ARROW FIELD SERVICES, LLC'S CONSOLIDATED APPLICATION FOR A CERTIFICATE OF CORRIDOR COMPATIBILITY AND ROUTE PERMIT, AND WAIVER APPLICATION CASE NO. PU-17-__

January 23, 2017

SUBMITTED TO

North Dakota Public Service Commission
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ACRONYMS AND ABBREVIATIONS

Arrow	Arrow Field Services, LLC
BMP	Best Management Practice
CFR	Code of Federal Regulations
Commission	North Dakota Public Service Commission
Consolidated Application	Consolidated Certificate of Corridor Compatibility and Route Permit Application
EMP	Environmental Mitigation Plan
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDOT	North Dakota Department of Transportation
NDSWC	North Dakota State Water Commission
NGL	natural gas liquid
NWI	National Wetlands Inventory
PHMSA	Pipeline Hazardous Materials Safety Administration
Project	Arrow NB Residue Gas Pipeline and Arrow Bakken NGL Pipeline Project
ROW	right-of-way
SCADA	supervisory control and data acquisition system
SHPO	State Historic Preservation Office
Study Area	1-mile-wide corridor between, and including, the natural gas processing plant and the terminus of the residue gas and Bakken NGL Pipelines
SWCA	SWCA Environmental Consultants
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

CHECKLIST FOR COMBINED CORRIDOR COMPATIBILITY AND ROUTE PERMIT APPLICATION

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INTRODUCTION

Arrow Field Services, LLC (Arrow) proposes to construct an approximately 2.6-mile-long, 10-inch-diameter welded steel residue gas transmission pipeline that will extend from a natural gas processing plant to a third-party transmission pipeline and an 8-inch-diameter welded steel natural gas liquids (NGLs) transmission pipeline that will extend from the same natural gas processing plant to a different third-party NGL facility. Both pipelines will be located in the same right-of-way (ROW) and installed in the same ditch, but with a minimum of 2 feet of separation between them. The proposed pipelines and associated surface facilities owned by Arrow are referred to as the Arrow NB Residue Gas Pipeline and the Arrow Bakken NGL Pipeline Project (Project). The Project is located approximately 7.5 miles southeast of Watford City, McKenzie County, North Dakota (Figures 1 and 2).

The Project, in conjunction with a proposed natural gas processing plant ("Natural Gas Processing Plant") and associated natural gas gathering system, will provide for enhanced recovery and utilization of natural gas resources, including NGLs. Residue gas is defined as natural gas from which NGLs have been removed and thus, both resources must be managed and transported separately.

Arrow is submitting a Consolidated Certificate of Corridor Compatibility and Route Permit Application (Consolidated Application) to the North Dakota Public Service Commission (Commission) requesting a Certificate of Corridor Compatibility and Route Permit for construction of the Project. In addition, Arrow is also submitting the enclosed Application for Waiver or Reduction of Procedures and Time Schedules.

This Consolidated Application supports Arrow's request for a Certificate of Corridor Compatibility and Route Permit and complies with Chapter 49-22 of the North Dakota Century Code (NDCC) and Chapters 69-06-05 and 69-06-08 of the North Dakota Administrative Code (NDAC).

1.0 FACILITY TYPE

The proposed Project is comprised of two underground pipelines and associated facilities for the transport of residue gas (i.e., processed natural gas where NGLs have been removed) and NGLs. The residue gas pipeline will be 10 inches in diameter and the Bakken NGL Pipeline will be 8 inches in diameter. Both pipelines will be approximately 2.6 miles in length and will commence at a proposed Natural Gas Processing Plant at the northern end of the pipelines and terminate at a third-party natural gas transmission pipeline and a third-party NGL processing facility. The Natural Gas Processing Plant at the northern end of the Project will have a capacity of 30 million cubic feet per day. The Natural Gas Processing Plant will be supplied by a natural gas gathering system pipeline ("Bear Den West Gathering Pipeline") that will be approximately 21 miles in length. Both the Natural Gas Processing Plant and the Bear Den West Gathering Pipeline will be owned and operated by Arrow, but are not subject to the jurisdiction of the Commission and are not part of this Consolidated Application.

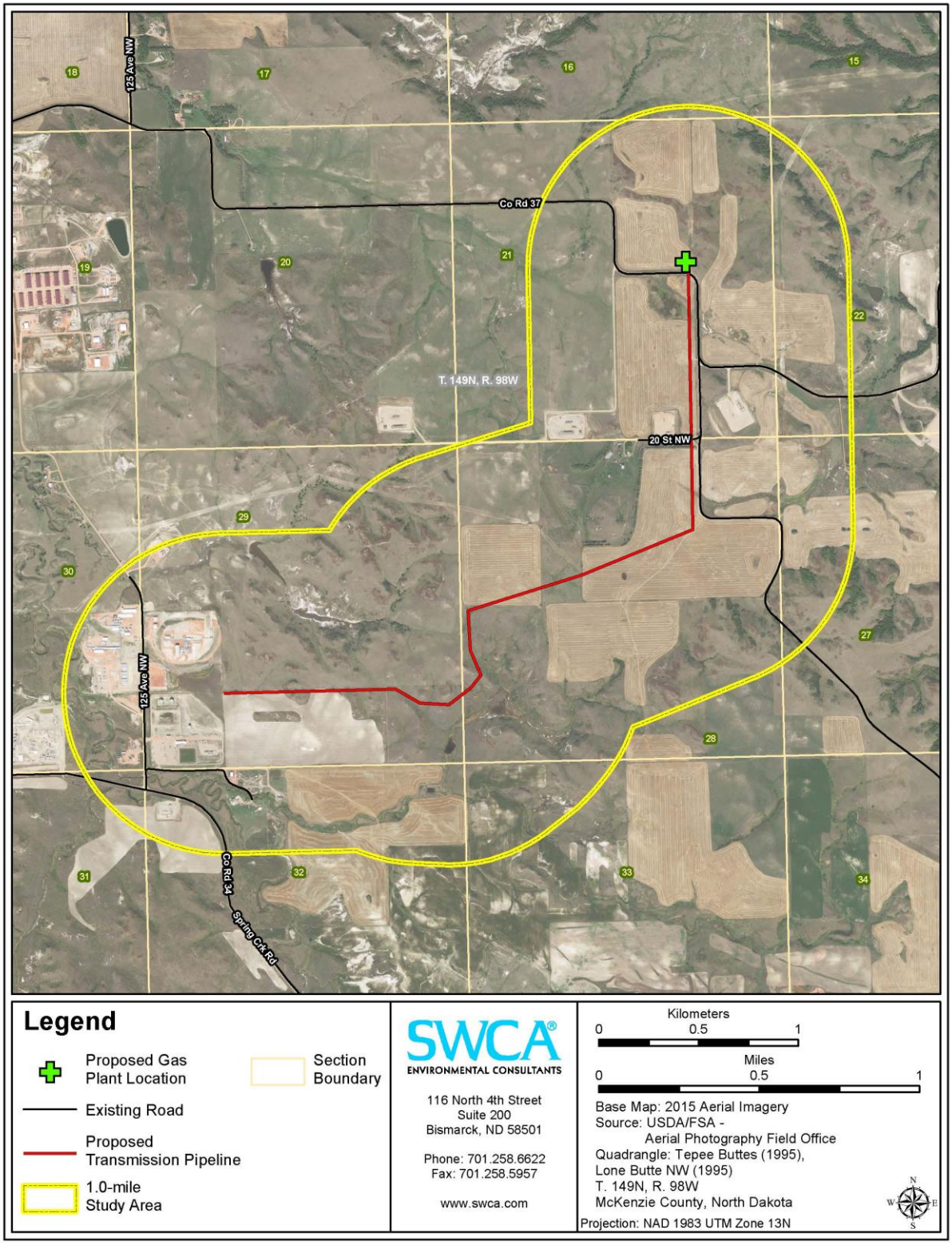

Figure 1. Arrow NB Residue Gas Pipeline and Arrow Bakken NGL Pipeline Study Area.

2.0 LOCATION

2.1 Project Study Area

Arrow defined its study area as a 1.0-mile-wide corridor (0.5 mile on either side of the proposed pipelines centerline) between, and including, the Natural Gas Processing Plant and the terminus of the residue gas and NGL pipelines (Study Area).

2.2 Preferred Location of Project Corridor and Route

Arrow is seeking approval of a corridor that will align with the survey area used for conducting environmental field surveys. The survey corridor is primarily 200 feet wide (centered on the proposed alignment), but also includes: temporary workspace areas that may extend beyond the 200-foot-wide survey area; the point where the pipelines tie into the gas processing plant; and, the locations of where the NB Residue Gas Pipeline connects to the third-party natural gas pipeline and the Bakken NGL Pipeline connects to the third-party NGL processing facility (collectively, the Corridor). The location and width of the proposed Corridor are illustrated on the aerial maps in Appendix A. The location of the proposed Route within the proposed Corridor is also depicted on the aerial maps provided in Appendix A.

Arrow's proposed Corridor and Route are the result of a thorough site analysis, and coordination with Arrow, landowners, local officials, agencies, and existing infrastructure owners. Arrow obtained and analyzed public and proprietary information to identify sensitive areas and features within the Study Area, such as exclusion and avoidance areas, populated areas, wetlands, waterbodies, natural resources, areas of cultural significance, and public lands. In addition, Arrow considered existing ROWs (e.g., pipelines and roads) in an effort to maximize co-location with other infrastructure, where appropriate. Arrow also sought input from affected landowners, agencies, local governments, and other infrastructure owners, and refined the Corridor and Route based on input received. Arrow completed civil and environmental field surveys and additional constructability reviews to further refine its Route. Ultimately, the Corridor and Route presented in this Consolidated Application were selected, to meet the Project needs, comply with the Commission's siting criteria, and minimize impacts to landowners, the environment, and existing infrastructure.

Additional discussion of the factors considered in selecting the Corridor and the Route is provided in Sections 14.0, 17.0, 18.0, and 19.0 of this Consolidated Application.

3.0 PURPOSE AND NEED OF THE FACILITY

Between 2009 and 2015, nonmarketed (i.e., flared or vented) natural gas production in the Williston Basin in North Dakota increased significantly—from approximately 26,876 to 106,590 million cubic feet per day.[1] A large portion of this natural gas was flared at the wellhead, due to inadequate gathering and processing systems and coverage. Although natural gas gathering system coverage has increased in recent years, oil and gas production is expected to increase in the next 10 years and the Project will help fulfill the need to provide additional collection and processing capabilities that will help maximize oil and gas resource development and utilization.

The proposed Natural Gas Processing Plant and associated Bear Den West Gathering Pipeline will help reduce the volume of nonmarketed natural gas released presently, but will also minimize future releases as more wells are completed and tied into the gathering system pipeline. In addition, the consumer-quality residue gas that will be produced by the gas processing plant will be transported to an existing natural gas transmission pipeline and sent to consumers in North Dakota and adjoining states. The NGLs removed by the gas processing plant are valuable products that will be collected and transported to a third-party NGL facility for subsequent use in a variety of manufacturing and commercial enterprises. Thus, the Project will help maximize environmentally sound and economic development and utilization of the oil and gas resources in the North Dakota.

The Project will also provide direct benefits to local communities through temporary construction employment and additional property tax revenue. Additional indirect benefits will result from Project-related purchases of local goods and services, such as the purchase of local gravel for access roads, purchase of fuel, and restaurant and hotel expenditures by Project construction and operations personnel.

A map showing the route of the proposed Arrow NB Residue Gas Pipeline and the Bakken NGL Pipeline is shown in Figure 1 and Appendix A.

4.0 PRODUCT

4.1 Type of Product to be Transmitted

The Project will transmit residue gas and NGLs in two separate pipelines.

4.2 Source of Product

The residue gas and NGLs will be produced at the proposed natural gas processing plant.

4.3 Final Destination of Product

The residue gas pipeline will be connected to a third-party natural gas transmission pipeline and the gas will be transported to markets in the Chicago, Illinois, area. The Bakken NGL Pipeline

[1] *See* U.S. Energy Information Administration, Nonmarketed Natural Gas in North Dakota Still Rising Due to Higher Total Production, http://www.eia.gov/todayinenergy/detail.php?id=15511# (last visited Jan. 17, 2017).

will be connected to a third-party NGL facility and the NGLs will be transported to processing facilities where they will be separated into various marketable components (e.g., propane, butane, pentane, hexane, and heptane) and distributed to markets in the mid-continent region of the country.

5.0 TECHNOLOGY TO BE DEPLOYED

The Project will be designed, constructed, maintained, inspected, and operated to meet or exceed the U.S. Department of Transportation (USDOT) Pipeline Hazardous Materials Safety Administration (PHMSA) regulations, and in accordance with industry standards and company policies. Technologies used to satisfy these requirements and standards include:

- use of an external protective coating and cathodic protection to prevent external pipeline corrosion;
- regular internal pipeline inspection using in-line inspection tools to detect internal anomalies, including corrosion or denting;
- regular aerial and foot patrols of the permanent ROW; and
- installation of a supervisory control and data acquisition system (SCADA) monitoring and alarm system that continuously monitors the flow and pressure of the system and triggers alarms for anything outside normal operating conditions.

Construction and installation of the pipelines will use different techniques to avoid or minimize impacts to sensitive areas and identified road and ditch crossings, such as trenchless construction methods (e.g., borings). These techniques are discussed further in Section 11.0.

6.0 ESTIMATED TOTAL COST FOR CONSTRUCTION

The estimated total cost for construction is $6.3 million.

7.0 SCHEDULE

7.1 Obtaining Certificate of Corridor Compatibility

Arrow requests a Certificate of Corridor Compatibility and Route Permit from the Commission in April 2017.

7.2 Obtaining Route Permit

Arrow requests a Certificate of Corridor Compatibility and Route Permit from the Commission in April 2017.

7.3 Completing Right-of-Way Acquisition

Arrow initiated ROW acquisition in November 2016, and anticipates that ROW acquisition will be completed in February 2017.

7.4 Starting Construction

Construction of the Project is scheduled to begin May 1, 2017.

7.5 Completing Construction

Arrow expects to complete construction of the Project by August 2017.

7.6 Testing Operations

Arrow expects to conduct hydrostatic testing of the pipeline and associated site facilities prior to placing the pipelines in service in September 2017. Once the pipelines are placed into service, an internal inspection tool will be run to establish a baseline assessment of the pipelines.

7.7 Commencing Operations

The Project is anticipated to be operational no later than September 2017.

8.0 TEN-YEAR PLAN

Arrow filed its Ten-Year Plan for 2017 through 2027 with the Commission in January 2017. The proposed Project is consistent with Arrow's Ten-Year Plan that is presented as Appendix B to this Consolidated Application.

9.0 FACILITY SIZE AND DESIGN

The following provides a description of the Project design, including the pipeline infrastructure and aboveground facilities.

9.1 Pipeline

9.1.1 Width of Right-of-Way

In general, the Project will be installed using a 100-foot-wide construction ROW, consisting of a 50-foot-wide permanent easement and a 50-foot-wide temporary workspace. Refer to the Topsoil Salvage Trench and Spoil Side schematic in Appendix A for an overview of the typical proposed Project construction ROW. Additional temporary workspace will be required to accommodate boring crossings at existing features, such as roads. The Project will also require construction of permanent access driveways and may require upgrading of existing private roads for operations and maintenance use.

9.1.2 Length of Facility

The Arrow NB Residue Gas Pipeline and the Arrow Bakken NGL Pipeline routes are approximately 2.6 miles long, originating at the proposed Arrow Natural Gas Processing Plant and terminating at the third-party natural gas transmission pipeline and the third-party NGL facility, respectively.

9.1.3 Pipe Size

The Project will require installation of a nominal 10.750-inch outside diameter steel pipeline with a nominal wall thickness of 0.365 inch for the Residue Gas Pipeline and a nominal 8.625-inch outside diameter steel pipeline, with a nominal wall thickness of 0.322 inch for the Bakken NGL Pipeline. The nominal wall thicknesses will increase to 0.500 inch for both pipelines at specific locations, such as road crossings. The pipe material will be API5L X42.

9.1.4 Maximum Design Operating Pressure and Temperature

The maximum operating pressure for the Arrow NB Residue Gas Pipeline is 1,480 pounds per square inch gauge and for the Arrow Bakken NGL Pipeline is 1,440 pounds per square inch gauge. The pipelines will be designed to operate at a maximum of 100 degrees Fahrenheit.

9.2 Aboveground Facilities

9.2.1 General Location of New Associated Facilities

The proposed Arrow Natural Gas Processing Plant will be situated on a 40-acre parcel of land in the SW¼NE¼ of Section 21, Township 149 North, Range 98 West, located an estimated 6.85 miles southeast of Watford City, North Dakota. The Residue Gas Pipeline compressors, metering station, and block valve as well as the Bakken NGL Pipeline pumps, metering station, and block valve will be tied directly to the discharge end of the natural gas processing plant, although a PIG launcher for each pipeline will be included as well.

Block valves at the tie-in points to the third-party natural gas transmission pipeline and the third-party NGL facility will be equipped with pneumatic controllers and will have emergency shutdown capability if over pressuring of the pipeline(s) is detected. In addition to the block valves, delivery point equipment will include PIG receivers, and the SCADA system and associated equipment.

9.2.2 Estimated Distance between Surface Structures

The estimated distance between the Arrow Natural Gas Processing Plant and the third-party natural gas pipeline and the third-party NGL facility is 2.6 miles. The approximate distances between surface structures associated with the Project are listed in Table 1. Pipeline markers will also be placed at designated locations along the Route (e.g., public road crossings).

Table 1. Distance between Surface Structures

From	To	Approximate Mileage
Natural Gas Processing Plant	Third-Party Natural Gas Pipeline	2.6 miles
Natural Gas Processing Plant	Third-Party NGL Facility	2.6 miles

9.2.3 Maximum Design Flow Rate for Pipeline Facilities

The maximum design flow rate for the Arrow NB Residue Gas Pipeline is 30 million cubic feet per day, and the maximum design flow rate for the Arrow Bakken NGL Pipeline is 5,000 barrels per day.

9.2.4 Number and Location for Compressor and/or Pumping Stations

The Residue Gas Pipeline Compressor Station and the Bakken NGL Pipeline Pump Station are the only compressor/pumping stations for the Project, and will be located at the discharge end of the Natural Gas Processing Plant in the SW¼NE¼ of Section 21, Township 149 North, Range 98 West, an estimated 6.85 miles southeast of Watford City, North Dakota.

10.0 EASEMENT ACQUISITION

10.1 Informing Landowners of Easement Acquisition

Upon identifying the preliminary route, Arrow used publicly available information to identify landowners along the proposed route. Arrow contacted landowners via telephone to introduce the Project and discuss the easement acquisition process. Arrow sent introductory letters providing Project and land agent contact information to any landowners who could not be reached by telephone. During in-person meetings with landowners, the Arrow land agent presented proposed route maps for landowner review and input. Arrow used landowner input for route planning purposes, and when practicable, made adjustments in the proposed route to accommodate landowner concerns. When landowners were located out of state, Arrow provided Project information via telephone and mail.

Arrow has obtained preliminary approval from all landowners along the Route and received all necessary survey permissions. Arrow has signed an option agreement to purchase the approximately 40-acre parcel for the Natural Gas Processing Plant and will obtain the necessary easements from the respective third-party entities for the connections to the natural gas transmission pipeline and the NGL facility.

10.2 Compensation for Easement

Landowners will be compensated for Project-required interests at or above their fair market values. Compensatory offers for easements and fee acquisitions have been based on careful analysis of comparable property values. All offers have been presented to landowners in writing with appropriate legal descriptions and depictions identifying the parameters and location of the permanent pipeline ROW easement and temporary construction easements. Arrow's land agent is trained and tasked to negotiate respectfully and in good faith with all landowners and

governing entities. Arrow stresses to its land agent its preference for all negotiations, when possible, to be conducted with each landowner in person and as often as necessary to reach a mutually beneficial agreement.

Arrow will compensate landowners for permanent easement rights, temporary workspace use, and incidental damages that may occur. Arrow uses a formula for compensation relating to incidental damages incurred as a result of its pipeline construction activity, such as loss of marketable trees or crop losses. Anticipated damages, such as crop loss, will be calculated and included in the original compensation amount. If additional damage claims are made at a later date, Arrow will address the claims as they arise.

11.0 RIGHT-OF-WAY PREPARATION, CONSTRUCTION, AND RECLAMATION PROCEDURES

11.1 Description of Right-of-Way Preparation and Construction

The proposed Project will be designed, constructed, tested, operated, and maintained in accordance with applicable requirements under the USDOT regulations in Title 49 Code of Federal Regulations (CFR) Part 192 (NB Residue Gas Pipeline) and Part 195 (Bakken NGL Pipeline), U.S. Department of Labor regulations, Occupation Safety and Health Administration requirements, and other applicable federal and state regulations. Among other design standards, 49 CFR Part 192 and Part 195 specify pipeline materials selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and qualification procedures for welding and operations personnel.

Prior to the start of construction, a pre-construction safety and environmental orientation will be held with all contractors and personnel involved in the Project. The orientation will review safety compliance; incident reporting; protocols for determining, correcting, and documenting safety non-compliance; and expectations for compliance enforcement. All construction personnel will be briefed and trained on all construction and environmental requirements, including laws, rules, and regulations applicable to the work. Arrow will have a qualified and experienced safety representative on-site throughout construction.

Construction would typically take place during daylight hours. Spill prevention measures would be in place to maintain construction personnel safety and to protect the environment.

The standard pipeline construction process includes clearing and grading; trenching; pipe stringing, bending, welding; lowering the pipeline; padding and backfilling; hydrostatic testing; and ROW cleanup and restoration (see Pipeline Construction Sequence schematic drawing in Appendix A). Each of these activities is discussed in more detail below.

11.1.1 Clearing and Grading

Once the limits of the approved work area (the construction ROW and temporary workspaces), pipeline centerline, access roads, aboveground facilities, and sensitive areas, such as wetland boundaries and cultural sites, have been staked and flagged, the construction area will be cleared and graded. Prior to removal, trees and shrubs will be inventoried in accordance with the Commission's Tree and Shrub Mitigation Specifications. The ROW will be graded to provide

a relatively level surface that is wide enough to allow for the passage of heavy construction equipment.

To prevent soil mixing, topsoil will be removed and segregated from the underlying subsoil. Topsoil will be removed from both the trench and spoil side for the entire length of the pipeline and stored on the temporary construction ROW on the spoil side of the trench.

After pipeline installation is complete, the subsoil will be replaced in the pipeline trench and the adjacent areas to restore the natural contours of the land. Then the topsoil will be replaced in the locations from which it was originally removed. Construction activities will be suspended during abnormally wet conditions to prevent excessive rutting or mixing of topsoil with subsurface soils. Refer to the Pipeline Construction Sequence and Topsoil Salvage Trench and Spoil Side schematic drawings in Appendix A for additional detail.

Fences and gates will be constructed during the clearing and grading operations to allow continuous use of pastures, grazing units, and livestock facilities. Best Management Practices (BMPs) such as silt fences will be installed along the ROW adjacent to wetlands. Temporary erosion controls will be installed after initial disturbance of soils, where necessary, to minimize erosion. Erosion control BMPs will be maintained throughout construction.

11.1.2 Pipe Stringing, Bending, and Welding

Pipe will be either stored at storage yards or transported directly to the pipeline ROW. In general, pipe stringing will occur after clearing and grading, but before trenching. Pipe will be strung along the ROW by a stringing crew, using special trailers to move the pipe along the ROW. Pipes are typically 40 to 80 feet long.

A pipe-bending machine will be used for making slight bends in the pipe to accommodate variations in the pipeline route or to conform to the topography. Using a series of clamps and hydraulic pressure, the bending machine is used to make a smooth, controlled bend in the pipe. Bending will be in accordance with federal standards to ensure integrity of the bend. Pipe used for sharp bends is bent at the mill, or will be forged pipeline fittings. The pipe will be pre-coated with a fusion-bonded epoxy external coating to provide corrosion protection.

The welding process joins the sections of pipe into one continuous length. All welders will be required to pass an approved qualification test; the test will use Project-specific weld procedures developed in accordance with federally adopted welding standards. All field welds will be nondestructively tested to ensure structural integrity and compliance with USDOT regulations. Once welds are approved, the joints will be externally coated and the entire pipeline will be visually and electronically inspected for coating defects, scratches, or other damage. Any damage or defects will be repaired before lowering the pipe into the trench.

11.1.3 Trenching

Trenches will be excavated using a wheel trencher or backhoe to a depth sufficient to provide the minimum cover required by federal, state, and local governments, as well as landowner requirements. If areas of solid rock are encountered, special excavation equipment and/or techniques will be used.

The amount of open trench permitted at any time during the Project will be dependent on the stability of the trench and weather conditions. In areas where livestock is confined or in cultivated fields, temporary fences, gates, and/or bridges will be installed to provide appropriate restriction or safe access across the open trench.

11.1.4 Pipeline Installation and Trench Backfilling

Several side-boom tractors, or trackhoes will simultaneously lift the welded sections of pipe and lower them into the trench. Non-metallic slings will be used to protect the pipe and coating as it is raised and lowered into position. Sand bags or foam blocks will be placed at the bottom of the trench prior to laying the pipe in rocky areas to protect the pipe and coating from damage.

As necessary, trench breakers or water stops will be installed adjacent to wetlands and in steep topography to eliminate water migration along the trench. When required, the trench will be dewatered prior to lowering in the pipe. Dewatering effluent will pass through sediment filters such as hay bale structures and/or filter bags to ensure compliance with applicable water quality requirements.

Once the pipe is installed, the trench will be backfilled. Soil will be returned to the trench in the reverse order of excavation. Subsoil will be returned to the trench first, followed by the topsoil. The trench line will be compacted with a wheeled-roller or other suitable construction equipment. A crown will be left over the trench line to allow for natural subsidence. If the excavated material contains rocks that could damage the pipe and/or coating, a rock shield will be used to protect the pipe. Topsoil will not be used for padding.

11.2 Special Construction Techniques

Conventional Boring Construction

Conventional boring is a trenchless technique for installing pipelines or other linear utilities to avoid or minimize surface disruptions and typically consists of two types.

1. Auger Method – a dry rotating auger driven through a steel casing that is jacked in as the auger advances. Boring machine is usually placed in a pit on-grade with the bore profile and exits into an exit or bell pit. This method is widely used for road crossings up to 60 inches in diameter and is the most cost effective crossing method in many areas and soil conditions.

2. Wet Boring/Guided Boring – the boring machine uses a pressurized jet of water or drilling fluid through hollow bore rods to excavate the bore. A cutting drill head or dry percussive drill head can also be used with this method. The bore head can be angled and steered by rotating the bore rod. A locating sonde (transmitter) may be placed behind the bore head for guidance and the bore hole can be enlarged by pulling back a reamer. This method is often used for smaller diameter, shorter installations.

Regardless of the method used to complete the bore, prior to drilling the bore, pipe sections are welded together to fabricate a pipeline segment of sufficient length for the bore. Generally, the pipe is laid out and welded on the exit side of the bore. After welding the pipe sections together and performing non-destructive weld testing (e.g., radioactive photography), the pipeline

segment for the bore is hydrostatically pressure tested prior to installation. Once the bore hole has been enlarged and is stable, the welded pipeline segment is pulled through the hole, usually from the bell pit to the entry pit.

Refer to the Typical Conventional Bore Road Crossing schematic drawings in Appendix A.

Waterbody and Wetland Crossings

"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. As noted in the *Natural Resources and Wetland Delineation Report for the Arrow NB Residue Gas Pipeline and Arrow Bakken NGL Pipeline Project* (SWCA Environmental Consultants [SWCA] 2016), no waterbodies were identified in the pipeline ROW. Three wetlands were identified in the ROW and crossing these wetlands will entail trenching, as shown in the Typical Wetland Crossing schematic drawing in Appendix A.

The proposed Project stormwater pollution prevention plan will specify measures based on BMPs that will address erosion control, equipment refueling, temporary bridge crossings, construction timing and methods, and restoration. Temporary workspaces are typically required on each side of a wetland crossing to stage construction, fabricate the pipeline, and store materials. Temporary workspaces will be located within the ROW at upland areas a minimum of 50 feet from the edge of the wetland. Sediment barriers, such as a silt fence, will be installed to prevent spoil and sediment-laden water from entering the wetland.

11.3 Restoration Procedures

Once construction is complete, the pipeline ROW and temporary workspaces will be restored to their prior contour and condition to the extent practicable, except that trees and shrubs will be regularly removed from the ROW to facilitate Project inspection and maintenance. All timber riprap, timber mats, and prefabricated equipment mats and other construction debris will be removed. Topsoil will be replaced and approximate original contours restored. Wetland edges will be stabilized and permanent erosion control measures will be installed. Disturbed areas will be revegetated using seeding requirements specified by the Natural Resources Conservation Service or as required by the landowner with the exception of cultivated lands. Specific restoration measures are described in the Environmental Mitigation Plan (EMP), which is provided in Appendix C.

12.0 OPERATION AND MAINTENANCE

During Project operation, pipeline pressure, temperature, and flow rate data will be transmitted via satellite to a central SCADA system control center located at Arrow's offices in Keene, North Dakota. The SCADA system will provide continuous monitoring of pipeline operations data 24 hours a day, 7 days a week. Where changes in the data occur that indicate a potential issue with the pipeline or facilities, alarms will be triggered, notifying Arrow of the potential issue. Arrow will develop a Pipeline Integrity Management Plan that complies with applicable federal regulations (49 CFR 195.400) and outlines preventive maintenance, inspection, line patrol, leak detection systems, SCADA system, and other pipeline integrity procedures to be implemented to ensure the safe operation of the Project.

In the event of an emergency, Arrow will implement emergency response measures to address the situation. Arrow contracts with an experienced emergency response service provider, whose experience includes implementing emergency response protocols for releases impacting surface waters, wetlands, or other environmentally sensitive areas. Further, as required by 49 CFR 194, Arrow is preparing an Emergency Response Plan that will outline specific protocols to be implemented in the event of a pipeline release or other emergency.

During operations, Arrow will use the permanent ROW easements to conduct inspections and perform maintenance activities. Maintenance activities will include making any necessary pipeline and facility repairs, and removing any vegetation on the ROW that impacts the safe and reliable inspection and operation of the pipeline. Inspections and maintenance will be performed in compliance with applicable USDOT regulations.

13.0 ALTERNATIVES CONSIDERED

13.1 Project Alternatives

13.1.1 No Action

Under the No Action Alternative, the Project would not be constructed. Without the Project, valuable natural gas and NGL resources would not be captured and used, thereby reducing utilization of the resource and contributing additional emissions to the environment. As such, the purpose and need of the Project would not be fulfilled. For these reasons, No Action is not an alternative to the Project.

13.1.2 Other Pipelines and Natural Gas Processing Plants

No existing or planned pipeline and natural gas processing plant projects, other than Arrow's Bear Den West Gathering Pipeline and the Arrow Natural Gas Processing Plant, provide a means to gather nonmarketed gas from wells in the Bear Den area, remove NGLs, and provide consumer-quality gas for interconnection with third-party natural gas and NGL facilities. As such, no other pipelines or natural gas processing plants meet the purpose and need of this Project.

13.1.3 Trucking

Due to the inefficiencies and limited success with on-site gas capture technologies, trucking the captured gas to a separate natural gas processing plant is not a viable alternative. On-site gas capture and trucking would not be as economical, efficient, or safe and thus, does not meet the purpose and need of the Project.

13.1.4 Rail

Due to logistical constraints, the collection and transport by rail from the well head to a natural gas processing facility is not a viable alternative.

13.1.5 Route Alternatives

The overall objective of the Project is to safely and reliably transport residue gas and NGLs from Arrow's Natural Gas Processing Plant to a third-party natural gas transmission pipeline and a third-party NGL facility. Factors considered in selecting the Route include the following.

- Meeting the Project's geographic requirements.
- Complying with Commission siting criteria, including exclusion area, avoidance area, selection, and policy criteria.
- Co-locating with existing infrastructure where possible.
- Avoiding and minimizing potential impacts to existing infrastructure, landowners, and environmentally sensitive areas.
- Using constructability and operational efficiencies.
- Minimizing safety concerns.
- Ensuring the ability to acquire ROW from landowners.

During route development, Arrow attempted to locate the Arrow NB Residue Gas Pipeline and the Arrow Bakken NGL Pipeline adjacent to or within existing pipeline ROWs and/or parallel to existing infrastructure (e.g., roads, electrical power lines), to the extent practicable.

14.0 ENVIRONMENTAL STUDIES

14.1 Cultural Resource Inventory

As part of the initial phase of investigation, a Class I literature search of archaeological and historical literature and records for the 1-mile wide Study Area was conducted on October 5 and 26, 2016. The background search included a review of files maintained at the State Historical Society of North Dakota, as well as historical survey plats for 1 mile on either side of the proposed alignment. Three previously recorded cultural resources were identified within the Study Area, but none occurred within the 200-foot wide Corridor. Two of the previously recorded resources—one site lead and one prehistoric site—are recommended for avoidance. No historic buildings or structures, historic sites, or other areas of historic significance were identified within the Corridor.

A Class III intensive cultural resource inventory was conducted by SWCA on November 15 and 16, 2016 (Schleicher 2016). The 200-foot wide pedestrian survey area encompassed 42.53 acres. During the inventory, SWCA personnel did not identify any newly or previously recorded cultural resources within the survey corridor; therefore, no further work is recommended.

In the cultural resources report submitted to the North Dakota State Historic Preservation Office (NDSHPO) on December 22, 2016, SWCA recommended that a determination of *No Significant Sites Affected* be issued for the Project. SHPO concurred with that determination in a letter dated December 23, 2016 (see Appendix F).

SWCA prepared an Unanticipated Discovery Plan that was submitted to the NDSHPO on January 12, 2017. In a letter dated January 13, 2017, NDSHPO concurred that the Unanticipated Discovery Plan was adequate for the Project (see Appendix F).

14.2 Wetland and Waterbody Inventory

Prior to conducting surveys, SWCA reviewed National Wetlands Inventory (NWI) data and National Hydrography Data to determine the location and extent of mapped wetlands and waterbodies within the Study Area. The desktop analysis identified Elkhorn Creek and one unnamed intermitted stream within the Study Area, totaling approximately 0.18 river mile, and no NWI wetlands within the Study Area.

SWCA conducted field surveys of the Corridor on November 15 and 16, 2016, to confirm the presence and/or absence of wetlands and waterbodies within the Corridor (SWCA 2016). Three wetlands were identified and recorded during the field surveys. WET1 is a seasonal wetland found within an agricultural field; its total size within the 100-ft construction right-of-way is 0.46 acres. WET2 is associated with a National Hydrography Data flowline; its total size within the 100-ft construction right-of-way is 0.12-acres. WET3 is a spring-fed wetland on a south-facing slope; its total size within the 100-ft construction right-of-way is less than 0.01-acre. SWCA's preliminary determination is that WET2 is potentially jurisdictional due to its connectivity to Elkhorn Creek. WET1 and WET3 are isolated and likely non-jurisdictional. All three wetlands will only be temporarily impacted by matting and bridging within temporary workspace to provide for construction. While individual disturbances to each of these wetlands will be temporary, any discharges that may occur are not foreseen to result in a permanent loss of greater that 0.1-acre of waters of the U.S. for any one wetland crossed. No non-wetland waterbodies (e.g., streams, rivers, lakes, etc.) were identified in the surveyed Route. Refer to Appendix D, Natural Resources Report, for additional information on these features and mapped locations.

14.3 Habitat Assessment

14.3.1 Tree/Sapling/Shrub Inventory

SWCA used aerial imagery and LANDFIRE (LANDFIRE 2012) to analyze the Study Area for land use and woody vegetation. Less than 1% of the Study Area contains woody vegetation.

SWCA conducted field surveys of the Corridor on November 15 and 16, 2016, to confirm the presence or absence of woody vegetation. The Commission requires 2:1 mitigation for all shrubs and all trees that are 1 inch diameter at breast height or greater that will be impacted during the construction of the Project. Two areas of woody vegetation were identified during the field surveys. These areas were found to contain a combined 24 plants that met the 1 inch diameter at breast height or greater mitigation requirement. Arrow will need to plant at least 48 2-year old saplings to fulfill the mitigation requirement. Refer to Appendix D, Natural Resources Report, for additional information on these features and mapped locations.

14.3.2 Federally Protected Species

In McKenzie County, North Dakota, nine species are listed under the Endangered Species Act: the gray wolf (*Canis lupus*) (Endangered), black-footed ferret (*Mustela nigripes*) (Endangered), whooping crane (*Grus americana*) (Endangered), interior least tern (*Sterna antillarum*) (Endangered), pallid sturgeon (*Scaphirhynchus albus*) (Endangered), piping plover (*Charadrius melodus*) (Threatened) and its designated critical habitat, Dakota skipper (*Hesperia dacotae*) (Threatened) and its designated critical habitat, rufa red knot (*Calidris canutus rufa*) (Threatened), and northern long-eared bat (*Myotis septentrionalis*) (Threatened). SWCA conducted field surveys of the Route on November 15 and 16, 2016, to confirm the presence or absence of suitable habitat for these federally protected species. No threatened or endangered species or their associated critical habitat were observed during the field surveys. Refer to Appendix D, Natural Resources Report, for additional information on these species.

Gray Wolf

Although gray wolves have been observed in the region, no packs are known to have become established in North Dakota, and most of the observed individuals are likely dispersing from Minnesota and Canada. Due to the highly mobile nature of the gray wolf, individuals may be found in the Study Area. Because wolves require large areas of relatively undisturbed habitat with low human activity, development of infrastructure could be a potential stressor and result in wolves avoiding these areas of disturbance. Nonetheless, there are no established wolf packs or known reports of occurrence in the Study Area, so any stressors due to the Project are not likely to affect gray wolves.

Black-footed Ferret

Black-footed ferrets have been largely extirpated from the wild primarily because of the rangewide decimation of the prairie dog (*Cynomys* spp.). The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (U.S. Fish and Wildlife Service 2013b) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres, and towns of this dimension may be important for ferret recovery efforts. It is possible the Study Area contains complexes greater than 80 acres, and may contain suitable habitat for the black-footed ferret.

Field surveys conclude that prairie dog complexes of 80 acres are not within the Corridor or crossed by the Route.

The black-footed ferret is not expected to be impacted by the proposed Project.

Whooping Crane

The Study Area is located within the 80% delineated migration corridor in North Dakota. It is well-documented that migrating whooping cranes use habitats in the vicinity of the Project for roosting and feeding. The nearest verified sighting of a whooping crane occurred in 2006 when one adult was located 13.31 miles to the west of the Study Area (USFWS 2013a).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed within the Survey Area; however, high levels of disturbance near the project area from existing roads,

agriculture production, oil and gas activity, etc., minimize the likelihood for cranes to use the area within or near the pipeline Corridor.

The whooping crane is not expected to be impacted by the proposed Project.

Interior Least Tern

Least terns have distinct breeding areas. Their breeding season is from May 1 through August 31, and breeding birds require the presence of dry, exposed sandbars, with favorable river flows. Field surveys conclude that suitable tern habitat does not occur within the Corridor or along the Route.

The interior least tern is not expected to be impacted by the proposed Project.

Pallid Sturgeon

The fundamental elements of pallid sturgeon habitat are defined as the bottom of swift waters of large, turbid, free-flowing rivers with braided channels; dynamic flow patterns; flooding of terrestrial habitats; and extensive microhabitat diversity. The pallid sturgeon population occurs from the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and from the lower Yellowstone River up the confluence of the Tongue River, Montana. Field surveys confirm that suitable pallid sturgeon habitat does not occur along the Corridor or along the Route.

The pallid sturgeon is not expected to be impacted by the proposed Project.

Piping Plover

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems. Designated critical habitat for piping plovers consists of all of the Lake Sakakawea shoreline, and bars where the primary constituent elements occur, as well as certain alkali lakes. Desktop analysis confirms that critical habitat for the piping plover is not within the Corridor or crossed by the Route. Field surveys conclude that suitable piping plover habitat does not occur within the Corridor.

The piping plover is not expected to be impacted by the proposed Project.

Dakota Skipper

The Dakota skipper is a small butterfly with a 1-inch wingspan. It is found primarily in undisturbed, native tall grass and upland dry northern mixed grass prairie areas with a high diversity of wildflowers and grasses. Desktop analysis confirms the presence of potential habitat for the Dakota skipper within the Study Area. However, the nearest proposed critical habitat (Unit 12) is located 28.11 miles north from the proposed Project.

Field surveys concluded that cropland and non-native grass prairie is dominant in the Corridor and along the Route, and therefore not suitable as Dakota skipper habitat.

The Dakota skipper is not expected to be impacted by the proposed Project.

Rufa Red Knot

The rufa red knot breeds in the Canadian Arctic and migrates 19,000 miles to winter on the U.S. Gulf Coast and in South America. The species generally occurs along the ocean coasts during migration, but a small number have been reported across the interior United States. Desktop analysis confirms suitable habitat along Lake Sakakawea is approximately 21.88 miles northwest of the Route.

The likelihood of the rufa red knot occurring in the Corridor or along the Route is low, as only a small number have been reported across the interior United States.

The rufa red knot is not expected to be impacted by the proposed Project.

Northern Long-eared Bat

Northern long-eared bats are not known to occur in the Study Area, although species-specific surveys have not been conducted. No known winter hibernacula are located in North Dakota, due to either no suitable hibernacula present or a lack of survey effort (USFWS 2013b). Suitable winter habitat for northern long-eared bats does not occur within the Study Area; however, nearby trees can act as suitable summer day roosts.

Due to the small amount of woody vegetation and lack of other suitable habitat along the Route, the northern long-eared bat is not expected to be impacted by the proposed Project.

14.3.3 Migratory Bird Treaty Act

Suitable habitat for migratory birds exists in the Survey Area, and field surveys confirmed the presence of suitable habitat along the Route. Specifically, grassland nesting birds have the potential to occur and nest along the Route, especially during the migratory bird breeding season between February 1 and July 15. Suitable woodland nesting habitat occurs along the Route, but it is minimal. To avoid or minimize potential impacts of the proposed Project on migratory birds, Arrow will use standard construction practices associated with migratory birds. As such, migratory birds are not expected to be impacted by the proposed Project. Refer to Appendix D, Natural Resources Report, for additional information on migratory birds.

14.3.4 Bald and Golden Eagle Protection Act Consultation

The bald eagle (*Haliaeetus leucocephalus*) feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat typically consists of any mature stands of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles in eastern North Dakota are usually observed along the Red River and Sheyenne River. The nearest known bald eagle nest is located approximately 10.46 miles to the east (North Dakota Game and Fish Department 2015) of the Study Area. Bald eagles may migrate through the Study Area; however, no bald eagles or nests were observed during the field surveys.

The golden eagle (*Aquila chrysaetos*) prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles in North Dakota can be found in proximity to badland cliffs, which provide suitable nesting habitat. Golden eagles may occur within or near the Study

area; however, no golden eagles or nests were observed during the field surveys. The closest known golden eagle nest is approximately 21.1 miles east of the Study Area.

Due to the lack of occupied bald and golden eagle nests in the Corridor and lack of suitable habitat within the project area, bald and golden eagles are not expected to be impacted by the proposed Project.

Refer to Appendix D, Natural Resources Report, for additional information on these species.

15.0 CONSULTATION

On November 14, 2016, on behalf of Arrow, SWCA sent letters to various agencies and officials, including those identified in NDAC Section 69-06-01-05, providing information regarding the Project and requesting input. This letter mistakenly identified the Project proponent and did not include information on the Bakken NGL Pipeline. Consequently, SWCA sent a letter, dated December 16, 2016, to the identified agencies and officials to provide corrected and updated information concerning the Project. The responses received to-date are summarized below. Please refer to Appendix E, Agency Correspondence/Consultation, for copies of the consultation letters sent and the correspondence received.

15.1 North Dakota Department of Health

In letters dated November 23, 2016 and January 4, 2017, the North Dakota Department of Health stated that environmental impacts will be minor and can be controlled by proper construction methods. The Department owns no land within or adjacent to the project area, does not have any projects scheduled in the area, and believes the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota. The North Dakota Department of Health provide the following comments and recommendations.

- All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.
- Care is to be taken during construction activity near any water of the state to minimize adverse effects on a waterbody. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached. (Guidelines were attached to the North Dakota Department of Health letter).
- Oil and gas projects disturbing 1 or more acres are required to obtain a permit to discharge storm water if runoff from the project will carry eroded material to a water of the state. A permit is not required for oil and gas projects if runoff from the project will not carry eroded material to a water of the state. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). In addition, cities or counties may impose additional

requirements and/or specific BMPs for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

- The construction project location is within 1 mile southeast of six non-community wellhead protection areas. Three are of active status, two are inactive, and one with a status of unknown. Four domestic wells and one stock well are located within the project area. Additional domestic and stock wells are located near the site with the majority being concentrated primarily to the west and northwest. Care should be taken to avoid spills of any materials that may have an adverse effect on groundwater quality. All spills must be immediately reported to this Department and appropriate remedial actions performed.
- The proposed Project appears to have the potential to be a source of emissions to the air capable of causing or contributing to air pollution and may be required to have an Air Pollution Control Permit to Construct/Operate as required by Chapter 33-15-14 of the North Dakota Air Pollution Control Rules. The applicant should contact the Department's Air Pollution Control Program at 701-328-5188 prior to commencing construction.
- Projects that involve construction of pipelines should select locations that minimize the potential for impacts to human health and the environment during and after construction by avoiding, when possible, source water protection areas and sensitive surface and groundwater environments. Additionally, when possible, pipeline routes should select areas with natural barriers to both surface and ground waters. Human health and the environment should be further protected by developing a spill response plan that emphasizes rapid deployment of prepositioned assets necessary to contain spills and subsequent cleanup. Proper surveillance and monitoring for early detection of leaks should be required.

The letter further states that the U.S. Army Corps of Engineers may require a water quality certification from the North Dakota Department of Health if the Project is subject to their Section 404 permitting process.

15.2 Federal Aviation Administration

In a response dated November 16, 2016, the Federal Aviation Administration has no objection to the Project provided that it is notified of construction or alterations as required by Federal Aviation Regulations Part 77, Objects Affecting Navigable Airspace, Paragraph 77.9.

15.3 North Dakota State Historic Preservation Office

In a letter dated November 17, 2016 (see Appendix E), SHPO recommended a Class III (pedestrian) survey of the Project with specific recommendations that the proposed Project avoid significant cultural resources or sites eligible for the National Register of Historic Places, especially in areas with high densities or previously identified sites.

SWCA completed a Class I background search of files maintained at the State Historical Society of North Dakota and historic survey plats for the Study Area on October 5 and 26, 2016. SWCA

completed a Class III cultural resource inventory on November 15 and 16, 2016. The results of these investigations are discussed in Section 14.1. In the cultural resources report submitted to the SHPO on December 22, 2016, SWCA recommended that a determination of *No Significant Sites Affected* be issued for the Project. SHPO concurred with the recommended determination in a letter dated on December 23, 2016 (see Appendix F).

15.4 North Dakota State Water Commission

In a letter dated December 2, 2016, the North Dakota State Water Commission (NDSWC) stated that no permits relative to the National Flood Insurance Program are required. The NDSWC indicate that a conditional or temporary permit for water appropriation may be required, if surface water or groundwater will be diverted for industrial use, such as water use for construction or long-term operation of the Project.

The NDSWC noted that it is the responsibility of the Project sponsor to ensure that local, state, and federal agencies are contacted for any required approvals, permits, and easements, and that all waste materials are disposed of properly and not placed in identified floodway areas. The NDSWC stated that no sole-source aquifers have been designated in North Dakota.

The Project is not anticipated to impact gaging stations or water wells. No waste materials will be placed in identified floodway areas, and all waste materials will be properly disposed of in accordance with measures outlined in Arrow's EMP (see Appendix C).

15.5 North Dakota Department of Transportation

In a letter dated December 7, 2016, the North Dakota Department of Transportation (NDDOT) stated that the proposed Project should have no adverse effect on NDDOT highways. The NDDOT also stated that if any Project work needs to be done on NDDOT highway ROWs, appropriate permits and risk management documents will need to be obtained from the NDDOT District Engineer, Joel Wilt, who can be reached at 701-774-2700.

15.6 North Dakota Trust Lands

In an email dated November 16, 2016, the North Dakota State Trust Lands Department stated that Section 16, T149N, R98W, the section of land just to the north of the proposed natural gas processing plant, is School Trust Land. However, the email did not identify any School Trust Lands along the proposed Project route.

15.7 North Dakota Aeronautics Commission

In letters dated January 3 and 9, 2017, the North Dakota Aeronautics Commission stated that they found no private and/or public use airports within the Project boundary. However, the NADC recommended that Federal Aviation Administration Form 7460-1 Notice of Construction or Alteration be submitted if manmade objects greater than 200 feet above ground level are constructed as part of the Project.

15.8 McKenzie County, North Dakota

In an email dated November 17, 2016, Andrea Higgins (McKenzie County Weed Control Officer) requested that a Weed Management Plan be prepared and submitted for approval. Jim Dawson (SWCA) responded that a Weed Management Plan would be prepared and sent to her for approval.

In an email dated December 19, 2016 to Jim Dawson (SWCA), Shari Buck (McKenzie County Planning and Zoning Department) responded to the December 16, 2016 Consultation Letter and requested a copy of the November 14, 2016 Consultation Letter and also inquired about Arrow obtaining a Conditional Use Permit (CUP) for the Project. In a telephone conversation between Ms. Buck and Mr. Dawson on that same day, Mr. Dawson stated that a copy of the November 14, 2016 letter would be forwarded to her and confirmed that Arrow would be applying for a CUP for the Project. A copy of the November 14, 2016 Consultation Letter was emailed to Ms. Buck by Kathy Schmidt (SWCA) on December 19, 2016.

15.9 U.S. Army Corps of Engineers

In letters dated November 28, 2016 and January 5, 2017, the U.S. Army Corps of Engineers (USACE) provided information regarding the USACE's administration of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. If the Project requires discharge of dredge or fill material into waters of the United States, the USACE determined that the proposed Project may need a Section 404 and provided guidance on where to obtain additional information and how to apply for that permit.

15.10 North Dakota Game and Fish Department

In letters dated December 9, 2016 and January 12, 2017, the North Dakota Game and Fish Department stated that it did not believe that the Project will have significant adverse on wildlife or wildlife habitat, including species of conservation priority, provided disturbed areas are reclaimed to pre-project conditions.

16.0 IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

As indicated in correspondence received from some of the consulting agencies discussed in Section 15.0, and in accordance with NDAC 49-22-16, Table 2 summarizes federal, state, and local permits that may be needed prior to construction of the Project.

Table 2. Potential Permits/Approvals

Agency	Permit/Approval	Status
Federal		
U.S. Army Corps of Engineers	Section 404 permit for dredge/fill in jurisdictional wetlands.	Project will qualify for Nationwide Permit 12 with no single wetland crossing triggering submission of a Pre-Construction Notice.
U.S. Fish and Wildlife Service	Consultation and review of the proposed Project regarding impact to federally threatened and endangered species, migratory birds, and bald and golden eagles	Consultation requested.
State		
North Dakota Public Service Commission	Certificate of Corridor Compatibility & Route Permit	Application pending.
North Dakota Department of Health, Water Quality Division	National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity	Submit Notice of Intent at least 7 days prior to construction and develop/implement Stormwater Pollution Prevention Plan.
	NPDES General Permit for Temporary Dewatering/Hydrostatic Testing	Submit Notice of Intent at least 30 days prior to discharge date.
North Dakota State Historic Preservation Office (SHPO)	Cultural and historic resources consultation and review	A Class III intensive cultural resource inventory was completed for the Corridor
Local		
McKenzie County	County Road and Section Line Crossing Permits	To be obtained prior to crossing county roads and section lines.
McKenzie County	Conditional Use Permit for the pipelines and the natural gas processing plant.	To be obtained prior to project construction.

17.0 SITING CRITERIA

17.1 Exclusion Areas

In accordance with NDAC § 69-06-08-02(1), certain geographical areas shall be excluded from consideration for a transmission facility route. A buffer zone of a reasonable width to protect the integrity of the area must be included. Exclusion areas may be located within a corridor, but at no given point may such an area or areas encompass more than 50% of the corridor unless there is no reasonable alternative. A summary of exclusion areas in relation to the Corridor and Route is provided in Table 3.

Table 3. Exclusion Areas Summary

Feature	Within Corridor (Y/N)	Route Crosses (Y/N)	Description	Section Addressed
Designated or registered national parks, memorial parks, historic sites and landmarks, natural landmarks, monuments, and wilderness areas.	N	N	N/A	17.1.1
Designated or registered state parks, historic sites, monuments, historical markers, archaeological sites, and nature preserves.	N	N	N/A	17.1.2
County parks and recreational areas, municipal parks, and parks owned or administered by other governmental subdivisions.	N	N	N/A	17.1.3
Areas critical to the life stages of threatened or endangered animal or plant species.	N	N	N/A	17.1.4
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	N	N	N/A	17.1.5
Areas within 1,200 feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	N	N	N/A	17.1.6
Areas within 30 feet on either side of a direct line between ICBM launch or launch control facility.	N	N	N/A	17.1.7

17.1.1 Designated or Registered National Parks, Memorial Parks, Historic Sites and Landmarks, Natural Landmarks, Monuments, and Wilderness Areas

No designated or registered national parks, memorial parks, historic sites and landmarks, natural landmarks, monuments, and wilderness areas would be crossed by the Corridor or Route. See also Section 14.1 of this Consolidated Application.

17.1.2 Designated or Registered State Parks, Historic Sites, Monuments, Historical Markers, Archaeological Sites, and Nature Preserves

No designated or registered state parks, historic sites, monuments, historical markers, archaeological sites, and nature preserves would be crossed by the Corridor or Route. See also Section 14.1 of this Consolidated Application.

17.1.3 County Parks and Recreational Areas, Municipal Parks, and Parks Owned or Administered by Other Governmental Subdivisions

The Corridor and Route do not cross any county parks and recreational areas, municipal parks, or parks owned or administered by other governmental subdivisions.

17.1.4 Areas Critical to the Life Stages of Threatened or Endangered Animal or Plant Species

The Corridor and Route do not cross any areas critical to the life stages of threatened or endangered animal or plant species.

17.1.5 Areas Where Animal or Plant Species that are Unique or Rare to This State Would be Irreversibly Damaged

The Corridor and Route do not cross any areas where animal or plant species that are unique or rare to this state would be irreversibly damaged by the Project.

17.1.6 Areas within 1,200 Feet of the Geographic Center of an Intercontinental Ballistic Missile Launch or Launch Control Facility

The Corridor and Route are not located within 1,200 feet of the geographic center of an Intercontinental Ballistic Missile Launch or Launch Control Facility.

17.1.7 Areas within 30 Feet on Either Side of a Direct Line between Intercontinental Ballistic Missile Launch or Launch Control Facility

The Project Corridor and Route do not cross areas within 30 feet on either side of a direct line between an Intercontinental Ballistic Missile Launch or Launch Control Facility.

17.2 Avoidance Areas

In accordance with NDAC § 69-06-08-02(2), certain geographical areas may not be considered in the routing of a transmission facility unless the applicant shows that, under the circumstances, there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the Commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. In addition, a buffer zone of a reasonable width to protect the integrity of the area must be included, unless a distance is specified in the criteria. Avoidance areas may be located within a corridor, but at no given point may such an area or areas encompass more than 50% of the corridor unless there is no reasonable alternative. Table 4 summarizes the avoidance areas in relation to the Corridor and Route.

Table 4. Avoidance Areas Summary

Feature	Within Corridor (Y/N)	Route Crosses (Y/N)	Description	Section Addressed
Designated or registered national historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	N	N	N/A	17.2.1
Designated or registered state wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.	N	N	N/A	17.2.2
Historical resources which are not specifically designated as exclusion or avoidance areas.	N	N	N/A	17.2.3
Areas which are geologically unstable.	N	N	N/A	17.2.4
Within 500 feet of a residence, school, or place of business.	N	N	N/A	17.2.5
Reservoirs and municipal water supplies.	N	N	N/A	17.2.6
Water sources for organized rural water districts.	N	N	N/A	17.2.7
Areas of recreational significance which are not designated as exclusion areas.	N	N	N/A	17.2.8

17.2.1 Scenic, or Recreational Rivers; Wildlife Refuges; and Grasslands

No designated or registered national historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; or grasslands are crossed by the Corridor and Route.

17.2.2 Designated or Registered State Wild, Scenic, or Recreational Rivers; Game Refuges; Game Management Areas; Management Areas; Forests; Forest Management Lands; and Grasslands

The Corridor and Route do not cross any designated or registered state, wild, scenic, or recreational rivers; game refuges, game management areas; management areas; forests; forest management lands; or grasslands.

17.2.3 Historical Resources Not Specifically Designated as Exclusion or Avoidance Areas

No historical resources not specifically designated as exclusion or avoidance areas are within the proposed Corridor or crossed by the Route.

17.2.4 Areas that are Geologically Unstable

The Corridor and Route do not cross geologically unstable areas.

17.2.5 Within 500 Feet of a Residence, School, or Place of Business

The Corridor and Route are not located within 500 feet of a residence, school, or place of business.

17.2.6 Reservoirs and Municipal Water Supplies

No reservoirs and municipal water supplies were identified in the Corridor or along the Route.

17.2.7 Water Sources for Organized Rural Water Districts

No water sources for organized rural water districts are present in the Corridor or along the Route.

17.2.8 Areas of Recreational Significance that are not Designated as Exclusion Areas

No areas of recreational significance which are not designated as exclusion areas are crossed by the Project Corridor or Route.

17.3 Selection Criteria

17.3.1 Agricultural Production

Agricultural land use comprises approximately 17.3% of the Project's Route (LANDFIRE 2012). The Project Route would temporarily impact approximately 1.15 acres of prime farmland, 4.36 acres of farmland of statewide importance, and approximately 26.31 acres of non-prime farmland, totaling 31.82 acres (Table 5). Dominant crops include corn, soybeans, and sunflowers. With the exception of aboveground facilities, once construction is complete, the ROW may return to its prior use, including in areas currently used for agricultural production. As such, impacts to agricultural production along the Route would be minimal and temporary.

Table 5. Farmland in Study Area

Type of Farmland	1-mile-wide Study Area		Survey Corridor		Right-of-Way	
	Area (acres)	Percent Total Area	Area (acres)	Percent Total Area	Area (acres)	Percent Total Area
All areas are prime farmland	23.87	1.13%	2.29	3.58%	1.15	3.60%
Farmland of Statewide Importance	499.38	23.74%	8.13	12.72%	4.36	13.70%
Not prime farmland	1,580.41	75.13%	53.48	83.70%	26.31	82.68%
Total	**2,103.66**	**100.0%**	**63.90**	**100.0%**	**31.82**	**100.0%**

17.3.2 Family Farms and Ranches

No family farms and no ranches are located within the Study Area and no farm units are crossed by the Route. Construction impacts to tilled agricultural fields would be short term and minor,

with the primary impact being the loss of standing crops and the use of the land within the work area during construction activities as well as potential diminished yields following construction. Arrow will implement mitigation measures to minimize potential impacts to family farms and ranches, as outlined in the EMP (Appendix C).

No long-term or permanent impacts are expected to rangeland and/or tilled agricultural fields. Post-construction restoration would return the ROW to pre-construction contours, and farming operations would continue over the operational ROW. Arrow has acquired and will compensate landowners for easements for the Project.

17.3.3 Land Economically Suitable for Irrigation

Arrow has not identified any center pivot irrigation within the Project Corridor or Route, or any land that is planned to be irrigated. Thus, the Project is not anticipated to impact irrigated land or any irrigation systems. In the event that irrigation systems are encountered, Arrow will compensate and/or repair any damages to the systems that may result from the Project's construction activities.

17.3.4 Surface Drainage Patterns and Groundwater Flow Patterns

Surface Drainage

Surface drainage patterns will not be altered by construction of the Project. Swales, ditches, and other natural drains will be restored to approximate pre-construction contours after construction is complete. The pipelines will be installed at depths that will not interfere with flow or future maintenance efforts by landowners.

Groundwater Flow Patterns

This portion of McKenzie County is underlain by the Tertiary age Sentinel Butte Formation, which consists of gray-brown silt, sand, clay, sandstone, and lignite that was derived from river, lake, and swamp deposits and is up to 600 feet thick. The pipeline alignment is also located within the same formation.

No surficial sand and gravel aquifers underlie the Study Area. The Tobacco Garden Aquifer is the nearest surficial aquifer and it is located approximately 2.5 miles northwest of the alignment. Spring Creek, west of the alignment, flows in that direction.

Regional groundwater flow directions are northwest toward the Missouri River and east-southeast toward the Little Missouri River. Local groundwater flow directions along the northern and eastern portions of the Route are toward Cherry Creek and the Little Missouri River, while the local groundwater flow at the western end of the Route is to the west and northwest toward Spring Creek and the Missouri River.

Any construction impacts that may occur to local groundwater flow would be highly localized and temporary in nature. No permanent impacts to groundwater flow are expected as a result of the Project.

17.3.5 Sound Sensitive Land Uses

The proposed Project is located in a rural area that is sparsely populated, but with numerous oil and gas production locations and facilities. Sound intensity is measured by the decibel; the A-weighted scale is used in most noise ordinances and standards and approximates the range of human hearing by filtering out lower frequency noises, which are not as damaging as higher frequency noises. In rural areas, background noise is generally at levels of 40 to 50 A-weighted decibel (McCain and Associates, Inc. 2011). Due to the surrounding oil and gas development activities, the background noise level may be higher than this range.

Construction-related activities are expected to be short-term and during the daytime; therefore, impacts to area residents would be minimal. During operations, noise impacts would be primarily vehicles used to transport maintenance personnel at the ROW and aboveground facilities. Arrow and its contractors will comply with all state and local noise requirements during construction and operation of the Project.

17.3.6 Visual Effect on Adjacent Areas

Impacts to visual resources as a result of Project development are assessed by the degree of modification to the existing landscape and sensitivity of the viewer. Changes to the line, form, and character of the existing landscape can result in a level of contrast that would attract the attention of those in the area. The number of viewers, their activities, and the extent their activities are related to the visual quality of the area determine the level of viewer sensitivity.

The Project is located in a rural area that is sparsely populated and is primarily used for agriculture and oil and gas development. Viewers of the landscape would be limited to area residents and travelers along local roadways. Based on the number of viewers and the duration of their views, viewer sensitivity is considered low.

With the exception of aboveground facilities, the Project will be buried. During construction, vegetation will be removed, temporarily resulting in distinct contrasting lines within the landscape. However, once vegetation is re-established within the construction ROW, visual impacts will be limited to aboveground facilities. Painting these facilities with colors that blend with the surrounding landscape will reduce the visual contrast.

17.3.7 Extractive and Storage Resources

Active extractive resources occur within the Study Area and consist of oil and gas production associated with the Williston Basin, which covers much of the western and central portions of the state (North Dakota Department of Mineral Resources 2015). The Project is planned to not interfere or otherwise impact access to, or the operations of, oil and gas production. No mineable coal, geothermal or uranium resources, or sand or gravel deposits are located in the Study Area (North Dakota Department of Mineral Resources 2015). The nearest clay deposit suitable for lightweight aggregate is located over 5 miles from the Study Area (North Dakota Department of Mineral Resources 2015). Therefore, construction and operation of the proposed Project will not impact access to, or the operations of, mineral resource extraction.

17.3.8 Wetlands, Woodlands, and Wooded Areas

A desktop review was completed of the Study Area and included the review of aerial imagery, NWI data, and LANDFIRE dataset to identify any wetlands, woodlands, and wooded areas with the Study Area. Field surveys conducted on November 15 and 16, 2016, identified these areas within the Corridor. Please refer to Sections 14.2 and 14.3 for further discussion on the results of the desktop analysis and field surveys with respect to these resources.

SWCA counted 24 tree, sapling, and shrub individuals that may be impacted by pipeline construction activities. Therefore, approximately 48 2-year-old saplings may need to be replanted to fulfill the Commission's 2:1 mitigation requirement found in the Tree and Shrub Mitigation Specifications.

17.3.9 Radio and Television Reception and Other Communication or Electronic Facilities

No radio and television reception and/or other communications and electronic facilities are located within the Corridor or are crossed by the Route. Arrow does not anticipate the Project will impact radio and television reception and/or other communications and electronic facilities.

17.3.10 Human Health and Safety

Construction of the proposed Project could generate a possible risk to local citizens' public safety from increased traffic along rural roadways. Increased truck traffic and transport of heavy equipment will be temporary during construction.

Transport of petroleum products by pipeline involves some risk in the event of an accident and the release of the product. A release of natural gas and NGLs during pipeline operations could contaminate soil and groundwater if the leak is not properly contained and remediated. To minimize this risk, both the Arrow NB Residue Pipeline and the Arrow Bakken NGL Pipeline will be remotely monitored using a SCADA system 24 hours a day, 7 days a week. In addition, routine pedestrian and aerial patrols will be conducted, as will internal inspections using in-line inspection tools. During operations, Arrow will comply with the safety measures set forth in 49 CFR Part 195, as required by PHMSA.

To minimize potential impacts during operation, an Emergency Response Plan will be developed in conjunction with local authorities and first responders that details site-specific response plans, emergency equipment availability and location, and emergency contacts. In addition to the Emergency Response Plan, a Pipeline Integrity Management Plan will be developed to outline pipeline integrity management procedures to be implemented during operation.

17.3.11 Animal Health and Safety

No threatened or endangered species were observed in the Study Area. Wildlife species currently inhabiting the Corridor are common and likely will not be permanently displaced by the proposed Project. Temporary disturbance will occur during construction of the proposed Project; however, no direct, long-term impacts to wildlife are anticipated from the Project.

17.3.12 Plant Life

Plants species currently inhabiting the Corridor are common. Impacts to plant species in the Study Area from the Project are anticipated to be primarily temporary and minimal.

17.4 Policy Criteria

17.4.1 Location and Design

Arrow selected the Corridor and Route based on a number of factors, including environmental, engineering, and constructability considerations.

Arrow worked with landowners and consulted with local, state, and federal agencies to identify siting constraints and inform the siting of the proposed Corridor and Route. Field surveys, including those assessing natural and cultural resources, provided supplemental information to assist in refining the siting process to avoid or minimize impacts to sensitive resources.

17.4.2 Training and Use of In-State Labor

Arrow expects to employ approximately 30 workers during peak Project construction. Local, in-state labor will be used to the extent practicable; however, if specialized skilled workers (e.g., licensed welders) are not available for hire within the state, Arrow may need to employ workers from out-of-state.

17.4.3 Economies of Construction and Operation

Direct and indirect economic benefits to the state of North Dakota resulting from construction of the proposed Project are discussed in Sections 13.0 and 17.7. Once the Project is constructed and online, Arrow expects annual maintenance and operation costs to be minimal.

17.4.4 Use of Citizen Coordinating Committees

Arrow contacted and worked closely with county agencies and personnel, utility companies, and others throughout development of the proposed Project. Other than one-on-one communication with landowners, no formal Citizen Coordinating Committees were used for communications and outreach to the public or jurisdictional entities.

17.4.5 Commitment of a Portion of Transmitted Product for Use in State

The residue gas and NGLs transported by the Project will be delivered to third-party natural gas transmission and NGL facilities for transport to in-state and out-of-state markets.

17.4.6 Labor Relations

Arrow maintains a positive relationship with its employees, contractors, and the public, and is committed to a safe working environment. Arrow is an Equal Opportunity Employer and expects to use local personnel for construction of the proposed Project, to the extent practicable.

17.4.7 Coordination of Facilities

Arrow performed a centerline survey of the Route and, based on that survey, Arrow identified all third-party entities/utilities that will be encountered (e.g., petroleum, water, electric,

highways). Arrow then contacted each entity to obtain its respective crossing and encroachment guidelines and requirements and negotiated surface use agreements with landowners along the proposed Route. Arrow has incorporated these requirements into the Project design, and will work closely with each entity during construction and future operation and maintenance to ensure the safe construction and operation of the Project around these adjacent utilities/entities. Refer to the Typical Foreign Pipeline Crossing schematic in Appendix A for more information.

17.4.8 Monitoring Impacts

Arrow is committed to the protection of the environment as well as public and employee safety. The proposed Project will be constructed and maintained in accordance with industry and government requirements and will meet or exceed all applicable federal, state, and local environmental laws, regulations, and standards, including those regulations stipulated by PHMSA. An EMP has been developed specifically for this Project (see Appendix C).

In addition, Arrow will provide construction oversight to confirm contractor compliance with mitigation measures, landowner agreements, and applicable permits. Arrow will have third-party inspectors who are knowledgeable of the environmental mitigation requirements for the Project. The inspectors will have the authority to stop construction activities and order corrective mitigation and will maintain appropriate compliance documents.

During Project operation, Arrow will conduct regular aerial and foot patrols of the ROW to identify issues of concern, including operational issues and ROW encroachment. In addition, the SCADA system will continuously monitor pressure, temperature, and product flow 24 hours a day, 7 days a week, with information transmitted via satellite to Arrow's Keene, North Dakota, offices, which will promptly respond to any anomalies. Arrow will monitor landowner and community concerns throughout Project operations and respond appropriately.

17.4.9 Using Existing and Proposed Rights-of-Way and Corridors

Arrow's proposed Route was sited to co-locate with existing utility corridors, roads, and other existing linear features to the extent practical. Approximately 0.37 mile of the proposed alignment is adjacent to an existing pipeline and approximately 0.75 mile follows road ROWs or property boundaries. In some instances, the proposed ROW does not follow property boundaries due to landowner preferences or by mutual agreement with the landowners.

17.4.10 Other Existing or Proposed Transmission Facilities

The Project will provide a connection between Arrow's proposed Natural Gas Processing Plant and third-party natural gas transmission and NGL facilities.

18.0 EVALUATION OF NDCC SECTION 49-22-09 FACTORS

In selecting the proposed Corridor and Route for the Project, Arrow evaluated the factors set forth in NDCC Section 49-22-09. A discussion of each factor is provided below.

18.1 Effects on Public Health, Welfare, Natural Resources, and the Environment

Please see Sections 14.0, 15.0, 17.0, 19.0, and 20.0 of this Consolidated Application for a discussion of available research and investigations relating to the effects of the location, construction, and operation of the proposed Project on public health and welfare, natural resources, and the environment. As discussed further in those sections, the Project is not anticipated to have any significant or long-term negative impacts on public health and welfare, natural resources, or the environment.

18.2 Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects

The Project design is consistent with existing pipeline technologies. Mitigation measures have been or will be used to avoid or minimize any potential impacts to sensitive resources, including use of trenchless construction (bores) at road crossings or due to constructability concerns. In addition, throughout construction, BMPs will be implemented to reduce any potential impacts to resources from ROW clearing, grading, trenching, and pipe and facility installation. Once constructed, the Project will be monitored remotely via a SCADA system 24 hours a day, 7 days a week.

18.3 Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The Project does not include any energy conversion facilities; therefore, the potential for beneficial uses of waste energy from a proposed energy conversion facility does not apply.

18.4 Unavoidable Adverse Direct and Indirect Environmental Effects

With the exception of aboveground facilities, unavoidable adverse direct and indirect environmental impacts from the Project would be temporary and minimized through the use of mitigation measures and BMPs. Permanent environmental impacts would be limited to the tie-in points to Arrow's proposed Natural Gas Processing Plant and the third-party natural gas transmission pipeline and the third-party NGL facility. See Sections 14.0, 15.0, 17.0, 19.0, and 20.0 for further discussion of the Project's potential direct and indirect environmental effects, as well as planned mitigation measures.

18.5 Corridor or Route Alternatives Developed During the Hearing that Minimize Adverse Effects

A description of the route selection process is presented in Section 13.0. Arrow analyzed alternatives during selection of its proposed Corridor and Route by one-on-one landowner discussions, and incorporated route deviations proposed by landowners and others in its Route to the extent practicable. As a result, Arrow has identified a Project Corridor and Route that

meets the needs of the Project, as well as the Commission's siting criteria, while minimizing potential impacts to landowners, existing infrastructure, and the environment.

If other corridor or route alternatives are developed during the Commission's hearing process, Arrow will analyze those alternatives, as necessary.

18.6 Irreversible and Irretrievable Commitments of Natural Resources if Designated

Irreversible or irretrievable commitments of natural resources include steel for the pipelines and ancillary facilities; gravel for improvements to access roads, if required; and petroleum products to power construction equipment, the pump station and compressor station, and other pipeline facilities. The Project will convert approximately 2 acres to industrial use at the Natural Gas Processing Plant, third-party natural gas transmission pipeline, and third-party NGL facility tie-in locations.

18.7 Direct and Indirect Economic Impacts of the Facility

Direct and indirect economic impacts from Project construction include short-term employment opportunities during construction, increased local revenue for Project-related expenditures, and increased local and state tax revenues. Local property taxes would be realized on an annual basis during the Project's operational phase. Project-related local expenditures during the construction, for example, would include lodging and food, fuel, and construction materials and equipment.

18.8 Existing Plans for Other Developments (State, Local, and Private) in the Vicinity of the Project

Arrow has been in consultation with federal, state, and local governments, landowners, existing infrastructure owners, and water districts, and Arrow has not identified any potential conflicts with existing or planned developments. Arrow will obtain all necessary permits and approvals for the Project from federal, state, and local governments and agencies, and will comply with applicable local land use requirements.

18.9 Effects of the Proposed Route on Existing Scenic Areas, Historic Sites and Structures, and Cultural Resources

The Project avoids all known scenic areas, historic sites and structures, and cultural resources; therefore, the Project is not anticipated to impact these resources. For further discussion, please see Sections 14.0, 15.0, 17.0, and 20.0 of this Consolidated Application.

18.10 Effects of the Proposed Route on Areas Which are Unique Because of Biological Wealth or Rare and Endangered Species Habitats

Although suitable nesting and foraging habitat and migratory birds are present in the Study Area, the Project location is such that the likelihood of migratory birds being impacted by the Project is extremely low. No other potential areas that are unique because of biological wealth or because they are habitats for rare and endangered species are located within the Corridor or crossed by the Route and thus, the Project is not anticipated to impact these resources. For

further discussion, please see Sections 14.0, 15.0, 17.0, and 20.0 of this Consolidated Application.

18.11 Problems Raised by Federal Agencies, other State Agencies, and Local Entities

A summary of consultations, notifications, and agency responses is provided in Section 15.0; copies of correspondence are provided in Appendix E. Consultation is ongoing and Arrow will respond to and address concerns if raised.

19.0 OTHER FACTORS CONSIDERED

19.1 Design Construction Limitations

Specific factors taken into account in the selection of the Corridor and Route, including design and construction limitations, are identified in Sections 2.0 and 13.0 and discussed throughout this Consolidated Application. In particular, the Project was designed to gather unmarketable gas from individual oil and gas production facilities, process this natural gas to remove NGLs and produce consumer-quality residue gas, and transport this residue gas and NGLs to a third-party natural gas transmission pipeline and a third-party NGL facility. Road crossings (bore) and wetland crossings (trenching/bores) will require special construction techniques, which have been incorporated into the proposed Project design (see Section 11.2).

The Project will be designed, constructed, and operated in accordance with USDOT regulations governing the transportation of hazardous liquids by pipeline, which are set forth in 49 CFR Part 192 and Part 195.

19.2 Economic Considerations

In selecting the Corridor and Route, one of many factors Arrow considered was facilitating construction of the Project in the most economical and efficient manner. However, Corridor and Route selection required balancing of a number of factors, as discussed specifically in Sections 2.2 and 13.0 of this Consolidated Application.

Other economic considerations associated with the Project include the positive direct and indirect economic benefits that the Project will provide within and beyond North Dakota. As discussed in Section 18.7 of this Consolidated Application, the Project will provide short-term employment of workers during construction, increased revenues from local expenditures, and increased tax revenues.

19.3 Present and Future Natural Resource Development

As discussed in Section 17.1.1, there are no national parks, national memorial parks, national historic sites or landmarks, national wilderness areas, or national monuments located within the Corridor and along the Route. Similarly, there are no designated or registered state parks, sites, monuments, or nature preserves along the Route. There are also no county parks, municipal parks, or parks owned or administered by other governmental subdivisions along the Project Route.

In addition, as discussed in Section 17.2.1, there are no wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; or grasslands within the Corridor or along the Route. Also, no designated or registered state wild or recreational rivers, game refuges, game management and management areas, forests, forest management lands, or grasslands will be crossed by the Corridor or Route.

The Project will cross range land and land used for agricultural crop production. Once construction is complete, the ROW will be restored to its prior use. Further, as discussed in Sections 17.3.7 and 17.4.7, Arrow will continue to work closely with existing infrastructure owners to safely construct and operate the Project and to minimize the potential for impacts to existing facilities. Thus, impacts along the Route are anticipated to be primarily temporary and minimal.

20.0 APPLICANT'S MITIGATION MEASURES AND POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

Arrow is committed to avoiding, minimizing, and mitigating the environmental impacts of the Project. The Project has been designed and routed with these commitments in mind. The Project will be constructed and operated to meet or exceed federal, state, local, and industry safety, environmental, and operational standards.

In addition to the mitigation measures discussed throughout this Consolidated Application, Arrow has developed an EMP, presented as Appendix C, which outlines general construction-related mitigation measures to minimize impacts to natural and cultural resources from Project development. These measures meet or exceed applicable industry standards and regulatory requirements. Specifically, the EMP provides a detailed description of the mitigation measures that will be implemented during Project construction, including:

- general mitigation measures;
- spill prevention;
- temporary erosion and sediment control;
- highway, road, and railroad crossings;
- uplands;
- wetland crossings; and
- hydrostatic testing.

Arrow is also developing specific plans for the Project, including a Stormwater Pollution Prevention Plan and a Frac-Out Contingency Plan.

21.0 QUALIFICATIONS OF PREPARERS

Mr. Jake Richardson
Senior Project Manager
Crestwood Midstream Partners, L.P., 1125 17th Street, Suite 1575, Denver, CO 80202

Mr. Richardson is a licensed Professional Engineer and Senior Project Manager responsible for all project work in the western region (North Dakota, Wyoming, Colorado, and California) and provides oversight for the Project Managers, Project Engineers, and Construction Managers who execute the various projects executed in the region, including gathering systems, pipelines, pump/compressor stations, truck stations, central delivery point stations, and processing plants.

Mr. Jim Dawson
Senior Project Manager
SWCA Environmental Consultants, 116 North 4th Street, Bismarck, North Dakota 58501

Mr. Dawson is a Professional Geologist and Certified Hazardous Materials Manager who provides regulatory compliance consulting services for oil and gas operations, including environmental site assessments and due diligence activities; stormwater permitting and inspections; preparation of Spill Prevention, Contingency and Countermeasure Plans, Facility Response Plans, and Pipeline Spill Response Plans; spill investigation, assessment, and cleanup services; and investigation and cleanup/remediation of reserve pits and legacy contamination sites.

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