



BEAR DEN PHASE 2 PROJECT

Plan of Development

APPENDIX P
Hydrostatic Test Plan



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Hydrostatic Test Plan

**Prepared for:
BUREAU OF LAND MANAGEMENT**

MAY 2014

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TABLE OF CONTENTS

1.0 INTRODUCTION..... 1
2.0 HYDROSTATIC TESTING PROCEDURES..... 1
3.0 SOURCE WATER, VOLUMES, AND DISCHARGE LOCATIONS 1
4.0 HYDROSTATIC TESTING BEST MANAGEMENT PRACTICES..... 4
 4.1 Water Use Registration and Discharge Permitting 4
 4.2 Sample Collection and Analysis 5
 4.3 Test Water Discharge 5

LIST OF TABLES

Table 3-1 Pipeline Segments, Discharge Locations, and Water Requirements 2
Table 3-2 Pretested Pipeline Segments, Discharge Locations, and Water Requirements... 3

1.0 INTRODUCTION

Enable Bakken Crude Services, LLC (EBCS) prepared this *Hydrostatic Test Plan* (Plan) to be implemented during hydrostatic testing of the Bear Den Phase 2 Project (Project) crude and produced water pipeline systems. The Plan identifies measures to ensure pipeline integrity in accordance with U.S. Department of Transportation (DOT) regulations under Title 49 Code of Federal Regulations 195, entitled *Transportation of Hazardous Liquids by Pipeline*, and to be carried out in accordance with federal, state, and local agency regulations. These activities will be permitted under a General Permit for Construction Dewatering and Discharge of Hydrostatic Test Water under the National Pollution Discharge Elimination System issued by the North Dakota Department of Health, Division of Water Quality.

2.0 HYDROSTATIC TESTING PROCEDURES

Following backfilling of the trench, the completed pipeline will be hydrostatically tested according to DOT specifications to ensure structural integrity. Each pipeline segment to be installed by horizontal directional drill (HDD) will also be pre-tested prior to installation. Test segments of the pipeline will be capped, filled with water, and pressurized. Any loss of pressure that cannot be attributed to other factors such as temperature changes will be investigated. Any leaks detected will be repaired and the segment retested. Upon completion of the test, the water may be discharged, or it will be pumped to the next pipeline segment for testing.

Sources, volumes, and discharge locations of hydrostatic test water are provided in in section 3.0. Upon completion of each test, the water will be discharged in accordance with applicable permits. It is anticipated that hydrostatic test water will be discharged overland along the edges of the construction right-of-way using energy dissipation devices to minimize erosion and sedimentation.

Hydrostatic test water will contact only new pipe, and no chemicals or biocides will be added to the test water. The water will be sampled prior to discharge and tested in accordance with permit requirements to determine suitability for discharge. If treatment of hydrostatic test water is found to be required, treatment procedures will be developed prior to discharge.

Once a segment of pipe has been successfully tested and dried, the test cap and manifold will be removed, and the pipe segment will be connected to the remainder of the pipeline. After completion of hydrostatic testing, the new pipeline will be cleaned and dried using pipeline pigs that are propelled through the pipeline with compressed air. Once cleaned and purged of air, the pipeline will be packed with the product to be transported.

3.0 SOURCE WATER, VOLUMES, AND DISCHARGE LOCATIONS

EBCS plans to utilize water from municipal water sources to hydrostatically test both the crude and produced water pipelines. The pipelines will be hydrostatically tested in segments with multiple tests. The total estimated volume of water to be used for testing is approximately 67,960 gallons. The anticipated pipeline segments, discharge locations, and volumes of hydrostatic testing water are provided in Table 3-1. Additionally, pipe that is fabricated for HDD locations will be tested prior to being pulled through the bore hole. The approximate locations, length, and volumes of water for these pipe sections are provided in Table 3-2.

TABLE 3-1				
Bear Den Phase 2 Project				
Pipeline Segments, Discharge Locations, and Water Requirements				
Pipeline Segment	Approximate Length (feet)	Size (Inches)	Approximate Discharge Location	Approximate Volume (gallons)
Crude Oil Pipeline				
AR-18	2,641	3	MP 0.0	969.7
AR-25	29,267	4	MP 0.0	19,104.1
AR-48	37,427	4	MP 0.0	24,430.6
AR-50	355	3	MP 0.1	130.3
AR-51	3,742	3	MP 0.7	1,374.0
AR-54	224	3	MP 0.0	82.2
AR-55	945	3	MP 0.2	347.0
			TOTAL	46,438.0
Produced Water Pipeline				
ARW-18	2,641	3	MP 0.0	969.7
ARW-25	29,267	4	MP 0.0	19,104.1
ARW-48	37,614	4	MP 0.0	24,430.6
ARW-50	355	3	MP 0.1	130.3
ARW-51	3,742	3	MP 0.7	1,374.0
ARW-54	224	3	MP 0.0	82.2
ARW-55	945	3	MP 0.2	347.0
			TOTAL	46,438.0

TABLE 3-2

**Bear Den Phase 2 Project
Pretested Pipeline Segments, Discharge Locations, and Water Requirements**

Horizontal Directional Drill Segment	Length (feet)	Diameter (inches)	Entry Point (milepost)	Exit Point (milepost)	Approximate Discharge Location (milepost)	Approximate Volume (gallons)
Crude Oil Pipeline						
AR-18	744	3	0.4	0.6	0.6	273.2
AR-25	240	4	0.1	0.1	0.1	156.7
AR-25	150	4	1.2	1.3	1.2	97.9
AR-25	400	4	1.4	1.4	1.3	261.1
AR-25	500	4	1.7	1.6	1.7	326.4
AR-25	200	4	1.9	1.8	1.9	130.6
AR-25	250	4	2.1	2.1	1.9	163.2
AR-25	200	4	2.2	2.1	2.2	130.6
AR-25	185	4	2.7	2.7	2.7	120.8
AR-25	262	4	4.4	4.4	4.4	171.0
AR-25	500	4	4.7	4.8	4.7	326.4
AR-48	270	4	0.0	0.1	0.0	176.2
AR-48	750	4	0.3	0.1	0.3	489.6
AR-48	290	4	0.4	0.5	0.4	189.3
AR-48	160	4	1.0	1.0	1.0	104.4
AR-48	200	4	1.7	1.8	1.7	130.6
AR-48	660	4	2.1	1.9	2.1	430.8
AR-48	200	4	2.3	2.4	2.3	130.6
AR-48	130	4	2.8	2.8	2.8	84.9
AR-48	80	4	3.5	3.5	3.5	52.2
AR-48	450	4	3.8	3.7	3.8	293.7
AR-48	190	4	4.9	5.0	4.9	124.0
AR-48	375	4	5.2	5.3	5.2	244.8
AR-48	120	4	5.5	5.5	5.5	78.3
AR-48	175	4	6.4	6.5	6.4	114.2
AR-51	150	3	0.0	0.0	0.0	55.1
AR-51	160	3	0.4	0.5	0.4	58.7
AR-51	360	3	0.7	0.6	0.7	132.2
AR-55	190	3	0.1	0.1	0.1	69.8
					TOTAL	5,117.1
Produced Water Pipeline						
AR-18	744	3	0.4	0.6	0.6	273.2
AR-25	240	4	0.1	0.1	0.1	156.7
AR-25	150	4	1.2	1.3	1.2	97.9
AR-25	400	4	1.4	1.4	1.3	261.1
AR-25	500	4	1.7	1.6	1.7	326.4
AR-25	200	4	1.9	1.8	1.9	130.6
AR-25	250	4	2.1	2.1	1.9	163.2

TABLE 3-2						
Bear Den Phase 2 Project						
Pretested Pipeline Segments, Discharge Locations, and Water Requirements						
Horizontal Directional Drill Segment	Length (feet)	Diameter (inches)	Entry Point (milepost)	Exit Point (milepost)	Approximate Discharge Location (milepost)	Approximate Volume (gallons)
AR-25	200	4	2.2	2.1	2.2	130.6
AR-25	185	4	2.7	2.7	2.7	120.8
AR-25	262	4	4.4	4.4	4.4	171.0
AR-25	500	4	4.7	4.8	4.7	326.4
AR-48	270	4	0.0	0.1	0.0	176.2
AR-48	750	4	0.3	0.1	0.3	489.6
AR-48	290	4	0.4	0.5	0.4	189.3
AR-48	160	4	1.0	1.0	1.0	104.4
					TOTAL	5,117.1

In general, pipeline laterals will be filled and dewatered at the serviced well pad locations, since those locations will provide the best access for water haul trucks. Trunk line pipeline will be split into approximately 5-mile-long segments for hydrostatic testing, with breakpoints located at block valve locations where feasible. Additionally, and to minimize total water volumes utilized for hydrostatic testing, water will be transferred between successive pipeline segments for reuse where feasible.

Prior to placing the storage/transfer facility, as well as other aboveground facilities, in service, the tanks, piping systems (both above and below ground), and assemblies will also be hydrostatically tested (or tested with a comparable or equivalent method to meet applicable DOT standards). Facilities such as pig launcher/receivers, valves, and other assemblies will typically be tested during their fabrication, prior to deliver to the Project work area.

4.0 HYDROSTATIC TESTING BEST MANAGEMENT PRACTICES

4.1 Water Use Registration and Discharge Permitting

- The proposed source water and discharge plans for all hydrostatic testing must be identified and permitted prior to initiation of hydrostatic testing, or associated water withdrawals.
- Discharge of hydrostatic test water must comply with National Pollutant Discharge Elimination System (NPDES) or state-issued water discharge permits. Appropriate Federal, state, and/or local permits shall be obtained prior to discharging hydrostatic test water.
- EBCS will ensure that any requisite landowner approvals for discharges of hydrostatic test water are obtained in writing prior to initiating such activities.
- Planned use of municipal water for hydrostatic testing, whether sourced locally or trucked to the test site, will not typically require resource agency approval. If

trucked, water tanks must be verified as clean and free of contaminants to avoid inadvertent contamination of the test water.

4.2 Sample Collection and Analysis

Samples of both source and discharge water will be collected and analyzed in association with hydrostatic testing. The effluent parameters or constituents for which analyses must be conducted may vary somewhat by state, but will be specified by permit conditions.

- Proper care will be taken to ensure proper collection, treatment, and transport of samples. Only properly trained individuals will be allowed to collect source and/or discharge samples for analysis.
- Source water samples must be obtained during the filling operation and at the intake point.
- Discharge samples must be taken at the point of discharge, prior to mixing with receiving waters and immediately after exiting the treatment mechanism (e.g., hay bale containment structure), and samples shall be representative of the monitored discharge. The discharge permit may specify the exact timing and frequency of sample collection (e.g., prior to discharge, during discharge, etc.).

4.3 Test Water Discharge

- No test water discharge will commence until requisite permits have been received.
- Once compliance with the effluent limitations and permit requirements is confirmed discharge activities may commence.
- If the analytical test results are not within the effluent limitations or permitted requirements, no discharge will occur until re-analysis and/or alternate plans (e.g., on-site filtration/treatment or collection/hauling of discharge water) can be implemented.
- All water discharges will be performed in accordance with permit requirements and Company procedures, as applicable.
 - Discharge rates of hydrostatic test waters shall be regulated and energy dissipation devices shall be used to prevent upland area erosion, streambed scour, suspension of sediments, or excessive stream flow.
 - Test water shall be discharged into a filter bag, hay/straw bale or silt fence containment structure to minimize erosion and sedimentation of adjacent streams and wetlands.
 - Any solid wastes, such as straw used for filtering or erosion control, shall be disposed of in accordance with local, state, and federal law.