES PROJECT

Hawkeye Project Directional Drilling Frac-out Contingency Plan

HESS BAKKEN SHALE

- ■ **ISSUE FOR INFORMATION**
- ☐ **DRAFT ISSUE FOR COMMENTS**
- ☐ **ISSUE FOR CLIENT REVIEW / COMMENT**
- ☐ **ISSUE FOR CLIENT APPROVAL**
- ☐ **ISSUE FOR CONSTRUCTION – Rev 0**
- ☐ **ISSUE AS REVISED DOCUMENT**

APPROVALS	
UPI – Lead Engineer	Date
Joseph Colduvell	11/12/2014
UPI – Project Manager	Date
Tom Del Prato	11/12/2014
HESS – Project Manager	Date
Murray Jackson	11/12/2014

	By	Date
Initiator	RN	11/12/2014
Process		
Mechanical		
Civil		
Electrical		
Instrumentation		
Project Eng.		
Project Eng.		
Project Mgr.		

Revisions:

Rev	Date	By	Approval
0	11/12/2014	JLC	RN

This document is solely for the use of the contractual Company and vendors of Universal Pegasus International, Inc. (UPI). UPI assumes no liability to any other party for any representations contained in this document.

TABLE OF CONTENTS

1.0. Project Description 3

2.0. Drilling Basics 3

3.0. Drilling Fluid and Drilling Fluid System 3

4.0. Drilling Fluid Release 4

4.1. Prevention 4

4.1.1. Suitable Material and Adequate Overburden 4

4.1.2. Pipeline Geometry 4

4.1.3. Responsibility of Drilling Contractor 4

4.2. Detection and Monitoring Procedures 4

5.0. Notification Procedures 5

6.0. Corrective Action 5

6.1. Inadvertent Surface Release 5

6.2. Water Body Release 5

6.3. Wetland/Riparian Area Release 6

6.4. Follow-Up 6

7.0 Response Equipment 6

1.0 PROJECT DESRICPTION

Hess Corporation will install a new 12” oil line, 12” High Pressure Gas (HPG) line and two 24-strand fiber optic cables (FOC) from Williams County to McKenzie County, North Dakota. The 12” oil pipeline and FOC will connect the proposed Hawkeye Central facility to the expanded Ramberg Truck Facility (RTF). The new 12” HPG pipeline and FOC will connect the proposed Hawkeye Compressor facility expansion to the Silurian Compressor facility. The existing 8” gas pipeline will be converted to transport Natural Gas Liquids (NGL) from the Hawkeye Compressor facility to the Silurian facility via Hoffland valve station. Each of the pipelines and the FOC will utilize one of the existing 8” pipelines that cross Lake Sakakawea between North Charlson and North River Crossing (NRC). New launchers/receivers, remotely operated shut down valves, monitoring and control systems will be installed at the facilities.

2.0 DRILLING BASICS

Horizontal directional drilling is a trenchless pipeline installation technique with the advantage of minimal surface impact, limited to the established entry and exit sites for drilling equipment which can be located outside the environmentally sensitive area. This method of crossing will eliminate any future ground surface disturbance associated with an operating company’s required annual maintenance for bank stabilization and depth of cover control typically for an open ditch crossing. This is a technically advanced process requiring skilled operators. Detection of drilling fluid seepage is dependent upon the skill and experience of the drilling crew. For this reason, Hess will contract with firms that specialize in horizontal directional drilling. The entry and exit sites vary in size depending on the diameter of the drill and associated equipment required. No surface ground disturbance by equipment will occur between the entry and exit drill path locations. The typical minimum depth of a drill will be 25 feet below the area of avoidance based on the site-specific design parameters. Pipe with increased wall thickness and abrasion resistant overcoat will be utilized to insure pipeline integrity for the proposed crossing.

Any future maintenance of an HDD crossing if problems occur will result in the existing pipe abandonment and re-drilling the crossing which again minimizes any surface impacts. There is a potential for drilling fluid release (Frac-out) during installation, which can be signaled when pressure in the drill hole is not maintained. Minimal consistent loss of drilling fluid typically occurs during the drilling process when layers of loose sand, gravel, or fractured rock are encountered and drilling fluid fills voids in the material. The loss of

Returning drilling fluid and a reduction in drilling pressure indicates that seepage is occurring outside of the drill hole. For example, a loss of drilling fluid and an absence of subsurface material would indicate a loss of containment pressure within the hole.

3.0 DRILLING FLUID AND DRILLING FLUID SYSTEM

The directional drilling process uses drilling fluid to remove the cuttings from the borehole, stabilize the borehole, and act as a coolant and lubricant during the drilling process. The fluid consists primarily of water and bentonite, naturally occurring clay, made up of 1-5 percent active clays, 0-40 percent inert solids and the remainder being water. Drilling fluid is not a hazardous material as it is composed of benign components; however, an inadvertent release will require mitigation measures to reduce the impact to a water body or sensitive area.

The drilling fluid is prepared in the mixing tank using both new, recycled, and cleaned drilling fluids. The fluid is pumped at rates of 200 to 1,000 gpm through the center of the drill pipe to the cutters. Return flow is through the annulus created between the wall of the boring and the drill pipe. Cuttings are returned to the entry pit. In the entry pit, the fluid is pumped to fluid processing equipment. Typically, shaker screens, desanders, desilters, and centrifuges remove increasingly finer cuttings from the drilling fluid. The cleaned fluid is recycled to the mixing tank and pumps for reuse in the borehole. The cuttings are disposed of at an approved disposal site.

4.0 DRILLING FLUID RELEASE

4.1 PREVENTION

HDD process is typically used to avoid disturbance of sensitive surface features, including water bodies and wetlands. There is however the potential for surface disturbance through an inadvertent drilling fluid release. Drilling fluid releases are typically caused by excessive pressurization of the drill hole beyond the containment capability of the overburden soil material, which allows the drilling fluid to flow to the surrounding strata. Releases can be caused by fractures in bedrock or other voids in the geologic strata that allow the fluid to surface even if downhole pressures are low. Providing adequate depth of cover for the installation can substantially reduce the potential for inadvertent releases.

4.1.1 SUITABLE MATERIAL AND ADEQUATE OVERBURDEN

Prevention of a drilling fluid seepage is a major consideration in determining the profile of the horizontal directional drilled crossing. The primary factors in selecting the pipeline crossing profile include the type of soil and rock material and the depth of cover material. Cohesive soils, such as clays, dense sands, and competent rock are considered ideal materials for horizontal drilling. The depth of adequate overburden is also considered. A minimum depth of cover of 25 feet in competent soils is required to provide a margin of safety against drilling fluid seepage. The areas that present the highest potential for drilling fluid seepage are the drill entry and exit points where the overburden depth is minimal. At the entry and exit points, a pit can be constructed to collect and provide temporary storage for the drilling fluid seepage until it can be pumped into the drilling system. These pits will be sized adequately to accommodate the maximum volume of drilling fluid that may need to be contained in the pits. Secondary containment of the pits will contain any seepage and minimize any migration of the mud from the work area. This containment system may consist of straw bales and silt fencing around the pit.

4.1.2 PIPELINE GEOMETRY

The geometry of the pipeline profile can also affect the potential for drilling fluid seepage. In a profile that forces the pipe to make compound or excessively tight radii turns, downhole pressures can build up, thereby increase the potential for drilling fluid seepage. The profiles for the drilled crossing are intended to minimize this potential, with very smooth and gradual vertical curves. Therefore, the potential for pressure buildup caused by pipeline geometry has been minimized.

4.1.3 RESPONSIBILITY OF DRILLING CONTRACTOR

The drilling contractor will be responsible for submitting a site specific “Fracture Prevention Plan” to include execution of the directional drilling operation, and actions for detecting and controlling drilling fluid seepage. Hess will review this plan with all relevant government agencies prior to execution for approval and closely supervise the progress and actions of the drilling contractor.

4.2 DETECTION AND MONITORING PROCEDURES

To determine if an inadvertent release has occurred, horizontal directional drilling activities will constantly be monitored on this project, either by the contractor, the Construction Inspector, the

Environmental Inspector or any combination of these. Monitoring and sampling procedures will include:

- Inspection along the drill path
- Continuous examination of drilling mud pressures and returns flows
- Periodic status information regarding drilling conditions during the course of drilling activities

- If a wetland release occurs inspection to determine the potential movement of released drilling mud within the wetland will be necessary
- If a wetland release occurs, drilling mud will be collected at the drill entry location for future analysis, as required. If a wetland release occurs, monitoring of the release will be documented by the Environmental Inspector. Hess will keep photographs of release events on record.

5.0 NOTIFICATION PROCEDURES

If an inadvertent release is discovered, procedures will be taken by the drilling contractor and Hess to contain the release as described below in the Corrective Action section. Procedures for notification of construction management personnel and regulatory agencies are identified in this section. If monitoring indicates a wetland release has occurred or is occurring, the contractor, Construction Inspector, or Environmental inspector will immediately notify Hess's construction management personnel.

Hess will notify all applicable federal and state agencies immediately upon discovery of an inadvertent wetland release, detailing the location and nature of the release, corrective actions being taken, and whether the release poses any threat to public health and safety.

6.0 CORRECTIVE ACTION

The greatest potential for drilling fluid seepage is during drill entry and exit where the overburden is minimal. To contain and control drilling fluid seepage on land, the contractor will have available equipment and materials onsite, including backhoes or small bulldozers, portable pumps, sand bags, and hay bales. Hess will address an inadvertent release immediately upon discovery. Containment equipment including portable pumps, hand tools, sand, hay/straw bales, silt fencing, and lumber will be readily available and stored at the drilling site. The following measures will be implemented to minimize or prevent further release, contain the release, and clean up the affected area:

6.1 INADVERTENT SURFACE RELEASE

- The contractor will determine and implement any modifications to the drilling technique or composition of drilling fluid (e.g. thickening of mud by increasing bentonite content) to minimize or prevent further releases of drilling mud.
- Hess will place containment structures at the affected area to prevent migration of the release.
- If the amount of the release is large enough to allow collection, the drilling mud released into containment structures will be collected. It will then be returned to the drilling operations, taken to a disposal site by hose or tanker, or filtered through bladder bags (with bags either buried on site or removed for disposal).
- If the amount of the release is not large enough to allow collection, the affected area will be diluted with fresh water and pumped into a vacuum truck or equivalent. Steps will be taken to prevent silt-laden water from flowing into a wetland or water body.
- If public health and safety are threatened by an inadvertent release, drilling operations will be shut down until the threat is eliminated.

6.2 WATER BODY RELEASE

- If a release occurs within a water body, Hess will stop work and contact all applicable Federal and State agencies as soon as possible. Hess will notify the applicable state representative for department of environmental quality control if there is a threat to public health and safety and explain whether or not the release can be corrected without incurring additional environmental impact. If necessary, drilling operations will be reduced or suspended to assess the extent of

the release and to implement corrective actions.

- If public health and safety are threatened, drilling fluid circulation pumps will be turned off. This measure will be taken as a last resort because of the potential for downhole collapse resulting from loss of downhole pressure.
- If monitoring indicates that the intake water quality at downstream user locations is impacted to the extent that it is no longer suitable for treatment, alternative water sources (i.e. trucked or bottled water) will be provided to impacted users.

6.3 WETLAND/RIPARIAN AREA RELEASE

- The contractor will determine and implement any modifications to the drilling technique or composition of drilling fluid (e.g., thickening of mud by increasing bentonite content) to minimize or prevent further releases of drilling mud.
- If a release occurs within the wetland, reasonable measures, within the limitation of directional drilling technology and contractor's capability, will be taken to re-establish drilling mud circulation.
- Hess will evaluate the release to determine if containment structures are warranted and can effectively contain the release. When making this determination, Hess will also consider if placement of containment structures will cause additional adverse environmental impact.
- Upon completion of the drilling operations, Hess will consult with applicable regulatory agencies to determine any final clean-up requirements for the inadvertent release.
- If public health and safety are threatened by an inadvertent release, drilling operations will be shut down until corrective actions can eliminate the threat. If corrective actions do not prevent the threat, Hess may opt to re-drill the hole along a different alignment after receiving appropriate regulatory approvals. In this case, the following procedures will be implemented to abandon the previous drill hole: To seal the abandoned drill hole, high viscosity drilling mud will be pumped into the hole as the drill assembly is extracted. At the surface (within approximately 5 feet of the surface) Hess will fill the drill end points with soil and grade the location to the original contour.

6.4 FOLLOW-UP

After a drilling fluid seepage has been contained, the drilling contractor and Hess will make every effort to determine the cause of the seepage. After the cause has been determined, measures will be implemented to control the factors causing the seepage and to minimize the chance of recurrence. Developing the corrective measure will be a joint effort of Hess and the drilling contractor and will be site and problem specific. In some cases, the corrective measure may involve a determination that the existing hole encountered a void, which could be bypassed with a slight change in the profile. In other cases, it may be determined that the existing hole encountered a zone of unsatisfactory soil material and the hole may have to be abandoned. If the hole is abandoned, it will be filled with cuttings and drilling fluid.

7.0 RESPONSE EQUIPMENT

Containment equipment and materials, including lumber for temporary shoring, sandbags, portable pumps, hand tools, silt fence, and hay bales, will be stored within the drilling sites. The drilling contractor will also have heavy equipment such as backhoes that can be utilized to control and clean up drilling fluid seepage. The drilling contractor will be responsible for correctly implementing these devices as soon as an incident is detected.