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Wenck File #2579-14

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4 Bears to CDP Connect Pipeline
Post-Construction Inspection Report
PU-11-099

Prepared for:

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1.0 Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the 4 Bears to CDP Connect Pipeline (Project) in McKenzie County, North Dakota (ND), constructed by Arrow Field Services, LLC (Arrow), and currently operated by Hiland Crude, LLC (Hiland). Construction for the Project was completed in February 2012. Wenck reviewed all Project documents to identify those aspects that required compliance, and visually inspected the Project area on 14 May 2013.

The Project was well-maintained and appeared to have been constructed as planned with numerous efforts to minimize impacts. However, there were several non-critical issues that may need to be resolved for the Project to be considered complete and in full compliance, including 1) written verification of some items, in particular, maps of the approved corridor and revised as-builts, 2) repair of a drainage southeast of the tie-in with the 4 Bears pipeline on the west end of the pipeline, 3) vegetation establishment in grassland areas and crop production in agricultural lands, 4) repair and eventual removal of silt fences along Dry Creek, 5) tree and shrub mitigation, and 6) justification for USFWS recommendations that were not followed. Follow-up actions taken by Hiland to address these issues can be corroborated in writing or photos and will not require a subsequent site visit. Wenck recommends the PSC take the following steps to resolve these issues.

Recommended Action Steps

→Request Now

- Maps of approved corridor and associated GIS files, to be reconciled with the as-built drawings. Clarification is needed for 1) which route was chosen on the east end of the pipeline where it left the CDP facility (two alternatives were analyzed), 2) the alignment of the built route, 3) the disturbed area adjacent to the route in the NE ¼ of Section 19.
- Repair of compacted soils and ruts in the drainage southeast of the tie-in on the west end.
- Repair of silt fences at Dry Creek.
- Monitoring of areas with possible topsoil/subsoil mixing or inadequate topsoil replacement.
- Explanation of USFWS recommendations not followed (refer to list in Section 4.6).
- Tree and Shrub Mitigation Plan and 2013 Planting Report.

→Review Internally, Clarify, Then Request if Needed

- Several "potential" items may need written verification, but the PSC should review since some may not be needed or may be best verified in some other way (refer to list in Section 4.1).

→ Expect Later, Request if Needed

- Documentation of satisfactory establishment of vegetation in the grassland area and satisfactory crop production in the cropland. Soil amendments or re-seeding may be necessary if former land uses cannot be attained in the next couple years.
- Removal of silt fences along Dry Creek once adjacent vegetation is established and soils are stabilized.
- 2014-2016: Tree and Shrub Survival Reports.

2.0 Background & Scope

2.1 INTRODUCTION

The 4 Bears to Central Delivery Point (CDP) Connect Pipeline (Project) was completed in 2012 in McKenzie County, North Dakota (ND), approximately 18 miles east of Watford City, ND (**Figure 1**). The Project was constructed by Arrow Field Services, LLC (Arrow), and is currently operated by Hiland Crude, LLC (Hiland). The Project is an 8-inch diameter underground pipeline with a total length of approximately 1.5 miles. The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-11-099 on 02 November 2011, granting a Certificate of Corridor Compatibility No. 126 and Route Permit No. 135 for the Project.

2.2 PURPOSE

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Post-construction inspections ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable Commission Findings of Fact, Conclusions of Law, and Order (Order). The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Project.

2.3 METHODS AND SCOPE OF INSPECTION

2.3.1 Project Compliance Items Identified

Wenck identified a list of "Project Specifications", which Arrow/Hiland were obligated or responsible to follow and that can be verified either in written documentation or by an on-site inspection. These items were taken from 1) siting laws and rules, 2) Project activities or specifications proposed in the Application for a Certificate of Corridor Compatibility and Route Permit (Application), 3) Project plans described in the Findings of Fact, 4) Orders, and 5) recommendations by other agencies. These Project specifications are listed in Table 2.1 under 7 categories: Siting & Location; Project Design & Engineering; Pre-Construction; Cultural Resources; Natural Resources; Construction, Reclamation & Soils; and Operation.

2.3.2 Document Review

Wenck staff reviewed publicly-available Project documents in the PSC Online Case Search (ND PSC 2013) to find written verification of compliance for the Project specifications listed in Table 2.1. If written verification was filed, the findings are described in Section 3 and the source and name of the documentation is listed in Table 2.1, Column 3 (Written Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant because they have no written verification.

2.3.3 On-Site Inspection

Sara Simmers, Wenck botanist and natural resource scientist, visited the Project site on 14 May 2013. A representative from Hiland, the company currently operating the pipeline, accompanied Wenck staff during the site visit.

The site was inspected visually by driving to access points and walking within the Project area at those points. Digital photographs (Canon Power Shot SD1300 IS, 12 megapixel) were taken showing typical Project infrastructure and documenting problem areas (**Appendix A**). Geographic coordinates were recorded at observation points or potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Figure 1; Appendix B**).

If on-site inspection of a Project specification was completed, the findings are described in Section 3 and referenced in Table 2.1, Column 4 (Site Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant based on site verification.

Table 2-1: Project Specifications with Written or Site Verification Information

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	SITING & LOCATION		
Corridor App. p. 2; Route App. p. 2; Findings of Fact 3; Certification 30	Designated location in McKenzie County, about 18 miles east of Watford City, ND. Provide maps of approved corridor and associated GIS files within 3 months of approved Order.	None.	Section 3.1.1
ND Admin. Code Article 69-06-08; Corridor App. p. 11-18; Route App. p. 10-12; Findings of Fact 12-14, 16, 20	Siting Criteria analysis – exclusion, avoidance, selection, and policy. No exclusion or avoidance areas within study area. No impacts to Selection Criteria. Meets Policy Criteria.	Docket #7, Application	Section 3.1.2
Route App. p. 13	Project will temporarily impact approx. 22 acres of agricultural land. No impacts to quality of cropland anticipated. Settlements provided to landowners for crop loss resulting from Project construction.	None.	Section 3.1.3
Route App. p. 13	Setback of 500ft from occupied structures. No structures were within 500ft of route.	Docket #7-9, Appendix B, Project Maps	Section 3.1.4
ND State Land Dept. (04-06-11); NDGF (04-26-2011); NDPR (filed 10-24-2011)	No state trust surface or mineral ownership within study area. No PLOTS lands in or adjacent to corridor. No state parks or NDPR-managed lands.	Docket #07-05, State Land Dept. Correspondence; Docket #07-03 NDGF Correspondence; Docket #43 NDPR Correspondence	Section 3.1.5
	PROJECT DESIGN & ENGINEERING		
Corridor App. p. 2; Route App. p. 2; Findings of Fact 4	Authorized 1.5 miles of 8-inch diameter underground pipeline and above ground markers.	Docket #74, As-built Drawings	Section 3.2.1
Route App. p. 2; Findings of Fact 23	Temporary construction within 120ft wide right-of-way (ROW), reduced to 80ft at approach to waterbodies, and 50ft in wooded areas. Permanent ROW is 50ft wide.	N/A	Section 3.2.2
Corridor App. p. 17, 19; Route App. p. 2, 20, 22; Findings of Fact 24	Design, construction, and operation in compliance with US DOT 49 CFR Parts 194 and 195.	None.	N/A
Certification 32	Provide engineering design drawings prior to construction upon request.	Docket #07-08, Engineering Design Drawings	N/A
Certification 33	Provide as-built design specifications and associated GIS files within 3 months after construction complete.	Docket #74, As-built alignment sheets	N/A
	PRE-CONSTRUCTION		
ND Century Code Ch. 49-22-07.1; ND Admin. Code Article 69-06-03	Letter of Intent.	Docket #1, Letter of Intent; Docket #3, Revised Letter of Intent	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
ND Century Code Ch. 49-22-08; ND Admin. Code Article 69-06-04	Application for a Certificate of Site or Corridor Compatibility and Route Permit.	Docket #7, Application	N/A
ND Century Code Ch. 49-22-07	Certificate of Site Compatibility or Route Permit.	Docket #51, Order with Certificate 126 and Route Permit 135	N/A
ND Century Code Ch. 49-22-04; ND Admin. Code Article 69-06-02	Ten-year Plan (submit before July 1).	Docket #07-12, 2011 Ten-year Plan; Case No. PU-11-563, 2011 Ten-year Plan	N/A
Certification 2, 5	Conduct Pre-construction Conference. Provide notice of intent to start construction.	Docket #57, Pre-construction Conference Minutes, including notice of intent to start construction	N/A
Certification 31, 35	Inform Commission of plans to modify facility and obtain approval. Any facilities not included in current Application must be applied for in a separate Route or Site Permit.	None filed to date.	N/A
Certification 3, 4	Compliance with rules and regulations of other jurisdictional agencies. Obtain permits and approvals from other agencies and provide copies prior to applicable permitted activity.	Docket #44, Table of Permits Required; #58 NDPDES Temporary Dewatering and Hydrostatic Testing Permit; Docket #62 NDPDES Stormwater Discharge Permit	N/A
Route App. p. 21; Certification 37	Participate in ND One-Call Excavation Notice System.	None.	Section 3.3.5
	CULTURAL RESOURCES		
Corridor App. p. 14; Route App. p. 12, 19; Findings of Fact 15	Cultural resource sites determined ineligible for National Register of Historic Places. SHPO concurrence provided with Application. No avoidance or mitigation necessary.	Docket #07-11 Class I and III Cultural Resource Inventory; Docket #6, ND SHPO Concurrence	Section 3.4.1
Certification 11, 12	Submit cultural resource mitigation plans to SHPO prior to construction for approval. Report discovery of cultural, archeological, historic, etc. sites and stop construction, consult SHPO for clearance, and file report to PSC.	Docket #40 Unanticipated Discovery Plan; Docket #34 ND SHPO Letter Concurring with Unanticipated Discovery Plan. No discoveries reported to date.	N/A
	NATURAL RESOURCES		
Route App. p. 19; Findings of Fact 18, 19; USFWS (04-20-2011)	Expect temporary displacement of wildlife due to clearing and construction, but no significant impacts. No impacts expected to T+E or	Docket #59, Weekly Construction Report, start date 10 Nov 2011,	Section 3.5.1

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	sensitive species. Project construction to occur outside migratory season for whooping cranes and outside the nesting season for bald and golden eagles and other migratory birds. Will comply with USFWS recommendations for minimizing wildlife impacts.	clearing/ grubbing done 22 Nov 2011; Docket #71, Weekly Construction Report, construction complete 1 Feb 2012; Docket #7-10, Natural Resource Report	
Route App. p. 18-19, 21; Findings of Fact 17; USFWS (04-20-2011); NDGF (04-26-2011)	No permanent impacts to wetlands or waterbodies are anticipated. Spill control, erosion and sediment controls, and other specific construction measures will be used through wetlands, according to permit. Dry Creek will be crossed underneath with HDD; an 80ft vegetation buffer will be left on either side during clearing. USFWS recommends impacts to wetlands and streams be minimized by workspace modification, narrowing ROW, horizontal drilling, and/or use of Best Management Practices (BMPs). NDGF recommends erosion control, no drainage alteration.	Docket #7-10, Natural Resource Report; Docket #35, Wetland Delineation Letter Report; Docket #63, Weekly Construction Report, completion of 6 bores.	Section 3.5.2
USFWS (04-20-2011)	USFWS recommended minimal disturbance and narrowing of ROW within native prairie.	None.	Section 3.5.3
Certification 10; USFWS (04-20-2011)	Report presence of T+E species, bald or golden eagles during construction and operation. USFWS: Project is within whooping crane migration corridor; stop work if one is sighted during construction and notify USFWS.	None reported to date.	N/A
Corridor App. p. 19; Route App. p. 20, 22; Certification 17; USFWS (04-20-2011)	Reclamation, fertilization, and reseeding according to NRCS (or landowner if approved). Mulch and erosion control fabric will be applied according to desires of landowner. USFWS request: reseed with grass/forb mixture of native species from local seed sources.	None.	Section 3.5.5
Route App. p. 18, 21; Findings of Fact 17; Certification 20	Shrubland avoided to extent practicable. Tree and shrub removal and replacement will comply with “Tree and Shrub Mitigation Specifications”.	Docket #7-10, Natural Resource Report; Docket #45, Exhibit 9, Revised Tree and Shrub Count Table	Section 3.5.6
Route App. p. 20	Contractors required to clean equipment and materials prior to entrance to ROW to minimize spread of noxious weeds.	Docket #7-10, Natural Resource Report	Section 3.5.7
	CONSTRUCTION, RECLAMATION & SOILS		
Corridor App. p. 16, 18, 19; Route App. p. 15-16, 17, 20; Findings of Fact 25; Certification 5, 9, 15	Environmental monitors and inspectors utilized during construction. Construct and operate in accordance with Application and safety requirements. Construction suspended during adverse weather conditions. Provide weekly construction reports.	Docket #59, 61, 63-71, Weekly Construction Reports	N/A
Route App. p. 20, 21;	Pipeline buried to 48in in range land, 48in in cultivated land, 48in at the	Docket #74, As-built alignment	Section 3.6.2

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
Certification 6	bottom of ditch for road crossings, and 72in in undeveloped section lines. Route App. specifies minimum 4ft soil cover on cultivated lands.	sheets	
Corridor App. p. 15, 19; Route App. p. 14, 18	Soil erosion minimized by use of BMPs during and after construction to protect surface water and soils/topsoils.	None.	Section 3.6.3
Route App. p. 20, 21; Certification 16, 24	Topsoil and subsoil must be segregated and replaced separately. No staging areas on land of other ownership. Rocks (> 3in diameter) will be removed from cultivated lands post-construction.	None.	Section 3.6.4
Certification 13	Crossings of graded roads bored.	Docket #63, Weekly Construction Report for 12-7-11; Docket #74, As-built alignment sheets	Section 3.6.5
Corridor App. p. 15, 19; Route App. p. 13, 14, 20, 22; Certification 14, 18, 19, 26;	Temporarily disturbed areas and roads will be restored. Pre-existing roads restored to satisfactory condition. Restoration of area to pre-construction contours as soon as practicable upon completion of construction. ROW will be de-compacted per landowner request. Reclamation and maintenance throughout life of facility.	Docket #59, 61, 63-71, Weekly Construction Reports	Section 3.6.6
Route App. p. 20; Certification 22, 23, 25	Temporary fences and gates will be installed as necessary. Repair/replace all damaged fences and gates. Repair/replace damaged drainage tile. Waste removed and disposed regularly.	None.	Section 3.6.7
Route App. p. 19; Certification 36	Underground irrigation or water lines and wells will be avoided or shutoff coordinated. Damage to underground facilities reported to PSC. Construction suspended until clearance to proceed.	None reported.	N/A
	OPERATION		
Corridor App. p. 16; Route App. p. 15-16, 20; Certification 8, 9, 28	Construct and operate in accordance with Application and safety requirements. Maintain records of compliance with Order and Certificate of Site Compatibility. Extraordinary events (e.g. injuries, T+E wildlife fatalities) reported within 5 business days.	None reported to date.	Section 3.7.1
Certification 18, 19, 25	Reclamation and maintenance throughout life of facility. Waste removed & disposed regularly.	None.	Section 3.7.2
Findings of Fact 26; Certification 21, 27, 29	Cooperation with landowners/residents to mitigate adverse effects. Company's existing Emergency Action Plan will include the Project. Safety measures for traffic control or to restrict public access. Procedure for handling complaints.	None.	Section 3.7.3

***Note: Shaded boxes represent non-compliance or potential non-compliance issues.**

3.0 Findings

3.1 SITING & LOCATION OF FACILITY

3.1.1 Designated Location & Maps of Corridor

The Project was built generally as proposed in the designated location described in the Application and Order (**Figure 1**). However there were two discrepancies in the details of the location.

One discrepancy was on the east end of the route where the pipeline left the Arrow CDP Connect facility. Maps included in the Corridor and Route Applications show the pipeline leaving the CDP facility on the southeast corner, continuing straight south about 800ft, then turning directly west in parallel to the south edge of the facility across a field, existing road, and Dry Creek (Docket #7-09, Appendix B, Project Maps). In contrast, the as-built design drawings submitted post-construction show the pipeline going straight south for about 250ft, turning west for about 375ft, turning south for about 550ft, then turning west to cross the road and Dry Creek (Docket #74, As-built Drawings).

Both route alternatives were analyzed during natural resource/biological surveys, wetland delineations, and cultural resource surveys. Subsequent reports were included by appendix in the Applications (Docket #7-10, Appendix D, Natural Resource Report; Docket #7-11, Appendix E, Cultural Resource Report) or as exhibits during the hearing (Docket #42, Exhibit 6, Wetland Delineation Letter Report). Therefore, there is no concern that impacts were not fully analyzed.

However, it is unclear which route was approved for the Project, or whether both were approved. No maps of the approved corridor and associated GIS files were submitted to the PSC after the Order for this project was issued, as per item #32 of the Certification Relating to Order Provisions. No clarification of the chosen route was given during the hearing for the Project. Maps presented at the hearing were either from the Application, which showed the “south, then west” route, or from natural resource reports, which showed both routes.

During the post-construction site inspection, Wenck observed pipeline markers and disturbance in an agricultural field to the south of the CDP facility that would indicate the pipeline followed the “south, then west” route (**Appendix A, Photo 1**), coinciding with the Application Maps. However, those markers could have also been associated with another pipeline continuing east from the CDP facility, evident on current aerial imagery (**Figure 1**). Based on this information, there is a concern that either 1) the pipeline was built in the approved project corridor, but as-built drawings are incorrect and do not reflect the actual built facility or 2) the pipeline was built as shown on the as-builts, but that route had not been an officially approved corridor.

The second discrepancy relating to the specific location of the Project was that when viewed on aerial imagery, the built route of the pipeline is shifted approximately 65 feet north of where the as-built shows the centerline of the route (**Figure 1**). This is an indication that the as-built drawings are not a reflection of the actual built location of the Project.

3.1.2 Siting Criteria

Siting criteria were analyzed in detail in the Applications for the Project (Docket #7). Wenck confirmed during the site inspection that there were no exclusion or avoidance areas within the Project area. Wenck also confirmed that impacts to selection and policy criteria were considered and kept at a minimum.

3.1.3 Land & Agricultural Impacts

The Project was built as proposed within the estimated construction ROW, except for one area. This area of approximately 1.2 acres was evident on current aerial imagery extending north from the pipeline route in the NE ¼ of Section 19, and appeared to have been excavated in association with Project construction (**Figure 1**). The use of this area was unknown; no information had been provided in the Application or design documents. It appeared to either be a staging area or the route of another pipeline extending to the north.

The Project was constructed within the maximum acreage estimated in the Route Application. Topsoil replacement and soil de-compaction were satisfactory (**Appendix A, Photos 1, 5-10**). Crop production appeared to have been suspended in the year following construction in the large field crossed by the pipeline in the NW ¼ of Section 19; stubble from presumably the 2011 crop was compacted along access routes to the pipeline and soil was still bare along the route (**Appendix A, Photos 5, 6**). Also, the corner of a recently planted field had been left unplanted in the NE ¼ of Section 24 where the west end of the pipeline tied into the 4 Bears pipeline (**Appendix A, Photo 8**). A few areas also showed lighter-colored surface soils, an indication of topsoil-subsoil mixing, which could have an impact on future crop yields (**Appendix A, Photos 7, 8**). However, Hiland stated that any crop production losses were being mitigated with settlements and that in general, any issues or landowner concerns related to agriculture or cropland are addressed promptly (J. Coleman, 2013, pers. comm.).

3.1.4 Setbacks

The Project was in a rural setting, with no occupied dwellings or structures along the pipeline route or within the ROW corridor, complying with the 500ft setback specified in the Application.

3.1.5 ND State-Owned or Managed Lands

Consultation with officials in the ND Department of Trust Lands, Surface Management and Minerals Management Divisions indicated that no trust surface or mineral ownership was within the study area (Docket #7-05, State Land Dept. Correspondence). Consultation with the ND Game & Fish Department (NDGF) indicated no NDGF-managed lands were within or adjacent to the pipeline corridor (Docket #7-03 NDGF Correspondence). The ND Parks & Recreation Department (NDPR) indicated that no state parks or other lands they manage were in the vicinity of the Project (Docket #43, NDPR Correspondence). Therefore no state owned or managed lands were potentially impacted by the Project.

3.2 PROJECT DESIGN & ENGINEERING

3.2.1 Length & Infrastructure

The Project was authorized as 1.5 miles of 8in diameter underground pipeline, as described in the Application and at the hearing. The site inspection observations and as-built drawing information coincide with these parameters (Docket #74, As-builts). Aboveground markers were in place along the route and the pipeline tied into the 4 Bears Pipeline at its west end (**Figure 1; Appendix A, Photos 1, 3, 7, 8**).

3.2.2 Right-of-Way Corridor

The Order for the Project authorized construction within a 120ft ROW centered on the pipeline route, reduced to 80ft at waterbodies and 50ft in wooded areas. The pipeline appeared to have been constructed at a ROW width between 50-80ft, well within the maximum 120ft. The disturbance width did not appear to have been reduced at the approach to Dry Creek; however, since the maximum disturbance width was no more than 80ft, construction was within the requirements. Additionally, the creek was bored underneath rather than open-trenched to avoid disturbance (**Appendix A, Photos 3, 4**).

3.2.3 Compliance with US DOT Regulations

There was no written verification or certification of compliance with US DOT 49 CFR Parts 194 and 195.

3.2.4 Engineering Design Drawings

Engineering design drawings were provided in the Application materials (Docket #07-08, Appendix A, Engineering Documents).

3.2.5 As-built Drawings and GIS Files

As-built alignment drawings and associated CAD files (acceptable alternative to GIS) were received on 25 April 2012 (Docket #74), within three months after construction was completed. The as-built drawings were inspected in relation to the on-the-ground infrastructure of the facility and appeared to coincide, except for two discrepancies (explained in detail in Section 3.1.1): 1) the route at the east end leaving the CDP facility was unclear and 2) the built route was about 65ft north and parallel to the as-built route. The accuracy of the as-built drawings should be confirmed.

3.3 PRE-CONSTRUCTION

3.3.1 PSC-Required Documents

A Letter of Intent was received on 28 March 2011 (Docket #1), and a revised Letter of Intent with a revised company name was received on 19 April 2011 (Docket #3). The PSC moved that the one year waiting period between filing the Letter of Intent and the Application be shortened to two months (Docket #4, Commission Motion acknowledging Letter of Intent). An Application for a Certificate of Corridor Compatibility and Route Permit was subsequently submitted on 22 July 2011 (Docket #7, Application). A Certificate of Corridor Compatibility No. 126 and Route Permit No. 135 were issued on 2 November 2011, in accordance with the Order and Certification Relating to Order Provisions signed by Arrow on 21 October 2011 (Docket #51, Order). A Ten-Year Plan was filed as part of the Application (Docket #07-12, Appendix F, 2011 10-Year Plan). The same plan was also filed under a different case number (Case No. PU-11-563 Docket #1, 2011 Ten-Year Plan, Arrow Field Services).

3.3.2 Pre-Construction Conference/Notice of Intent to Start Construction

Record of the pre-construction conference was on file and notice was provided during the meeting of intent to start construction as early as 9 November 2011 (Docket #57, Preconstruction Conference Minutes).

3.3.3 PSC Approval of Modifications

There were no notifications to modify the facility filed to date. Observations of on-the-ground infrastructure coincided with maps of the approved corridor and as-built drawings, other than the discrepancies described in Section 3.1.1. No separate approvals were sought for those differences.

3.3.4 Permits and Approvals from Other Agencies

There were no indications in the Applications that federal or local permits would be required for the Project. State agency permits identified as required for the Project (Docket #44, Table of Permits Required) included:

- NDDH NDPDES General Permit for Temporary Dewatering/Hydrostatic Testing (Docket #58), for discharge of potable water into Dry Creek;
- ND Department of Health (NDDH) General Permit for Stormwater Discharges from Construction Activity (Docket #62).

These permits were filed with the PSC as required.

3.3.5 North Dakota One-Call Participation

There was no written documentation that Arrow participated in North Dakota One-Call. However, the Preconstruction Conference Minutes (Docket #57) noted that a call would be placed that same day. In addition, as-built alignment drawings (Docket #74) indicated several utility intersections along the route, indicating knowledge of existing utility lines.

3.4 CULTURAL RESOURCES

3.4.1 Cultural Site Avoidance

One previously discovered cultural site and one newly recorded cultural site were documented in the archeological survey of the pipeline corridor submitted as part of the Application (Docket #7-11, Appendix E, Cultural Resource Report). These sites were recommended ineligible for listing on the National Register of Historic Places with no avoidance or mitigation necessary. The ND State Historic Preservation Office (SHPO) concurred with this recommendation (Docket #6, ND SHPO Concurrence Letter).

3.4.2 Mitigation Plans & Reporting

An Unanticipated Discovery Plan for the Project was filed during the hearing which documented the procedure that would be implemented if any cultural resources were discovered during construction of the Project (Docket #40, Exhibit 4, Unanticipated Discovery Plan for Cultural Resources Identified During Construction). ND SHPO concurred with the plan (Docket #34, ND SHPO Letter Concurrence). No new discoveries of cultural, archeological, or historic sites have been reported to the PSC to date and no discoveries were recorded on the weekly construction reports for the Project (Dockets #59, 61, 63-71). Presumably no new sites were encountered during construction of the Project.

3.5 NATURAL RESOURCES

3.5.1 Wildlife

In general, it appeared Arrow attempted to minimize impacts to wildlife and habitat. A natural resources survey was completed prior to construction which included a wetland determination; a cursory assessment of wildlife, threatened and endangered species, and potential habitat; an inventory of woody vegetation; and a noxious weed survey (Docket #7-10, Appendix D, Natural Resource Report). Disturbance from pipeline construction was temporary in nature for most species.

The US Fish and Wildlife Service (USFWS) gave several recommendations to minimize wildlife impacts; Arrow stated they would comply with those recommendations. Below, each recommendation is discussed along with measures Arrow took to follow those recommendations.

- The USFWS recommended that if any overhead power lines were planned for the project, that they be installed underground instead. No overhead powerlines were associated with the Project and this was confirmed during the site visit.
- The USFWS was concerned about fragmentation of native prairie on the east half of the route, which would be suitable Sprague's pipit habitat. They suggested following the section line more closely to reduce fragmentation. Arrow did not alter the route of the pipeline based on this recommendation (**Appendix A, Photo 3**). However, several natural features on the landscape likely prevented Arrow from moving the route closer to the section line, including steeper, rolling topography and a wetland area extending from the meanders of Dry Creek (**Figure 1**).
- The USFWS recommended an eagle nest survey with at least ½-mile avoidance for any documented nests. A cursory survey for general wildlife and avian habitat within the Project corridor was part of the natural resources survey completed for the Project. No eagle nests were found "within or near the survey area," though it was determined they *may* occur within or near the area because of potential habitat (Docket #7-10, Appendix D, Natural Resource Report). Though the recommended ½-mile was not technically documented as being surveyed, it was apparent from aerial imagery and during the site inspection that the project area was not typical eagle nesting habitat; it was along a busy highway with agriculture predominant across the landscape.
- The USFWS requested construction be avoided during the migratory bird nesting season. Weekly construction reports indicated that construction began 10 November 2011 (Docket #59) and ended 1 February 2012 (Docket #71), and therefore avoided migration and nesting season (Feb 1-Aug 31).
- The USFWS recommended that a Conservation Plan be developed to identify potential impacts to migratory birds as a result of the Project. They also recommended that Arrow document the steps taken to minimize disturbance and reclaim habitat. Other than the mitigation measures discussed in the Applications, a Conservation Plan was not developed for the Project.

3.5.2 Wetlands

A wetland determination during the natural resource survey indicated the presence of two potential wetlands and one intermittent stream (Dry Creek) along the Project ROW (Docket #7-10, Natural Resource Report). A subsequent wetland delineation concluded that the potential areas did not meet criteria for consideration as wetlands (Docket #35, Wetland Delineation Letter Report). Wenck confirmed during the site visit that Dry Creek was bored to avoid impacts (**Appendix A, Photo 4**). Weekly construction reports also noted the progress of 6 bores along the route (Dockets #59, 61, 63-71, Weekly Construction Reports). Erosion and sediment control structures were in place and the vegetation within Dry Creek had not been disturbed. However it did not appear that an 80ft vegetation buffer had been left on either side of the Creek; rather the disturbed ROW was evident up to the stream edge (**Figure 1; Appendix A, Photos 3, 4**).

3.5.3 Native Prairie

Native prairie was crossed on the east half of the Project corridor which was potentially suitable habitat for the Dakota skipper and Sprague's pipit (**Appendix A, Photo 3**) (Docket #7-10, Natural Resource Report). It was noted during the inspection that although potentially suitable, the grassland had been heavily grazed and was not currently likely to support either of these species. The width of the pipeline disturbance had been minimized to between 50-80ft, which was considerably less than the maximum proposed 120ft ROW, thus fulfilling the USFWS request. Reseeding of the disturbed area had been done in Fall 2012 as a way to mitigate disturbance (J. Coleman, 2013, pers. comm.).

3.5.4 Reporting

Weekly construction reports indicated that no environmental incidents or issues occurred during construction (Docket #59, 61, 63-71, Weekly Construction Reports). There were no reports filed documenting the presence of threatened or endangered species or bald or golden eagles during construction or operation to date.

3.5.5 Reclamation & Reseeding

At the time of the site inspection, the pipeline trench had been backfilled, soils had been recontoured, and reseeding had been completed in grassland areas (**Appendix A, Photos 1-10**). Vegetation was beginning to emerge along most of the reseeded portion of the route, though it was not fully established. The timing of the site inspection was too early to identify the species composition of the emerging vegetation (**Appendix A, Photo 3**). Hiland stated that an approved grass mix was planted in the grassland area in Fall 2012, though whether it was composed of native species as requested by the USFWS was unknown (J. Coleman, 2013, pers. comm.). Wenck recommends the PSC request documentation from Hiland/Arrow once vegetation has fully established in the grassland area.

3.5.6 Tree & Shrub Mitigation

It appeared that in general, major woody areas were avoided through Project siting. As required, a count of trees and shrubs was done within the area expected to be impacted by construction (Docket #7-10, Natural Resource Report), along with a revised report (Docket #45, Exhibit 9, Revised Tree and Shrub Count Table). Hiland stated that tree and shrub mitigation had not been done yet, but that a company from Dickinson was going to be planting trees and shrubs this year (J. Coleman, 2013, pers. comm.). To date, no mitigation plan or planting reports have been submitted for the project. This will need to be done for the Project to be considered complete.

3.5.7 Noxious Weeds

A survey for noxious weeds was part of the natural resource survey prior to Project construction; no noxious weed populations were found (Docket #7-10, Natural Resource Report). Mitigation measures were identified in the Application to prevent the spread of noxious weeds during construction. No documentation was available to verify these measures were taken. No noxious weed populations were observed incidentally during the site inspection.

3.6 CONSTRUCTION, RECLAMATION & SOILS

3.6.1 Construction Management & Safety

There was no specific documentation of the use of an environmental inspector during construction, though during the hearing Arrow representatives indicated one would be retained. Weekly construction reports were submitted for the duration of construction (Docket #59, 61, 63-71, Weekly Construction Reports). Each report indicated whether any safety or environmental incidents had occurred, and documented that construction of the Project proceeded in accordance with the Application and safety requirements. No major adverse weather occurred during construction, so no delay of construction was necessary (Dockets #59, 61, 63-71, Weekly Construction Reports).

3.6.2 Pipeline Depth

The Route Application and PSC Certification of Order Provisions stated the pipeline must be buried to 48in in rangeland, cultivated land, and bottoms of ditches for road crossings, and 72in in undeveloped section lines. Wenck did not visually confirm the depth of the pipeline, but Hiland stated that the pipeline was buried to at least the specified depth, and deeper where it bored under roads and Dry

Creek (J. Coleman, 2013, pers. comm.). The as-built indicated the pipeline was buried at a depth of 6ft (Docket #74, As-built alignment sheets).

3.6.3 Erosion & Sedimentation

The Project Applications state BMPs would be used during and after construction to minimize soil erosion and protect surface water. Most erosion control devices were removed following completion of the Project; however, silt fences were still in place along Dry Creek (**Appendix A, Photo 3, 4**). No major erosional concerns were seen during the inspection. However, one minor concern was at a drainage to the southeast of the tie-in to the 4 Bears pipeline, which had deep ruts from the use of heavy equipment (**Appendix A, Photo 9**). Wenck recommends the ruts and compaction in this area be repaired and that it be protected from future use by heavy equipment.

3.6.4 Soil Segregation & Staging

In general it appeared that measures were taken to minimize the overall impact of the Project and the extent of land and soil disturbance. Wenck observed that topsoil appeared to be replaced to the required depth and separately from subsoils, except for a few areas. These areas were in the northeast corner of Section 24 to the east of the tie-in to the 4 Bears pipeline (**Appendix A, Photos 7, 8**) and in the northeast corner of Section 19 at the base of the hillslope to the west of Dry Creek (**Appendix A, Photos 3, 4**). In these areas the surface soils were lighter in color which indicated potential mixing with clay subsoils. The hillslope area was bare of vegetation, even though the area had been reseeded and surrounding soils supported emerging vegetation. The areas to the east of the tie-in were in crop fields; one area appeared to have been disturbed after the past year's crop and the other area had been excluded from this year's planting. It was not clear if the latter area had been avoided due to soils or difficulty in driving farm equipment around the aboveground tie-in structure. The condition of crops could therefore not be used as an indicator of proper soil replacement in this case. Wenck recommends that these areas be monitored by Hiland and documentation provided to the PSC. Soil amendments may be necessary in the future if vegetation or crops cannot be supported in these areas. It appeared large rocks had been removed from cropland if any had surfaced during soil disturbances.

Though Project plans did not include any staging areas, there was a disturbed area of about 1.2 acres adjacent to the north edge of the route in the NE ¼ of Section 19 in native prairie (**Figure 1**). It appeared to be associated with Project construction, though the purpose of the area was not clear. It may have been a staging area or the route of another pipeline. The PSC should request an explanation of the area since it is outside the Project ROW.

3.6.5 Graded Roads Bored

Remarks in the weekly construction reports (Docket #63, Weekly Construction Report for 7 December 2011) and information on the as-built (Docket #74, As-built alignment sheets) indicated there were six bores along the pipeline route, corresponding with an access road crossing (**Appendix A, Photos 1-3**), Dry Creek, other existing utilities and pipelines, and the gravel-surfaced 108th Ave NW (**Appendix A, Photos 7-8**). Wenck verified that the road crossings appeared to have been directionally bored, with the route of the pipeline indicated by markers on either side.

3.6.6 Reclamation & Roads

Weekly construction reports indicated that cleanup and reclamation had occurred concurrently with construction activities (Docket #59, 61, 63-71, Weekly Construction Reports). At the time of the inspection, the pipeline trench had been backfilled, soils had been recontoured, and reseeding had been completed, with vegetation beginning to establish in most seeded areas (**Appendix A, Photos 1-4**).

Wenck recommends that the PSC request documentation from Hiland when vegetation has fully established. No temporary roads had been used during construction. All roads within the Project area appeared to be in good condition and properly maintained, except one location. There was a culvert installed on an access road to the south of the CDP facility where the road surface had settled and created a dip (**Appendix A, Photo 2**). However, Hiland noted that this road was associated with new oil well sites to the south and was the responsibility of those oil companies (J. Coleman, 2013, pers. comm.).

3.6.7 Fencing, Repairs & Waste

Fences had been repaired where the Project crossed fencelines (**Appendix A, Photo 3**). Hiland reported there had not been any agricultural fields with drainage tile impacted by construction of the Project. There was no waste or debris observed at the site (**Appendix A, Photos 1-10**).

3.6.8 Underground Facilities

No reports of damage to underground facilities were reported to the PSC. Wenck confirmed with Hiland that no damage to facilities occurred during construction (J. Coleman, 2013, pers. comm.).

3.7 OPERATION

3.7.1 Safety & Record-keeping

No concerns were identified during the site review that would indicate that Project operation was out of compliance with the Application or safety regulations. Examples of operational safety measures observed at the site include: use of personal protective equipment, warning signs marking the pipeline route, and a protective metal frame surrounding the tie-in to the 4 Bears pipeline (**Appendix A, Photo 10**). No reports of extraordinary events were filed to date with the PSC.

3.7.2 Maintenance

Hiland indicated that the pipeline is regularly inspected and maintained. There was no waste, debris, or abandoned equipment observed during the inspection. The site appeared to be regularly maintained. However, the silt fences along Dry Creek should be repaired and will need to be removed once vegetation has more fully established on adjacent slopes (**Appendix A, Photo 4**).

3.7.3 Public Contact & Safety

There was a metal fence structure around the tie-in, which prevented damage by farm equipment to the above-ground pipeline connections (**Appendix A, Photo 10**). Warning signs marking the location of the pipeline had been installed and were in place at all fencelines and road crossings (**Appendix A, Photos 1, 3, 4, 7, 8**). Hiland indicated that resident/landowner concerns and issues are handled promptly and Hiland makes every reasonable attempt to alleviate problems caused by the Project (J. Coleman, 2013, pers. comm.).

4.0 Issues to Resolve and Recommendations

4.1 PROJECT SPECIFICATIONS NEEDING WRITTEN VERIFICATION

Several components of the Project were asserted in the Application or proposed construction and could be verified in writing, but have not been filed with the PSC. Table 2-1 summarizes these items, which are indicated as those shaded in the "Written Verification" column, indicating no written verification was provided where applicable and necessary. Wenck does not consider any of these items to be critical for Project compliance. However some were more important than others and Wenck suggests they be on file with the PSC to confirm compliance. Wenck recommends the PSC request from Arrow/Hiland the following list of "Necessary" items, and if the PSC deems appropriate, the list of "Potential" items could also be requested.

Necessary Items

- Maps of approved corridor and associated GIS files. If approved corridor differs from the as-built drawings, this discrepancy should be reconciled. Since there also appeared to be a potential difference between the built route location and the as-built alignment, this should be corrected and revised as-builts provided to the PSC. An explanation should also be provided of the disturbed area adjacent to the pipeline route in the NE ¼ of Section 19.

Potential Items

- Written verification of compliance with US DOT 49 CFR Parts 194 and 195.
- Conservation Plan for the Project as recommended by USFWS.

4.2 DRAINAGE NEAR TIE-IN

The drainage to the southeast of the tie-in to the 4 Bears pipeline had deep ruts from the use of heavy equipment which needed repair. Wenck recommends any ruts and compaction be repaired, documented with the PSC, and that the area be protected from future use by heavy equipment.

4.3 SOIL REPLACEMENT, REVEGETATION & CROP PRODUCTION

There were a couple outstanding issues at the Project site related to reclamation. 1) Establishment of vegetation was ongoing within the grassland area on the east half of the corridor. 2) There were indications in a few areas that mixing of topsoil with subsoil had occurred, or that insufficient topsoil was replaced during reclamation. These areas had lighter-colored soils and poor revegetation establishment within the grassland area. Because of the timing of the site inspection, it was not clear whether these areas were impacting crop production. 3) It also appeared crop production may have been suspended due to pipeline construction activities. Though presumably crop losses were being monetarily mitigated, former land uses will need to be achieved within the next couple years. Wenck recommends the PSC request monitoring and documentation of these issues. Soil amendments or re-seeding may be necessary.

4.4 EROSION CONTROL AT DRY CREEK

Though Dry Creek had been bored underneath to minimize impacts, it did not appear that an 80ft vegetated buffer had been retained as proposed. Hiland/Arrow should provide justification of why the buffer was not retained. Silt fences were still in place along Dry Creek, though most were not functional. The structures should be repaired so they can function until vegetation has established on adjacent slopes. Hiland should document with the PSC when erosion control structures are repaired and when they are removed.

4.5 TREE & SHRUB MITIGATION

Hiland noted that tree and shrub mitigation had not been completed, but was planned for this spring. To date, no mitigation plan or planting reports have been submitted. This mitigation and subsequent survival reports will need to be done for the Project to be considered complete.

4.6 USFWS RECOMMENDATIONS

Arrow stated they would comply with USFWS recommendations, but there were a few recommendations that were not followed. Wenck suggests that the company be able to provide written documentation or justification for each recommendation that was not followed. In particular, an explanation is needed for why the route was not moved closer to the section line to avoid fragmentation of Sprague's pipit habitat; why a Conservation Plan was not provided; and documentation of the seed mix used for the grassland portion.

5.0 Conclusions

Overall, the Project appeared to have been constructed as designed with minimal impacts to the surrounding natural or human environment. The Project site was well-maintained and in good condition. However, Wenck observed several issues that may need to be resolved before the Project is considered complete and in full compliance. This includes: clarification of the approved Project corridor and reconciliation with as-built drawings, repair of soils in the drainage southeast of the tie-in on the west end, documentation of satisfactory vegetation establishment in the grassland and crop production in the agricultural land, repair and eventual removal of the silt fences adjacent to Dry Creek, completion of tree and shrub mitigation, and justification for USFWS recommendations that were not or could not be followed. None of these are critical issues, but the PSC should determine which are necessary for the company to comply with and then notify the company what actions are required on their part.

6.0 References

North Dakota Public Service Commission (ND PSC). 2013. Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed May, June 2013.

Coleman, Jess. 2013. Hiland Crude, LLC. Personal Communication: discussion during site visit.

7.0 Signatures

The services performed by Wenck scientists for this project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area under similar time and budget constraints. Recommendations and findings contained in this report represent our professional judgment and are based upon available information and technically accepted practices at the present time and location. Other than this, no warranty is implied or expressed.

Lead Project Manager, Kevin Magstadt and Secondary Project Manager, Sara Simmers, prepared the report.

Kevin Magstadt, P.E., Associate/Regional Manager — Date: 6/28/2013

Sara Simmers, Botanist/Natural Resource Scientist — Date: 6/28/2013

Figures

North Dakota Public Service Commission

Project Area and Field Observation Map

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Figure 1

Appendix A

Photographs

Photo 1. Direction: East. Pipeline markers on the east end of the pipeline which appeared to indicate an east-west routed portion of the pipeline, parallel to the south edge of the CDP facility. This route did not correspond to the submitted as-built drawings for the Project, which denoted that the pipeline was routed north-south in this area, but it could have also been the route of another pipeline. The field appeared to have been disturbed in the recent past (note difference in coloration), but was reclaimed properly and revegetation growth was good.

Photo 2. Direction: West. Access road (north-south alignment) crossed by the pipeline route. The as-built indicated the pipeline was bored underneath what was previously a trail through a field. The road had recently been built up and surfaced with scoria as access to new oil wells to the south. The road had a shallow dip where the culvert had been installed and the soil had settled. The Hiland representative stated that an oil company built and was responsible for the condition of the access road.

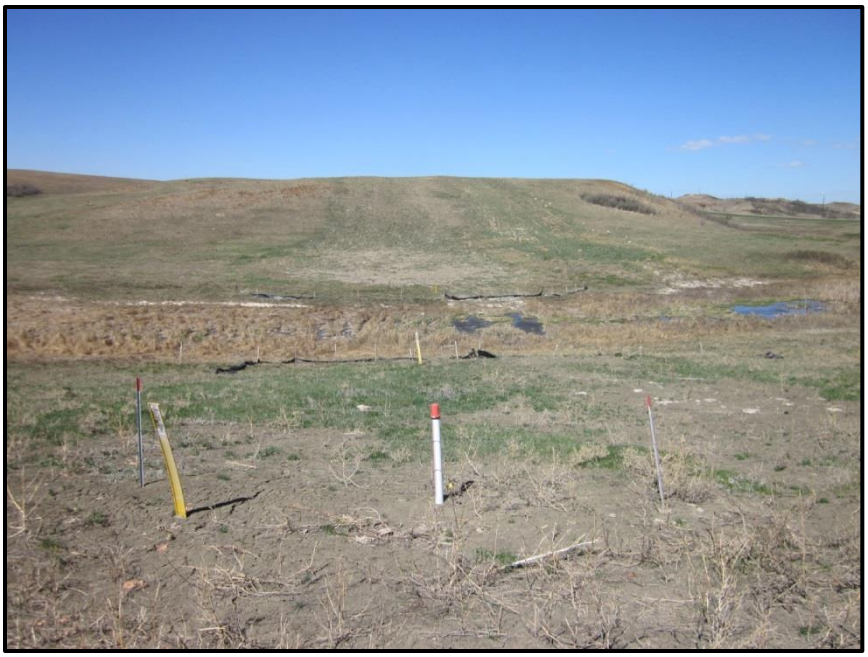

Photo 3. Direction: West. Crossing of Dry Creek on the east end of the pipeline route. Pipeline markers and cathodic protection system markers were in place. Note the new fence installed parallel to the creek in the foreground. The pipeline route is visible on the far side of Dry Creek going upslope to rolling hills of native prairie in the NE ¼ of Section 19. Note the bare patches of soil where vegetation had not yet established.

Photo 4. Direction: West. Closer view of Dry Creek crossing with silt fences on both sides. The vegetation and lowest margins of Dry Creek did not appear disturbed, which confirmed that the creek was bored underneath. Arrow had planned an 80-foot vegetation buffer on either side; however, the soils within the corridor were obviously disturbed up to within a few feet of the edge of the creek.

Photo 5. Direction: Southeast. View across field in the NE ¼ of the NW ¼ of Section 19. The pipeline route was diagonal to the southeast; a line of disturbed soils was faintly visible in the field. The Hiland representative stated the stubble was compressed from accessing the pipeline corridor, which would indicate the stubble was from the 2011 season and that a 2012 crop had not been planted.

Photo 6. Direction: Southwest. View across field in the NW ¼ of the NW ¼ of Section 19. The pipeline route turned straight west across the remainder of the field. Reclamation appeared complete and the soils were stabilized.

Photo 7. Direction: East. Pipeline route in the far northwest corner of the field from Photos 5 and 6, on the east side of 108th Ave NW. Pipeline marker was in place in the east ditch. Note the bare, lighter colored soils on the hillslope which could be an indication of topsoil/subsoil mixing.

Photo 8. Direction: West. West ditch of 108th Ave NW. The existing road had been bored underneath. Pipeline markers and cathodic protection system markers were in place. Note the light colored soils in the corner of the field, which could be an indication of topsoil/subsoil mixing. The core portion of the field had been planted for this year's crop, but this far corner had been excluded.

Photo 9. Direction: West. Markers were for an existing buried power line perpendicular to the pipeline route. Note the disturbed soils on the left of the photo where there were deep ruts (not visible) in the upper portion of a drainage, presumably due to heavy equipment, which needs repair. Otherwise reclamation was complete and soils were stabilized.

Photo 10. Direction: West. West end of pipeline at the tie-in to the existing 4 Bears Pipeline in the NE ¼ of the NE ¼ of Section 24.

Appendix B

Field Observation Points

Appendix B. Field Observation Points (GPS Coordinates)

Point	Feature	Northing (m)*	Easting (m)*	Observation Notes
732	Dry Creek Crossing	5301469.78	209754.25	Visual observation of Dry Creek crossing. No evidence of cut through creek; erosion control in place but needs repair.
733	Road Depression	5301508.60	209749.44	Depression in access road west of CDP facility where culvert was installed. This road is responsibility of another company.
734	Cropland	5301820.61	208756.26	Viewpoint across cropland with pipeline route visible.
735	Road Crossing - Bore	5301808.41	207990.12	108th Ave NW; appeared to be bored underneath as proposed.

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