North Dakota Public Service Commission
Consolidated Application

Certificate of Corridor Compatibility and Route Permit

Targa Lateral Pipeline Project

Prepared for:
ONEOK Bakken Pipeline, L.L.C.

Prepared by:
E3 Environmental, L.L.C.

May 2014

ONEOK
BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
Enhancing Execution with Experience

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INTRODUCTION

ONEOK Bakken Pipeline, L.L.C. (ONEOK) a wholly owned subsidiary of ONEOK Partners, L.P., owns and operates natural gas liquids (NGLs) assets in North Dakota. ONEOK is planning the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile, steel, 6-inch diameter NGL pipeline that will originate at the Targa Resources LLC's Little Missouri Plant (TLMP or Plant) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's existing Garden Creek Pipeline (GCP) south of Arnegard, North Dakota. The GCP originates at the ONEOK Rockies Midstream, L.L.C. (ORM) Garden Creek Gas Plants, near Watford City, and proceeds generally west and south through McKenzie County. The pipeline crosses the state line into Montana where it can deliver into the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

ONEOK submits to the North Dakota Public Service Commission (PSC) a single consolidated application for a Certificate of Corridor Compatibility and Route Permit for the Project.

The application provides the requisite information as stipulated by:

- North Dakota Century Code, Energy Conversion and Transmission Facility Siting Act, Chapter 49-22-08; and,
- PCS Administrative Code, Chapter 69-06-05, Certificate of Site or Corridor Compatibility.

SECTION 1: DESCRIPTION

1.1 TYPE AND SIZE OF FACILITY

1.1.1 TYPE

The Project is a Y-grade NGL transmission pipeline. The steel pipeline will meet U.S. Department of Transportation (DOT) regulations, specifically the design, construction, operation, and maintenance criteria outlined in 49 CFR 195.

1.1.2 SIZE

The Project pipeline specifications are the following:

- 6.625-inch Outside Diameter (O.D.) Steel Pipe
- API 5L GR B FBE/ARO Coated ERW pipe
- Nominal Wall Thickness of 0.188 inch
- Maximum Operating Pressure: 1,440 pounds per square inch gauge (psig)
- Maximum Throughput: 290 gallons per minute (gpm), approximately 10,000 barrels per day (bpd)
- Maximum Temperature: 100 degrees Fahrenheit

The proposed pipeline would include two block valves, one on the pig launcher and another at the pig receiver. The receiver facilities are located on the terminus of the Project. These valves are installed to meet DOT regulations. The valves will be actuated, and operated by ONEOK operations employees responsible for that area. Please see Appendix A for typical drawings of these facilities.

1.1.3 LENGTH

The proposed Project is approximately 10.6 miles in length.

1.2 PURPOSE OF FACILITY

The purpose of this Project is to provide take away capacity for Y-grade NGLs (a mixture of ethane, propane, butanes, iso-butane mix, pentanes and natural gasoline) produced at the TLMP. The Project would provide products produced at TLMP access to ONEOK's GCP for transport to facilities in the Mid-Continent and Gulf Coast for additional processing prior to distribution to various markets.

1.3 LOCATION

The Project will be located in McKenzie County, North Dakota, originating at the TLMP, moving generally west and north, terminating at ONEOK's GCP approximately 7 miles south of Arnegard, North Dakota. Please refer to maps provided in Appendix B.

1.4 ABOVEGROUND FACILITIES

The proposed pipeline would include a meter skid for measurement and custody transfer at TLMP, a pig launcher at TLMP and a pig receiver at the connection to GCP. The pig

launcher and receiver enable in-line inspection of the pipeline for integrity management per DOT requirements and ONEOK standards. Please see Appendix A for engineering documents.

1.5 PROJECT SCHEDULE

1.5.1 CERTIFICATE OF CORRIDOR COMPATIBILITY

ONEOK seeks a Certificate of Corridor Compatibility on or before mid-September 2014.

1.5.2 ROUTE PERMIT

ONEOK seeks a Route Permit on or before mid-September 2014.

1.5.3 CONSTRUCTION SCHEDULE

ONEOK plans to commence construction as early as October 1, 2014 with an estimated completion date of December 15, 2014. The proposed schedule is closely tied to producer dedication dates under long-term contracts with TLMP.

SECTION 2: STUDIES

2.1 CORRIDOR

ONEOK selected the proposed corridor based upon several criteria designed to conform to the PSC's siting requirements and to avoid and minimize socioeconomic and environmental impacts, while maximizing the benefits to local resource developers in the Williston Basin. The location of existing assets was also considered during the selection process.

The proposed corridor is a one-mile wide area centered upon the proposed Project alignment (*i.e.*, one-half mile on either side of the proposed Project alignment) (Corridor). The proposed Corridor is illustrated on the maps in Appendix B.

A comprehensive desktop analysis of the Corridor included notifications to the federal and state agencies identified below. The results of this environmental analysis are summarized in Section 2.2: Environmental Desktop Analysis of this document. Records of the notification provided to the agencies listed below are provided in Appendix C.

- U.S. Fish and Wildlife Service (USFWS)
- North Dakota Game and Fish Department (NDGFD)
- North Dakota Parks and Recreation - Natural Heritage Program (NDPRD)
- North Dakota State Lands Department (NDSLD)
- North Dakota State Preservation Office (NDSHPO)
- North Dakota Department of Health (NDDoH)

2.2 ENVIRONMENTAL DESKTOP ANALYSIS

2.2.1 WILDLIFE INVENTORY

Approximately 160 wildlife species are residents or seasonal visitors to the greater Missouri River ecosystem, and hundreds of native fish species live in the river and its tributaries, including the Knife River. Some of these animal species include fur-bearing mammals (e.g. beaver, muskrat, moose and mule deer), and game birds (e.g. sharp-tailed grouse and pheasants) waterfowl species (e.g., mallard, gadwall and Canada goose) and raptors (red-tailed hawk and golden eagles).

Several wildlife species listed as threatened or endangered under the Endangered Species Act (ESA) either currently reside or once resided in McKenzie County.

ONEOK engaged federal and state agencies in notifications to identify potential occurrences of sensitive species or their critical habitats. Refer to Appendix C for complete record of agency notifications.

2.2.2 WETLAND AND WATERBODIES ANALYSIS

To evaluate the location and extent of mapped wetlands and waterbodies within the Corridor a desktop analysis of aerial photography, National Hydrography Data set (NHD) and National Wetland Inventory (NWI) maps was completed. Desktop analysis identified 20 individual streams, five waterbodies (i.e. ponds) and approximately 10 wetland features. ONEOK commissions field studies to augment the desktop analysis, the field study results are discussed in the Route Permit Application.

2.2.3 TREE/SAPLING/SHRUB ANALYSIS

Desktop analysis of aerial photography was used to evaluate the location and extent of woody vegetation within the Corridor. The density of the woody cover is generally sparse, and typically appeared in association with significant topographic relief such as defined banks or incised drainage channels. ONEOK commissioned additional studies of the proposed route to inventory woody vegetation, study avoidance measures and inventory proposed impacts for mitigation. The results of these studies are included in Appendix D and proposed mitigation is detailed in Section 4: Mitigative Measures of the Route Permit application.

2.3 AGENCY NOTIFICATIONS

2.3.1 U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (USFWS) administers several programs designed to identify and protect special status plant and animal species and critical habitats. E3 Environmental, LLC (E3), on behalf of ONEOK, provided project notification of the Corridor by the USFWS on April 28, 2014. A response from the USFWS is pending. Please see Appendix C for a record of this notification.

2.3.1.1 FEDERALLY PROTECTED SPECIES REVIEW

The USFWS identifies and maintains a list of species and critical habitats that have been afforded protection by the ESA. The ESA provides a program for the conservation of threatened and endangered plants and animals and the critical habitats.

E3 reviewed USFWS published data and identified the following listed species and the potential for the species to occur within the Corridor.

- Whooping Crane (*Grus Americana*) - Endangered
- Interior Least tern (*Sterna antillarum*) – Endangered
- Piping plover (*Charadrius melodus*) – Threatened
- Pallid sturgeon (*Scaphirhynchus albus*) – Endangered
- Gray wolf (*Canis lupus*) – Endangered
- Black-footed Ferret (*Mustela nigripes*) – Endangered

E3 reviewed the available information that described the life history, critical habitats, and conservation measures associated with each species to assess the potential effects of the Project on these resources. The results of the assessment are provided below.

Additionally ONEOK commissioned surveys of the route and developed mitigation plans for sensitive species or habitat identified within the route. Please refer to Section 4: Mitigative Measures of the Route Permit application for additional details.

Whooping crane: The Aransas Wood Buffalo Population of Whooping Cranes engages in semi-annual migration through North Dakota. This flock breeds in the Wood Buffalo National Park in Alberta and Northwest Territories, Canada, and winters in the Aransas National Wildlife Refuge in Texas. North Dakota provides migratory habitat for the species, providing roosting and feeding opportunities during migration. During migration, the species is most closely associated with larger wetland complexes for roosting habitat, typically using adjacent uplands to forage. Desktop screening identified potential foraging habitat for the whooping crane within the Corridor.

Interior least tern: The interior population(s) of the least tern have historically been associated with large river systems for breeding and migratory habitats. Breeding birds are known to breed in colonies, utilizing sandbar habitat common to larger rivers. Regionally the Missouri River is known to host remnant-breeding populations of terns. The Project is approximately 16 miles south of the Missouri River, and therefore will have no effect on the species.

Pallid sturgeon: The pallid sturgeon preferred habitat includes the benthic environment associated with swift waters of large turbid, free-flowing rivers with braided channels, dynamic flow patterns, periodic flooding of terrestrial habitats and requiring extensive microhabitat diversity. Portions of the Missouri River are thought to provide the required habitat for the pallid sturgeon though much of the habitat has been compromised due to channelization, installation of impoundments and altered flow regimes. The proposed Project is approximately 16 miles south of the Missouri River and Lake Sakakewea, and therefore is not likely to affect the species.

Gray wolf: The gray wolf uses a variety of habitats that support a large prey base including montane and low-elevation forests, grasslands and desert scrub. The Corridor generally lacks forested habitat and is a great distance from the know Minnesota and Manitoba populations. The Corridor does not provide suitable habitat or host known populations of the gray wolf as such proposed Project will have is not likely to affect the gray wolf.

Black-footed ferret: Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog ecosystem. Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically 80 acres or larger. Prairie dog towns of this size are not contained within the Corridor; therefore, the proposed project would is not likely to affect on this species.

Piping plover: The piping plover is a small shorebird, which 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. The shorelines of the Missouri River and Lake Sakakewea provide suitable habitat. The Missouri River is a minimum

of 16 miles from the Corridor as such habitat is not present within the Corridor. The Project is not likely to affect this species.

2.3.1.2 MIGRATORY BIRD TREATY ACT CONSULTATION

On April 28, 2014, ONEOK, provided project notification to the USFWS; the notification addressed several topics that fall under the purview of the USFWS including the Migratory Bird Treaty Act (MBTA). The management of MBTA concerns correspond with the regional timing associated with annual phenology of migratory species. In North Dakota, it is generally acknowledged MBTA species of concern may be present and active in North Dakota from February 1 through July 15 annually. Currently the proposed Project construction is scheduled to commence in October and be complete in December 2014; provided the schedule is maintained no additional mitigation will be required. ONEOK will maintain open lines of communication with agencies as necessary regarding this subject and will develop additional MBTA mitigation measures as appropriate.

2.3.1.3 BALD AND GOLDEN EAGLE PROTECTION ACT CONSULTATION

The Bald and Golden Eagle Act (BGEA) prohibits anyone without a permit from taking a bald or golden eagle including their parts, nests or eggs. The BGEA defines "take" as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The BGEA also addresses impacts resulting from human-induced alterations occurring around previously used nesting sites.

On April 28, 2014, E3, on behalf of ONEOK, provided project notification to the USFWS, which addressed the topic of BGEA. To date, no response has been received from the USFWS. See Appendix C for a copy of the correspondence.

2.3.1.4 U.S. FISH AND WILDLIFE SERVICE MANAGED LANDS

The USFWS administers National Wildlife Refuges and Waterfowl Production Areas (WPAs) as well as wetland and grassland easements throughout North Dakota. Based upon a review of information available in the public domain, including U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps, USGS PAD-US dataset, and the USFWS Information, Planning, and Conservation System (IPaC), no USFWS managed areas were identified within the Corridor

A notification was provided to the USFWS providing opportunity for the Agency to identify any additional USFWS managed lands, which may be impacted by the Project. A response from the USFWS is pending.

2.3.2 NORTH DAKOTA GAME AND FISH DEPARTMENT

The North Dakota Game and Fish Department (NDGFD) has oversight of the State's game species. On April 28, 2014, project specific notification was submitted to the NDGFD requesting information on the presence or absence of State Conservation Priority Species within the Corridor. The NDGFD provided a written response dated May 21, 2014. See Appendix C for a copy of the correspondence.

The NDGFD's response confirmed the absence of lands managed by the department. The Department primary concern is with the disturbance to native prairie and wooded draws associated with construction of the pipeline and associated access roads. Avoidance of these areas is recommended, if avoidance cannot be achieved areas should be reclaimed to pre-project conditions. Additionally Cherry Creek is a Classified fishery, as such directional boring is recommended to protect the resource. If directional drilling is not feasible construction should not occur between April 15th and June 1st and controls to minimize erosion and sediment.

2.3.3 NORTH DAKOTA PARKS AND RECREATION DEPARTMENT

The NDPRD Natural Resource Division's scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The NDPRD also maintains a database comprised of the location and recorded occurrences of plant and animal species of special concern. The NDPRD authority includes management of state park lands and Land and Water Conservation Funded recreation projects.

On April 28 2014, ONEOK submitted project notification to the NDPRD seeking confirmation regarding the presence or the absence of managed lands, ecological resources, rare species or their critical habitats within the Corridor. The NDPRD response is pending. See Appendix C for a copy of the correspondence.

2.3.4 NORTH DAKOTA STATE LANDS DEPARTMENT

The NDSLD is in charge of managing surface acres and mineral interests held in trust for various schools and institutions. Based on review of publically available information, one state trust land is crossed by the Corridor.

On April 23, 2014, ONEOK provided Project notification to the NDSLD requesting comments regarding the presence of school trust lands within the Corridor; the NDSLD responded on May 7, 2014 confirming that no school trust lands are located within the Corridor.

On April 23, 2014, E3 ONEOK provided Project notification to the NDSLD requesting comments regarding the presence or absence of state mineral trust lands within the Corridor. The NDSLD responded on May 7 2014 confirming the presence of one mineral trust land tract within the proposed Project Corridor as depicted in the consultation map. See Appendix C for a copy of this correspondence.

2.3.5 NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

The North Dakota State Historic Preservation Office (SHPO) is responsible for managing the historic and archaeological resources of the state; as such, the SHPO maintains records of all previously recorded cultural resources within the state.

E3 commissioned SWCA Environmental Consultants to conduct a Class I of the Corridor. The Class I effort was completed on April 21, 2014. The Class I identified 22 previously recorded cultural resources that were previously identified within the Corridor. Of these 22 sites, 11 were not eligible for inclusion into the National Register

of Historic Places (NHRP) and 11 remained unevaluated for the NHRP. The results of this Class I effort are documented in Appendix E. To augment this Class I effort SWCA conducted a Class III field investigation, the details of this effort are included in Appendix E and in the Route Permit application.

2.3.6 NORTH DAKOTA DEPARTMENT OF HEALTH

The North Dakota Department of Health (NDDoH) administers regulatory programs governing certain water quality issues including construction stormwater runoff and other discharges. ONEOK is currently in the process of preparing permit application materials to acquire the requisite NDDoH approval with respect to these issues.

2.3.6.1 NDDOH POLLUTION DISCHARGE ELIMINATION SYSTEM

The North Dakota Pollution Discharge Elimination System (ND PDES) is the regulatory program that regulates water discharges such as construction stormwater, site dewatering, and hydrostatic discharge permits. ONEOK will procure the following ND PDES permits from the NDDoH as described below.

Construction Stormwater: ONEOK will seek coverage under NDR10-0000 *Authorization to Discharge Under the North Dakota Pollutant Discharge Elimination System* general permit for construction activities. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared and maintained on-site for the duration of the Project. ONEOK will properly implement the SWPPP, which will be designed to manage run-off and trench dewatering discharges in a manner that will minimize exposure to chemicals, waste, and petroleum products, and to describe erosion control measures designed to minimize off-site transfer of sediments.

Hydrostatic test water discharges: ONEOK will seek coverage under NDG07-0000 *Authorization to Discharge Under the North Dakota Pollutant Discharge Elimination* general permit for various temporary discharges including both construction site dewatering and hydrostatic test water discharges.

SECTION 3: NEED FOR FACILITY

3.1 ANALYSIS OF NEED BASED ON PRESENT AND PROJECTED DEMAND, INCLUDING SYSTEM STUDIES

Technological advances in drilling and completion associated with horizontal wells currently employed in the Bakken Shale and Three Forks formations of the Williston Basin has dramatically increased hydrocarbon production in the area. In addition to technological advances, drilling activity has increased measurably. In March of 2014, natural gas production in North Dakota was reported to reach 1040 MMcfd, with approximately 440 MMcfd of that statewide total produced in McKenzie County.

The increased production of oil and natural gas products continues to be constrained by the available infrastructure take away capacity. While near term demands associated with increased crude oil production can be readily addressed with the installation of tankage for temporary storage coupled with additional trucking or rail capacity to bring it to market, the associated natural gas production is typically lost to flaring until the required infrastructure is placed into service. Approximately 33% of natural gas produced was being flared (approximately 345 MMcfd), this is a decrease of approximately 3% per data released in March of 2014. The requisite infrastructure includes gathering systems and gas processing to refine the raw feedstock into commercial products. The function of the gas processing plant is to separate commercial grade methane (i.e.; natural gas) from NGLs such as butane, propane and ethane; and in turn prepare these products for delivery.

A major constraint in transporting NGLs and other hydrocarbons from North Dakota to processing/distribution centers and eventual end users in the United States is the lack of pipeline capacity. To relieve the pipeline constraints, several projects have been planned to address the growing volumes of natural gas, NGL, and other hydrocarbons. However, pipeline capacity is not expected to keep pace with production, leaving incremental volumes to find alternative transportation methods, primarily rail or other surface transportation alternatives.

Construction of the proposed Project will provide firm, reliable service for up to 10,000 barrels of NGLs per day and will provide a critical link between the TLMP and GCP. The products will be delivered to the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

SECTION 4: CORRIDOR LOCATION AND CRITERIA EVALUATION

The information presented in this section was developed to demonstrate conformation with the PSC's siting criteria for transmission facilities. ONEOK has conducted a thorough inventory of the Corridor and evaluated the resources within it to assess the compatibility of the Project with the PSC's siting criteria. The following sections identify and discuss the presence or absence of siting criteria within the Corridor. Where siting criteria are identified, the location of each is shown on the maps in Appendix B.

4.1 CORRIDOR LOCATION

ONEOK identified a preferred Corridor, which is a one-mile-wide area centered upon the preferred pipeline alignment. The selection of the proposed Corridor was a multi-disciplinary effort that included socioeconomic, environmental, logistics, engineering and financial considerations. The Corridor described in this application provides ONEOK with the opportunity to utilize existing assets, and minimize landowner and environmental impacts.

ONEOK owns and operates several assets throughout the region. The operation of these assets are conducted in a manner that maximizes the overall value of the NGLs, which benefits regional stakeholders (producers, royalty owners, and the State) through tax revenues.

ONEOK initiated landowner negotiations, agency consultations, and performed internet-based research and desktop analysis of the Corridor. These efforts were augmented by field studies, including natural and cultural resource field surveys, the results of which are discussed in detail in the Route Permit application.

4.2 FACTORS TO BE CONSIDERED IN EVALUATING APPLICATIONS AND DESIGNATION OF CORRIDORS AND ROUTES (NDCC 49-22-09)

4.2.1 FEASIBLE ALTERNATIVES TO THE PROPOSED CORRIDOR OR ROUTE

Construction of the proposed Project will provide firm, reliable service for up to 10,000 barrels of NGLs per day and will provide a critical link between the TLMP and GCP. The products will be delivered to the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline. ONEOK identified and evaluated several project alternatives; however, none of these alternatives effectively satisfied the Project objective. These alternatives included:

- No-Action Alternative;
- Trucking Alternative; and
- Rail Alternative

4.2.1.1 No Action Alternative

A No Action Alternative would leave the region constrained by limited transport capacity for safe and reliable transmission of NGL products to markets. The TLMP, is currently

a 20 MMcfd/d natural gas processing plant with an expansion underway to increase capacity to 40 MMcfd/d. Without adequate infrastructure to transport this influx in NGLs, the TLMP would have to flare off this additional product or operate the Plant at a reduced capacity. Overall, regional oil and gas production would continue to be constrained by the limited volume of product that could be shipped utilizing existing infrastructure, resulting in continued or increased flaring of natural gas and/or curtailment of crude oil production. This alternative is not desirable. For these reasons, ONEOK rejected a *No Action Alternative*.

4.2.1.2 Trucking Alternative

A Trucking Alternative was reviewed and eliminated due to the volumes of NGLs that will be produced at the TLMP. The maximum daily capacity of the proposed Project would be equal to an estimated 10,000 barrels or 420,000 gallons of NGLs. The average load for an NGL truck is approximately 10,000 gallons per truck. Thus, it will require 42 trucks per day to be loaded at the TLMP, an average of 1.75 trucks every hour for 24 hours a day. Similarly, it would require these 42 trucks per day to be unloaded (trans-loaded) at the railcar facility terminal. This level of truck activity is not logistically feasible; as it would cause significant amounts of heavy vehicle traffic for the area residents' as well additional wear and tear on the infrastructure. Further, any disruption in the trucking capacity due to seasonal load restrictions on roads, inclement weather or road repairs would result in a Plant shutdown and flaring of gas production. This alternative is not desirable; therefore, ONEOK rejected a *Trucking Alternative*.

4.2.1.3 Rail Alternative

A Rail Alternative was also evaluated as a surface transportation alternative. However, the lack of active railroad service within reasonable proximity to the TLMP limited the viability of this alternative. Upon further analysis, this alternative was determined not feasible due to the associated environmental impacts and financial, logistic and time constraints necessary to acquire land and construct the requisite rail infrastructure. This alternative would also require a third party rail operator. For these reasons, ONEOK rejected a *Rail Alternative*.

4.2.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF NATURAL RESOURCES SHOULD THE PROPOSED CORRIDOR BE DESIGNATED

ONEOK is not aware of any irreversible or irretrievable commitments of natural resources that would result from the requested approvals.

4.2.3 EXISTING PLANS OF THE STATE, LOCAL GOVERNMENT AND PRIVATE ENTITIES FOR OTHER DEVELOPMENTS AT OR IN THE VICINITY OF THE PROPOSED ROUTE

ONEOK is not aware of any other future development plans within or in close proximity to the Project.

4.2.4 PROBLEMS RAISED BY FEDERAL AGENCIES, OTHER STATE AGENCIES AND LOCAL ENTITIES

ONEOK provided project specific notification to various federal, state and local agencies; through this notification process, these agencies have the opportunity to identify possible sensitive environmental resources within the Corridor and any related agency concerns. A summary of these concerns is below, a complete record of these communications can be found in Appendix C.

- NDPRD: The Department recommend that the Project be accomplished with minimal impacts and that measures should be implemented to ensure that critical habitats not be disturbed and that impacted areas be revegetated with native species.
- NDGFD: The Department's primary concern is with the disturbance to native prairie and wooded draws associated with construction of the pipeline and associated access roads. Avoidance of these areas is recommended, if avoidance cannot be achieved areas should be reclaimed to pre-project conditions. Additionally Cherry Creek is a Classified fishery, as such directional boring is recommended to protect the resource. If directional drilling is not feasible construction should not occur between April 15th and June 1st and controls to minimize erosion and sediment should be implemented.

4.3 EXCLUSION AREAS (NAC 69-06-08-02.1)

Exclusion areas are geographical areas that should be excluded from consideration when siting an energy transmission facility. A proposed Corridor may contain exclusion areas, but exclusion areas may not encompass more than 50 percent of the Corridor width at any point, unless there is no reasonable alternative. The following table and text identify and discuss exclusion areas identified within the Corridor.

Exclusion Area	Within Corridor
Federal	
National Parks or Memorial Parks	No
Historic Sites, or Landmarks	No
Natural Landmarks or Monuments	No
Wilderness Areas	No
State	
Historic Sites, Monuments, or Historical Markers	No
Archaeological Sites	Yes
Parks	No
Nature Preserves	No
County	
Parks	No
Recreation Areas	No

Exclusion Area	Within Corridor
Municipal Parks	No
Other	
Areas critical to the life stages of Threatened and Endangered animal or plant species	No
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	No
Areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	No
Areas within 30 feet on either side of a direct line between ICBM launch or launch control facilities to avoid microwave interference.	No

4.3.1 FEDERAL RESOURCE REVIEW

ONEOK provided project specific notification to various federal and state agencies and conducted a comprehensive review of published information. ONEOK concluded no national or memorial parks, natural landmarks or monuments, or wilderness areas will be crossed or affected by the Project. Please refer to Section 2: Studies of this document for a comprehensive discussion of ONEOK's agency notifications and Appendix C for copies of the related correspondence.

4.3.2 STATE RESOURCE REVIEW

ONEOK confirmed through a combination of agency notifications, review of publicly available information and field studies the absence of state parks, historic sites, monuments, historical markers, or nature preserves within the proposed Corridor. Please refer to Section 2: Studies of this document for a comprehensive discussion of the results of agency correspondence and field studies conducted for this project.

ONEOK commissioned a Class I Inventory of the Corridor. These efforts identified previously recorded historic properties and cultural resources. Please refer to Section 2: Studies of this document for a comprehensive discussion of ONEOK's related agency correspondence, and Appendix E for the Cultural Resource Report. Mitigation details are discussed in Section 5: Mitigative Measures of the Route Permit Application.

4.3.3 COUNTY RESOURCE REVIEW

Through a combination of agency notifications and review of publicly available information, ONEOK confirmed the absence of county parks or recreation areas, and municipal parks, or parks owned by other subdivisions of government bodies within the proposed Corridor. Please refer to Section 2: Studies of this document for a comprehensive discussion of ONEOK's agency notifications and Appendix C for documentation of agency correspondence.

4.3.4 AREAS CRITICAL TO THE LIFE STAGES OF THREATENED AND ENDANGERED ANIMAL OR PLANT SPECIES

ONEOK conducted a comprehensive desktop review of the Corridor; these efforts were augmented with agency correspondence and additional field surveys to confirm presence or absence of critical habitat.

Please refer to Appendix C for documentation of the agency notifications as well as Section 2: Route Analysis and Environmental Studies of the application for a Route Permit for details of the field studies.

4.3.5 AREAS WHERE ANIMAL OR PLANT SPECIES THAT ARE UNIQUE OR RARE TO THIS STATE WOULD BE IRREVERSIBLY DAMAGED

ONEOK provided project specific notification to various federal and state agencies, reviewed published information and conducted a desktop analysis of the Corridor to determine if areas of critical animal or plant habitat may occur. Based on these studies, ONEOK has confirmed the absence of protected species and/or their critical habitats. Refer to Appendix C for supporting documentation of agency correspondence.

4.3.6 AREAS WITHIN 1,200 FEET OF THE GEOGRAPHIC CENTER OF AN ICBM LAUNCH OR LAUNCH CONTROL FACILITY

ONEOK conducted a review of publicly available information and concluded there are no ICBM launch or launch control facilities within the Corridor.

4.3.7 AREAS WITHIN 30 FEET ON EITHER SIDE OF A DIRECT LINE BETWEEN ICBM LAUNCH OR LAUNCH CONTROL FACILITIES TO AVOID MICROWAVE INTERFERENCE

ONEOK conducted a review of publicly available information and concluded there are no ICBM launch or launch control facilities within the Corridor.

4.4 AVOIDANCE AREAS (NAC 69-06-08-02.2)

Avoidance areas are geographic areas that would not be considered in the routing of a transmission facility unless it is shown there is no reasonable alternative under the circumstances. A proposed corridor may contain avoidance areas, but may not encompass more than 50 percent of the corridor width at any point, unless there is no reasonable alternative. The following table and text identify and discuss avoidance areas within the proposed Corridor.

Avoidance Area	Within Corridor
Federal	
Historic Districts	No
Wildlife Areas	No
Wild, Scenic or Recreational Rivers	No
Wildlife Refuges	No

Avoidance Area	Within Corridor
Grasslands	No
State	
Wild, Scenic, or Recreational Rivers	No
Game Refuges or Game Management Areas	No
Forests or Forest Management Areas	No
Grasslands	No
Other	
Other Historic Resources not meeting Exclusion Areas criteria	No
Areas of Known Geologic Instability	Yes
Areas within 500-Feet of a Residence, School, or Place of Business	Yes
Reservoirs and Municipal Water Supplies	No
Water Sources for Organized Rural Water Districts	No
Irrigated Land (not applicable to underground facilities)	N/A
Areas of Recreational Significance which are not designated as Exclusion Areas	No

4.4.1 FEDERAL RESOURCE REVIEW

ONEOK conducted a comprehensive review of publicly available information, and initiated project specific agency notification of the proposed Corridor. This review indicated the absence of designated or registered historic districts, refuges, grasslands, and wild, scenic or recreational rivers within the Corridor. Refer to Appendix C for documentation of agency correspondence.

4.4.2 STATE RESOURCE REVIEW

ONEOK conducted a review of publicly available information and initiated project specific agency notifications and through these efforts has concluded that there are no designated or registered state game refuges, game management areas, management areas, forests, forest management lands, grasslands or wild, scenic, or recreational rivers within the Corridor. Refer to Appendix C for documentation of agency correspondence.

4.4.3 HISTORICAL RESOURCES NOT MEETING EXCLUSION AREA CRITERIA

ONEOK commissioned a Class I Cultural Resource Inventory of the Corridor. This study, conducted on April 21, 2014, identified the presence of 22 previously recorded cultural sites within the Corridor. Of these 22 sites, 11 were not eligible for inclusion in the National Register of Historic Places (NHRP) and 11 remained unevaluated for NHRP eligibility. Refer to Appendix C for related agency correspondence and Appendix E for the Cultural Resource Survey Report.

4.4.4 AREAS OF KNOWN GEOLOGIC INSTABILITY

A desktop review of the North Dakota Geological Survey (NDGS) landslide mapping data was completed. Review of *Areas of Landslides, Teppee Butte 24K Sheet, North Dakota* indicated landslide deposits are present within the Corridor in T149N R99W Sec. 21 and 25 and T149N R98W Sec. 30. These areas are not traversed by the preferred Route.

Additionally, North Dakota has not experienced an earthquake of sufficient magnitude to damage steel welded pipe or structural steel structures in recorded history. Sinkholes are known to occur in the region, but these are related to subsurface mining activities as opposed to limestone dissolution. According to review of PSC abandoned mine data, five mines are located within the Corridor.

4.4.5 AREAS WITHIN 500-FEET OF A RESIDENCE, SCHOOL OR PLACE OF BUSINESS

ONEOK utilized aerial photography to identify structures located within 500 feet of the proposed pipeline alignment. Three occupied structures are located within 500 feet of the Project. ONEOK is in the process of obtaining landowner waivers from those residences within 500-feet of the Project. Executed landowner waivers can be found in Appendix G.

4.4.6 RESERVOIRS AND MUNICIPAL WATER SUPPLIES

ONEOK has confirmed the Corridor does not contain reservoirs or municipal source water protection areas for community water supply sources. While a number of wells were identified within the Corridor, these wells are used for either local domestic, stock, or irrigation purposes. The maps in Appendix B depict the location of these resources.

4.4.7 WATER SOURCES FOR ORGANIZED RURAL WATER DISTRICTS

Desktop analysis confirmed the Corridor is located within the boundaries of the McKenzie County Rural Water Association. There are no documented source water protection areas for community and non-community water supplies within the proposed Corridor. While a number of wells were identified within the Corridor, these wells are used for either local domestic, stock, or irrigation purposes. The maps in Appendix B depict the location of these resources.

4.4.8 IRRIGATED LAND

This criterion does not apply to underground transmission facilities; as such, it is not applicable to this Project.

4.4.9 AREAS OF RECREATIONAL SIGNIFICANCE WHICH ARE NOT DESIGNATED AS EXCLUSION AREAS

ONEOK confirmed the Corridor does not contain any other areas of recreational significance.

4.5 SELECTION CRITERIA (NAC 69.06-08-02.3)

The selection criteria require assessment of the environmental impacts and alterations to land use that may result from the siting of the proposed project. Through this process, ONEOK believes the Project would successfully avoid or minimize these effects to the maximum extent practicable.

4.5.1 AGRICULTURAL IMPACT

Agricultural Production: The Project will temporarily affect approximately 96 acres of private land in North Dakota. Once the construction is complete, the land will be restored to its pre-construction contours and land use. ONEOK will provide settlements to landowners for crop loss resulting from Project construction.

Family Farms and Ranches: The Project will temporarily affect approximately 96 acres of private land in North Dakota. Once construction is complete, the land will be restored to its pre-construction contours and land use. ONEOK will negotiate easements with all affected landowners. The Project will have no permanent impacts to lifestyle or farm/ranch operations once construction is completed.

Lands Suitable for Irrigation: This section is not applicable to buried pipelines (69-06-08-02.2h).

Surface Drainage: Standard pipeline construction techniques will not modify existing surface drainage patterns. Care will be taken throughout the construction process to minimize environmental impacts, including modification of drainage patterns. During restoration, those areas that were disturbed during construction will be restored, the local topography will be restored to its original contours, vegetation will be reestablished and impacts will be minimal and temporary.

Ground Water: Well data has been recorded by the State Water Commission for the Project area. Well data indicates that groundwater in upland areas is located more than 14 feet below the surface. Typical subsurface excavations associated with the Project will not extend to more than 10 feet below the ground surface. At that depth, the Project will not intersect the groundwater table, nor will the Project alter recharge rates or the infiltration, permeability, or percolation of water into the groundwater reservoir. Additionally, construction will not affect the lateral movement and groundwater quality.

4.5.2 THE IMPACTS UPON OTHER RESOURCES

Noise-Sensitive Land Uses: The Project is located in a rural setting, effectively isolating it from the majority of sensitive receptors. Construction of the proposed Project would affect the local noise environment. The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually comprised of sounds emanating from natural and artificial sources. Construction could cause temporary increases in the ambient sound environment in the areas immediately surrounding active construction. Once constructed and in-service, normal pipeline operations are not audible.

Construction of the proposed Project will be conducted during typical working hours and is expected to cause temporary increases in ambient sound within and adjacent to the Project area. The use of heavy equipment or trucks will be the primary noise source during construction and excavation. The level of impact may vary by equipment type, duration of construction activity, and the distance between the noise source and the receptor.

Visual Effect on Adjacent Areas: The proposed Project will include the installation of a launcher or receiver at each of the Project terminuses. These are small aboveground features which will be installed within the footprint of each the TLMP and GCP maintained right-of-way. The visible piping and equipment are finished and maintained with a white painted surface. No other permanent aboveground features are proposed as a part of the Project.

Extractive and Storage Resources: This Project will not affect any extractive or storage resources.

Wetlands, Woodlands and Wooded Areas: A comprehensive desktop review of published data, including aerial photography and NWI data, was conducted to assess the presence or absence of wetlands, woodlands and wooded areas. The review of the proposed Corridor confirmed the presence of these resources. ONEOK commissioned field surveys to identify and record the locations of these resources along the proposed Route. Please refer to Section 2: Studies in this document for a comprehensive discussion of the field studies results, as well as Appendices C for copies of related correspondence. Mitigation details are discussed in Section 5: Mitigative Measures of the Route Permit Application.

Radio and Television Reception, and other Communication or Electronic Control Facilities: ONEOK does not anticipate the Project will affect radio, television, or other electronic control facilities.

Human Health and Safety: ONEOK's corporate Health and Safety policy meets or exceeds federal and state laws, rules and regulations, and is enforced equally with respect to both ONEOK and contractor employees. The implementation of this policy promotes a safe and healthy workplace during construction and operation of all ONEOK's assets.

The design of the Project has incorporated the use of block valves at regular intervals. The purpose of the block valve is to segment the system and allow for the isolation of select portions of the system to facilitate maintenance in a safe and controlled manner. Additionally, in the event of an abnormal operating condition, block valves can be closed as necessary to prevent an uncontrolled release of NGLs. Finally, the operation of the pipeline will be monitored in accordance with DOT regulations.

Animal Health and Safety: The wildlife currently inhabiting the Corridor is common and is generally mobile. The local wildlife inhabitants will not be displaced by the Project and no measurable impact to the viability of these populations will occur. ONEOK does

not anticipate species of special concern to experience direct impacts due to construction or operation of the proposed Project.

Plant Life: There will be no impacts to plant life associated with the conversion or operation of the pipeline. No species of special concern will be impacted by the Project.

4.6 POLICY CRITERIA

4.6.1 POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

ONEOK will comply with requirements contained in the Corridor Compatibility Certificate and Route Permit. ONEOK will conduct its activities with the objectives of providing a healthful and safe workplace for its employees, and preventing accidents and environmental incidents. All persons and firms providing service to ONEOK are required to conduct their work in compliance with environmental conditions, permit authorizations, and applicable regulations, and will be held accountable for their actions in that regard. ONEOK is committed to conducting its business in compliance with all applicable environmental laws and regulations. These laws, regulations and standards are designed to safeguard the environment, human health, wildlife and natural resources.

4.6.2 LOCATION AND DESIGN

This Project will connect two existing facilities, the TLMP and ONEOK's GCP. The GCP is part of a mainline transmission grid from which the NGL will be distributed to market hubs/centers in the south and south central United States. Refer to Appendix B for project location maps.

The proposed pipeline will be constructed of carbon steel and will be a nominal 6.625-inch outside diameter pipe. The pipe installed will have a nominal wall thickness of 0.188 inches and manufactured to meet API Code 5L specification Grade B pipe. The maximum operating pressure (MOP) of the pipeline will be 1,440 psig.

The proposed pipeline will meet US Department of Transportation regulations, specifically the design criteria outlined in 49 CFR 195.100, constructed per 49 CFR 195.200 operated and maintained per 49 CFR 195.400.

4.6.3 TRAINING AND UTILIZATION OF AVAILABLE LABOR IN THIS STATE FOR THE GENERAL AND SPECIALIZED SKILLS REQUIRED

Pipeline construction is a specialized niche construction market and the labor force needed to build the Project will be primarily comprised of a non-local workforce. The primary contractor will be a non-local contractor, supplying specialized skilled labor. ONEOK will draw upon the local labor force to supply general laborers. The workforce is anticipated to reach a peak of approximately 100 personnel, of which up to 10 percent could be drawn upon locally.

4.6.4 ECONOMIES OF CONSTRUCTION AND OPERATION

ONEOK will invest approximately $6 million in North Dakota to develop this Project, generating approximately $90,000 of additional ad valorem tax revenues annually. Once constructed and in-service, the continued costs of maintenance and operation of the proposed pipeline are minimal. While the Targa Pipeline itself will not generate any direct tariff revenues, it is estimated that the gross NGL product value produced at the Plant and transported through the Project will be in excess of $100 million annually, generating significant producer, royalty and state tax revenues in the most efficient and minimally intrusive way possible.

4.6.5 USE OF CITIZEN COORDINATING COMMITTEES

ONEOK has established and maintained a good relationship with the local residents through its long-term regional presence operating various assets in the area. Through these relationships, ONEOK has maintained several grass roots communication channels to inform local residents regarding the developments associated with the Project. ONEOK will continue to maintain contact with local government officials. Through this contact, project related information will be exchanged and should concerns arise, ONEOK will work with officials to resolve those issues.

4.6.6 COMMITMENT OF A PORTION OF THE TRANSMITTED PRODUCT FOR USE IN THIS STATE

The proposed Project will interconnect with existing facilities. The products handled, transferred and shipped at these facilities are currently delivered to markets both in State and out of state.

4.6.7 LABOR RELATIONS

ONEOK maintains positive labor relations with its staff and contract work force and does not anticipate encountering any adverse labor relations on this Project. The labor market in the region is generally supportive of the oil and gas industry.

4.6.8 THE COORDINATION OF FACILITIES

ONEOK owns and operates the GCP. ORM, ONEOK's affiliate, owns and operates the Riverview Terminal. Coordination with the TLMP is anticipated to be seamless as the proposed Project will provide critical takeaway transport of NGLs produced at the Plant allowing the Plant to operate at full capacity.

4.6.9 MONITORING OF IMPACTS

ONEOK has established and maintained positive landowner and community relationships throughout the region through its open communication and commitment to corporate citizenship standards that are based on integrity. ONEOK will monitor landowner concerns through its right-of-way department and will respond to all reasonable requests. In a similar manner, ONEOK will monitor community concerns and will respond to all reasonable concerns brought to its attention by local community leaders. ONEOK will select a contractor for construction of the Project and will coordinate the oversight responsibilities for construction activities with this contractor

throughout the Project. Environmental responsibilities shall be coordinated in the same manner.

4.6.10 UTILIZATION OF EXISTING AND PROPOSED RIGHTS-OF-WAY AND CORRIDORS

ONEOK chose the preferred Project alignment in an effort to maximize the use of existing utility corridors. Approximately 57% of the Project would be co-located with other utilities. Refer to Appendix B for project maps depicting the portions of the Project, which are collocated with other utilities.

4.6.11 OTHER EXISTING OR PROPOSED TRANSMISSION FACILITIES

Appendix F contains ONEOK's 10-Year Plan, which contains details regarding existing and planned ONEOK assets.

SECTION 5: MITIGATIVE MEASURES

5.1 LOCATION

The selection of the proposed Corridor was a multi-disciplinary effort, which included socioeconomic, environmental, logistics, engineering, and financial considerations. The Corridor described in this application maximizes the use of established utility corridors, maximizes ONEOK's opportunity to access existing infrastructure and operating assets and minimizes landowner and environmental impacts.

Landowner considerations also factored into the Corridor selection. The proposed Corridor limits the number of potentially affected landowners while providing potential routing opportunities that would further minimize individual impacts to current land practices. All affected landowners will be compensated for project impacts through negotiated easement agreements and settlements for seasonal crop losses.

The proposed Corridor selection was also influenced by environmental studies that suggested the area lacked sensitive features such as critical wildlife habitat, major wetlands or waterbodies, or other unique environmental features. The proposed Corridor will allow routing options that will further minimize waterbody crossings and potentially avoid all the wetland crossings entirely. In addition to these routing considerations, compliance with environmental permits procured for the Project will serve further mitigate the impacts of construction. Standard pipeline construction techniques will involve temporary impacts, but long term or permanent impacts will be avoided through implementation of modern construction techniques, adherence to permit requirements, and avoidance of sensitive features identified during routing studies.

ONEOK and its affiliates own and operate several assets in the region. Planning and development of these assets are conducted in a manner that maximizes the benefits to the region's resources. The proposed Corridor and Route will allow ONEOK to draw upon existing pipeline and facility assets in the region. While siting is typically conducted on an individual, project specific basis, ONEOK's logistical planning includes consideration for potential inter-connects with existing infrastructure to gain and maximize operating functionality.

5.2 CONSTRUCTION

The proposed construction of the pipeline will be conducted in an orderly sequence designed to complete the project in the minimum amount of time required to safely prepare the site, install the pipeline and restore the areas disturbed by construction.

Construction is estimated to require a minimum of 60 days to complete. Construction techniques will be employed that minimize the area of ground disturbance, off site deposition of sediments and long-term impacts to agricultural productivity. Construction activities shall conform to all applicable permit stipulations; these

requirements are mandated by the agency and implemented by the project sponsor for minimizing impacts to the environment.

Restoration will immediately follow pipeline construction. Final grading will restore the original contours of the land. Disturbed areas will be prepared for re-seeding and restoration will be coordinated to meet landowner specifications.

5.3 OPERATION

Once put into service, the proposed Project will operate continuously, delivering NGLs from the TLMP to the GCP. Normal pipeline operations are imperceptible to the public, as they are silent, buried and therefore not visible, and require only minimal aboveground activity. Standard operating procedures will conform to applicable DOT requirements, which include regular pipeline monitoring and periodic inspection; additionally, routine maintenance of the right-of-way will likely be required to remain in compliance.

SECTION 6: LIST OF PREPARERS

James Akingbola

Operations Engineer
ONEOK Partners 100 West 5th Street, Tulsa, OK 74103

B.S Chemical Engineering – University of Oklahoma. Mr. Akingbola is an Operations Engineer with 6 years of pipeline integrity and pipeline construction experience. As an Operations Engineer, Mr. Akingbola has managed several pipeline projects for ONEOK Partners Large Projects group. He also serves as project manager for the proposed pipeline project.

William McCarthy, C.W.B.

Senior Environmental Compliance Analyst
E3 Environmental, LLC, 871 West Jefferson Avenue, St. Paul, MN 55102

M.S. Wildlife Biology, University of Minnesota – Twin Cities; and B.S. Wildlife Biology, Michigan State University. Mr. McCarthy is an environmental compliance analyst with 15 years of environmental consulting experience working with various energy assets and regulatory agencies. As a compliance analyst, he has managed the environmental requirements for facility siting, pipeline routing, federal licensing and various federal, state and local permits. Mr. McCarthy is a certified wildlife biologist, in this role conducts, and coordinates field studies, agency consultations, mitigation and avoidance plans.

Katie Schmidt, EIT

Environmental Engineer and Senior Consultant
E3 Environmental, LLC, 871 West Jefferson Avenue, St. Paul, MN 55102

B.S. Civil Engineering with an emphasis in Environmental Engineering-Iowa State University. Ms. Schmidt is a Senior Environmental Consultant with 8 years of experience working with various energy assets and regulatory agencies. As a consultant, she has managed multiple pipeline projects supporting clients through the construction permitting and siting processes, which included coordination with various federal, state and local agencies.

Lindsey Danielson
GIS Analyst
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

Graduate Certificate in Geographic Information Science, St. Mary's University of Minnesota; B.S. Geoscience: Geology, Winona State University. Ms. Danielson is also working toward a M.S. in Geographic Information Science at St. Mary's University of Minnesota with concentrations in Homeland Security/Emergency Management as well as Natural Resource Management. Ms. Danielson has almost 3 years of professional experience creating and editing data from various sources and formats. She specializes in advanced cartography, data management and spatial analysis.

Dan Woodward, RPA
Senior Archaeologist
E3 Environmental, LLC, 871 Jefferson Ave St Paul, MN 55102

M.A. Anthropology (archaeology focus), California State University -- Fullerton; and B.A. History, University of Florida. Mr. Woodward is a secretary of the interior qualified archaeologist with 15 years of environmental consulting experience working with various energy assets and regulatory agencies. As a senior archaeologist, he has overseen all phases of archaeological fieldwork from class I record searches and class III intensive surveys to detailed excavations and archaeological damage assessments. He has authored dozens of cultural resource technical reports fulfilling NHPA and NEPA cultural resource requirements. Mr. Woodward has also coordinated with multiple Native American groups and has met with interested Tribal representatives in the field to address project concerns. Mr. Woodward has performed historic building analysis and authored built-environment technical reports. Mr. Woodward has also assisted with extensive paleontological fieldwork including paleontological surveys, monitoring, and salvage activities.

North Dakota Public Service Commission

Application for Route Permit

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Prepared by:
E3 Environmental, L.L.C.

May 2014

ONEOK
BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
Enhancing Execution with Experience

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APPENDICES:

INTRODUCTION

ONEOK Bakken Pipeline, L.L.C. (ONEOK) a wholly owned subsidiary of ONEOK Partners, L.P., owns and operates natural gas liquids (NGLs) assets in North Dakota. ONEOK is planning the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile, steel, 6-inch diameter NGL pipeline that will originate at the Targa Resources LLC's Little Missouri Plant (TLMP or Plant) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's existing Garden Creek Pipeline (GCP) south of Arnegard, North Dakota. The GCP originates at the ONEOK Rockies Midstream, L.L.C. (ORM) Garden Creek Gas Plants near Watford City and proceeds generally west and south through McKenzie County. The pipeline crosses the state line into Montana where it can deliver into the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

ONEOK submits to the North Dakota Public Service Commission (PSC) a single consolidated application for a Certificate of Corridor Compatibility and Route Permit for the Project.

The application provides the requisite information as stipulated by:

- North Dakota Century Code, Energy Conversion and Transmission Facility Siting Act, Chapter 49-22-08.1 and,
- North Dakota Administrative Code, Chapter 69-06-05, Transmission Facility Permit.

SECTION 1: DESCRIPTION

1.1 TYPE OF TRANSMISSION FACILITY

The Project is a Y-grade NGL transmission pipeline. The steel pipeline will meet U.S. Department of Transportation (DOT) regulations, specifically the design, construction, operation, and maintenance criteria outlined in 49 CFR 195.

The purpose of this Project is to transport Y-grade NGLs (a mixture of ethane, propane, butanes, iso-butane mix , pentanes and natural gasoline) produced at the TLMP to ONEOK's GCP for transport to facilities in the Mid-Continent and Gulf Coast for additional processing prior to distribution to market hubs/centers.

1.2 LENGTH, SIZE AND DESIGN OF PIPELINE FACILITY

1.2.1 LENGTH OF FACILITY

The proposed Project is approximately 10.6 miles in length.

1.2.2 PIPE SIZE

The Project pipeline specifications are detailed below:

- 6-inch Nominal Diameter Steel Pipe
- 6.25-inch Outside Diameter Steel Pipe
- API 5L GR B FBE/ARO Coated ERW pipe.
- Nominal Wall Thickness of 0.188 inch.

1.2.3 OPERATING PRESSURE AND THROUGHPUT

The Project has been designed with the following design parameters listed below:

- Maximum Operating Pressure: 1,440 pounds per square inch gauge (psig).
- Maximum Throughput: 290 gallons per minute (gpm) or approximately 10,000 barrels per day (bpd)
- Maximum Temperature: 100 degrees F

1.3 ABOVEGROUND FACILITIES

The proposed pipeline would include a meter skid for measurement and custody transfer at TLMP, a pig launcher at TLMP and a pig receiver at the connection to GCP. The pig launcher and receiver enable in-line inspection of the pipeline for integrity management per DOT requirements and ONEOK standards. Please see Appendix A for engineering documents.

1.4 WIDTH OF RIGHT-OF-WAY

The Project will be constructed utilizing a typical 75-foot construction right-of-way (ROW). ONEOK maintains a typical 50-foot permanent ROW along the entire length of the pipeline.

1.5 LOCATION

The Project will be located in McKenzie County, North Dakota, originating at the TLMP, moving generally west and north, terminating at ONEOK's GCP approximately 7 miles south of Arnegard, North Dakota. Please refer to maps provided in Appendix B.

1.6 PROJECT SCHEDULE

1.6.1 ROUTE PERMIT

ONEOK seeks a Route Permit on or before mid-September 2014.

1.6.2 CERTIFICATE OF CORRIDOR COMPATIBILITY

ONEOK seeks a Certificate of Corridor Compatibility on or before mid-September 2014.

1.6.3 CONSTRUCTION SCHEDULE

ONEOK plans to commence construction as early as October 1, 2014 with an estimated completion date of December 15, 2014. The proposed schedule is closely tied to increased gathering and processing at TLMP.

SECTION 2: ROUTE ANALYSIS AND ENVIRONMENTAL STUDIES

2.1 PIPELINE ROUTE

ONEOK has conducted a thorough analysis of the proposed Corridor as reported in the Application for a Certificate of Corridor Compatibility. This analysis was a broad based study of the proposed Corridor (a 1-mile corridor centered upon the proposed route, *i.e.,* one-half mile on either side of the proposed route). The purpose of this analysis was to confirm that the proposed pipeline routing was suitable and that it would cause minimal environmental impacts thus conforming to the PSC siting criteria.

In conjunction with these efforts, ONEOK studied routing alternatives and developed the proposed pipeline alignment (Route) which meets the Project's objectives while conforming to the PSC's transmission route siting requirements. In support of ONEOK's route selection, the desktop studies from the Corridor were refined and augmented with field studies along the entire length of the Project by trained natural and cultural resource specialists. The environmental survey corridor was a minimum of 250-feet centered on the proposed Route. Field crews performed these comprehensive natural and cultural resource surveys on April 24 and 25, May 7, and 15, 2014. The purpose of these field studies was two-fold: (1) to definitively identify any potential resource issues (*i.e.* wetlands, waterbodies, protected species, critical habitats or cultural resources) within the survey corridor; and (2) to provide the baseline field data necessary to prescribe alternative routing or mitigation as necessary to minimize environmental impacts. The results of these field surveys are discussed in the following sections, while the full Natural Resource Survey Report is contained in Appendix D. The Class I and Class III Cultural Resource Inventory Report can be found in Appendix E. Additionally, the proposed alignment reflects ONEOK's efforts to coordinate with affected landowners to address individual concerns during route development. Through this process, ONEOK successfully addressed and accommodated, as appropriate, individual landowner concerns or preferences as they related to the proposed alignment of the Project.

2.2 ROUTE ALTERNATIVES

Construction of the proposed Project will provide firm, reliable service for up to 10,000 barrels of NGLs per day and will provide a critical link between the TLMP and GCP. The products will be delivered to the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline. ONEOK identified and evaluated several project alternatives; however, none of these alternatives effectively satisfied the Project objective. These alternatives included:

- No-Action Alternative;
- Trucking Alternative; and
- Rail Alternative.

No Action Alternative:

A No Action Alternative would leave the region constrained by limited transport capacity for safe and reliable transmission of NGL products to markets. The TLMP, is currently a 20 MMcfd natural gas processing plant with an expansion underway to increase capacity to 40 MMcfd. Without adequate infrastructure to transport this influx in NGLs, the TLMP would have to flare off this additional product or operate the Plant at a reduced capacity. Overall, regional oil and gas production would continue to be constrained by the limited volume of product that could be shipped utilizing existing infrastructure, resulting in continued or increased flaring of natural gas and/or curtailment of crude oil production. This alternative is not desirable. For these reasons, ONEOK rejected a *No Action Alternative*.

Trucking Alternative:

A Trucking Alternative was reviewed and eliminated due to the volumes of NGLs that will be produced at the TLMP. The maximum daily capacity of the proposed Project would be equal to an estimated 10,000 barrels or 420,000 gallons of NGLs. The average load for an NGL truck is approximately 10,000 gallons per truck. Thus, it will require 42 trucks per day to be loaded at the TLMP, an average of 1.75 trucks every hour for 24 hours a day. Similarly, it would require these 42 trucks per day to be unloaded (trans-loaded) at the railcar facility terminal. This level of truck activity is not logistically feasible; as it would cause significant amounts of heavy vehicle traffic for the area residents' as well additional wear and tear on the infrastructure. Further, any disruption in the trucking capacity due to seasonal load restrictions on roads, inclement weather or road repairs would result in a Plant shutdown and flaring of gas production. This alternative is not desirable; therefore, ONEOK rejected a *Trucking Alternative*.

Rail Alternative:

A Rail Alternative was also evaluated as a surface transportation alternative. However, the lack of active railroad service within reasonable proximity to the TLMP limited the viability of this alternative. Upon further analysis, this alternative was determined not feasible due to the associated environmental impacts and financial, logistic and time constraints necessary to acquire land and construct the requisite rail infrastructure. This alternative would also require a third party rail operator. For these reasons, ONEOK rejected a *Rail Alternative*.

2.3 ENVIRONMENTAL SURVEY.

Field surveys were conducted of a minimum 250-foot wide survey corridor centered upon the proposed pipeline alignment. Initial natural resource and cultural resource surveys were conducted on April 24th and 25th of 2014. Subsequent natural resource and cultural resource surveys were conducted in May of 2014.

2.3.1 NOXIOUS WEEDS

"Noxious weed" is a general term used to describe fast-spreading, non-native plant species in a given area. Noxious weeds have adverse ecological and economic impacts due to their ability to outcompete native plant species for habitat and resources. No noxious weeds were identified within the survey corridor during field surveys. Appendix D contains the complete Natural Resource Survey Report.

2.3.2 TREE/SAPLING/SHRUB SURVEY

During field survey, crews performed a detailed tree/shrub inventory. This inventory recorded the pre-construction status of these resources, which will form the baseline for restoration and mitigation reconciliation. Based on this effort, fourteen (14) tree and shrub land areas were located within the survey corridor. In total 153 trees were identified within the 250-foot wide survey corridor, 15 of which were located within the 75-foot wide construction ROW. Please see Appendix D for the complete Natural Resource Survey Report and Section 4 for planned mitigation measures.

2.3.3 WETLAND AND WATERBODIES SURVEY

The survey corridor was inventoried for wetland and waterbody features (i.e., creek, pond, streams, rivers). Field crews identified features, characterized these features as a wetland or waterbody and recorded feature boundaries relative to the proposed Route to facilitate avoidance measures where practicable. Appendix D contains the Natural Resource Survey Report, which outlines the results of these field efforts.

2.3.3.1 WETLAND SURVEY

Field surveys identified and recorded seven (7) jurisdictional wetlands within the 250-foot survey corridor. ONEOK will implement appropriate construction mitigation measures at each of these features, which may include avoidance (e.g., workspace modification or horizontal directional drill) or use of construction mats and other best management practices to minimize impacts when working in or around wetlands. Please see Appendix B Project Maps, for the mapped location of each feature and Appendix D for the detailed Natural Resource Survey Report.

2.3.3.2 WATERBODIES SURVEY

Five (5) waterbodies that intersect the proposed Route were identified during field surveys. These include one (1) perennial stream (Cherry Creek), one (1) ephemeral stream, and three (3) intermittent streams. All five waterbodies are considered jurisdictional due to the presence of an ordinary high water mark (OHWM). Preliminary routing has considered these features and has avoided direct impacts where practicable. See Appendix B for the mapped location of each feature, Appendix D for the detailed Natural Resources Survey Report, and Section 4: Mitigative Measures of this application for the proposed mitigation measures.

2.3.4 WILDLIFE INVENTORY

Approximately 160 wildlife species are resident or seasonal visitors to the Project Area. These include common mammals (i.e., white-tailed deer, mule deer, raccoon and pronghorn antelope); various songbirds (i.e., western meadowlark, LeConte's sparrow, horned lark); raptors (i.e., bald eagle, golden eagle, red-tailed hawk, rough-legged hawk) and numerous other fauna. The proposed Route was inventoried for general wildlife species, state-listed plant and animal species of concern, and other significant ecological communities. No state-listed species or significant ecological communities were observed by field biologists during field surveys conducted. Please see Appendix D for the Natural Resource Survey Report.

2.3.4.1 FEDERALLY PROTECTED SPECIES SURVEY

The USFWS identifies and maintains a list of species and critical habitats that have been afforded protection by the ESA. The ESA provides a program for the conservation of threatened and endangered plants and animals and the critical habitats.

The proposed Route was inventoried for federally listed species' and their critical habitat. No threatened or endangered species were observed by field biologists during field surveys. Please see Appendix D for the Natural Resource Survey Report. A summary of this report is provided below.

Whooping crane: The Aransas Wood Buffalo Population of Whooping Cranes engages in semi-annual migration through North Dakota. This flock breeds in the Wood Buffalo National Park in Alberta and Northwest Territories, Canada, and winters in the Aransas National Wildlife Refuge in Texas. North Dakota provides migratory habitat for the species, providing roosting and feeding opportunities during migration. During migration, the species is most closely associated with larger wetland complexes for roosting habitat, typically using adjacent uplands to forage. Suitable foraging habitat (i.e., cultivated cropland and wetlands) was observed within the survey corridor. Additionally the Project is located within the migratory corridor for the whooping crane. The proposed project may affect but is not likely to adversely affect the whooping crane. Please refer to Appendix C for related agency notifications, Appendix D for the detailed Natural Resource Survey Report, and Section 4: Mitigative Measures in this document for proposed mitigation measures.

Interior least tern: Suitable habitat for breeding and nesting does not occur in the survey corridor. Please refer to Appendix C for related agency correspondence, and Appendix D for the detailed Natural Resource Survey Report.

Pallid sturgeon: No suitable habitat is present in the project area.

Piping plover: Suitable habitat for breeding and nesting does not occur in the survey corridor. Please refer to Appendix C for related agency notifications, and Appendix D for the detailed Natural Resource Survey Report.

Bald Eagle: Field studies confirmed the absence of nesting or roosting habitat within 0.5 miles of the centerline of the survey corridor.

Golden Eagle: Field studies confirmed the absence of nesting or roosting habitat within 0.5 miles of the centerline of the survey corridor.

2.3.5 NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

The North Dakota State Historic Preservation Office (SHPO) is responsible for managing the historic and archaeological resources of the state; as such, the SHPO maintains records of all previously recorded cultural resources within the state. E3 commissioned SWCA Environmental Consultants to conduct a Class I of the Corridor. On April 21, 2014, SWCA conducted a Class I Cultural Resources Literature Search of records from the SHPO to identify previously completed cultural resource investigations and previously recorded cultural resources within the Corridor. Results of the investigation identified 22 previously recorded cultural sites within the Corridor.

The ensuing Class III Cultural Resource Inventory of the survey corridor was completed on April 24 and 25 and May 7 and 15th, 2014 by SWCA. During the inventory, SWCA personnel revisited 10 previously recorded cultural resources (32MZ480, 32MZ481, 32MZ1561, 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, 32MZX364 and 32MZX1213) and one newly recorded isolated find (32MZX1399). Each cultural resource is detailed in Appendix E in the Cultural Resource Report.

The previously recorded resources include a prehistoric cultural material scatter (32MZ480); an historic homestead and cultural material scatter site (32MZ481); an historic transmission line site (32MZ1561); four cultural material scatters of unknown cultural or temporal associations (32MZX261, 32MZX262, 32MZX263, and 32MZX266); two historic quarries/mines (32MZX362 and 32MZX364); and an Archaic projectile point isolated find (32MZX1213). The newly recorded isolated find is an historic engine block isolated find (32MZX1399). Of these resources, 32MZ480, 32MZ481, 32MZ1561, 32MZX1213 and 32MZX1399 are recommended not eligible for the National Register of Historic Places, and therefore no further work is necessary. Site leads 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, and 32MZX364 remain unevaluated for the National Register of Historic Places.

The Cultural Resource Report was submitted to the SHPO for review and concurrence on May 23, 2014, the SHPO's response is pending. A record of this communication can be found in Appendix C.

2.3.6 U.S. FISH AND WILDLIFE SERVICE MANAGED LANDS

On March 6, 2014, ONEOK requested a USFWS review of the Project, requesting information relating to the presence or absence of USFWS managed land within the survey corridor. The USFWS response is pending. Refer to Appendix C for a record of this coordination.

SECTION 3: NEED FOR FACILITY

3.1 ANALYSIS OF NEED BASED ON PRESENT AND PROJECTED DEMAND, INCLUDING SYSTEM STUDIES

Technological advances in drilling and completion associated with horizontal wells currently employed in the Bakken Shale and Three Forks formations of the Williston Basin has dramatically increased hydrocarbon production in the area. In addition to technological advances, drilling activity has increased measurably. In March of 2014, natural gas production in North Dakota was reported to reach 1040 MMcfd, with approximately 440 MMcfd of that statewide total produced in McKenzie County.

The increased production of oil and natural gas products continues to be constrained by the available infrastructure take away capacity. While near term demands associated with increased crude oil production can be readily addressed with the installation of tankage for temporary storage coupled with additional trucking or rail capacity to bring it to market, the associated natural gas production is typically lost to flaring until the required infrastructure is placed into service. Approximately 33% of natural gas produced was being flared (approximately 345 MMcfd), this is a decrease of approximately 3% per data released in March of 2014. The requisite infrastructure includes gathering systems and gas processing to refine the raw feedstock into commercial products. The function of the gas processing plant is to separate commercial grade methane (i.e.; natural gas) from NGLs such as butane, propane and ethane; and in turn prepare these products for delivery.

A major constraint in transporting NGLs and other hydrocarbons from North Dakota to processing/distribution centers and eventual end users in the United States is the lack of pipeline capacity. To relieve the pipeline constraints, several projects have been planned to address the growing volumes of natural gas, NGL, and other hydrocarbons. However, pipeline capacity is not expected to keep pace with production, leaving incremental volumes to find alternative transportation methods, primarily rail or other surface transportation alternatives.

Construction of the proposed Project will provide firm, reliable service for up to 10,000 barrels of NGLs per day and will provide a critical link between the TLMP and GCP. The products will be delivered to the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

SECTION 4: SITING CRITERIA ANALYSIS

4.1 FACTORS TO BE CONSIDERED IN EVALUATING APPLICATIONS AND DESIGNATIONS OF SITES, CORRIDORS AND ROUTES (NDCC 49-22-09)

4.1.1 AVAILABLE RESEARCH AND INVESTIGATION RELATING TO THE EFFECTS OF THE LOCATION, CONSTRUCTION, AND OPERATION OF THE PROPOSED FACILITY ON PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES AND THE ENVIRONMENT:

The proposed Project is designed to provide delivery throughput from the TLMP to the mainline transmission grid from which the NGL will be distributed to processing and market hubs nationwide. As such, all routing was anchored from the TLMP to potential destinations. ONEOK owns and operates the GCP, an existing transmission line that currently handles NGL products produced in the region. The GCP was determined to be the preferred destination for TLMP products due its capacity to handle NGL products and provide greater access to more markets, as well as its proximity to the TLMP.

Route planning between the TLMP and the GCP identified and evaluated several options for routing this Project. These studies were designed to define a preferred route that achieves project objectives, is technologically and economically feasible to construct, and minimizes impacts on landowners and the environment. The key logistical considerations included the location of the TLMP, identification of existing utility corridors for collocation, and acquisition of pipeline rights-of-way (ROW) from area landowners. Approximately 57% of the proposed Project will be collocated with other existing utilities.

Field studies were conducted to identify environmental, biological and cultural resources throughout the survey corridor; the results of this effort are discussed in Section 2 of this document, and full reports are provided in Appendices D and E. The possible effects on the public health and welfare are addressed in the subsequent sections.

4.1.2 THE EFFECTS OF NEW ENERGY CONVERSION AND TRANSMISSION TECHNOLOGIES AND SYSTEMS DESIGNED TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS:

The Project does not include energy conversion or transmission technologies/systems that are specifically designed to minimize adverse environmental impacts. The proposed project will have the beneficial effect on local air quality by reducing the amount of flared hydrocarbons by the amount equal to the capacity of the processing plants and transmission pipeline.

The Project will be constructed in compliance with environmental permits; the conditions of these permits are designed to minimize adverse environmental impacts. Refer to Section 5 of this document for a full description of the mitigation measures

ONEOK has planned to minimize impacts resulting from the Project's location, construction and operation.

4.1.3 ADVERSE DIRECT AND INDIRECT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSED SITE OR ROUTE BE DESIGNATED:

Unavoidable adverse direct and indirect environmental effects will be temporary and will be minimized through compliance with environmental permits. The potential impacts to resources including vegetation, wildlife, agricultural operations, transportation and noise levels associated with construction as discussed in the sections below. ONEOK will mitigate these temporary impacts to the maximum extent possible.

The Project will be constructed in compliance with environmental permits; the conditions of these permits are designed to minimize adverse environmental impacts. Refer to Section 5 for a full description of the mitigative measures planned to minimize impacts resulting from the Project's location, construction and operation

4.1.4 ALTERNATIVES TO THE PROPOSED CORRIDOR OR ROUTE WHICH ARE DEVELOPED DURING THE HEARING PROCESS AND WHICH MINIMIZE ADVERSE EFFECTS:

ONEOK will fully participate in the hearing process and will address any alternatives developed during the hearing process, as applicable.

4.1.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF NATURAL RESOURCES SHOULD THE PROPOSED CORRIDOR AND ROUTE BE DESIGNATED:

ONEOK is not aware of any irreversible or irretrievable commitments of natural resources that would result from the requested approvals.

4.1.6 DIRECT AND INDIRECT ECONOMIC IMPACTS OF THE PROPOSED FACILITY:

ONEOK will invest approximately $6 million in North Dakota to develop this Project, generating approximately $90,000 of additional ad valorem tax revenues annually. Once constructed and in-service, the continued costs of maintenance and operation of the proposed pipeline are minimal. While the Targa Pipeline itself will not generate any direct tariff revenues, it is estimated the gross NGL product value produced at the Plants and transported through the Project will be in excess of $100 million annually, generating significant producer, royalty and state tax revenues in the most efficient and minimally intrusive way possible.

4.1.7 EXISTING PLANS OF THE STATE, LOCAL GOVERNMENT, AND PRIVATE ENTITIES FOR OTHER DEVELOPMENTS AT OR IN THE VICINITY OF THE PROPOSED ROUTE:

Through ONEOK's long-term regional presence, ONEOK has established and maintains a good relationship with the local residents. Through these relationships, ONEOK has maintained several grass roots communication channels to inform local residents regarding the developments associated with the Project. ONEOK will continue to maintain contact with local government officials. Through this contact, project related information will be exchanged and should concerns arise, ONEOK will work with officials to resolve those issues.

4.1.8 THE EFFECT OF THE PROPOSED ROUTE ON EXISTING SCENIC AREAS, HISTORIC SITES AND STRUCTURES AND PALEONTOLOGICAL OR ARCHAEOLOGICAL SITES:

ONEOK commissioned Class I and Class III cultural resource inventories. ONEOK developed mitigation plans for registered or eligible sites that encroach on the proposed construction corridor. The proposed mitigation is detailed in Section 5 of this document. All related correspondence can be found in Appendix C and supporting documentation of field studies can be found in Appendix E.

Project-specific coordination with various federal, state and local agencies did not identify any scenic areas within the Route. Refer to Appendix C for a record of these notifications.

4.1.9 THE EFFECT OF THE PROPOSED ROUTE ON AREAS WHICH ARE UNIQUE BECAUSE OF BIOLOGICAL WEALTH OR BECAUSE THEY ARE HABITATS FOR RARE AND ENDANGERED SPECIES:

The proposed Route is not anticipated to result in permanent detrimental impact to the environment. Please see Section 2 for comprehensive discussion of ONEOK's effort to identify sensitive environmental resources within the proposed Route and Section 5 for a comprehensive discussion of proposed mitigation. ONEOK has worked with agencies to develop a route that avoids or minimizes environmental impacts. Provided the mitigation plans are fully implemented and environmental permit conditions are executed, the Project will not result in any impact to listed or sensitive species or their habitats. Please see Appendix C for complete federal and state agency coordination. Appendix D contains the Natural Resource Survey Report.

4.1.10 PROBLEMS RAISED BY FEDERAL AGENCIES, OTHER STATE AGENCIES AND LOCAL ENTITIES:

ONEOK provided Project specific notification to various federal, state and local agencies; through this notification process, these agencies have the opportunity to identify possible sensitive environmental resources within the Corridor and any related agency concerns. A summary of these concerns is below, a complete record of these communications can be found in Appendix C. mitigation measures to address these concerns are discussed in Section 5 of this document.

- NDPRD: The Department recommend that the Project be accomplished with minimal impacts and that measures should be implemented to ensure that critical habitats not be disturbed and that impacted areas be revegetated with native species.
- NDGFD: The Department's primary concern is with the disturbance to native prairie and wooded draws associated with construction of the pipeline and associated access roads. Avoidance of these areas is recommended, if avoidance cannot be achieved areas should be reclaimed to pre-project conditions. Additionally Cherry Creek is a Classified fishery, as such directional boring is recommended to protect the resource. If directional drilling is not feasible construction should not occur between April 15th and June 1st and controls to minimize erosion and sediment should be implemented.

ONEOK incorporated this feedback into the Route selection process, and as appropriate, into field survey protocols. If field studies confirmed the presence of these items, ONEOK refined the proposed alignment or developed mitigation strategies to avoid or minimize direct impacts. Further discussion on agency coordination can be found in the Section 2 of the Certificate of Corridor Compatibility application and discussions of avoidance and mitigation measures are found in Section 5 of this document. Please see Appendix C for complete federal and state agency communications. Detailed survey results can be found in Appendix D and E.

4.2 EXCLUSION AREAS (NAC 69-06-08-02.1)

Exclusion areas are geographical areas that should be excluded in the consideration of a route for a transmission facility. The following table and text identify and discuss exclusion areas identified along the proposed Route.

Exclusion Area	Crossed by Proposed Route
Federal	
National Parks or Memorial Parks	No
Historic Sites or Landmarks	No
Natural Landmarks or Monuments	No
Wilderness Areas	No
State	
Historic Sites, Monuments, or Historical Markers;	No
Archaeological Sites	Yes
Parks	No
Nature Preserves	No
County	
Parks	No
Recreation Areas	No

Exclusion Area	Crossed by Proposed Route
Municipal Parks	No
Other	
Areas Critical to the Life Stages of Threatened or Endangered Animal or Plant Species	No
Areas where Animal or Plant Species that are Unique or Rare to this State would be Irreversibly Damaged	No
Areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	No
Areas within 30 feet on either side of a direct line between (ICBM) launch or launch control facilities to avoid microwave interference.	No

4.2.1 FEDERAL RESOURCE REVIEW

ONEOK provided project specific notification to various federal and state agencies and conducted a comprehensive review of published information. ONEOK has concluded that no national parks, historic sites, natural landmarks or wilderness areas will be crossed or affected by the Project. Please refer to Appendix C for related agency correspondence.

A Class I and a subsequent Class III cultural resource inventory of the Corridor and Route. These efforts confirmed the absence of historic districts or landmarks of federal interest. ONEOK's final routing will avoid impacts to cultural resource sites recorded during field surveys. Refer to Section 2 and Appendix C of this document for a comprehensive discussion of agency coordination, and Appendix E for the Cultural Resources Report.

4.2.2 STATE RESOURCE REVIEW

ONEOK confirmed through agency coordination, review of publicly available information and field studies, the absence of state parks, historic sites, monuments, historical markers, archaeological sites, or nature preserves within the proposed Route. Please refer to Section 2 of this document for a comprehensive discussion of ONEOK's agency notifications and Appendix C for a record of agency correspondence.

ONEOK commissioned a Class I Cultural Resource Inventory of the proposed Corridor and augmented that effort with a Class III Cultural Resource Inventory of the Route. The results of the Class III effort are summarized in Section 2.3.5 of this document. Please see Appendix C for a record of agency coordination and Appendix E for the Cultural Resource Survey Report.

4.2.3 COUNTY RESOURCE REVIEW

ONEOK confirmed through agency coordination, review of publicly available information and field studies the absence of county parks, recreation areas, municipal parks or parks owned by other subdivisions of government bodies within the proposed Route. Please refer to Section 2 of this document for a comprehensive discussion of ONEOK's agency coordination and Appendix C for copies of this correspondence.

4.2.4 AREAS CRITICAL TO THE LIFE STAGES OF THREATENED AND ENDANGERED ANIMAL OR PLANT SPECIES

ONEOK commissioned natural resource surveys of the survey corridor. The scope of the surveys included documentation of the presence or absence of federally listed and state listed species of concern or evidence of suitable habitats for these species. Emphasis was placed on those species that agencies indicated as having the potential to occur within the Corridor and therefore, the Route. The results of these field efforts are detailed in Section 2.3 and planned mitigative measures are discussed in Section 5 of this document. Appendix D contains the complete Natural Resource Survey Report.

4.2.5 AREAS WHERE ANIMAL OR PLANT SPECIES THAT ARE UNIQUE OR RARE TO THIS STATE WOULD BE IRREVERSIBLY DAMAGED

Based upon agency coordination and subsequent field surveys, the proposed project will not result in irreversible impacts that are detrimental to sensitive plant and animal species or their habitats. The implementation of the proposed mitigation plans and full compliance with environmental permits will mitigate the potential for irreversible damage.

4.2.6 AREAS WITHIN 1,200 FEET OF THE GEOGRAPHIC CENTER OF AN ICBM LAUNCH OR LAUNCH CONTROL FACILITY

ONEOK conducted a review of publicly available information and concluded there are no ICBM launch or launch control facilities within 1,200 feet of the Route.

4.2.7 AREAS WITHIN 30 FEET ON EITHER SIDE OF A DIRECT LINE BETWEEN ICBM LAUNCH OR LAUNCH CONTROL FACILITIES TO AVOID MICROWAVE INTERFERENCE

ONEOK conducted a review of publicly available information and concluded there are no ICBM launch or launch control facilities within 30-feet of the Route.

4.3 AVOIDANCE AREAS (NAC 69-06-08-02.2)

Avoidance areas are geographical areas that should not be considered in the routing of a transmission facility unless, under the circumstances, it is shown there is no reasonable alternative. The following table and text identify and discuss avoidance areas crossed by the proposed Route.

Avoidance Area	Crossed by Proposed Route
Federal	
Historic Districts	No
Wildlife Areas	No
Wild, Scenic or Recreational Rivers	No
Wildlife Refuges	No
Grasslands	No
State	
Wild, Scenic or Recreational Rivers	No
Game Refuges or Game Management Areas	No
Forests or Forest Management Lands	No
Grasslands	No
Other	
Historic Resources not meeting Exclusion Areas criteria	No
Areas of Known Geologic Instability	No
Areas within 500-Feet of a Residence, School, or Place of Business	Yes
Reservoirs and Municipal Water Supplies	No
Water Sources for Organized Rural Water Districts	Yes
Irrigated Land (not applicable to underground facilities)	N/A
Areas of Recreational Significance which are not designated as Exclusion Areas	No

4.3.1 FEDERAL RESOURCE REVIEW

ONEOK conducted a comprehensive review of publicly available information and field studies of the survey corridor. This review indicated the absence of designated or registered historic districts, refuges, grasslands, and wild, scenic or recreational rivers in the survey corridor.

4.3.2 STATE RESOURCE REVIEW

ONEOK conducted a review of publicly available resources and concluded no designated or registered state wild, scenic or recreational rivers, game refuges, game management

areas, management areas, forests, forest management lands, or grasslands are crossed by the survey corridor.

4.3.3 HISTORICAL RESOURCES NOT MEETING EXCLUSION AREA CRITERIA

ONEOK conducted a review of publicly available resources and concluded there are no historical resources within the survey corridor that meet the exclusion area criteria. Appendix E contains the complete Cultural Resource Survey Report.

4.3.4 AREAS OF KNOWN GEOLOGIC INSTABILITY

There are no known areas of geological instability within the proposed Route. North Dakota has not experienced an earthquake of sufficient magnitude to damage welded steel piping or structural steel in recorded history. Sink holes are known to occur in North Dakota but are more closely related to mining activities. No evidence of mining or sinkholes was identified. Finally, the potential for landslides was evaluated; earth movement of this nature is closely associated with areas of great topographic relief, high gradient slopes, recent deposits that have yet to reach a stable angle of repose, or where underground water movement may create a slurry of rock and mud resulting in subsidence. No locations along the proposed Route can be characterized as unstable or landslide-prone.

4.3.5 AREAS WITHIN 500-FEET OF A RESIDENCE, SCHOOL OR PLACE OF BUSINESS

ONEOK utilized aerial photography to identify structures located within 500 feet of the proposed pipeline alignment. Three (3) residences are located within 500 feet of the Project. ONEOK is obtaining landowner waivers from these residences and the executed waivers can be found in Appendix G.

4.3.6 RESERVOIRS AND MUNICIPAL WATER SUPPLIES

ONEOK confirmed the Route does not contain reservoirs or municipal source water protection areas for community water supply sources. While a number of wells were identified adjacent to the Route, these wells are used for either local domestic, stock, or irrigation purposes and none were located directly within the Route. The maps in Appendix B depict the location of these resources.

4.3.7 WATER SOURCES FOR ORGANIZED RURAL WATER DISTRICTS

The Route is located within the boundaries of the McKenzie County Rural Water Association. There are no known water sources used by the Association within the proposed Route. While a number of wells were identified adjacent to the Route, these wells are used for either local domestic, stock, or irrigation purposes and none were located directly within or near the 100-foot wide construction ROW. The maps in Appendix B depict the location of these resources.

4.3.8 IRRIGATED LAND

This criterion does not apply to underground transmission facilities; as such, it is not applicable to this project.

4.3.9 AREAS OF RECREATIONAL SIGNIFICANCE WHICH ARE NOT DESIGNATED AS EXCLUSION AREAS

ONEOK confirmed that the Route does not contain areas of recreational significance.

4.4 SELECTION CRITERIA (NAC 69-06-08-02.3)

The selection criteria require a study of environmental impacts and changes in land use that may result from the siting of the proposed Project. By avoiding ground-disturbing activities outside of ONEOK-owned facilities, ONEOK will avoid all negative effects with respect to the selection criteria.

4.4.1 AGRICULTURAL IMPACTS

Agricultural Production: The Project will temporarily affect approximately 96 acres of private land in North Dakota. The majority of the land crossed can be characterized, as either agricultural or natural vegetative cover. Once the construction is complete, the land will be restored to its pre-construction contours and land use. ONEOK will provide damage payments to landowners for crop loss resulting from Project construction.

Family Farms and Ranches: The Project will temporarily affect approximately 96 acres of private land in North Dakota. Once construction is complete, the land will be restored to its pre-construction contours and land use. ONEOK will negotiate easements with all affected landowners. The Project will have no permanent impacts to lifestyle or farm/ranch operations once construction is completed.

The location of pipeline markers is defined under 49 CFR 195 for pipelines. ONEOK will work with local landowners and county officials to ensure that pipeline markers are located where required but also in an acceptable location for these parties. These markers are to be placed in full view so that they are not accidentally damaged by or cause damage to landowner or county equipment.

Lands Suitable for Irrigation: This section is not applicable to buried pipelines (69-06-08-02.2h).

Surface Drainage: Standard pipeline construction techniques will not modify existing surface drainage patterns. Care will be taken throughout the construction process to minimize environmental impacts, including modification of drainage patterns. During restoration, those areas that were disturbed during construction will be restored, the local topography will be restored to its original contours, vegetation will be reestablished and impacts will be minimal and temporary. Best management practices will be implemented in accordance with the project-specific Stormwater Pollution Prevention Plan (SWPPP), which will comply with the NDDoH Construction Stormwater General Permit requirements.

Ground Water: Well data has been recorded by the State Water Commission for the Project area. Well data indicates that groundwater in upland areas is located more than 14 feet below the surface. Typical subsurface excavations associated with the Project

will not extend to more than 10 feet below the ground surface. At that depth, the Project will not intersect the groundwater table, nor will the Project alter recharge rates or the infiltration, permeability, or percolation of water into the groundwater reservoir. Additionally, construction will not affect the lateral movement and groundwater quality.

4.4.2 THE IMPACTS UPON OTHER RESOURCES

Noise-Sensitive Land Uses: The Project is located in a rural setting, effectively isolating it from the majority of sensitive receptors. Construction of the proposed Project would affect the local noise environment. The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually comprised of sounds emanating from natural and artificial sources. Construction could cause temporary increases in the ambient sound environment in the areas immediately surrounding active construction. Once constructed and in-service, normal pipeline operations are not audible.

Construction of the proposed Project will be conducted during typical working hours and is expected to cause temporary increases in ambient sound within and adjacent to the Project area. The use of heavy equipment or trucks will be the primary noise source during construction and excavation. The level of impact may vary by equipment type, duration of construction activity, and the distance between the noise source and the receptor.

Visual Effect on Adjacent Areas: There will be a total of two above ground facilities, one at each end of the pipeline. One pig receiver at the TLMP site and one pig receiver at the GCP tie in point. These facilities are typically enclosed with fences with locked gates to deter vandalism or accidental activation. Each location is clearly marked with a small placard that details ownership and contact information. The visible piping and equipment is maintained with a finished, white-painted surface. These features are common throughout the landscape and are not obtrusive. No other permanent aboveground features are to be installed for the Project.

Extractive and Storage Resources: This Project will not affect any extractive or storage resources.

Wetlands, Woodlands and Wooded Areas: ONEOK conducted a comprehensive desktop review of published data, including aerial photography and NWI data, to assess the presence or absence of wetlands, woodlands and wooded areas. The review of the proposed Corridor confirmed the presence of these resources. ONEOK commissioned field surveys to further identify and record the locations of these resources along the proposed Route. The results of these field studies will be used to determine a preferred alignment to avoid or minimize impacts to wetlands, woodlands and wooded areas. The proposed mitigation is detailed in Section 5 of this document and detailed survey results can be found in Appendix D.

Radio and Television Reception, and other Communication or Electronic Control Facilities: ONEOK does not anticipate that the Project will affect radio, television, or other electronic control facilities.

Human Health and Safety: ONEOK promotes a safe and healthy workplace during construction and operations of all its assets. A corporate policy that meets or exceeds federal and state laws, rules and regulations is enforced and adhered to by all regular and contract employees. ONEOK governs operations and construction activities with various safe work procedures designed to protect property, personnel and maintain regulatory compliance. The product transported is a cryogenic fluid, which will vaporize when exposed to normal atmospheric pressure. The product will contain no more than 4 ppm hydrogen sulfide and does not pose an exposure risk to environment nor humans; however, the product is flammable.

The design of the Project incorporates the use of valves at each pipeline terminus. The purpose of the valves is to allow for the isolation of a pipeline to facilitate maintenance in a safe and controlled manner. Additionally, in the event of an abnormal operating condition, valves can be closed as necessary to prevent an uncontrolled release of product. Finally, the operation of the pipeline will be monitored in accordance with DOT regulations

Animal Health and Safety: The wildlife currently inhabiting the Corridor is common and is generally mobile. The local wildlife inhabitants will not be displaced by the Project and no measurable impact to the viability of these populations will occur. ONEOK does not anticipate species of special concern to experience direct impacts due to construction or operation of the proposed Project.

Plant Life: The project will not result in the permanent loss of agricultural or pastureland. Construction impacts will be temporary and the restoration phase of the Project will return the fields to their preconstruction condition. No plant species of special concern will be impacted by the Project.

4.5 POLICY CRITERIA (NAC 69-06-08-02.4)

4.5.1 POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

ONEOK will comply with requirements contained in the Corridor Compatibility Certificate and Route Permit. ONEOK will conduct its activities with the objectives of providing a healthful and safe workplace for its employees, and preventing accidents and environmental incidents. All persons and firms providing service to ONEOK are required to conduct their work in compliance with environmental conditions, permit authorizations, and applicable regulations, and will be held accountable for their actions in that regard. ONEOK is committed to conducting its business in compliance with all applicable environmental laws and regulations. These laws, regulations and standards are designed to safeguard the environment, human health, wildlife and natural resources.

4.5.2 LOCATION AND DESIGN

This Project will connect two existing facilities, the TLMP and ONEOK's GCP. The GCP is part of a mainline transmission grid from which the NGL will be distributed to market hubs/centers in the south and south central United States. Refer to Appendix B for project location maps.

The proposed pipeline will be constructed of steel and will be a nominal 6.625-inch outside diameter pipe. The pipe installed will have a nominal wall thickness of 0.188 inches denoted as API Code 5L specification GR B pipeline pipe. The maximum operating pressure of the pipeline will be 1,440 psig.

The proposed pipeline will meet US Department of Transportation regulations, specifically the design, construction, operation, and maintenance criteria outlined in 49 CFR 195.

4.5.3 TRAINING AND UTILIZATION OF AVAILABLE LABOR IN THIS STATE FOR THE GENERAL AND SPECIALIZED SKILLS REQUIRED

Pipeline construction is a specialized niche construction market and the labor force needed to build the Project will be primarily comprised of a non-local workforce. The primary contractor will be a non-local contractor, supplying specialized skilled labor. ONEOK will draw upon the local labor force to supply general laborers. The workforce is anticipated to reach a peak of approximately 100 personnel, of which up to 10 percent could be drawn upon locally.

4.5.4 ECONOMIES OF CONSTRUCTION AND OPERATION

ONEOK will invest approximately $6 million in North Dakota to develop this Project, generating approximately $90,000 of additional ad valorem tax revenues annually. Once constructed and in-service, the continued costs of maintenance and operation of the proposed pipeline are minimal. While the Targa Pipeline itself will not generate any direct tariff revenues, it is estimated the gross NGL product value produced at the Plant and transported through the Project will be in excess of $100 million annually, generating significant producer, royalty and state tax revenues in the most efficient and minimally intrusive way possible.

4.5.5 USE OF CITIZEN COORDINATING COMMITTEES

ONEOK has established and maintained a good relationship with the local residents through its long-term regional presence operating various assets in the area. Through these relationships, ONEOK has maintained several grass roots communication channels to inform local residents regarding the developments associated with the Project. ONEOK will continue to maintain contact with local government officials. Through this contact, project related information will be exchanged and should concerns arise, ONEOK will work with officials to resolve those issues.

4.5.6 COMMITMENT OF A PORTION OF THE TRANSMITTED PRODUCT FOR USE IN THIS STATE

The proposed Project will interconnect with existing facilities. The products handled, transferred and shipped at these facilities are currently delivered to markets both in State and out of state.

4.5.7 LABOR RELATIONS

ONEOK maintains positive labor relations with its staff and contract work force and does not anticipate encountering any adverse labor relations on this Project. The labor market in the region is generally supportive of the oil and gas industry.

4.5.8 THE COORDINATION OF FACILITIES

ONEOK owns and operates the GCP. ORM, ONEOK's affiliate, owns and operates the Riverview Terminal. Coordination with the TLMP is anticipated to be seamless as the proposed Project will provide critical takeaway transport of NGLS produced at the Plant allowing the Plant to operate at full capacity.

4.5.9 MONITORING OF IMPACTS

ONEOK has established and maintained positive landowner and community relationships throughout the region through its open communication and commitment to corporate citizenship standards that are based on integrity. ONEOK will monitor landowner concerns through its right-of-way department and will respond to all reasonable requests. In a similar manner, ONEOK will monitor community concerns and will respond to all reasonable concerns brought to its attention by local community leaders. ONEOK will select a contractor for construction of the Project and will coordinate the oversight responsibilities for construction activities with this contractor throughout the Project. Environmental responsibilities will be coordinated in the same manner.

4.5.10 UTILIZATION OF EXISTING AND PROPOSED ROW AND CORRIDORS

ONEOK chose the preferred Project alignment in an effort to maximize the use of existing utility corridors. Approximately 57% of the Project would be co-located with other utilities.

4.5.11 OTHER EXISTING OR PROPOSED TRANSMISSION FACILITIES

Appendix F contains ONEOK's 10-Year Plan, which contains details regarding existing and planned ONEOK assets.

SECTION 5: MITIGATIVE MEASURES

5.1 LOCATION

The location of the proposed route is a function of location of the TLMP and suitable routing. ONEOK commissioned field surveys of the proposed Route to facilitate treatment of specific agency concerns expressed during consultations; inventory the resources throughout the survey corridor, define the location and boundaries of resources that intersect the proposed alignment; identify potential impacts to natural resources; and identify avoidance or other mitigation opportunities to further minimize the impacts of the Project.

Trees and shrubs: ONEOK will comply with the Commission's tree and shrub mitigation specifications. Field surveys included a pre-construction tree and shrub inventory. The clearing or removal of trees or shrubs will be done selectively, in a manner that minimizes the disturbance to woody vegetation and in compliance with the Commission's specifications. The replacement of trees and shrubs will be based upon actual impacts due to construction, shall meet the 2:1 ratio specified, and shall be fully documented.

Wetlands and Waterbodies: ONEOK's routing of the Project has minimized wetland and waterbody crossings to maximum extent practicable. The pipeline crossings of the wetland and waterbody features intersected by the Project will be done in a manner that conforms to U.S. Army Corps of Engineers Nationwide Permit No. 12 *Utility Line Activities* (NWP 12). The conditions associated with NWP 12 have been developed by the agency to minimize impacts to wetland and waterbody features associated with various utility line activities including pipeline construction. Generally, ONEOK will minimize workspace, install and maintain erosion control devices, segregate topsoil as necessary, restore original contours, and reseed disturbed areas when constructing through these features. The combination of routing to minimize crossings coupled with the implementation of construction techniques that conform to NWP #12 will mitigate Project impacts to these features.

Migratory Bird Treaty Act: The commonly observed timeframe for migration of protected species in North Dakota is February 15th to July 15th. Construction activities for the proposed Project are planned to occur from October-December, which is the preferred construction window to avoid impacts to breeding birds. Due to the timing of construction activities, impacts to species protected by the MBTA are not anticipated.

Whooping crane: The Whooping crane is federally listed as an endangered species. They are present in North Dakota on a semi-annual basis during the spring and fall during migration between their breeding grounds in Wood Buffalo National Park in Alberta and Northwest Territories, Canada, and their winter grounds in the Aransas National Wildlife Refuge in the Gulf of Mexico. The proposed Project is located within the migration corridor of the Whooping Crane. Whooping cranes will utilize a wide variety of habitats

during migration to satisfy roosting, resting and foraging needs. Field surveys identified potential foraging habitat in the survey corridor.

Scientists assume that the changing length of daylight coupled with seasonal weather patterns trigger the annual fall migration event. In North Dakota, the cranes will typically pass through the state during the fall migration occurring late August through mid-October with peak migration typically occurring in September. Construction activities for the proposed Project are scheduled to begin in October, which should largely mitigate impacts to this species. Additionally, to mitigate any adverse effects on migratory cranes, ONEOK will suspend heavy equipment operations when whooping crane(s) are found within 0.5 miles (line of sight) of the construction corridor. Suspended activities would resume in the absence of whooping cranes. Please see Appendix C for ONEOK's project notification to the USFWS.

Golden Eagle: Field surveys conducted in April and May of 2014 confirmed the absence of nests or nesting activities where suitable habitat was identified along the route. Construction activities for the proposed Project are planned to occur from October-December, which is the preferred construction window to avoid impacts to eagles.

Golden Eagle: Field surveys conducted in April and May of 2014 confirmed the absence of nests or nesting activities where suitable habitat was identified along the route. Construction activities for the proposed Project are planned to occur from October-December, which is the preferred construction window to avoid impacts to eagles.

Cultural Resources: On May 23, 2014, the Cultural Resource Survey Report was submitted to the SHPO requesting for concurrence of *No Significant Sites Affected* for the Project provided the mitigation measures outlined below are implemented. ONEOK will implement additional mitigation measures identified by the SHPO.

32MZX1399: This is an historic isolated find consisting of a General Motors V12 block engine with a maker's mark of GM D49 836010-3. The engine has an attached alternator, which is a Delco-Remy model number 738G, which dates to around the 1930s. By definition, isolated finds are considered to lack the historic integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended or mitigation required for this resource.

32MZ1561: This is the historic Williston to Charlie Creek segment of the WAPA electrical transmission line. This segment of the site is located immediately west of Highway 85 and runs parallel with the north/south-trending highway. The site consists of a series of wood H-frame pole structures that support three 115-kilovolt (kV) transmission lines and occasional ground wires. All previous recommendations deemed 32MZ1561 not eligible for the NRHP. SWCA recommends the site not eligible under Criterion A, B, C or D. Therefore, no further work is recommended or mitigation required for this site.

32MZ480: This is a prehistoric cultural material scatter consisting of faunal remains and chipped stone artifacts. The site is located in a harvested agricultural field on a low

interfluvial rise between two gullies. All surface materials were collected and six shovel tests were conducted, all of which yielded negative results for subsurface deposits. The site was recommended not eligible for the NRHP due to no intact subsurface cultural deposits. No additional work is recommended and no mitigation is required.

32MZ481: This is a homestead and cultural material scatter site consisting of two dugout depressions, an outhouse pit and a root cellar depression along with concentrations of historic cultural material consisting of bottles, bottle fragments, ceramics, metal scrap, window glass, metal cans, wood and a wagon tongue. The original recording left the site as unevaluated for the NRHP. Therefore, the site is recommended not eligible for the NRHP. No additional work is recommended and no mitigation is required.

Six previously recorded site leads consisting of four cultural material scatters of unknown cultural or temporal associations (32MZX261, 32MZX262, 32MZX263 and 32MZX266) and two historic quarries/mines (32MZX362 and 32MZX364) as well as an Archaic projectile point isolated find (32MZX1213) were within survey corridor. Although attempts were made to relocate the site leads and isolated find within the survey corridor, no cultural resources were identified at these locations within the survey corridor. The isolated find is not eligible for the NRHP and the site leads remain unevaluated for the NRHP.

5.2 CONSTRUCTION

The proposed construction of the pipeline will be conducted in an orderly sequence designed to complete the project in the minimum amount of time required to safely prepare the site, install the pipeline and restore the areas disturbed by construction.

Construction is estimated to require a minimum of 75 days to complete. Construction techniques will be employed that minimize the area of ground disturbance, off site deposition of sediments and long-term impacts to agricultural productivity. Construction activities will conform to all applicable permit stipulations; these requirements are mandated by the agency and implemented by the project sponsor for minimizing impacts to the environment.

Restoration will immediately follow pipeline construction. Final grading will restore the original contours of the land. Disturbed areas will be prepared for re-seeding and restoration will be coordinated to meet landowner specifications.

5.3 OPERATION

Once put into service, the proposed Project will operate continuously, delivering NGLs from the TLMP to the GCP. Normal pipeline operations are imperceptible to the public, as they are buried and therefore not visible, and require only minimal aboveground activity. Standard operating procedures will conform to applicable DOT requirements, which include regular pipeline monitoring and periodic inspection; additionally, routine maintenance of the right-of-way will likely be required to remain in compliance.

SECTION 6: DESCRIPTION OF RIGHT-OF-WAY PREPARATION, CONSTRUCTION AND RECLAMATION PROCEDURES

Construction will be an assembly-line process and will include the following general tasks: surveying and staking, clearing and grading, trenching, pipe stringing, pipe bending, welding, coating, hydrostatic testing, lowering in, tie-ins, backfilling, rough grading, and final restoration (*e.g.*, topsoil replacement, final grading, seeding and mulching, where required). The pipeline may be placed into service before final restoration has been completed in all areas.

At any location in the Project Area, construction activities will require approximately 75 days to complete from start to finish, except when weather-related delays affect the schedule. Construction activity at any location is not continual but occurs in distinct phases with several days or weeks between each phase. For example, clearing and grading may require 10 hours to progress for one mile along the pipeline right-of-way, but trenching may not follow in that area for several weeks. During the interim, activity in the area may be completely lacking or limited to occasional vehicular or pedestrian traffic.

Surveying and Staking: Prior to construction activities, ONEOK will stake the centerline and establish the boundaries of the approved work areas *(e.g.*, the construction right-of-way boundaries and temporary extra workspace areas), and flag the location of approved access roads and foreign utility lines. Wetland boundaries and other environmentally sensitive areas will also be marked or fenced for protection at this time.

Clearing and Grading: Prior to clearing, landowner fences will be braced and cut, and temporary gates and fences will be installed to control livestock where necessary. A clearing crew will clear the work area of vegetation and obstacles that may be encountered (*e.g.,* remaining trees, stumps, logs, brush, and rocks) in the work area.

The right-of-way will be graded, where necessary, to provide a reasonably level work surface and to segregate topsoil. Topsoil will be carefully removed and stored along the edge(s) of the right-of-way in a manner that allows for a haul road and trench line. The topsoil depth in the area is variable, but generally, the topsoil is between 2-9 inches deep with the deepest topsoil in valleys and the thinnest topsoil on the hillsides and hilltops. The topsoil depth and the layer removed will be determined in the field; upon completion of pipeline construction, the trench will be backfilled and topsoil will to be returned to the upper soil horizon. All disturbed areas will be graded to restore the original contours.

Where steep slopes or side slopes are encountered, the construction contractor may grade the slope to reduce the grade, or in areas of side slopes, two-tone the area to create level working surface. At these locations, excess spoil will be pushed to the side of the construction right-of-way, distributed over the working area and travel lane or stored in

alternative temporary workspace (ATWS.) This material will be returned to the original location and preconstruction contours reestablished during restoration.

Concurrent with grading, erosion and sediment control devices will be installed as required by the construction stormwater permit. Erosion and sediment control devices, which may include silt fences, straw wattles, straw bales and road access pads, will be installed where necessary to prevent soil and sediment from leaving the construction work area.

Trenching: The trench will be excavated by using track-mounted backhoes to a depth that provides sufficient cover over the pipeline after backfilling. The bottom width of the trench will be sufficient to accommodate the 6-inch-diameter pipeline. Typically, the trench will be excavated to a depth of about five feet deep to allow for a minimum of four feet of cover after construction. In cultivated areas, the depth of cover will be sufficient to be safely below the maximum tillage depth. Additional cover requirements may be applicable at public road crossings.

Trench spoil will be stored adjacent to but will not be mixed with topsoil on the non-working side of the right-of-way. In some cases, however, where sufficient space is lacking on the non-working side, trench spoil may be side cast on the travel lane and spread over the working side of the right-of-way.

Pipe Stringing, Bending, and Welding: Sections of externally coated pipe up to 60 feet long (*e.g.,* joints) will be transported over public roads to the right-of-way by truck and placed or "strung" along the right-of-way parallel to the trench in a continuous line. After the pipe sections are strung along the trench and before they are welded together, individual sections of the pipe may be bent, where necessary, so that the finished pipeline sections conform to the natural contours of the land. Typically, a track-mounted, hydraulic pipe-bending machine will be used. Where multiple or complex bends greater than what can be properly bent in the field are required, a factory made "fitting" will be used.

After the pipe sections are bent, the joints will be welded together into sections and placed on temporary supports. Welding will comply with requirements listed in Title 49 CFR Part 195 and API Standard 1104 *Welding of Pipelines and Related Facilities*. Each weld will be tested by using radiographic non-destructive examination (NDE) to ensure that no defective welds are present and that ONEOK's engineering standards are met. Welds that do not meet standards and specifications will be removed and/or repaired.

A third-party contractor certified in non-destructive inspection will be used and inspections will be performed as outlined in Title 49 CFR Part 195. After the welds are approved, a protective epoxy coating will be applied to the welded joints. The pipeline will be electronically and visually inspected for defects in the epoxy coating. Damage to or defects in the coating will be repaired prior to lowering-in the pipeline. Cathodic protection systems will also be directly bonded to the pipe at this time.

Lowering-in and Backfilling: The trench will be inspected for the presence of rocks and other debris that could damage the pipe or protective coating. If rocks or other obstructions that could impact the pipe are observed, these will be removed or the pipeline trench bottom will be padded with subsoil or sand prior to the pipeline lowered into the trench.

If the trench bottom is obscured by water, the trench will be dewatered. Where dewatering is required, ONEOK will pump water from the trench into well-vegetated upland areas or into sediment filtration/energy dissipation devices.

In areas of steep slopes, breakers consisting of sand bags or foam will be installed to prevent 'piping' from occurring along the pipe in the trench after the area is backfilled.

The trench will be backfilled using the native material removed and compacted; however, the trench may be slightly crowned to accommodate settling.

Hydrostatic Testing: ONEOK will hydrostatically test the pipeline following backfill. Hydrostatic testing shall conform to DOT standards and will establish the maximum operating pressure (MOP) for the pipeline when it is operational. Testing involves installation of test headers that control the pressure applied. Upon the completion of a successful pressure test, the test headers are removed. The test procedures are a function of pressure and time, once the desired test pressure has been achieved, the test section must hold the pressure for an 8-hour period, without a significant change in pressure. Once testing is completed, the test water is evacuated from the section; the line is dried, and prepared for commissioning. If the pipeline should be tested in multiple sections, the test water will be conserved and transferred to adjacent test sections. If the transfer of test water is not possible, ONEOK will procure discharge permit from the NDDOH and conform to the permit conditions, or capture and transport the water offsite for disposal.

Final Tie-in and Commissioning: Following a successful pressure test, test manifolds will be removed and the final pipeline tie-ins will be made. After final tie-ins are complete, and the tie-in welds have been inspected and the line is sufficiently dried, the pipeline will be commissioned. Commissioning involves activities to verify that equipment is properly installed and working, the controls and communications systems are functional, and that the pipeline is ready for service. Upon the completion of commissioning activities, the line will be purged of air and then loaded with product.

Cleanup and Restoration: Final cleanup will begin after backfilling as soon as weather and site conditions permit. During cleanup, construction debris remaining on the right-of-way will be collected and disposed of properly. Work areas will be graded and restored to preconstruction contours as closely as practical.

During restoration, segregated topsoil will be spread over the surface after final grading and permanent erosion controls will be installed. After permanent erosion control devices are installed, disturbed, non-cultivated areas will be seeded and slopes mulched

where required. Seed mixes will be approved in advanced by the landowner, and seeding will occur within the recommended seeding dates for the Project area.

For cultivated areas, no seed or mulch will be applied after the topsoil is replaced unless specifically requested by the landowner.

Every reasonable effort will be made to complete final cleanup (including final grading and installation of erosion control devices) in accordance with landowner requests or permit conditions within 21 days of backfilling.

Markers showing the location of the pipeline will be installed at fence and road crossings in order to identify the owner of the pipeline and convey emergency information in accordance with applicable governmental regulations, including DOT safety requirements. Special markers providing information and guidance to aerial patrol pilots will also be installed.

Waterbody Restoration: ONEOK will restore all waterbodies to their preconstruction contours and condition. Typical construction methods such as HDD and open-cut will be utilized as appropriate to cross waterbody features.

The horizontal directional drilling bore method involves setting a horizontal drill rig at one or both ends of the bore area. If the drill rig is located on or near the stream bank, erosion countermeasures will be installed to minimize bank disturbance and prevent further erosion during the drilling operation. The drill bores underneath the water body followed by a casing pipe, which provides drilling fluid to dissipate heat and remove soil spoils. The main pipe, known as the string pipe, will be installed inside the casing pipe once the bore has been completed. The string pipe will then be connected to the main pipeline.

Following installation of the casing and string pipes, the stream bank will be restored as necessary. ONEOK will compact the banks and install erosion and sediment control blankets on the banks after seeding to prevent scour and a discharge of sediment to the waterbody. In addition, sediment control barriers will be installed on the top of the banks to prevent sediment generated from the right-of-way from entering the waterbody. These barriers will remain in place until the right-of-way approaches are adequately vegetated.

ONEOK is proposing to cross-flowing waterbodies using methods that will minimize the length of time necessary to install the pipes and restore the stream bank, as well as to prevent sediment from entering the waterbody during construction to reduce the impacts on the waterbody. For all ephemeral, intermittent and perennial crossings, ONEOK will implement the following mitigative measures:

- Temporary extra workspaces will be located at least 50 feet from the edges of the waterbody, unless a 10-foot setback is identified for waterbodies located in actively cultivated agricultural fields.

- Temporary extra workspaces will be limited to the minimum size needed to construct the waterbody crossing.
- Riparian vegetation will be preserved by limiting clearing of vegetation between temporary extra workspace areas and waterbody edges;
- Temporary sediment and erosion control devices will be installed across the width of the right-of-way after clearing but before ground disturbance. These devices will remain in place throughout construction until stream banks and adjacent upland areas are stabilized.
- Trench spoil placement will be restricted to at least 10 feet from the water's edge on the right-of-way, or in temporary extra workspace areas.
- Waterbody buffers will be maintained (*e.g.,* temporary extra workspace area setbacks, refueling restrictions) in the field with signs until construction, related ground-disturbing activities are complete.
- The use of equipment operating in the waterbody will be limited to that needed to construct the crossing.
- Construction will be completed across minor waterbodies (*i.e.,* less than or equal to 10 feet wide) within a single 24-hour time period.
- Storage and refueling activities will be restricted near surface waters and procedures in the Spill Prevention, Control and Countermeasure (SPCC) Plan will be promptly implemented if a spill or leak occurs during construction.
- Bank stabilization and re-establishment of streambed and bank contours will be required after construction.
- A permanent slope breaker will be installed across the right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the water's edge.

Wetland Restoration: Following pipeline installation, the trench will be backfilled with the material excavated and, to the maximum extent possible, restored to pre-construction contours. Replacing the wetland soil and restoring pre-construction hydrology will promote the rapid re-establishment of hydrophytic vegetation.

ONEOK will also take precautionary measures outside wetland boundaries to prevent construction in uplands from having an impact on wetlands. These measures include:

- Installing sediment barriers across the entire construction right-of-way immediately upslope of the wetland boundary where necessary to prevent sediment flow into the wetlands.
- Installing sediment barriers along the edge of the construction work area where wetlands are adjacent to the construction right-of-way and the ground surface slopes toward the wetland.

Following backfilling, topsoil segregated before trenching will be returned to the area from which it was stripped. If timber mats or riprap were used, ONEOK will remove the supports from the wetland. No lime, mulch or fertilizer will be used in wetlands, but ONEOK will apply annual ryegrass in wetlands without standing water.

All materials used for equipment crossings in wetlands will be removed in their entirety following construction, and the area will be restored and stabilized according to the relevant permit authorizations.

Agricultural Land Restoration: Portions of the Project will involve construction through agricultural areas. These areas consist of active croplands and as range or pasture land used for livestock production. ONEOK will utilize the following general construction methods in agricultural areas, consistent with the requirements of landowners:

- Prior to construction, landowners will be contacted and irrigation facilities, and wells, waterlines and other and livestock watering systems will be located.
- Water flow will be maintained in supply systems unless shutoff is coordinated with the affected parties.
- Existing fences will be cut and braced along the right-of-way, and temporary gates and fences, if necessary, will be installed to control livestock and limit public access.
- On all active agricultural lands, which include fallow or rotated cropland, hayfields, improved pastures and rangeland, ONEOK will remove the topsoil removal and segregate the soil from subsoil.
- ONEOK will decompact the travel lane on the right-of-way if requested by the landowner.
- On all actively cultivated lands free of shallow bedrock, the trench would be excavated to sufficient depth to allow a minimum of 4 feet of soil cover between the top of the pipe and the final land surface after backfilling.
- Restoration and revegetation practices (*i.e.*, seeding) will comply with the requirements outlined in the landowner line list.
- ONEOK will not plant an annual cover crop on actively cultivated land unless requested by the landowner.
- Weed-free mulch will be used on steep slopes to control erosion unless the landowner requests that mulch not be applied. Mulch will be crimped into the soil.
- Earthen diversion berms will be constructed to reduce runoff on steep slopes only when the landowner approves.
- Erosion control fabric will not be used in rangeland without having landowner approval.
- Fences and gates will be replaced in accordance with landowner agreements.

- Private roads will be restored to equal pre-construction condition.
- ONEOK will respond promptly to landowner concerns following construction to mitigate areas of subsidence and erosion problems should they occur.

SECTION 7: EASEMENT, ACQUISITION, LANDOWNER NOTIFICATION AND EASEMENT COMPENSATION PLAN

7.1 LANDOWNER INFORMATION REGARDING EASEMENT ACQUISITION, AND NECESSARY EASEMENT CONDITIONS AND RESTRICTIONS

Once a preliminary route has been established, a title review is conducted of courthouse records to identifying the current landowner. ONEOK initiates contacts with affected landowners via telephone to be followed with personal visits and e-mail correspondence. Contact by surface mail may be used as a last resort if no other means of landowner contact is successful.

The refinement of the Route includes adjustments made per landowner request. ONEOK, at all times, negotiates in good faith and necessary easement conditions and restrictions are presented and discussed. All fee land easements for the proposed Route have been acquired at this time for the portion of the route located in the State of North Dakota.

7.2 COMPENSATION POLICY

ONEOK's practice for determining landowner compensation for easements is based on research of comparable fair market pricing and prior experience negotiating easements locally.

SECTION 8: LIST OF PREPARERS

James Akingbola

Operations Engineer
ONEOK Partners 100 West 5th Street, Tulsa, OK 74103

B.S Chemical Engineering – University of Oklahoma. Mr. Akingbola is an Operations Engineer with 6 years of pipeline integrity and pipeline construction experience. As an Operations Engineer, Mr. Akingbola has managed several pipeline projects for ONEOK Partners Large Projects group. He also serves as project manager for the proposed pipeline project.

William McCarthy, C.W.B.

Senior Environmental Compliance Analyst
E3 Environmental, LLC, 871 West Jefferson Avenue, St. Paul, MN 55102

M.S. Wildlife Biology, University of Minnesota – Twin Cities; and B.S. Wildlife Biology, Michigan State University. Mr. McCarthy is an environmental compliance analyst with 15 years of environmental consulting experience working with various energy assets and regulatory agencies. As a compliance analyst, he has managed the environmental requirements for facility siting, pipeline routing, federal licensing, and various federal, state and local permits. Mr. McCarthy is a certified wildlife biologist, in this role conducts, and coordinates field studies, agency consultations, mitigation and avoidance plans.

Katie Schmidt, EIT

Environmental Engineer and Senior Consultant
E3 Environmental, LLC, 871 West Jefferson Avenue, St. Paul, MN 55102

B.S. Civil Engineering with an emphasis in Environmental Engineering-Iowa State University. Ms. Schmidt is a Senior Environmental Consultant with 8 years of experience working with various energy assets and regulatory agencies. As a consultant, she has managed multiple pipeline projects supporting clients through the construction permitting and siting processes, which included coordination with various federal, state and local agencies.

Lindsey Danielson

GIS Analyst
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

Graduate Certificate in Geographic Information Science, St. Mary's University of Minnesota; B.S. Geoscience: Geology, Winona State University. Ms. Danielson is also working toward a M.S. in Geographic Information Science at St. Mary's University of Minnesota with concentrations in Homeland Security/Emergency Management as well as Natural Resource Management. Ms. Danielson has almost 3 years of professional experience creating and editing data from various sources and formats. She specializes in advanced cartography, data management and spatial analysis.

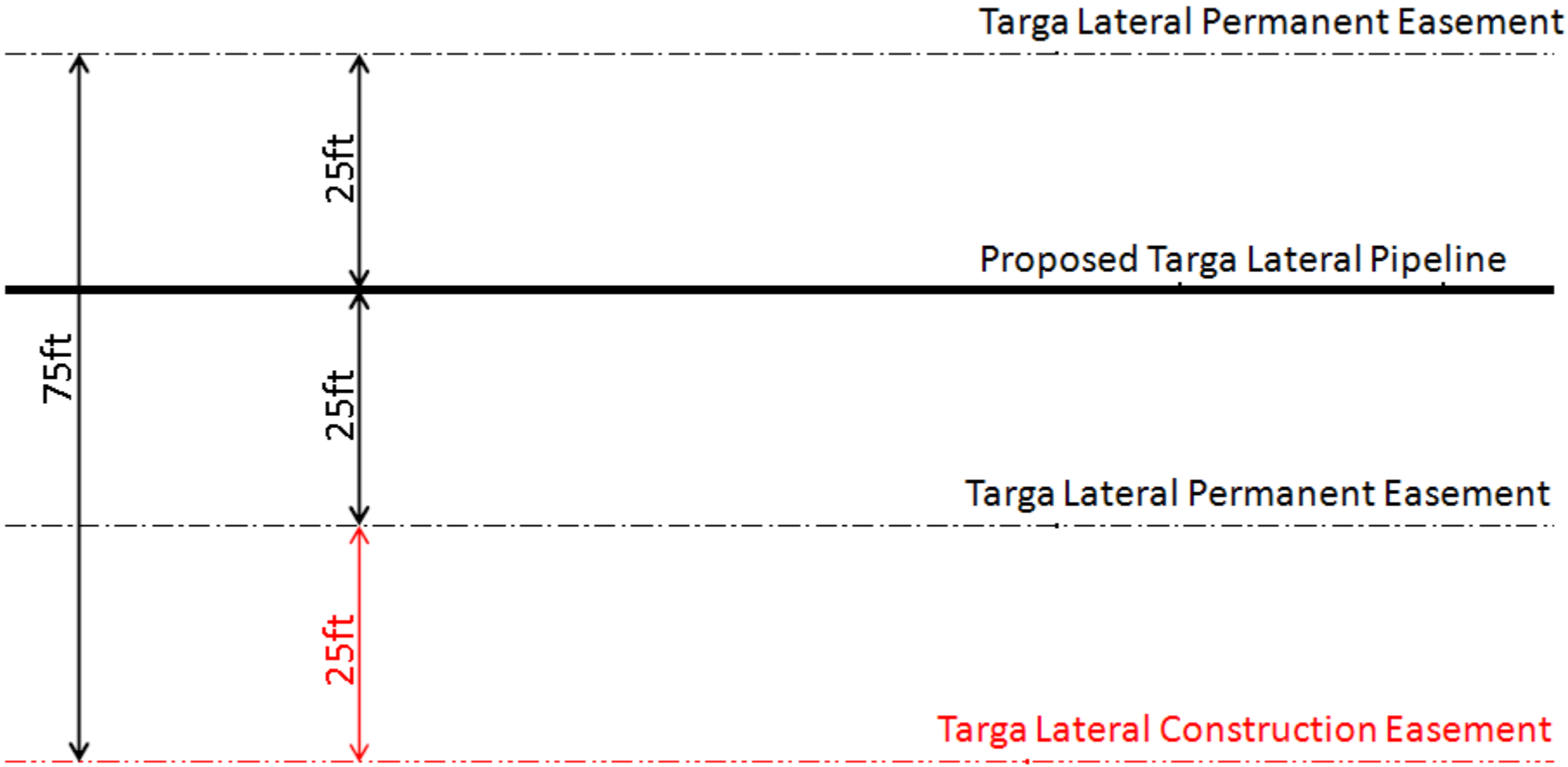
Dan Woodward, RPA
Senior Archaeologist
E3 Environmental, LLC, 871 Jefferson Ave St Paul, MN 55102

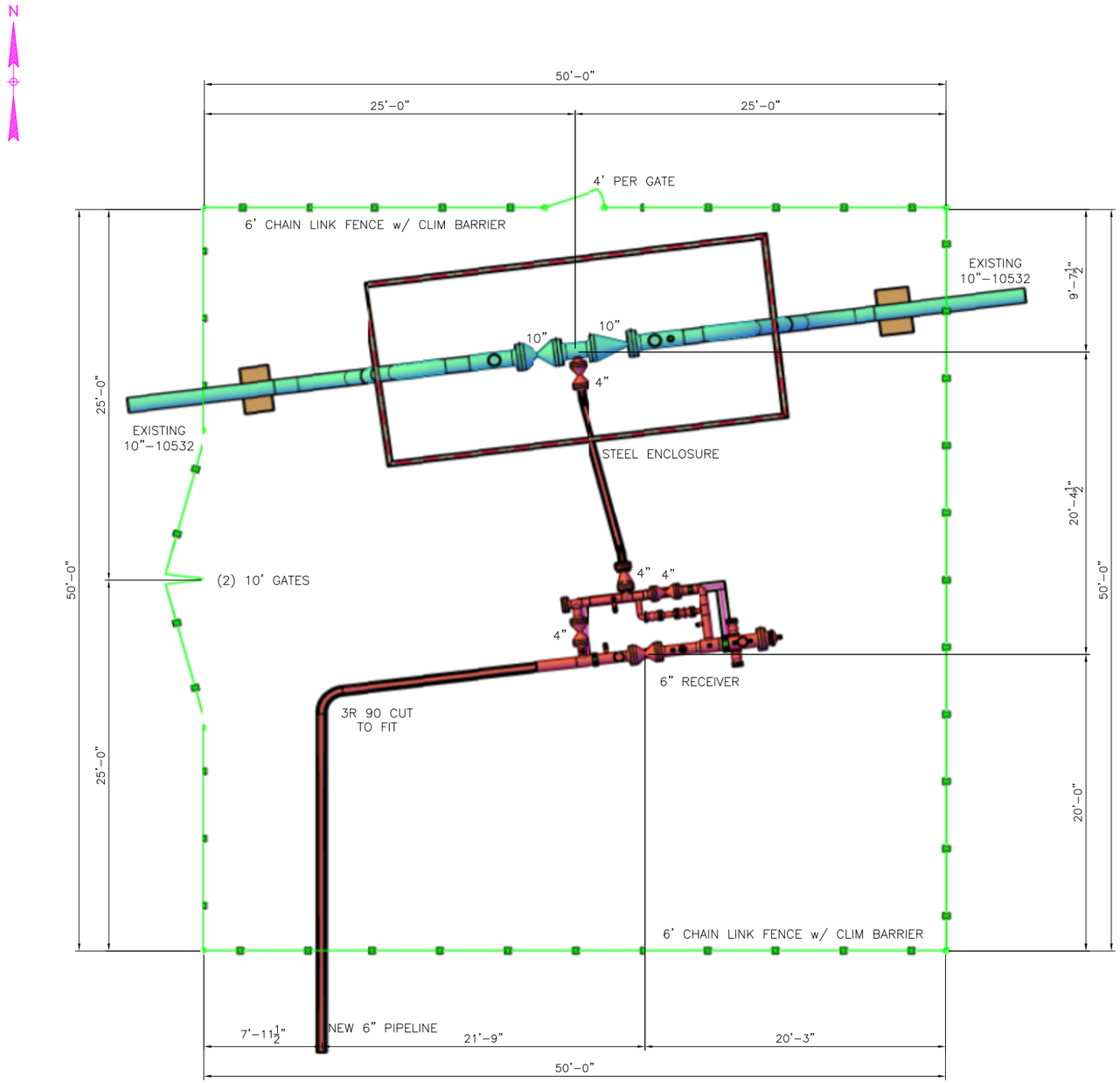
M.A. Anthropology (archaeology focus), California State University -- Fullerton; and B.A. History, University of Florida. Mr. Woodward is a secretary of the interior qualified archaeologist with 15 years of environmental consulting experience working with various energy assets and regulatory agencies. As a senior archaeologist, he has overseen all phases of archaeological fieldwork from class I record searches and class III intensive surveys to detailed excavations and archaeological damage assessments. He has authored dozens of cultural resource technical reports fulfilling NHPA and NEPA cultural resource requirements. Mr. Woodward has also coordinated with multiple Native American groups and has met with interested Tribal representatives in the field to address project concerns. Mr. Woodward has performed historic building analysis and authored built-environment technical reports. Mr. Woodward has also assisted with extensive paleontological fieldwork including paleontological surveys, monitoring, and salvage activities.

Appendix A

Engineering Documents

Attachment A





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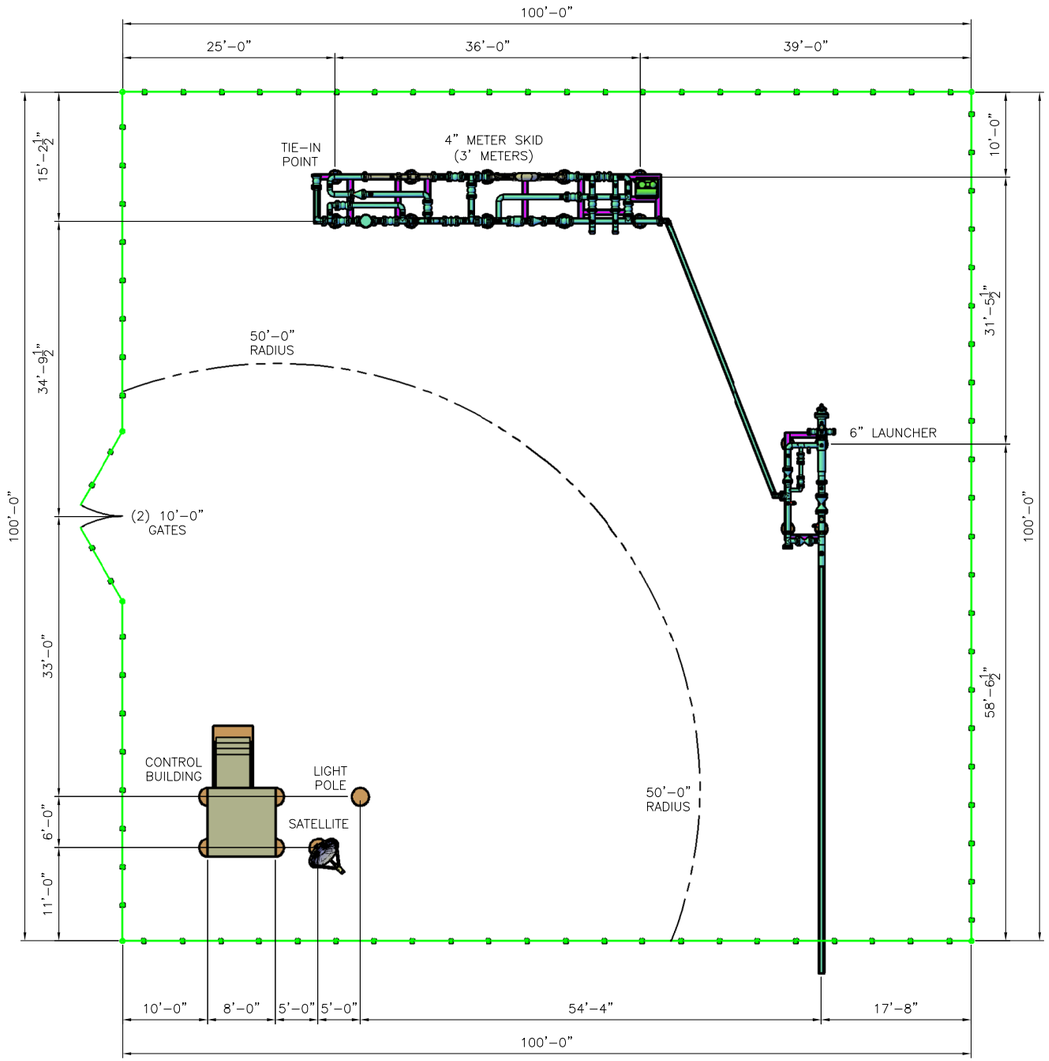
1					8				
2					9				
3					10				
4					11				
5					12				
6					13				
7					14				

DWG. NO.	REFERENCE DRAWINGS

ONEOK HYDROCARBON, L.P.
P.O. BOX 29
MEDFORD, OK 73759

TARGA GRASSLANDS JUNCTION SITE# 648
OVERALL SITE LAYOUT

DES.:	AFE#:	DATE: 5/15/14	
DR.:		DWG. NO.: 648-O-001	REV.
CH.:	SCALE: 1/4"=1'-0"		
AP.:	CAD#: 648-O-001		



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2					9				
3					10				
4					11				
5					12				
6					13				
7					14				

DWG. NO.	REFERENCE DRAWINGS

ONEOK HYDROCARBON, L.P.
P.O. BOX 29
MEDFORD, OK 73759

ONEOK TARGA SADDLE BUTTE SITE# 649
OVERALL SITE LAYOUT

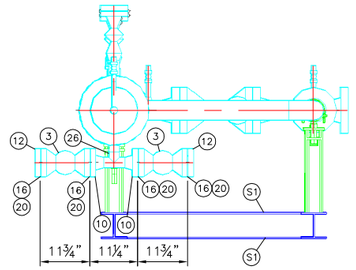
DES.:	AFE#:	DATE: 5/20/14	
DR.: MBC		DWG. NO.: 649–0–001	REV. –
CH.:	SCALE: 1/8"=1'		
AP.:	CAD#: 649–0–001		

STEEL BILL OF MATERIAL

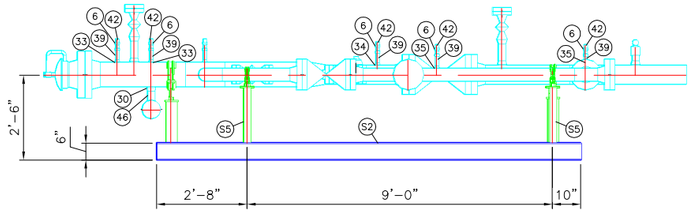
MARK	QTY	LONG ANNOTATION	LENGTH	WEIGHT
S1	2	W6X15	3'-10 1/2"	105.85
S2	2	W6X15	12'-3"	367.50
TOTAL WEIGHT: 473.35				

SUPPORT BILL OF MATERIAL

MARK	QTY	MODEL	LENGTH TO CENTERLINE OF PIPE	STYLE
S3	1	EZ-LINE 510-B-8"	2'-0"	PIPE SUPPORT
S4	1	EZ-LINE 510-B-6"	2'-0"	PIPE SUPPORT
S5	2	EZ-LINE 204-B-4"	2'-0"	PIPE SUPPORT



ELEVATION A
SCALE 3/4"=1'-0"



ELEVATION B
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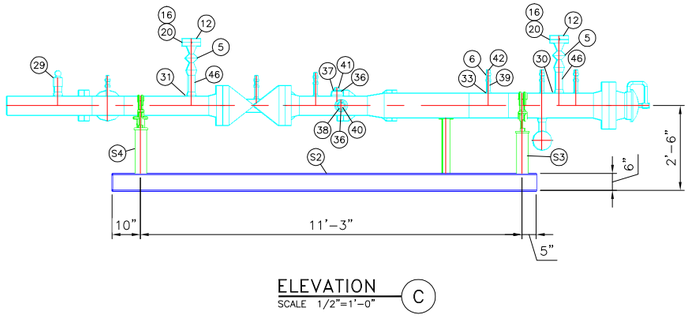

ELEVATION C
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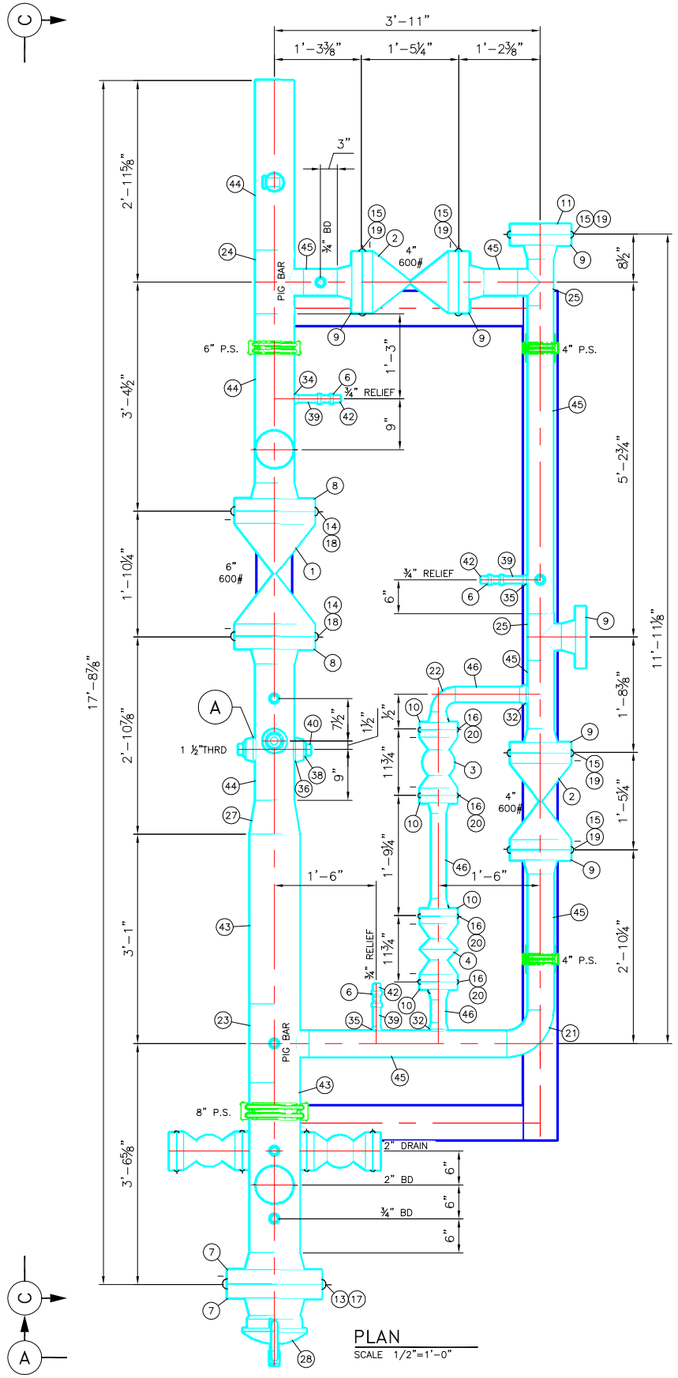
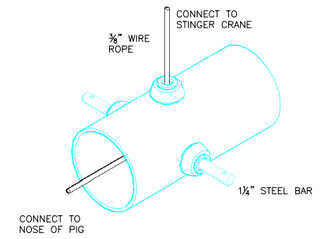


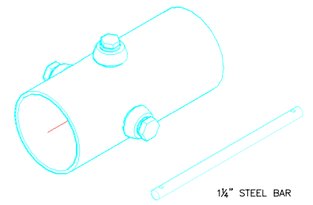
PLAN
SCALE 1/2"=1'-0"

PIPING BILL OF MATERIAL

MARK	SIZE	QTY	DESCRIPTION	LENGTH
1	6"	1	VALVE, GATE, RFFE, ANSI 600, FULL OPENING	1'-10"
2	4"	2	VALVE, GATE, RFFE, ANSI 600	1'-5"
3	2"	3	VALVE, BALL, RFFE, ANSI 600	11 1/2"
4	2"	1	VALVE, PLUG, RFFE, ANSI 600	11 1/2"
5	2"	2	VALVE, PLUG, RFxWE, ANSI 600	11 1/2"
6	3/4"	9	VALVE, BALL, THRD, 3000#	1 5/8"
7	8"	2	FLANGE, ANSI 600, RF WELD NECK, SCH STD, ASTM A-105	
8	6"	2	FLANGE, ANSI 600, RF WELD NECK, SCH STD, ASTM A-105	
9	4"	6	FLANGE, ANSI 600, RF WELD NECK, SCH STD, ASTM A-105	
10	2"	6	FLANGE, ANSI 600, RF WELD NECK, SCH XH, ASTM A-105	
11	4"	1	FLANGE, ANSI 600, RF BLIND, SCH STD, ASTM A-105	
12	2"	4	FLANGE, ANSI 600, RF BLIND, SCH XH, ASTM A-105	
13	8"	1	GASKET, 1/8" THK, 600LB RF SPIRAL WOUND TYPE 304 FLEXIBLE GRAPHITE FILLER, 1/8" CENTERING RING, FLEXITALLIC STYLE CGI OR EQUAL	
14	6"	2	GASKET, 1/8" THK, 600LB RF SPIRAL WOUND TYPE 304 FLEXIBLE GRAPHITE FILLER, 1/8" CENTERING RING, FLEXITALLIC STYLE CGI OR EQUAL	
15	4"	5	GASKET, 1/8" THK, 600LB RF SPIRAL WOUND TYPE 304 FLEXIBLE GRAPHITE FILLER, 1/8" CENTERING RING, FLEXITALLIC STYLE CG OR EQUAL	
16	2"	10	GASKET, 1/8" THK, 600LB RF SPIRAL WOUND TYPE 304 FLEXIBLE GRAPHITE FILLER, 1/8" CENTERING RING, FLEXITALLIC STYLE CG OR EQUAL	
17	1 1/8"	24	STUD BOLTS, ANSI 16.5, GRADE B-7, W/ (2) HVY HEX HEAD NUTS (8"-600#)	7 3/4"
18	1"	24	STUD BOLTS, ANSI 16.5, GRADE B-7, W/ (2) HVY HEX HEAD NUTS (6"-600#)	6 3/4"
19	7/8"	40	STUD BOLTS, ANSI 16.5, GRADE B-7, W/ (2) HVY HEX HEAD NUTS (4"-600#)	5 3/4"
20	5/8"	80	STUD BOLTS, ANSI 16.5, GRADE B-7, W/ (2) HVY HEX HEAD NUTS (2"-600#)	4 1/4"
21	4"	1	ELBOW, 90, LR, SCH STD, SML, GRADE B	
22	2"	1	ELBOW, 90, LR, SCH XH, SML, GRADE B	
23	8"x4"	1	TEE, RED, SCH STD, SML, GRADE B (WITH PIG BAR)	
24	6"x4"	1	TEE, RED, SCH STD, SML, GRADE B (WITH PIG BAR)	
25	4"	2	TEE, STR, SCH STD, SML, GRADE B	
26	2"	1	TEE, STR, SCH XH, SML, GRADE B	
27	8"x6"	1	REDUCER, CONC, SCH STD, SML, GRADE B	
28	8"	1	CLOSURE, ANSI 600, HORIZONTAL, STD BORE, WELD IN, HUBER-YALE, FIG. 500	
29	2	1	PIG SIG, SCRAPER PASSAGE INDICATOR	
30	8"x2"	2	WELDOLET, SCH XH, ASTM A-105	
31	6"x2"	1	WELDOLET, SCH XH, ASTM A-105	
32	4"x2"	2	WELDOLET, SCH XH, ASTM A-105	
33	8"x3/4"	3	SOCKOLET, 3000#, FS, ASTM A-105	
34	6"x3/4"	2	SOCKOLET, 3000#, FS, ASTM A-105	
35	4"x3/4"	4	SOCKOLET, 3000#, FS, ASTM A-105	
36	6"x1 1/2"	3	THREDOLET, 3000# FS, ASTM A-105	
37	1½"x1"	1	BUSHING, THREADED, HEX HEAD, 3000#	
38	1½"x1¼"	2	BUSHING, THREADED, HEX HEAD, 3000#	
39	3/4"	9	NIPPLE, SCH XXS, SMLS, ASTM A-106, GRADE B BOE-TOE	4"
40	1 1/4"	2	PLUG, THREADED, HEX HEAD, 3000#	
41	1"	1	PLUG, THREADED, HEX HEAD, 3000#	
42	3/4"	9	PLUG, THREADED, HEX HEAD, 3000#	
43	8"	1	8.625" O.D.x0.322" WT, API 5L, GRADE B, SCH 40, ERW, PE&B, LBS/FT 28.55	5'-0"
44	6"	1	6.625" O.D.x0.280" WT, API 5L, GRADE B, SCH 40, ERW, PE&B, LBS/FT 18.97	7'-0"
45	4"	1	4.500" O.D.x0.237" WT, API 5L, GRADE B, SCH 40, ERW, PE&B, LBS/FT 10.79	11'-5 3/8"
46	2"	1	2.375" O.D.x0.218" WT, API 5L, GRADE B, SCH 80, SML, PE&B, LBS/FT 5.02	3'-10 1/4"



SMART PIG ASSEMBLY



NORMAL OPPERATION ASSEMBLY

DETAIL A
SCALE 1 1/2"=1'-0"

MK	DATE	REVISIONS	BY	AP.
1	10/5/11	REVISED BOM	MBC	TDS
2	11/14/11	ADDED 4TH SUPPORT	MBC	TDS
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

DWG. NO.	REFERENCE DRAWINGS

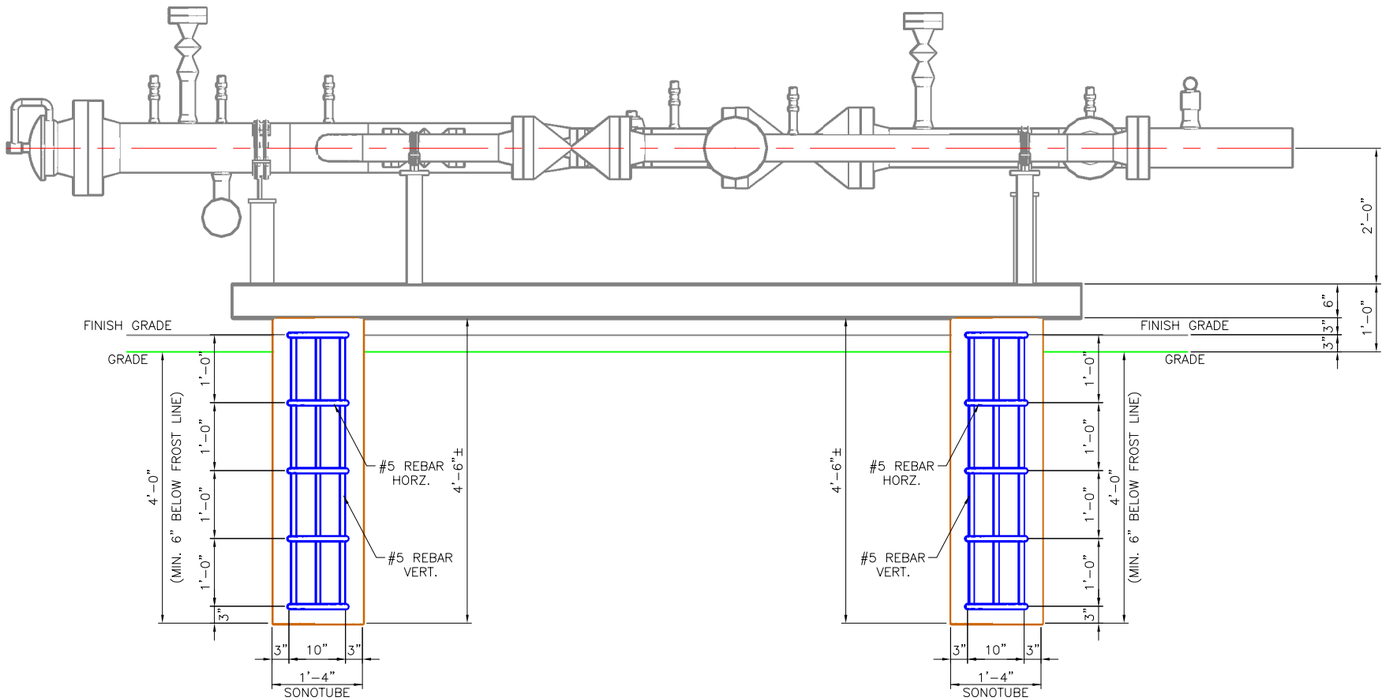
ONEOK NGL PIPELINE, L.P.
P.O. BOX 29
MEDFORD, OK 73759

STANDARD
6"-600# LAUNCHER W/ RIGHT HAND BYPASS
DIMENSIONS & B.O.M.

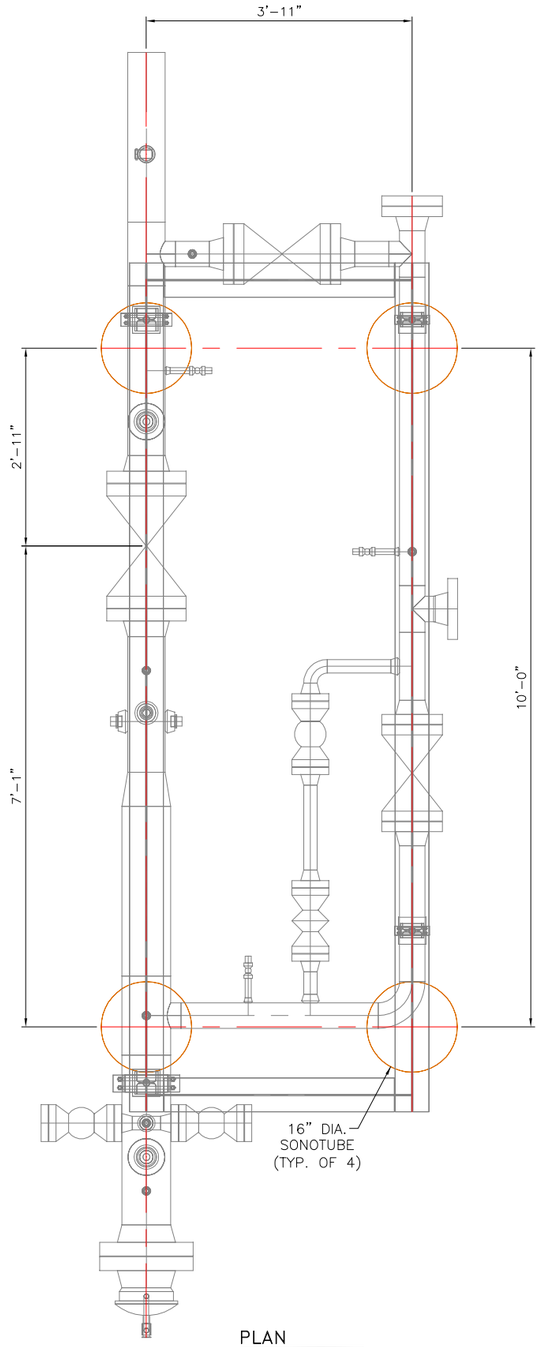
DES.:		AFE#:	DATE: 7/25/11
DR.:	MBC		DWG. NO.: STD-P-249 REV. 2
CH.:	TDS	SCALE: AS NOTED	
AP.:		CAD#: STD-P-249	

V:\Standards\Traps\6 inch\STD-P-249

FOUNDATION BILL OF MATERIAL				
MARK	UNIT	LONG ANNOTATION	MEASUREMENT	WEIGHT
1	FT	#5 REBAR	120 ±	125 ±
1	CY	3000# CONCRETE	1.25 ±	
TOTAL MEASUREMENTS DEPEND ON ACTUAL FROST LINE				



ELEVATION
SCALE 1" = 1'-0"



PLAN
SCALE 1" = 1'-0"

MK	DATE	REVISIONS	BY	AP.	MK	DATE	REVISIONS	BY	AP.
1					8				
2					9				
3					10				
4					11				
5					12				
6					13				
7					14				

DWG. NO.	REFERENCE DRAWINGS

ONEOK
NGL PIPELINE, L.P.
P.O. BOX 29
MEDFORD, OK 73759

STANDARD
6"-600# LAUNCHER W/ RIGHT HAND BYPASS
FOUNDATION DIMENSIONS & B.O.M.

DES.:	AFE#:	DATE: 11/15/11	
DR.: MBC		DWG. NO.: STD-F-250	REV. 0
CH.:	SCALE: AS NOTED		
AP.:	CAD#: STD-F-250		

V:\Standards\Traps\6 inch\STD-F-250

Appendix B

Project Maps

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_topo.mxd

Date: 5/27/2014

Author: LDanielson

Targa Little Missouri Plant

Bureau of Land Management Lands

Clay Butte

Stony Johnny Butte

State Hwy 200

US Hwy 85

125 Ave NW

Co Rd 34

Spring Crk Rd

Spring Creek

PIPELINE

4WD

2257

2390

2400

2496

2300

2264

2221

2215

2349

2347

25

26

30

31

36

34

85

1

2

McKenzie County

Dunn County

Valve

Milepost

Centerline

Not Co-located

Co-located

Inventory Corridor

Corridor (1 mile)

Launcher Boundary

Receiver Boundary

Criteria Data

Federal Land

Joint Ownership

Local Land

Native American Land

Private Conservation Land

State Land

PLOTS Land

NHD Waterway

NWI Wetland

NHD Waterbody

E3 Environmental
Enhancing Execution with Experience

N

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Topo Map

Page 1 of 4

McKenzie County, North Dakota

ONEOK Bakken Pipeline, L.L.C.

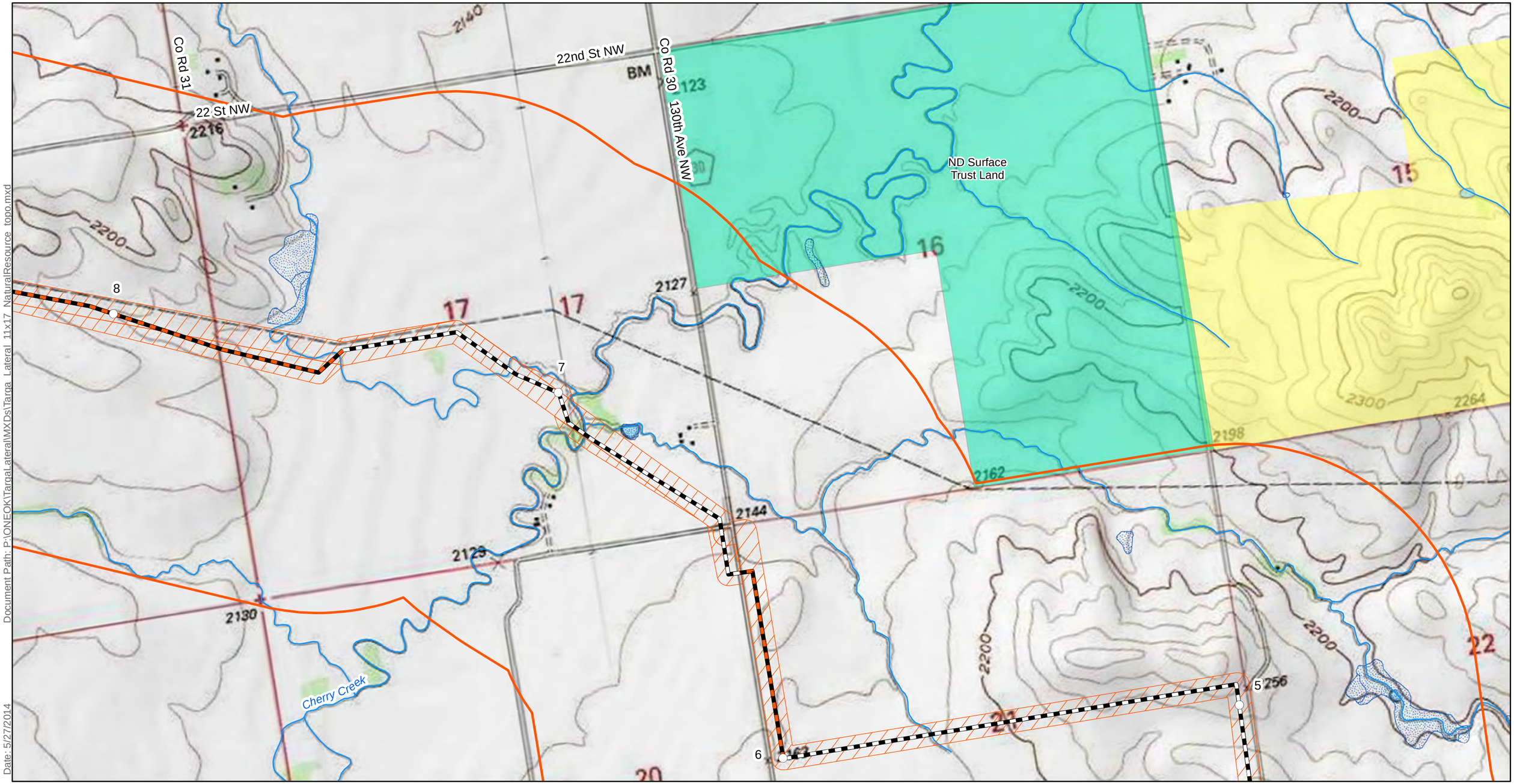
Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Topo Map

Page 2 of 4

McKenzie County, North Dakota



Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_topo.mxd

Date: 5/27/2014

Author: LDanielson

Valve
Milepost

Centerline
Not Co-located
Co-located
Inventory Corridor
Corridor (1 mile)
Launcher Boundary
Receiver Boundary

Criteria Data
Federal Land
Joint Ownership
Local Land
Native American Land
Private Conservation Land
State Land
PLOTS Land
NHD Waterway
NWI Wetland
NHD Waterbody

E3 Environmental
Enhancing Execution with Experience

N

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

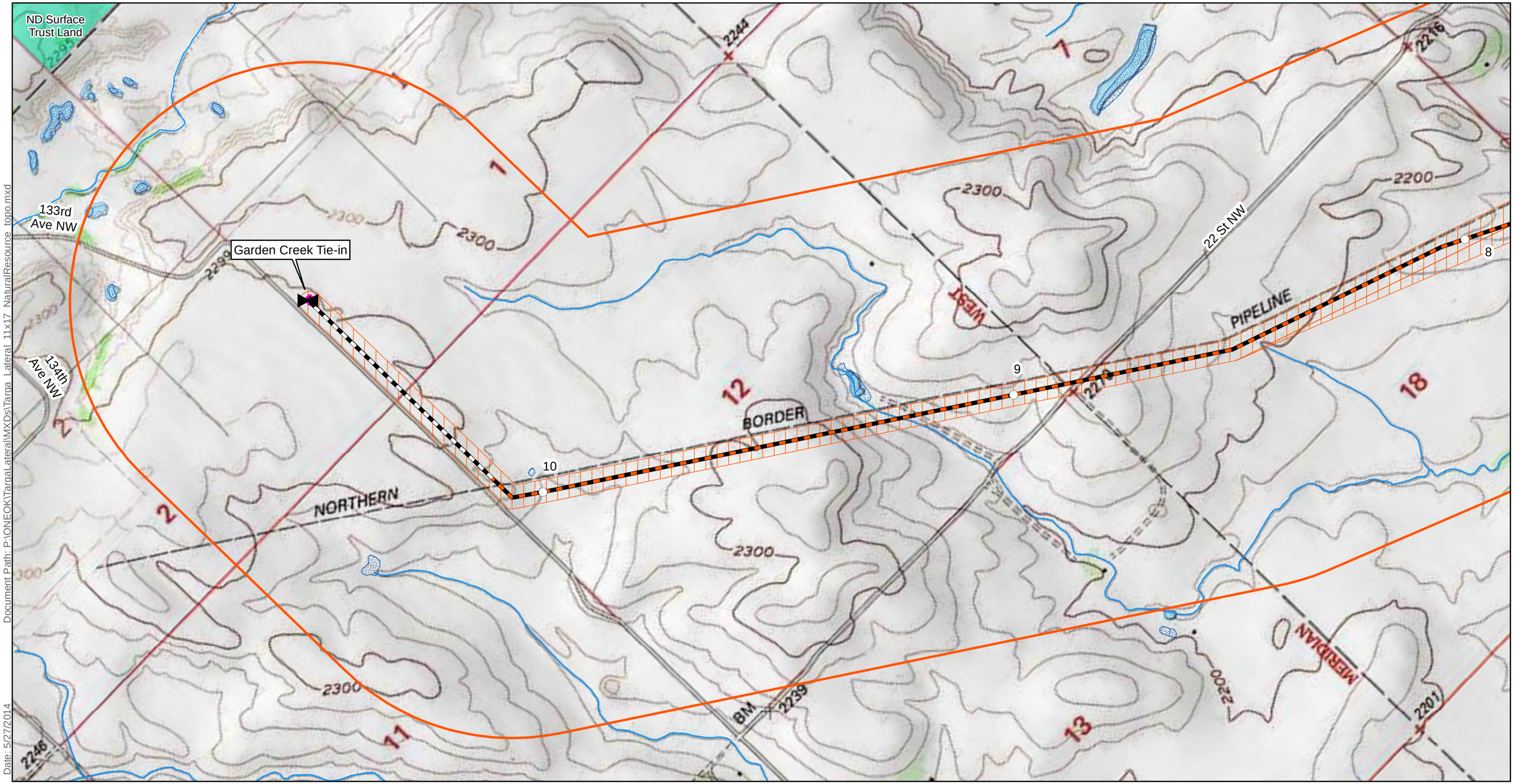
ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Natural Resource - Topo Map

Page 3 of 4

McKenzie County, North Dakota



Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_topo.mxd

Date: 5/27/2014

Author: LDanielson

- Valve
- Milepost

Centerline

- Not Co-located
- Co-located
- Inventory Corridor
- Corridor (1 mile)
- Launcher Boundary
- Receiver Boundary

Criteria Data

- Federal Land
- Joint Ownership
- Local Land
- Native American Land
- Private Conservation Land
- State Land
- PLOTS Land
- NHD Waterway
- NWI Wetland
- NHD Waterbody

E3 Environmental — Enhancing Execution with Experience

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Topo Map

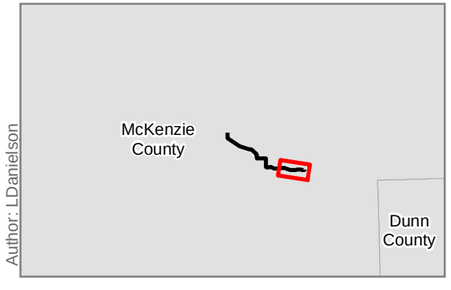
Page 4 of 4

McKenzie County, North Dakota

Document Path: P:\ONEOK\TargaLateralMXDs\Targa_Lateral_11x17_NaturalResource_Aerial.mxd

Date: 5/27/2014

Author: LDanielson



- Valve
- Milepost

Centerline

- Not Co-located
- Co-located
- Inventory Corridor
- Corridor (1 mile)
- Launcher Boundary
- Receiver Boundary

Survey Data

- Nest
- Nest Buffer
- Stream
- Stream
- Woody Vegetation
- Wetland

Criteria Data

- Occupied Structure
- Occupied Structure w/in 500ft of Inventory Corridor
- Occupied Structure (500ft Buffer)
- Abandoned Mine
- NDWC Well

E3 Environmental
Enhancing Execution with Experience

N

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Aerial Map

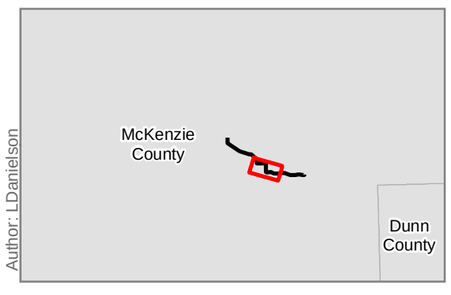
Page 1 of 4

McKenzie County, North Dakota

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_Aerial.mxd

Date: 5/27/2014

Author: LDanielson



- Valve
- Milepost

Centerline

- Not Co-located
- Co-located
- Inventory Corridor
- Corridor (1 mile)
- Launcher Boundary
- Receiver Boundary

Survey Data

- Nest
- Nest Buffer
- Stream
- Stream
- Woody Vegetation
- Wetland

Criteria Data

- Occupied Structure
- Occupied Structure w/in 500ft of Inventory Corridor
- Occupied Structure (500ft Buffer)
- Abandoned Mine
- NDWC Well

E3 Environmental
Enhancing Execution with Experience

N

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Natural Resource - Aerial Map

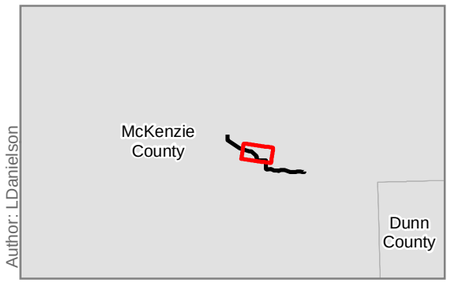
Page 2 of 4

McKenzie County, North Dakota

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_Aerial.mxd

Date: 5/27/2014

Author: LDanielson



- Valve
- Milepost

Centerline

- Not Co-located
- Co-located
- Inventory Corridor
- Corridor (1 mile)
- Launcher Boundary
- Receiver Boundary

Survey Data

- Nest
- Nest Buffer
- Stream
- Stream
- Woody Vegetation
- Wetland

Criteria Data

- Occupied Structure
- Occupied Structure w/in 500ft of Inventory Corridor
- Occupied Structure (500ft Buffer)
- Abandoned Mine
- NDWC Well

E3 Environmental — Enhancing Execution with Experience

N

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Aerial Map

Page 3 of 4

McKenzie County, North Dakota

Garden Creek Tie-in

STR1

STR1

8

9

10

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_NaturalResource_AerialA.mxd

Date: 5/27/2014

Author: LDanielson

McKenzie County

Dunn County

Valve

Milepost

Centerline

Not Co-located

Co-located

Inventory Corridor

Corridor (1 mile)

Launcher Boundary

Receiver Boundary

Survey Data

Nest

Nest Buffer

Stream

Stream

Woody Vegetation

Wetland

Criteria Data

Occupied Structure

Occupied Structure w/in 500ft of Inventory Corridor

Occupied Structure (500ft Buffer)

Abandoned Mine

NDWC Well

E3 Environmental
Enhancing Execution with Experience

0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria

Natural Resource - Aerial Map

Page 4 of 4

McKenzie County, North Dakota

Document Path: P:\ONEOK\TargaLateralMXDs\Targa_Lateral_11x17_CulturalResource.mxd

Date: 5/27/2014

Author: LDanielson

State Hwy 200

Targa Little Missouri Plant

125 Ave NW

Spring Crk Rd Co Rd 34

US Hwy 85

1

2

McKenzie County

Dunn County

Valves

Milepost

Centerline

Inventory Corridor

Corridor (1 mile)

Launcher Boundary

Receiver Boundary

Cultural Avoidance

N

0 875 1,750 3,500 Feet

1:12,000

E3 Environmental
Enhancing Execution with Experience

Note: Class III survey efforts confirmed the that the site leads do not occur within the Inventory Corridor.
Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Cultural Resource

McKenzie County, North Dakota

Author: LDanielson
Date: 5/27/2014
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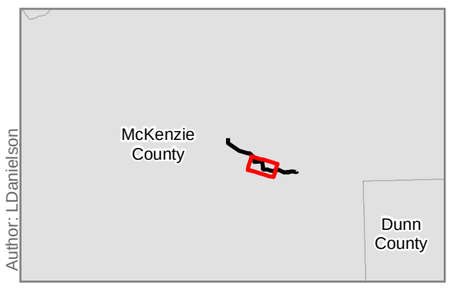


- Valves
- Milepost
- Centerline
- Inventory Corridor
- Corridor (1 mile)
- Launcher Boundary
- Receiver Boundary
- Cultural Avoidance

N

0 875 1,750 3,500 Feet

1:12,000

E3 Environmental
Enhancing Execution with Experience

Note: Class III survey efforts confirmed the that the site leads do not occur within the Inventory Corridor.
Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Cultural Resource

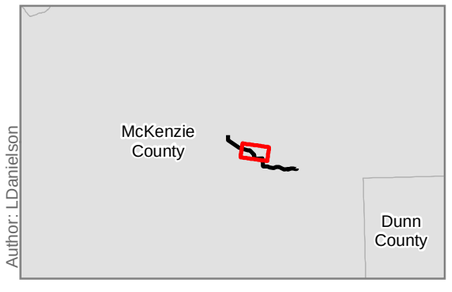
Page 2 of 4

McKenzie County, North Dakota

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_11x17_CulturalResource.mxd

Date: 5/27/2014

Author: LDanielson



Valves
Milepost
Centerline
Inventory Corridor
Corridor (1 mile)
Launcher Boundary
Receiver Boundary
Cultural Avoidance

N

0 875 1,750 3,500 Feet

1:12,000

Note: Class III survey efforts confirmed the that the site leads do not occur within the Inventory Corridor.
Map not to scale, for environmental review purposes only.

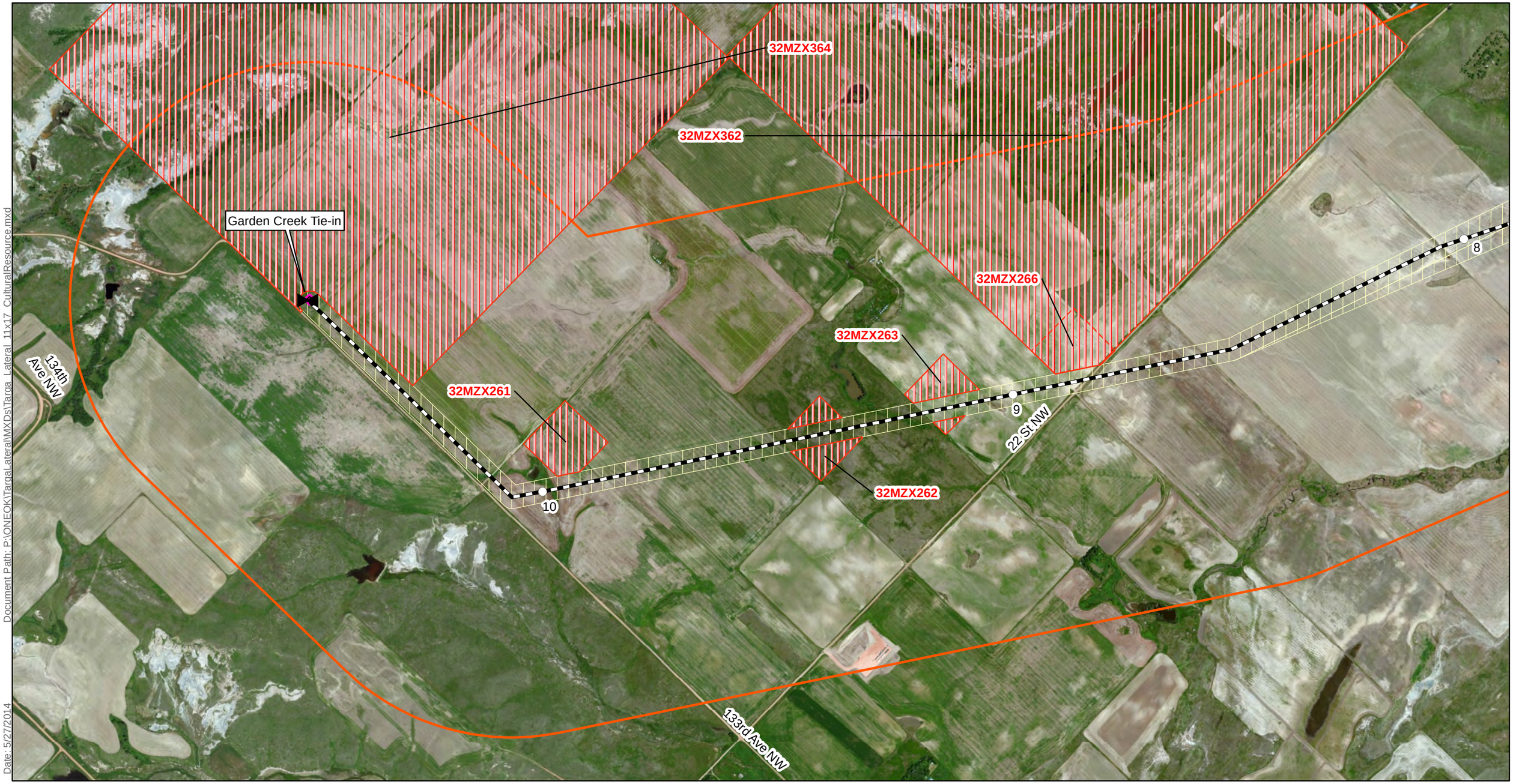
E3 Environmental
Enhancing Execution with Experience

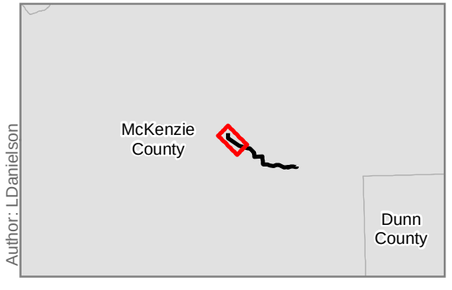
ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Cultural Resource

McKenzie County, North Dakota





Valves
Milepost
Centerline
Inventory Corridor
Corridor (1 mile)
Launcher Boundary
Receiver Boundary
Cultural Avoidance

0 875 1,750 3,500 Feet

1:12,000

Note: Class III survey efforts confirmed the that the site leads do not occur within the Inventory Corridor.
Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral Pipeline Project

Siting Criteria
Cultural Resource

Page 4 of 4

McKenzie County, North Dakota

Appendix C

Agency Notifications

North Dakota State Lands-School Trust Lands

From: Haupt, Michael L.
To: Jennifer Kamm
Cc: Brad Norling; William McCarthy
Subject: RE: ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project School Trust Lands Consultation
Date: Wednesday, May 07, 2014 1:29:03 PM
Attachments: image001.png

Jennifer,

Good afternoon! The ND School Trust does not own surface within the proposed project. Thanks.

Michael L. Haupt
Land Management Professional, CPRM
North Dakota Department of Trust lands
1707 Nth 9th Street
Bismarck ND 58506-5523
701-328-1916
mhaupt@nd.gov

Note: You can track the real time status of your right-of-way application 24/7 at http://www.land.nd.gov/surface/right-of-way.aspx using either the ROW number or by entering at least the first three letters of the company name. By checking this site you can find the name, telephone number and email address of the person working on the application as well as its current status in real time.

From: Jennifer Kamm [mailto:JKamm@go2e3.com]
Sent: Tuesday, May 06, 2014 2:13 PM
To: Haupt, Michael L.
Cc: Brad Norling; William McCarthy
Subject: ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project School Trust Lands Consultation

Dear Mr. Haupt,

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. The Garden Creek pipeline is part of a mainline transmission grid from which the NGL will be distributed to market hubs/centers in the south and south central United States.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

The purpose of this correspondence is to request a review of the proposed project

corridor (see attached) for the presence or absence of State School Trust Lands. This information will be included in a North Dakota Public Service Commission application for the Project.

E3 Environmental, LLC has been retained by ONEOK to provide environmental consulting support for this project. Should you have any questions or require additional information, please contact me at 651-282-0656 or jkamm@go2e3.com.

Sincerely,

Jennifer Kamm
Consultant
E3 Environmental, LLC
jkamm@go2e3.com
O: 651.282.0656
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

From:	Jennifer Kamm
To:	Michael L. Haupt (mhaupt@nd.gov)
Cc:	Brad Norling; William McCarthy
Subject:	ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project School Trust Lands Consultation
Date:	Tuesday, May 06, 2014 2:12:00 PM
Attachments:	Targa_Lateral_ConsultationMap_Combined.pdf image001.png

Dear Mr. Haupt,

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. The Garden Creek pipeline is part of a mainline transmission grid from which the NGL will be distributed to market hubs/centers in the south and south central United States.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

The purpose of this correspondence is to request a review of the proposed project corridor (see attached) for the presence or absence of State School Trust Lands. This information will be included in a North Dakota Public Service Commission application for the Project.

E3 Environmental, LLC has been retained by ONEOK to provide environmental consulting support for this project. Should you have any questions or require additional information, please contact me at 651-282-0656 or jkamm@go2e3.com.

Sincerely,

Jennifer Kamm
Consultant
E3 Environmental, LLC
jkamm@go2e3.com
O: 651.282.0656
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

Garden Creek Main Line

Targa Saddle Butte Gas Processing Plant

ND Surface Trust Land

ND Surface Trust Land

ND Surface Trust Land

Bureau of Land Management Lands

133 1/2 AVE
131ST AVE
130TH AVE
127TH AVE
125TH AVE
134TH AVE
133RD AVE
130 1/2 AVE
129TH AVE
126 1/2 AVE
125 1/2 AVE
124 1/2 AVE
123 1/2 AVE

24TH ST
23 1/2 ST
23RD ST
22ND ST
21ST ST
20 1/2 ST
20TH ST
19TH ST
18 1/2 ST

85

Roosevelt County
Williams County
Mountrail County
Richland County
McKenzie County
Dunn County
Billings County
Montana
North Dakota

Pipeline
Corridor (1 Mile)
Federal Land
State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
Enhancing Execution with Experience

N

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1:46,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Aerial Overview Map

McKenzie County, ND

Author: MEntinger
Date: 4/22/2014
Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_ConsultationMap_Aerial.mxd

Garden Creek Main Line

Targa Saddle Butte Gas Processing Plant

ND Surface Trust Land

ND Surface Trust Land

ND Surface Trust Land

Bureau of Land Management Lands

23RD ST

24TH ST

23 1/2 ST

22ND ST

21ST ST

20TH ST

19TH ST

18 1/2 ST

20 1/2 ST

133 1/2 AVE

131ST AVE

130TH AVE

134TH AVE

133RD AVE

130 1/2 AVE

129TH AVE

127TH AVE

126 1/2 AVE

125TH AVE

125 1/2 AVE

124 1/2 AVE

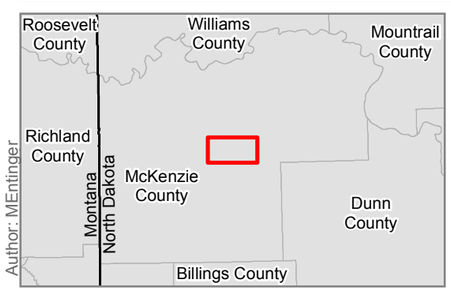
123 1/2 AVE

85

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa Lateral ConsultationMap Topo.mxd

Date: 4/22/2014

Author: MEntinger



Pipeline

Corridor (1 Mile)

Federal Land

State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
Enhancing Execution with Experience

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ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Topo Overview Map

McKenzie County, ND

North Dakota State Lands-Mineral Trust Lands

From: Bayley, Keith W. [mailto:kbayley@nd.gov]
Sent: Wednesday, May 7, 2014 12:01 PM
To: Katie Schmidt
Cc: Lindsey Danielson; Brad Norling; Nelson, Diane M.
Subject: RE: OBP Targa Lateral Consultation Follow Up

Katie,

Attached are plats of the Bison and Targa location data you provided to us. These plats show the location of our mineral interests along the routes.

If you need anything further, let me know.

Keith Bayley
Land Professional
ND Department of Trust Lands
701.328.1912
kbayley@nd.gov

From: Katie Schmidt [mailto:KSchmidt@go2e3.com]
Sent: Wednesday, May 07, 2014 10:38 AM
To: Bayley, Keith W.
Cc: Lindsey Danielson; Brad Norling
Subject: OBP Targa Lateral Consultation Follow Up

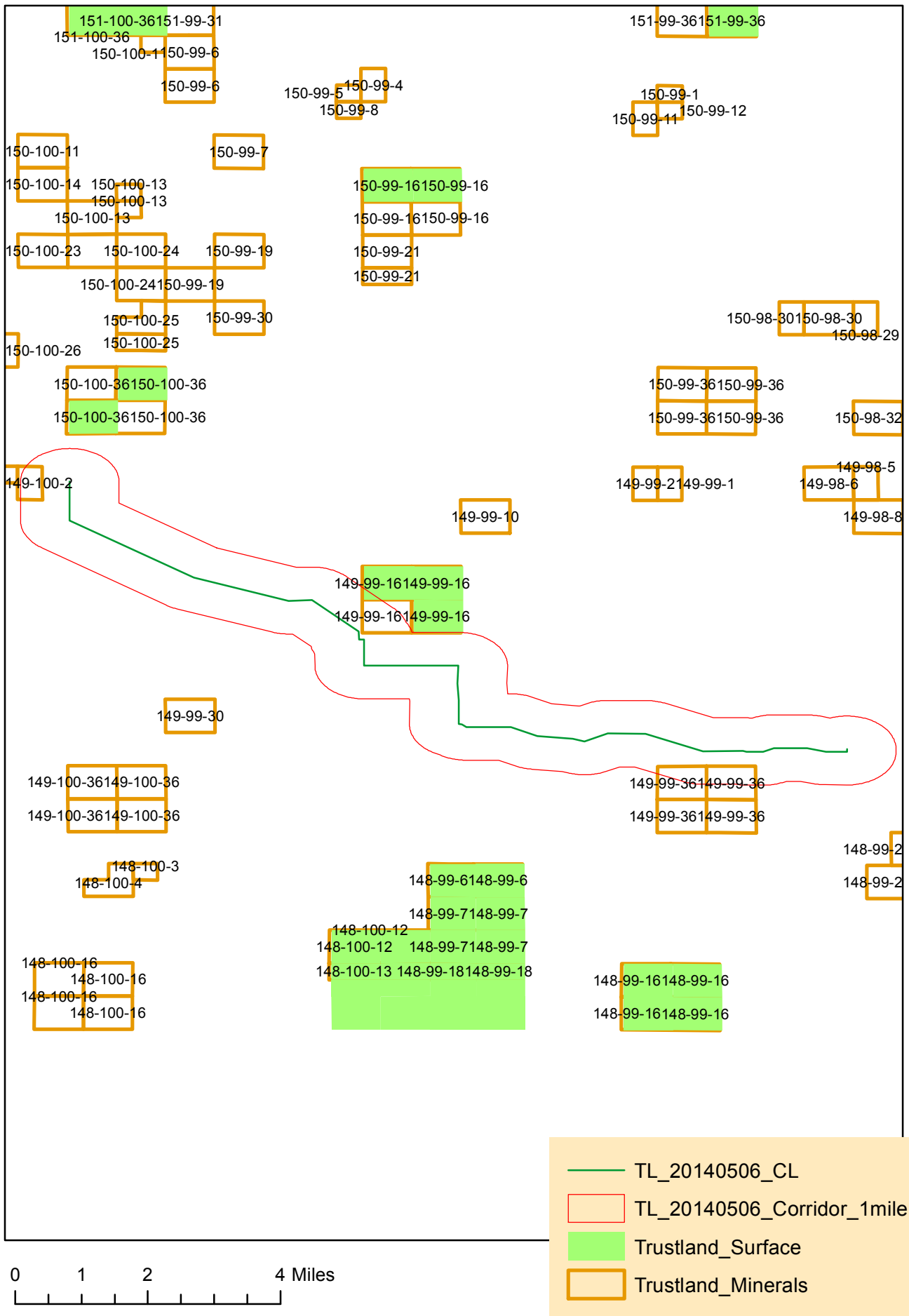
Mr, Bayley,

My name is Katie Schmidt, and I am the project manager for the ONEOK Bakken Pipeline Targa Lateral Project. My colleague Jennifer Kamm sent you a request for a consultation on this project yesterday May 6. In follow up to her request I am submitting to you the attached shapefile which contains the centerline and a 1-mile corridor for this project to aid in your review. The coordinate system is NAD 83 UTM Zone 13. You can rename the file extension from .piz to .zip and you should be able to open it in your system. If you have any problems opening this file please contact Lindsey Danielson (651-282-0658.) Please do not hesitate to contact me directly with any questions or concerns.

Thanks-Katie

Katie Schmidt, EIT
Senior Consultant
E3 Environmental, LLC
kschmidt@go2e3.com
O: 651.282.0652
M: 651.216.6881
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

Targa Pipeline Plat



From:	Jennifer Kamm
To:	Keith Bayley (kbayley@nd.gov)
Cc:	Brad Norling; William McCarthy (WMcCarthy@go2e3.com)
Subject:	ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project Mineral Trust Lands Consultation
Date:	Tuesday, May 06, 2014 2:32:00 PM
Attachments:	Targa_Lateral_MineralTrustLands.pdf image001.png

Dear Mr. Bayley,

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. The Garden Creek pipeline is part of a mainline transmission grid from which the NGL will be distributed to market hubs/centers in the south and south central United States.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

E3 has accessed www.land.nd.gov to review the proposed Project corridor for the presence of State Mineral Trust Lands. The results of this search concluded that the following sections intersect State Lands:

- Township 149N, Range 100W, Section 2
- Township 149N, Range 99W, Section 16 and 36

The purpose of this consultation is to seek your concurrence with this analysis. This information will be included in a North Dakota Public Service Commission application for the Project. For your convenience, please refer to the attached map which depicts the Project corridor.

E3 Environmental, LLC has been retained by ONEOK to provide environmental consulting support for this project. Should you have any questions or require additional information, please contact me at 651-282-0656 or jkamm@go2e3.com.

Sincerely,

Jennifer Kamm
Consultant
E3 Environmental, LLC

jkamm@go2e3.com
O: 651.282.0656
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

Garden Creek Main Line

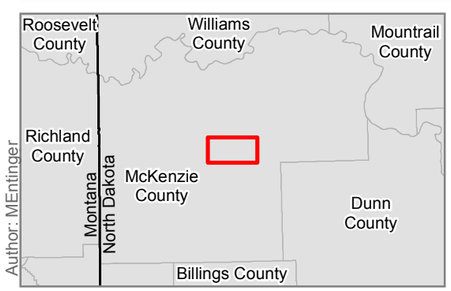
Targa Saddle Butte Gas Processing Plant

T150N R100W
T149N R100W
T150N R99W
T149N R99W
T150N R98W
T149N R98W

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_MineralTrustLands.mxd

Date: 4/23/2014

Author: MEntinger



Pipeline

Corridor (1 Mile)

Mineral Trust Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

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Map not to scale, for environmental review purposes only.

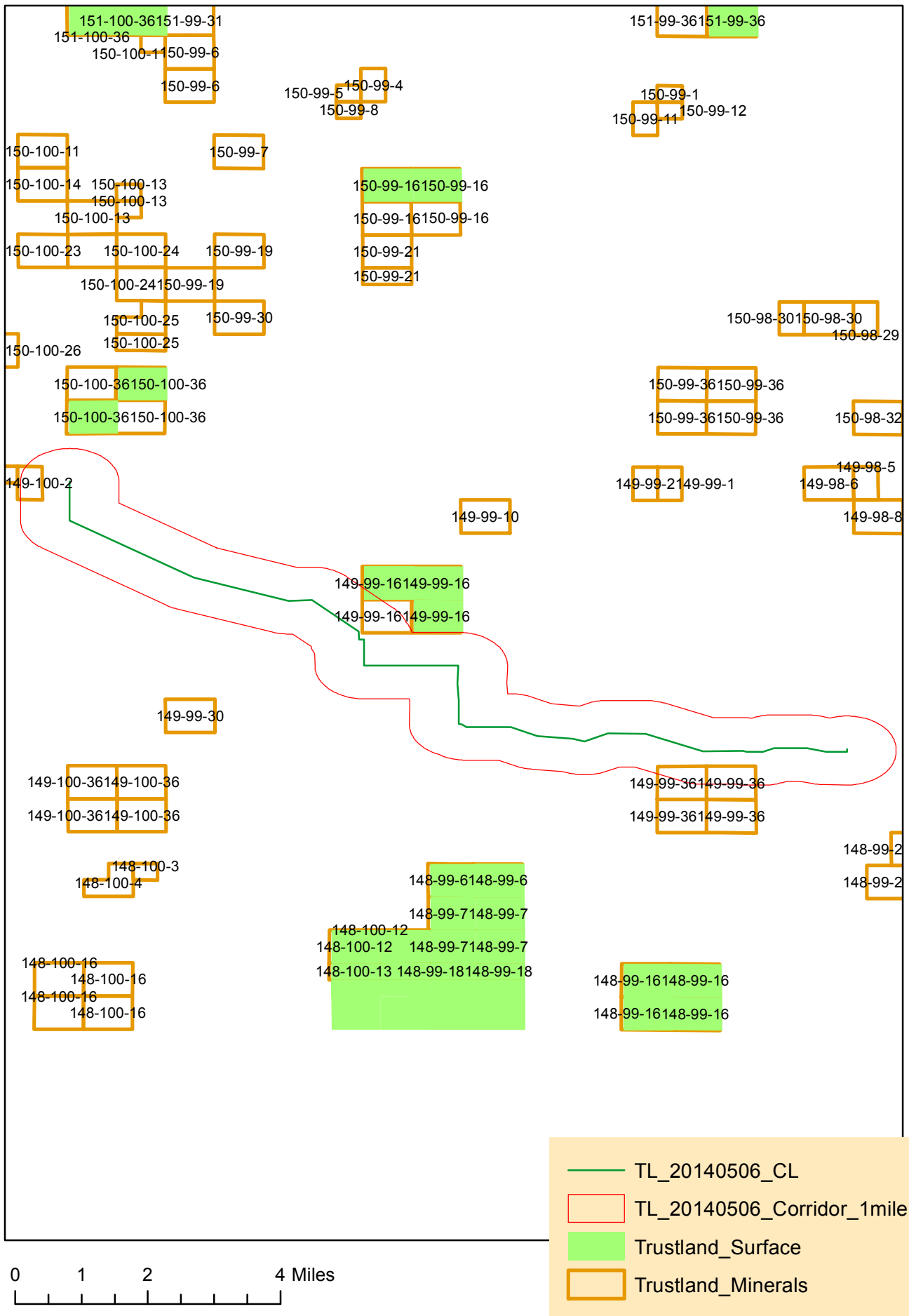
ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

ND Mineral Trust Lands

McKenzie County, ND

Targa Pipeline Plat



North Dakota Parks and Recreation

From: Duttenhefner, Kathy G.
To: Brad Norling
Subject: ONEOK Bakken Pipeline LLC - Targa Lateral Pipeline Project
Date: Monday, May 12, 2014 3:14:18 PM

May 12, 2014

Brad Norling
Portland, OR 97201

Re: ONEOK Bakken Pipeline LLC - Targa Lateral Pipeline Project

Dear Mr. Norling,

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced proposed ONEOK Bakken Pipelinem LCC Targo Lateral Pipeline Project in McKenzie County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, there are no documented occurrences in our database within or adjacent to project area. Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact me at (701-328-5370 or kgduttenhefner@nd.gov). Thank you for the opportunity to comment on this proposed project.

Sincerely,

Kathy Duttenhefner, Coordinator
Natural Resources Division

R.USNDNHI*2014-092KD5/12/2014DL5.12.2014

ND Parks and Recreation Department
Natural Resource Division
Nature Preserve Program/Natural Areas Registry
Natural Heritage Iventory
701-328-5370
701-220-3377 (cell)
1600 East Century Ave. Sute 3
Bismrck, ND 58503

RECORD OF TELEPHONE CONVERSATION

Contact: Kathy Duttenhefner, Coordinator, North Dakota Dept. of Parks and Rec.	
Phone No: 701-328-6347	
Date: 5/9/2014	**Time:** 9:40 am
Prepared By: Brad Norling, Senior Consultant, E3 Environmental, LLC	
Subject: Follow-up on Review of Consultation Letter	

I spoke with Mrs. Duttenhefner regarding her review and response to ONEOK's consultation letter dated 4/28/14. She mentioned that they just received their data from their GIS department and there were no issues. She mentioned that she would expedite their response and get a letter back to ONEOK sometime today.

ONEOK PARTNERS

Federal Express 8724 2710 1203

April 28, 2014

Ms. Kathy Duttenhefner, Coordinator
Natural Resources Division
North Dakota Department of Parks and Recreation
1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649

ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project
Threatened and Endangered Species, Migratory Bird, and Managed Lands Review

Dear Ms. Duttenhefner:

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. Pipeline construction activities would typically occupy a 75-foot right-of-way. Following construction, the pipeline would be operated within a 50-foot permanent easement. Pipeline construction involves temporary impacts, with a post-construction restoration standard of restoring disturbed areas to their original pre-construction condition.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

The purpose of this request is to compile the North Dakota Parks and Recreation Department's (Department) comments on environmental topics that are relevant to the North Dakota Public Service Commission's siting requirements for Energy Transmission Facility Siting. It is our understanding that the Department administers the following state programs:

- State Park Lands
- Land and Water Conservation Fund
- Natural Heritage Inventory

We request a review of the proposed corridor and route (see attached map) for the presence or absence of any lands, projects and/or sensitive species that fall under the purview of these programs.

100 West Fifth Street, Tulsa, OK 74103-4298
P. O. Box 871, Tulsa, OK 74102-0871

E3 Environmental, LLC (E3) has been retained by ONEOK to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact Brad Norling of E3 at 651-272-1154 or bnorling@go2e3.com.

Sincerely,

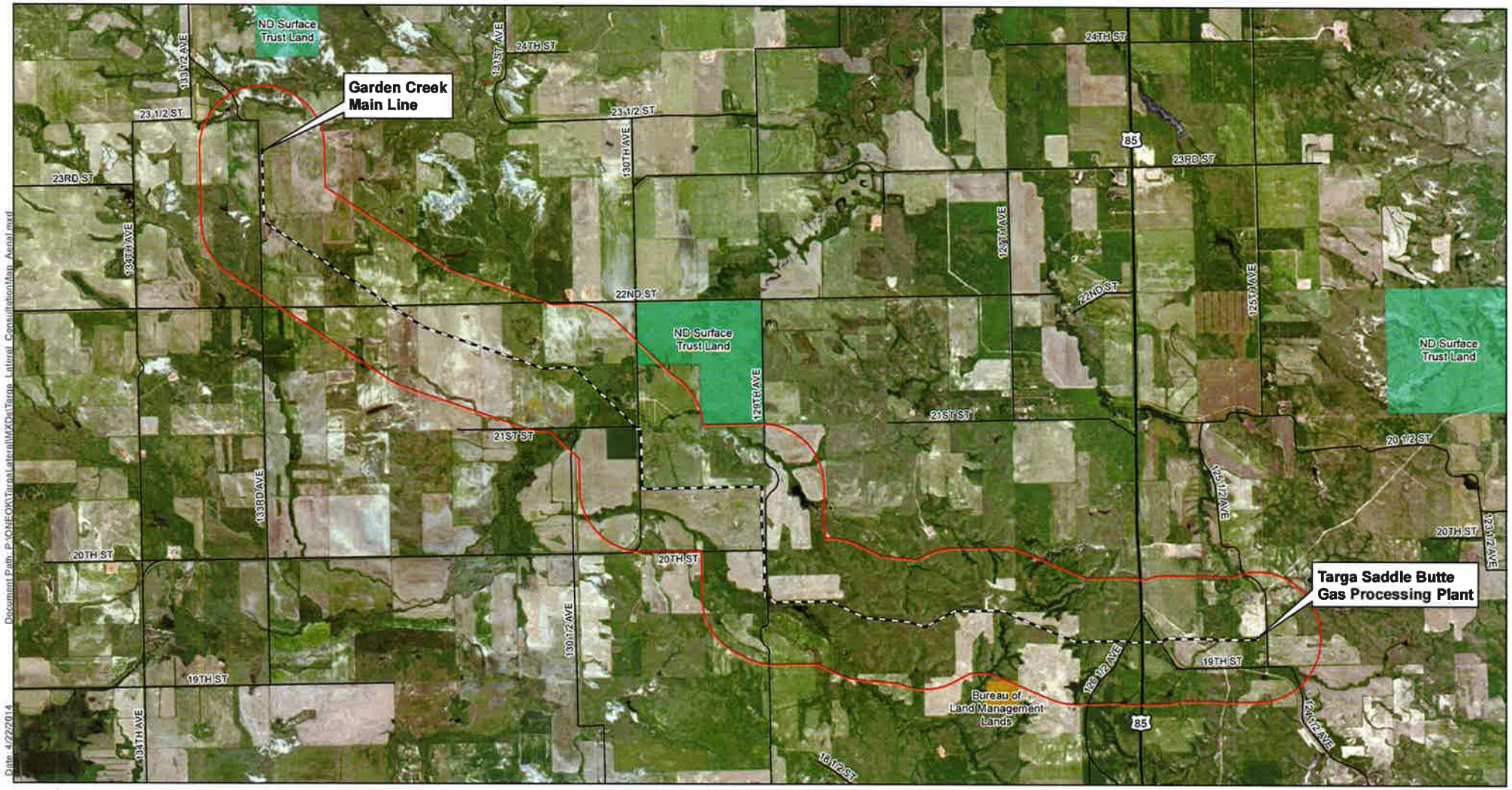
Loretta M. Earnest

Loretta M. Earnest
Manager – Environment
ONEOK Bakken Pipeline, L.L.C.

Enclosures: Project Map – USGS Topographic
Project Aerial Photography

xc: Brad Norling, E3/Loretta Earnest, ONEOK (pdf)
Tulsa Large Construction Projects – Targa Lateral PL

100 West Fifth Street, Tulsa, OK 74103-4298
P. O. Box 871, Tulsa, OK 74102-0871

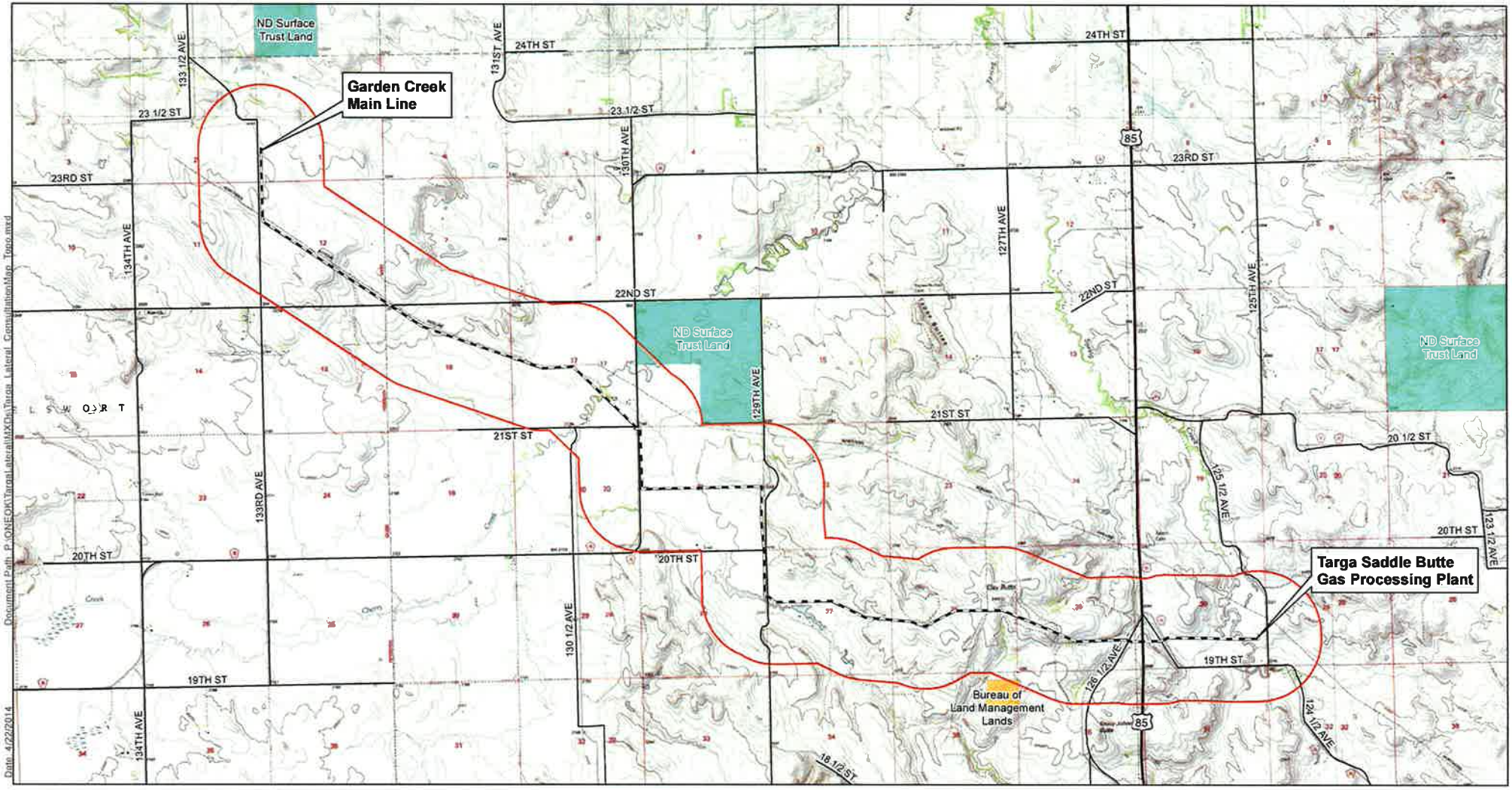


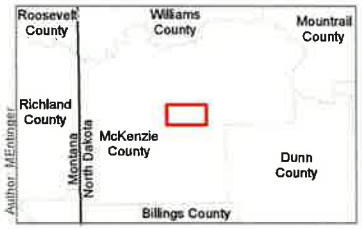
ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Aerial Overview Map

McKenzie County, ND





Pipeline
Corridor (1 Mile)
Federal Land
State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

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Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Topo Overview Map

McKenzie County, ND

Document Path: P:\ONEOK\TargaLateral\MXDs\Targa_Lateral_ConsultationMap_Topo.mxd
Date: 4/22/2014
Author: MEntinger

North Dakota Game and Fish Department

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

May 21, 2014

Loretta M. Earnest
Manager – Environment, Construction Projects
ONEOK Bakken Pipeline, L.L.C.
P.O. Box 871
Tulsa, OK 74102-0871

Dear Ms. Earnest:

RE: Targa Lateral Pipeline Project

ONEOK Bakken Pipeline, LLC has proposed the construction of the Targa Lateral Pipeline, a new 10.6-mile 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant in McKenzie County and terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard, North Dakota.

A primary concern with this project is the possible disturbance of native prairie and wooded draws associated with construction of the pipeline and access roads. We ask that work within these areas be avoided to the extent possible, every effort be made to prevent destruction of woody vegetation, and disturbed areas be reclaimed to pre-project conditions.

The pipeline route will cross Cherry Creek, a Classified fishery. We recommend this stream be crossed by directional boring to protect the resource. If this method is not feasible, construction should not take place within the waterway between April 15 and June 1, and controls should be implemented to minimize erosion and sedimentation.

The National Wetland Inventory indicates various wetlands within the proposed project corridor. Steps should be taken to protect any wetlands that cannot be avoided, no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas.

We do not believe this project will have any significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided these recommendations are implemented where appropriate.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js

RECORD OF TELEPHONE CONVERSATION

Contact: Greg Link, Chief, Conservation and Communication Division – North Dakota Game and Fish Department	
Phone No: 701-328-6347	
Date: 5/9/2014	**Time:** 8:30 am
Prepared By: Brad Norling, Senior Consultant, E3 Environmental, LLC	
Subject: Follow-up on Review of Consultation Letter	

I left a message with Mr. Link regarding their review and response to ONEOK's consultation letter dated 4/28/14. I received a call back from Mr. Steve Dyke who mentioned that they are scheduled to review and respond to the letter on 5/13/14. He noted that in the future, if we want an expedited review of the consultation letter, we need to request that in the letter. Otherwise the normal review time is from 3 to 4 weeks.

ONEOK PARTNERS

Federal Express 8724 2710 1199

April 28, 2014

Mr. Greg Link, Chief
Conservation and Communication Division
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

Dear Mr. Link,

ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project
State Conservation Priority Species Consultation

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. Pipeline construction activities would typically occupy a 75-foot right-of-way. Following construction, the pipeline would be operated within a 50-foot permanent easement. Pipeline construction involves temporary impacts, with a post-construction restoration standard of restoring disturbed areas to their original pre-construction condition.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

The purpose of this correspondence is to request a review of the proposed Project for presence or absence of State Conservation Priority Species within the proposed pipeline corridor (see attached). This information will be included in a North Dakota Public Service Commission application for the Project.

E3 Environmental, LLC (E3) has been retained by ONEOK to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact Brad Norling of E3 at 651-272-1154 or bnorling@go2e3.com.

Sincerely,

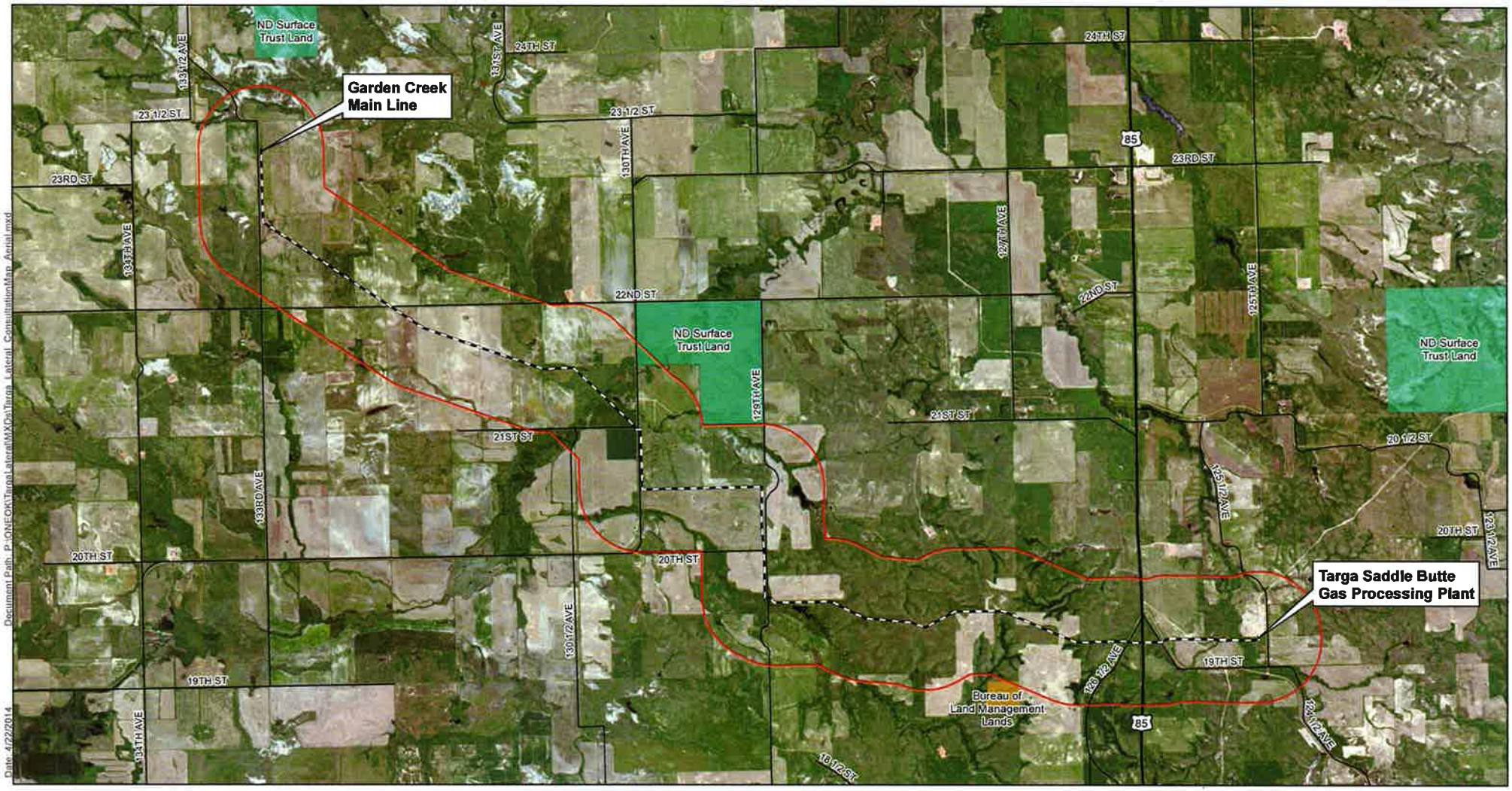
Loretta M. Earnest

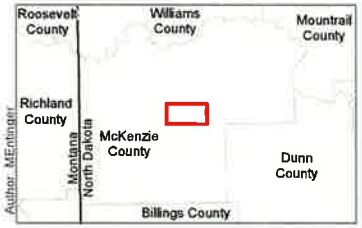
Loretta M. Earnest
Manager – Environment, Construction Projects
ONEOK Bakken Pipeline, L.L.C.

Enclosures: Project map – USGS Topographic
Project Aerial Photography

xc: Brad Norling, E3/Loretta Earnest, ONEOK (pdf)
Tulsa Large Construction Projects – Targa Lateral PL

100 West Fifth Street, Tulsa, OK 74103-4298
P. O. Box 871, Tulsa, OK 74102-0871





Pipeline
Corridor (1 Mile)
Federal Land
State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
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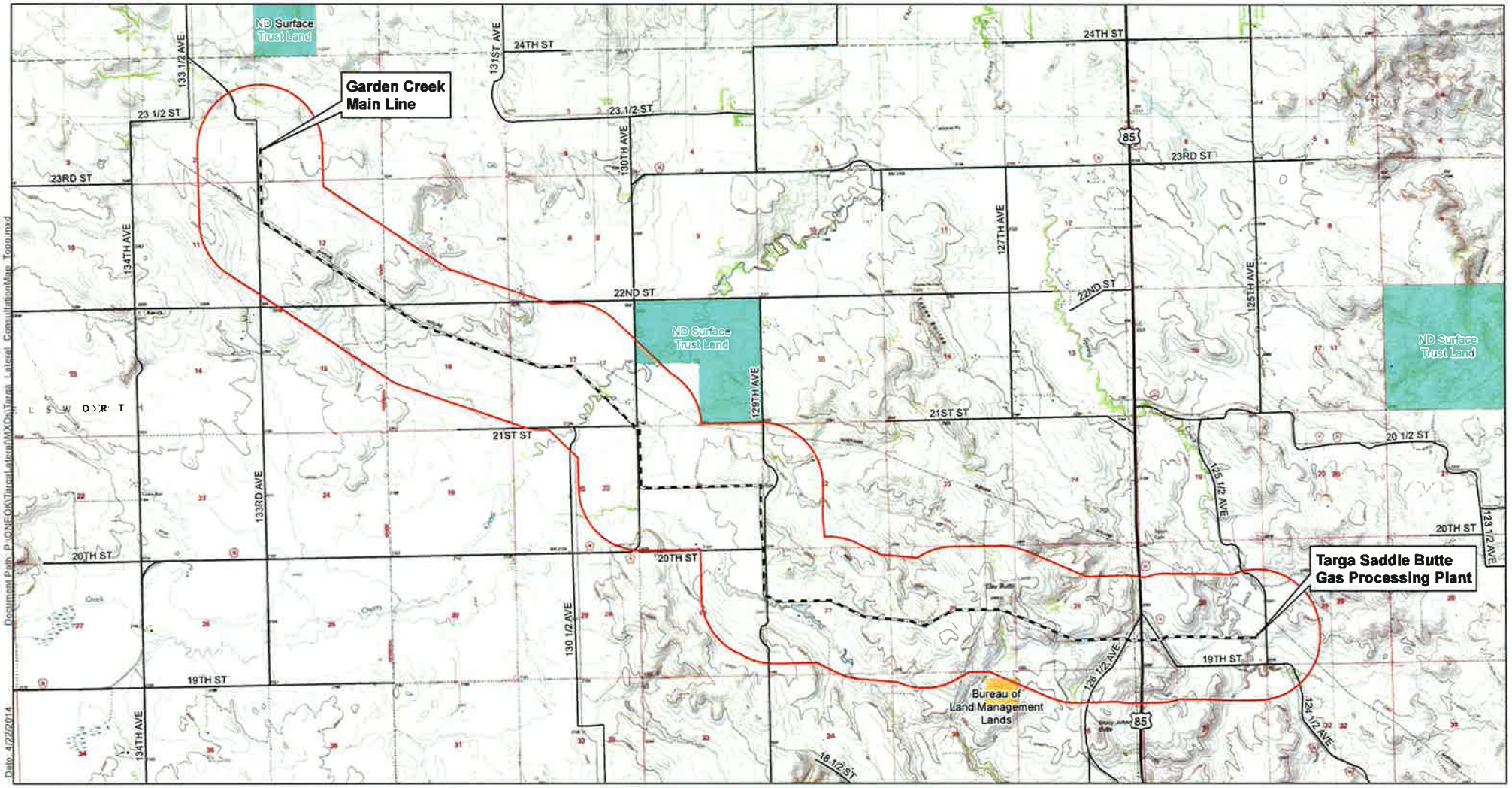
Map not to scale, for environmental review purposes only.

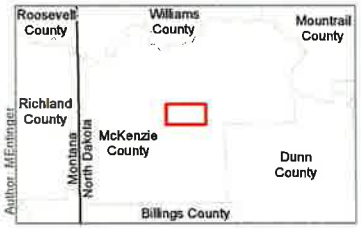
ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Aerial Overview Map

McKenzie County, ND





Pipeline
Corridor (1 Mile)
Federal Land
State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
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Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Topo Overview Map

McKenzie County, ND

US Fish and Wildlife Service

ONEOK PARTNERS

Federal Express 8724 2710 1225

April 28, 2014

Mr. Jeffrey Towner, Field Supervisor
U.S. Fish and Wildlife Service
North Dakota Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926

ONEOK Bakken Pipeline, L.L.C. – Targa Lateral Pipeline Project
Threatened and Endangered Species, Migratory Bird, and Managed Lands Review

Dear Mr. Towner,

ONEOK Bakken Pipeline, L.L.C. (ONEOK) has proposed the construction of the Targa Lateral Pipeline Project (Project). The proposed Project is a new 10.6-mile (approx.), 6-inch diameter NGL pipeline that will originate at Targa's Saddle Butte Plant (TSBP) in McKenzie County, North Dakota and will terminate at an interconnect with ONEOK's Garden Creek pipeline south of Arnegard. Pipeline construction activities would typically occupy a 75-foot right-of-way. Following construction, the pipeline would be operated within a 50-foot permanent easement. Pipeline construction involves temporary impacts, with a post-construction restoration standard of restoring disturbed areas to their original pre-construction condition.

The location of the proposed Project is described below and depicted on the attached maps.

In McKenzie County, North Dakota the pipeline crosses:

- Township 149N, Range 98W, Section 30;
- Township 149N, Range 99W, Sections 7, 17, 18, 20, 21, 25, 26, 27, and 28;
- Township 149N, Range 100W, Sections 1 and 12.

The purpose of this request is to compile U.S. Fish and Wildlife Service's (USFWS) comments on environmental topics that are relevant to the North Dakota Public Service Commission's (PSC) siting requirements for Energy Transmission Facility Siting. This request has been prepared to augment that effort and facilitate a thorough project review.

Federally Listed Species Analysis:
Results of the review of the USFWS Information Planning and Conservation System (IPaC) database, at http://ecos.fws.gov/ipac, on April 21, 2014 listed the following species to be considered in an effects analysis for the Project:

Federally Listed Species
Whooping crane (*Grus americana*) – Endangered
Interior least tern (*Sternula antillarum*) – Endangered
Pallid sturgeon (*Scaphirhynchus albus*) – Endangered
Gray wolf (*Canis lupus*) – Endangered
Piping plover (*Charadrius melodus*) – Threatened
Piping plover Designated Critical Habitat – Missouri River

100 West Fifth Street, Tulsa, OK 74103-4298
P. O. Box 871, Tulsa, OK 74102-0871

E3 has reviewed the available data describing the life history, critical habitat, and conservation measures associated with each species to evaluate the potential effects of the Project on these resources. The results of this analysis are as follows:

Whooping crane: This species prefers larger wetland complexes for roosting habitat, typically using adjacent uplands for foraging opportunities. Potential impacts are anticipated to be limited to the time period during active construction should it coincide with the spring or fall migration period. Spring migration by the Aransas/Wood Buffalo population from the Texas Gulf Coast begins between the end of March and mid-April, with the last birds generally leaving Texas by the first of May. Experienced breeders are among the first to arrive in Canadian nesting areas in late April, with the rest of the birds arriving throughout the following 6-8 weeks. Fall migration typically begins in mid-September. By late October to mid-November most birds have arrived on the wintering grounds in Texas.

Project precautionary measures would be implemented if a whooping crane is sighted in or near the Project area. ONEOK would voluntarily suspend all heavy equipment operation activities and notify the USFWS should a whooping crane be spotted within 0.5 mile of the Project area. Heavy equipment activities would resume upon the departure of the individual(s). The pipeline is a buried utility and will not have a direct impact on this species. The proposed Project will not result in a loss of crane habitat. As a result, the proposed pipeline would have **no effect** on the species.

Interior least tern: The interior population(s) of the least tern has historically been associated with large river systems for breeding and migratory habitats. Regionally, the Missouri River is known to host remnant breeding populations of terns. The Project is approximately 16 miles south of the Missouri River. Potential impacts are anticipated to be limited to the time period during active construction should it coincide with the breeding season. Best management practices developed for the Storm Water Pollution Prevention Plan (SWPPP) for the Project will be implemented during construction to minimize sedimentation, erosion and runoff and maintain water quality during construction. The proposed Project will not result in loss of nesting habitat due to alteration of the river channel, sedimentation or encroachment of vegetation. The proposed Project will not alter hydrologic patterns (i.e. water levels) or water quality of the Missouri River which could be detrimental to nesting birds during the breeding season (May – August). Therefore, the Project will have **no effect** on the species.

Pallid sturgeon: The pallid sturgeon preferred habitat includes the benthic environment associated with swift waters of large turbid, free-flowing rivers with braided channels, dynamic flow patterns, periodic flooding of terrestrial habitats, and requiring extensive micro habitat diversity. Portions of the Missouri River are thought to provide the required habitat for the pallid sturgeon though much of the habitat has been compromised due to channelization, installation of impoundments, and altered flow regimes. Best management practices (BMP) will be implemented during construction to minimize sedimentation, erosion and runoff. Therefore, the Project will have **no effect** on the species.

Gray wolf: Historical records show that wolf sightings are very rare within North Dakota. Sightings in proximity to the Project have been reported in the Killdeer Mountains in Dunn County. The Killdeer Mountains are about 22 miles to the southeast of the survey area. Most wolves in North Dakota are likely dispersed animals that originated in northern Minnesota, Riding National Park, or Spruce Woods Reserve, Manitoba. Currently, wolves are not known to inhabit the Project area. Therefore, the proposed Project will have **no effect** on the gray wolf.

Piping plover: The piping plover is associated with shorelines along small alkaline lakes, large reservoir beaches, and river islands and adjacent sand pits. Breeding birds select wide beaches with highly clumped vegetation covering less than 25 percent of the area. Current breeding range on the Northern Great Plains extends south along major prairie rivers including the Missouri River, and in alkali wetlands including those in North Dakota. Critical habitat for the piping plover is designated in 50 CFR Part 17, *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great*

Plains Breeding Population of the Piping Plover; Final Rule, Sept. 11, 2002. The Missouri River, the nearest designated critical habitat for the piping plover, is located approximately 16 miles north of the proposed Project. The Project will not intersect any prairie pothole wetlands which may provide suitable alkali wetland habitat. BMPs will be implemented during construction to minimize sedimentation, erosion, and runoff. The proposed Project will have **no effect** on piping plovers or designated critical habitat for the piping plover.

USFWS Managed Lands:

Conservation programs such as Waterfowl Production Areas (WPAs) and wetland and grassland easements represent an important tool used by USFWS to identify and manage high quality wildlife habitat. A review of public records did not identify any of these USFWS managed lands in the Project study area. ONEOK requests confirmation regarding the presence or absence of USFWS managed lands within the proposed Corridor.

Migratory Bird:

USFWS administers various wildlife related mandates of national concern including the Migratory Bird Treaty Act (MBTA). ONEOK understands that unlike the Endangered Species Act, the MBTA has no provisions for the allowance of a take and therefore compliance may best be achieved by avoiding or minimizing the potential to interact with migratory species during the active breeding season. ONEOK also understands that in North Dakota, the breeding season is typically defined as occurring annually from February 1 through July 15.

E3 Environmental, LLC (E3) has been retained by ONEOK to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact Brad Norling, of E3 at 651-272-1154 or bnorling@go2e3.com.

Sincerely,

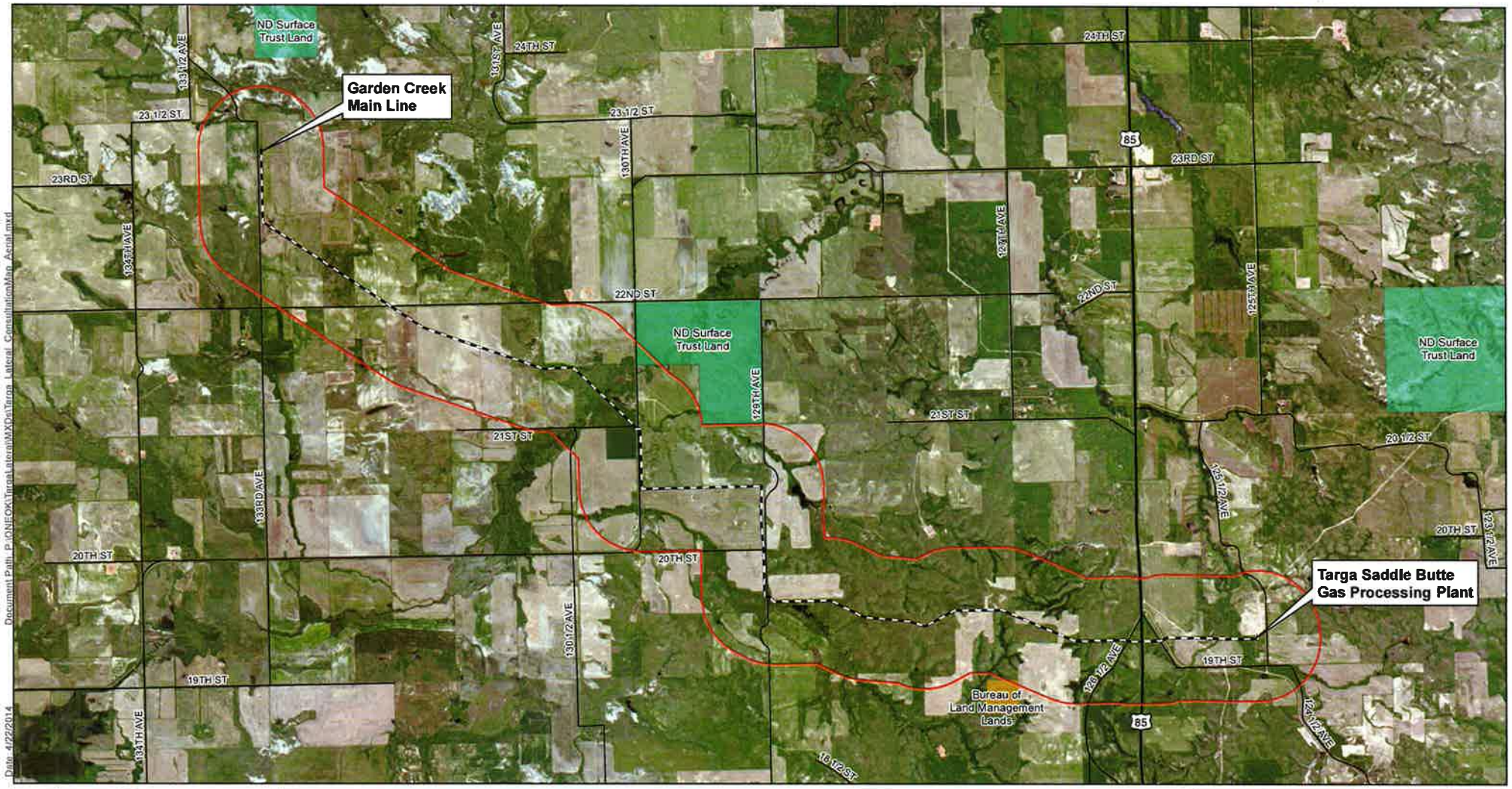
Loretta M. Earnest

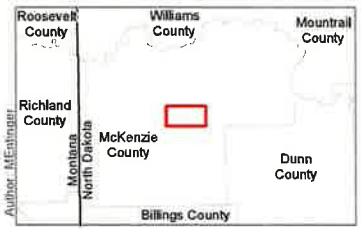
Loretta M. Earnest
Manager – Environment
ONEOK Bakken Pipeline, L.L.C.

Enclosures: Project Map – USGS Topographic
Project Aerial Photography

xc: Brad Norling, E3/Loretta Earnest, ONEOK (pdf)
Tulsa Large Construction Projects – Targa Lateral PL

100 West Fifth Street, Tulsa, OK 74103-4298
P. O. Box 871, Tulsa, OK 74102-0871





Pipeline
Corridor (1 Mile)
Federal Land
State Land

ONEOK BAKKEN PIPELINE
A SUBSIDIARY OF ONEOK PARTNERS

E3 ENVIRONMENTAL
Enhancing Execution with Experience

N

0 0.5 1 2 Miles

1:46,000

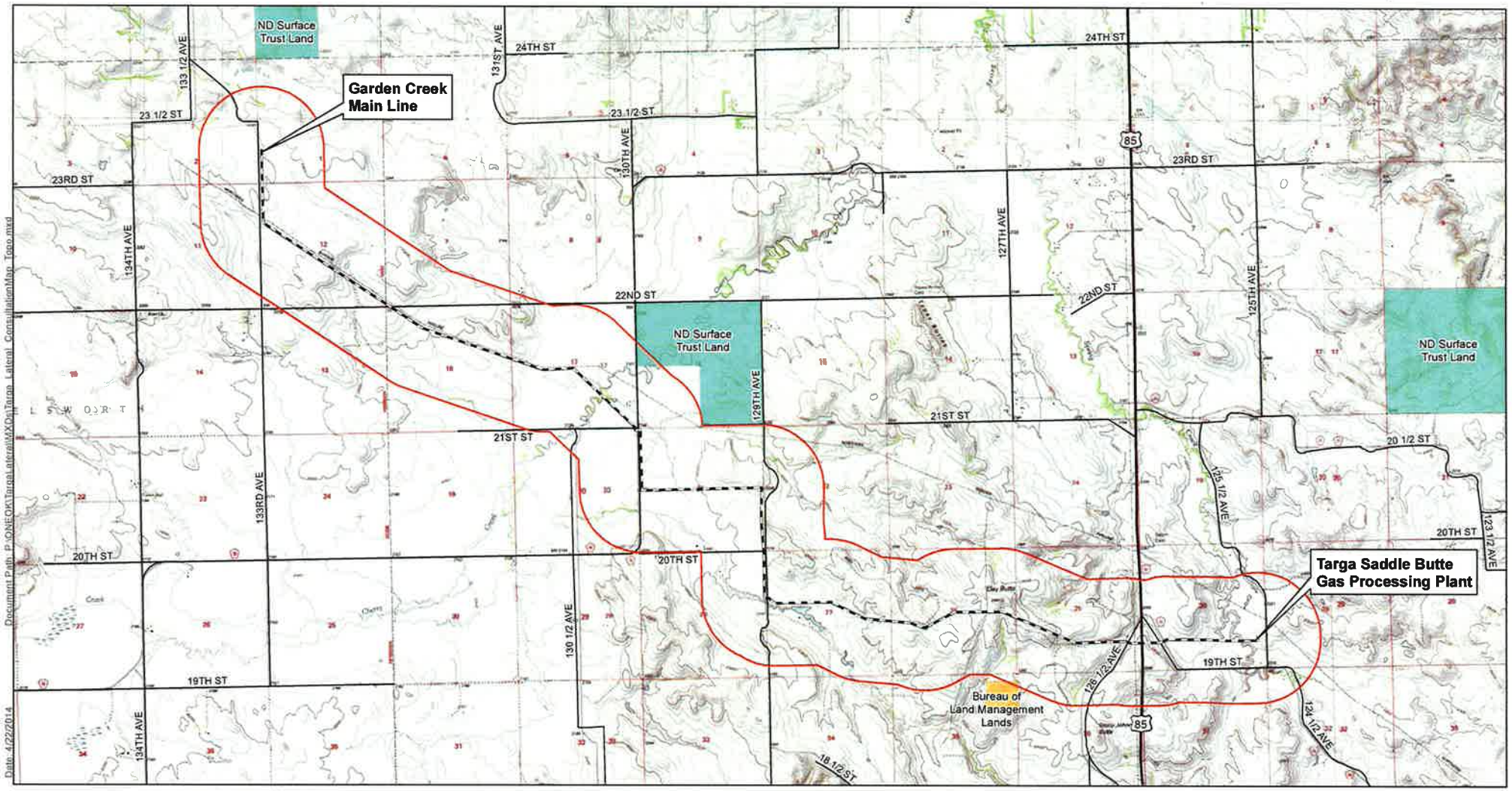
Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Aerial Overview Map

McKenzie County, ND



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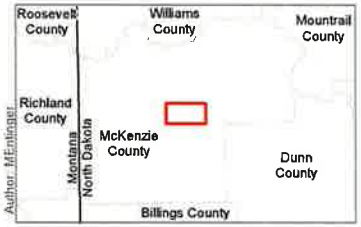
Date: 4/22/2014

Author: MEntinger



Pipeline

Corridor (1 Mile)

Federal Land

State Land

ONEOK BAKKEN PIPELINE
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N

0 0.5 1 2 Miles

1:46,000

Map not to scale, for environmental review purposes only.

ONEOK Bakken Pipeline, L.L.C.

Targa Lateral

Topo Overview Map

McKenzie County, ND

State Historic and Preservation Office

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

May 23, 2014

Paul Picha
Chief Archaeologist
State Historical Society of North Dakota
Archeology & Historic Preservation Division
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

ONEOK BAKKEN PIPELINE, L.L.C.: TARGA LATERAL PIPELINE PROJECT
CLASS III CULTURAL RESOURCE INVENTORY REPORT

Dear Mr. Picha,

Bakken Pipeline, L.L.C. (ONEOK) is proposing the Targa Lateral Pipeline Project (Project). This Project includes the construction of a 10.6-mile natural gas liquids transmission pipeline and as such is subject to the North Dakota Public Service Commissions (PSC) Siting Act. The Project will be wholly located in McKenzie County, North Dakota. E3 Environmental, LLC (E3), ONEOK's Environmental Consultant, is preparing the required application materials for the NDPSC; a cultural resource inventory is a required part of this filing.

ONEOK submits the enclosed report titled *A Class I and Class III Cultural Resource Inventory of the ONEOK Bakken Pipeline, L.L.C., Targa Lateral Pipeline Project, McKenzie County, North Dakota* (Report). This Report, prepared by SWCA Environmental Consultants (SWCA) documents the results of the cultural resource inventory conducted for the proposed Project.

Ten previously recorded cultural resources were revisited for the Project. They are described below:

- 32MZ480: Cultural material scatter; Not Eligible
- 32 MZ481: Homestead; Unevaluated
- 32 MZ1561: Transmission line; Not Eligible
- 32 MZX261: Cultural material scatter site lead; Unevaluated
- 32 MZX262: Cultural material scatter site lead; Unevaluated
- 32 MZX263: Cultural material scatter site lead; Unevaluated
- 32 MZX266: Cultural material scatter site lead; Unevaluated
- 32 MZX362: Quarry/mine site lead; Unevaluated
- 32 MZX364: Quarry/mine site lead; Unevaluated
- 32 MZX1213: Chipped stone isolated find; Not Eligible

One cultural resource was newly recorded; the site is described below:

- 32 MZ1399: Historic engine block, Not Eligible

Of the resources outlined above, 32MZ480, 32MZ481, 32MZ1561, 32MZX1213, and 32MZX1399 are recommended not eligible for the NRHP, and therefore no further work is necessary. Site leads 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, and 32MZX364 remain unevaluated for the NRHP. Although attempts were made to relocate the site leads within the project area, none was relocated during the current inventory. The site leads may be located within the documented site boundary outside the project area; therefore, no further work is necessary. With the above stipulations, it is recommended a determination of No Significant Sites Affected and No Historic Properties Affected be granted for the project to proceed as planned.

Upon review should you have any questions please contact Dan Woodward with E3 at 651-282-1150 or Katie Schmidt with E3 at 651-282-0652.

Sincerely,

Loretta M. Earnest

Loretta M. Earnest
Manager-Environment

Enclosures:

A Class I and Class III Cultural Resource Inventory of the ONEOK Bakken Pipeline, L.L.C., Targa Lateral Pipeline Project, McKenzie County, North Dakota (1 Copy)

cc w/enclosure:

Appendix D

Natural Resources Report

Natural Resources and Wetland Determination Report for the Targa Lateral Pipeline, McKenzie County, North Dakota

Prepared for

E3 Environmental, LLC

On behalf of

ONEOK Rockies Midstream, LLC

Prepared by

SWCA Environmental Consultants

May 2014

Natural Resources and Wetland Determination Report for the Targa Lateral Pipeline, McKenzie County, North Dakota

Prepared for:

E3 Environmental, LLC
871 Jefferson Avenue
St. Paul, Minnesota 55102

On behalf of:

ONEOK Rockies Midstream, LLC
1400 16th Street, Suite 310
Denver, Colorado 80202

Prepared by:

Mike Fettes, B.S., and Kate Kenninger, M.S.
Environmental Specialists

Reviewed by:

Tom Furgason
Principal, Rocky Mountain Plains Offices

SWCA Environmental Consultants
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501
Phone (701) 258-6622, Fax (701) 258-5957

SWCA Project No. 29408

May 21, 2014

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1.0 INTRODUCTION

1.1 BACKGROUND

ONEOK Rockies Midstream, LLC (ONEOK) proposes to construct an approximate 10-mile-long pipeline in McKenzie County, North Dakota. SWCA Environmental Consultants (SWCA) was selected by E3 Environmental, LLC (E3) to conduct natural resources field surveys in order to identify exclusion and avoidance areas as specified in North Dakota Administrative Code 69-06-08-02 for the proposed Targa Lateral pipeline project.

As proposed, the Targa Lateral pipeline is approximately 10 miles long, spanning private and state lands in North Dakota (Appendix A). The project falls under the jurisdiction of the North Dakota Public Service Commission (NDPSC). E3 is assisting ONEOK with their application to the NDPSC for a certificate of corridor compatibility and route permit for the project.

SWCA conducted field surveys, including reroutes, of a 250-foot-wide corridor on April 24, 25, and May 7, 15, 2014, to determine the potential presence and extent of wetlands and waterbodies, including jurisdictional waters of the U.S., within the proposed survey area. Concurrently with the wetland/waterbody determinations, SWCA conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. Site layout maps of the survey area and natural resource features identified during the field surveys are provided in Appendix A.

This report outlines the methodology used by SWCA's ecologists to complete each of the aforementioned surveys. Additionally, this report presents the results of the completed field surveys and regulatory recommendations to facilitate compliance with the NDPSC and the U.S. Army Corps of Engineers (USACE) Nationwide Permit 12.

1.2 REGULATORY BACKGROUND

1.2.1 Clean Water Act, Section 404

Section 404 of the Clean Water Act prohibits the discharge of fill material into waters of the U.S., also known as jurisdictional waters, without a permit from the USACE.

1.2.2 USACE Nationwide Permit 12

The USACE Nationwide Permit 12 authorizes the construction of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the permanent loss of greater than 0.5 acre of waters of the U.S., including wetlands.

Nationwide Permit 12 requires that the permittee submit a pre-construction notification prior to commencing construction if any of the following criteria are met.

- The activity involves mechanized land clearing in a forested wetland.
- A Section 10 permit is required to cross a navigable waterbody (Rivers and Harbors Act).
- The utility line exceeds 500 feet in length through any single crossing of a water of the

U.S.

- The utility line is placed within a jurisdictional area (i.e., water of the U.S.) and it runs parallel to a stream bed that is within that jurisdictional area.
- Discharges result in the permanent loss of greater than 0.1 acre of waters of the U.S.
- Permanent access roads are constructed above grade in waters of the U.S. for a distance of more than 500 feet.
- Permanent access roads are constructed in waters of the U.S. with impervious materials.

1.2.3 USACE Regional Conditions

The USACE has published several regional conditions for projects operating under Nationwide Permits in North Dakota. The regional conditions apply to wetlands classified as "fens," waters adjacent to natural springs, the Missouri River, historic properties, and fish spawning areas.

2.0 METHODS

2.1 SURVEY AREA

Overall, northwest North Dakota is characterized by a moderate to cool climate, with cold, dry winters and mild to warm summers. Mean annual precipitation for the area is 14 to 16 inches (Bryce et al. 1998).

The proposed project is located in the Great Plains (level I) ecoregion. Further, the proposed project is located in the West-Central Semi-Arid Prairies (level II) ecoregion, Northwestern Great Plains (level III) ecoregion, and the Missouri Pleateau (level IV). These ecoregions are characterized by unglaciated topography, complex stream drainages, and susceptibility to erosion. Primary land uses are grazing, small grain agriculture, and recreation (Bryce et al. 1998). Figure 1 is an overview of the project area.

Figure 1. Project area overview depicting general topography towards southeastern end of pipeline corridor, facing north.

The inventoried area for the North Dakota portion of the project area discussed herein is situated on the U.S. Geological Survey Arnegard (1979), Stocke Butte (1960), and Tepee Buttes (1960), North Dakota, quadrangles. The proposed project corridor that was surveyed on April 24, 25, and May 7, 15, 2014, encompasses portions of 12 sections within 3 townships and ranges.

- Sections 1 and 12, Township (T) 149 North (N), Range (R) 100 West (W)
- Sections 7, 17, 18, 20, 21, and 25–28, T149N, R99W
- Section 30, T149N, R98W

2.2 WETLANDS

National Wetland Inventory (NWI) mapping for the region indicates the presence of wetlands (U.S. Fish and Wildlife Service [USFWS] 2012a). SWCA ecologists conducted wetland determinations within the survey area based on the principles and guidelines provided in the 1987 Corps of Engineers Wetlands Delineation Manual (Manual) (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0* (Supplement) (USACE 2010). According to the Manual, an area is a wetland if three mandatory wetland indicators are present in a given area,

with special exceptions. These criteria include the presence of hydrophytic vegetation and wetland hydrology. During wetland determinations SWCA recorded indicators of hydrology and hydrophytic vegetation. All wetlands and waterbodies geographically referenced within the survey area during field survey are depicted on the site layout maps in Appendix A.

2.2.1 Hydrophytic Vegetation

Ecologists recorded all plants within the vegetative community based on the respective stratum in which each species occupied. A tree is defined by the Supplement to be a woody-stemmed plant with a trunk diameter at breast height (DBH) of equal to or greater than 3 inches, regardless of height. The sapling and shrub stratum is defined by the Supplement to be composed of woody-stemmed plants with a trunk DBH of less than 3 inches, regardless of height. The herbaceous stratum includes all non-woody-stemmed plants regardless of height. Finally, the woody vine stratum includes all woody-stemmed vines, regardless of diameter.

SWCA recorded the binomial scientific name and percent cover of all plants within a 30-foot radius for the tree stratum, a 15-foot radius for the sapling/shrub stratum, a 5-foot radius for the herbaceous stratum, and a 30-foot radius for the woody vine stratum. SWCA ecologists noted each plant species' respective USFWS indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). In some instances the size and shape of the vegetative sampling plot was manipulated to better encompass each wetland or upland area, though the overall area assessed remained unchanged. Vegetation communities met the hydrophytic vegetation criterion for wetlands if greater than 50% of dominant species had an indicator status of FAC, FACW, and OBL. SWCA also noted and geospatially referenced all populations of North Dakota state or county-listed noxious weeds identified within the survey area.

2.2.2 Wetland Hydrology

A wetland was determined to contain wetland hydrology if at least one primary indicator or at least two secondary indicators of wetland hydrology were present, as defined by the Manual and Supplement. Common hydrologic indicators include the presence of surface water, high water table, soil saturation, water marks on trees or other objects, sediment deposits, water-stained leaves, and oxidized rhizospheres on living roots.

2.3 WATERBODIES

Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; the destruction of terrestrial vegetation; the presence of litter and debris; and watermarks on structures that are inundated during normal high water conditions. The OHWM typically represents the potential limits of the USACE jurisdiction. Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

SWCA classified streams as perennial, intermittent, or ephemeral based on field observations. During a typical year, a perennial stream contains flowing water year-round and the water

table is located above the stream bed. Groundwater is the primary water source for stream flow while precipitation runoff is supplemental. Ecologists classified streams that showed significant flow during the field survey as perennial. Additionally, the U.S. Geological Survey topographic maps were used as reference.

An intermittent stream has flowing water for only portions of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

2.4 NOXIOUS WEED SURVEYS

SWCA conducted a noxious weed survey of all populations of North Dakota state- or county-listed noxious weeds within the project area. Surveys were conducted in early spring, therefore little to no new vegetation growth had occurred. It is possible that small isolated patches of noxious weeds could have been missed due to surveying early in the growing season, and potentially could emerge later in the year.

2.5 TREE, SAPLING, AND SHRUB COUNT

SWCA ecologists determined the total number of trees, saplings, and shrubs present within the survey area by employing several different techniques depending on the type of woody vegetation habitat (i.e., forested upland, shrubland, or shelterbelt) encountered and the overall extent of each habitat within the right-of-way (ROW). The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a Trimble GeoXT series handheld global positioning system (GPS) unit. In forested upland and shrubland habitat, SWCA counted or estimated the number of all woody-stemmed vegetation with a DBH of ≥1 inch. In shelterbelt areas, all woody-stemmed vegetation, regardless of DBH, was inventoried via direct count. No woody vegetation was inventoried in wetlands. Ecologists taxonomically identified all recorded individuals to the species level within each habitat type.

2.6 WILDLIFE INCLUDING THREATENED AND ENDANGERED SPECIES

Prior to conducting field surveys, SWCA reviewed information obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2014) regarding the presence of threatened or endangered species that may occur within the survey area. This document does not represent a comprehensive survey, but rather acknowledges the past and/or current presence of listed species. The lack of discovery of threatened or endangered species does not signify their non-existence within the area, but only that no primary or secondary indications of these species were recorded. SWCA completed a random survey for all listed species and suitable habitat.

A line-of-sight binocular survey for raptor species was also conducted for a distance of approximately 0.5 mile. SWCA ecologists noted all wildlife observed during the field survey. Wildlife sightings can involve primary observations (i.e., actual sighting of an animal) or secondary observations (i.e., observation of scat, tracks, or fur deposits).

2.7 MAPPING

The boundaries of each wetland, waterbody, woody vegetation habitat, and noxious weed assemblage were geographically recorded using a Trimble GeoXT GPS unit. The aforementioned GPS unit is capable of recording geographic data with sub-meter accuracy. SWCA used Universal Transverse Mercator Zone 13 North as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS v10.0 (ESRI Redlands, California) was used to analyze recorded features, calculate areas, and generate the maps provided in Appendix A. Please note that all data collected using the GPS unit, and displayed on the attached maps, are for review purposes only and do not represent a professional civil survey.

3.0 RESULTS

3.1 VEGETATION

During the field survey, SWCA ecologists identified four general types of vegetative communities within the survey area. These vegetative communities were classified as herbaceous upland, shrubland and upland woody vegetation, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic or submergent aquatic macrophytes. Photographs of the survey area are provide din Appendix C.

Vegetation communities met the hydrophytic vegetation criterion for wetlands if greater than 50% of dominant species had an indicator status of FAC, FACW, or OBL. The upland communities failed to meet at least one of the three assessed wetland criteria.

3.1.1 Herbaceous Upland

The herbaceous upland community consists of areas dominated by non-woody vegetation such as grasses and forbs. Herbaceous uplands observed were commonly comprised of smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), Kentucky bluegrass (*Poa pratensis*), and white sweetclover (*Melilotus alba*).

3.1.2 Shrubland and Woody Vegetation

Shrubland communities occurring throughout the survey area consisted of upland areas dominated by woody-stemmed vegetation including silver buffaloberry (*Shepherdia argentea*), creeping juniper (*Juniperus horizontalis*), and western snowberry (*Symphoricarpos occidentalis*).

Forested upland vegetation consisted of green ash (*Fraxinus pennsylvanica*), boxelder (*Acer negundo*), Siberian elm (*Ulmus pumila*), silver buffaloberry, and western snowberry.

3.1.3 Cropland

Cropland was confirmed in the survey area and classified as wheat (*Triticum aestivum*).

3.1.4 Hydrophytic Vegetation

Aquatic vegetation species confirmed during the survey included foxtail barley (*Hordeum jubatum*), sedge (*Carex* spp.), bulrush (*Scirpus* spp.), reed canarygrass (*Phalaris arundinacea*), prairie cordgrass (*Spartina pectinata*), western dock (*Rumex occidentalis*), and broad-leaf cattail (*Typha latifolia*).

3.2 HYDROLOGY

Wetland communities, observed during the determination effort, displayed at least one primary or two secondary indicators of wetland hydrology, as defined by the Manual and Supplement. Upland communities either failed to display hydrologic indicators or failed to meet the hydrophytic vegetation criterion, as defined by the Manual and Supplement. Common indicators of wetland hydrology observed during field surveys include Surface Water (A1), Saturation (A3), Drift Deposits (B3), Algal Mat or Crust (B4), Inundation Visible on Aerial Imagery (B7), and Salt Crust (B11).

According to National Weather Service preliminary climatological data for Williston, North Dakota, 2.58 inches of precipitation was recorded from February 1 through May 15, 2014 (Table 1). This amount is 0.32 inch below normal for this time period.

Table 1. Monthly Recorded Rainfall at National Weather Service Station in Williston, North Dakota.

Month	Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
February 2014	0.26	0.39	-0.13
March 2013	0.32	0.71	-0.39
April 2014	1.71	1.00	0.71
May 1–15, 2014	0.29	0.80	-0.51
Total	**2.58**	**2.90**	**-0.32**

Source: National Oceanic and Atmospheric Administration 2014

3.3 WETLANDS

SWCA recorded nine PEM wetlands within the 250-foot survey area, totaling approximately 6.14 acres. In total, approximately 0.92 acre of PEM wetland are proposed to be temporarily impacted in the 100-foot-wide construction ROW (Table 2). Seven jurisdictional wetlands will be temporarily impacted; however, the USACE has the final authority to determine jurisdictional status.

Table 2. PEM Wetland Acreage within the Survey Area.

Feature ID	Location	USACE Jurisdiction*	Temporarily Impacted Area within 100-foot-wide ROW (acres)	Total PEM Size (acres)	Length of Required Crossing (feet)
WET1	Intermittent Drainage	Jurisdictional	0.16	3.33	165.40
WET2	Depression	Isolated	0.04	0.09	113.83
WET3	Intermittent Drainage	Jurisdictional	0.06	0.33	137.19
WET4	Intermittent Drainage	Jurisdictional	0.00	0.89	0.00
WET5	Flood Plain	Jurisdictional	0.00	0.07	0.00
WET6	Intermittent Drainage	Jurisdictional	0.08	0.15	103.34
WET7	Depression	Isolated	0.33	0.66	116.54
WET8	Intermittent Drainage	Jurisdictional	0.20	0.39	121.11
WET9	Intermittent Drainage	Jurisdictional	0.05	0.23	106.83
		Total	**0.92**	**6.14**	**864.24**

* The USACE has the final authority on the jurisdictional status of a waterbody.
PEM = palustrine emergent
ROW = right-of-way
USACE = U.S. Army Corps of Engineers

3.4 WATERBODIES

SWCA identified five waterbodies during the field survey: one ephemeral stream, three intermittent streams, and one perennial stream (Table 3). One intermittent stream (STR5) was crossed twice within the survey area. All five waterbodies are considered to be jurisdictional due to the presence of an OHWM. In addition, SWCA recorded three upland swales that are likely to contain flowing water during high rain event or spring run-off; however, no OHWM was present. Representative photographs of waterbodies and upland swales delineated in the field are provided in Appendix C.

Table 3. Waterbody ID, Name, Classification, Acreages, and Jurisdictional Status.

Waterbody ID	Waterbody Name	Classification	Temporarily Impacted Area within 100-foot-wide ROW (acres)	Length in Construction ROW (feet)	Average Width of OHWM (feet)	USACE Jurisdictional Status*
STR1	Unnamed	Ephemeral	0.01	144.48	2	Jurisdictional
STR2	Unnamed	Intermittent	<0.01	40.79	6	Jurisdictional
STR3	Unnamed	Intermittent	0.02	135.47	6	Jurisdictional
STR4	Cherry Creek	Perennial	0.05	106.64	12	Jurisdictional
STR5	Spring Creek	Intermittent	0.03	106.83	4	Jurisdictional
		Total	**0.12**	**534.21**		

* The USACE has the final authority on the jurisdictional status of a waterbody.
OHWM = ordinary high water mark
ROW = right-of-way
USACE = U.S. Army Corps of Engineers

3.5 SOILS

Thirty soil types are present in the project construction corridor, based on Natural Resources Conservation Service mapping (NRCS 2013). The project area analyzed for soils covers the 100-foot-wide construction corridor. Table 4 lists all soil units within the project area. The following soil component descriptions represent the most prevalent soil series found within the survey area (NRCS 2013).

Table 4. NRCS Derived Soil Series Present within the ROW.

Soil Types	Slopes (%)	Acres within 100-foot-wide ROW	Percent within Map Unit
Daglum-Belfield complex	0 to 6	25.53	19.79
Rhoades-Daglum complex	0 to 6	15.21	11.79
Zahl-Cabba-Maschetah complex	6 to 70	11.51	8.93
Zahl-Williams loams	9 to 15	8.31	6.44
Cabba-Chama-Havrelon, occasionally flooded complex	2 to 70	6.88	5.33
Farnuf loam	0 to 2	6.82	5.28
Korchea loam, occasionally flooded	0 to 2	6.27	4.86
Zahl-Williams-Cabba complex	6 to 9	5.14	3.99
Korchea-Fluvaquents complex, channeled, frequently flooded	0 to 2	4.70	3.64
Belfield-Savage-Daglum complex	2 to 6	3.98	3.09
Savage-Grail silty clay loams	0 to 2	3.75	2.91
Reeder-Farnuf loams	3 to 6	3.46	2.68
Moreau-Wayden silty clays	6 to 9	2.83	2.19
Flasher-Vebar-Parshall complex	9 to 35	2.72	2.11
Zahl-Cabba-Williams complex	9 to 15	2.68	2.07
Chama-Sen-Cabba silt loams	3 to 6	2.51	1.94
Belfield-Grail clay loams	0 to 2	2.49	1.93
Chama-Cabba-Sen silt loams	6 to 9	2.49	1.93
Farnuf loam	6 to 9	2.36	1.83
Farnuf loam	2 to 6	2.30	1.78
Savage silty clay loam	2 to 6	1.42	1.10
Regent-Savage silty clay loams	3 to 6	1.22	0.94
Williams-Zahl loams	3 to 6	1.12	0.87
Flasher-Rock outcrop-Vebar complex	9 to 70	0.91	0.71
Cabba-Chama-Shambo loams	9 to 50	0.89	0.69
Cabba-Chama-Sen silt loams	9 to 15	0.87	0.68
Lawther silty clay	0 to 2	0.44	0.34

Soil Types	Slopes (%)	Acres within 100-foot-wide ROW	Percent within Map Unit
Golva silt loam	0 to 2	0.16	0.13
Williams-Zahl loams	6 to 9	0.02	0.02
Cabba-Badland complex	6 to 70	0.02	0.01
	Total	**128.98**	**100.00**

Source: NRCS 2013.
ROW = right-of-way

3.5.1 Daglum

The Daglum series consists of deep and very deep, moderately well- and well-drained, slow to very slowly permeable soils found on swales on upland terraces and foot slopes. Slopes range from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 42 degrees Fahrenheit (°F). This soil type is used for rangeland foraging and cultivation of small grains. Native vegetation species common to this soil type include western wheatgrass, blue grama (*Bouteloua gracilis*), and green needlegrass (*Nasella viridula*) (NRCS 2013).

3.5.2 Belfield

The Belfield series consists of deep and very deep, well- to moderately well-drained, very slowly permeable soils found on upland flats, terraces, and swales with slopes ranging from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 43°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, blue grama, and green needlegrass (NRCS 2013).

3.5.3 Rhoades

The Rhoades series consists of deep and very deep, well- to moderately well-drained, very slowly permeable soils found on swales and uplands with slopes ranging from approximately 0 to 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass and blue grama (NRCS 2013).

3.5.4 Zahl

The Zahl series consists of very deep, slowly permeable, well-drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western

wheatgrass, little bluestem (*Schizachyrium scoparium*), and needle and thread (*Hesperostipa comata*) (NRCS 2013).

3.5.5 Cabba

The Cabba series consists of shallow, well-drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem, green needlegrass, and other various herbs, forbs, and shrub species (NRCS 2013).

3.5.6 Maschetah

The Maschetah series consists of very deep, well-drained soils found on sedimentary plains and hills. Slopes range from approximately 0 to 45 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 17 inches and mean annual air temperature is approximately 43°F. This soil type is used for rangeland foraging and cultivation of small grains. Native vegetation species common to this soil type include western wheatgrass, blue grama, green needlegrass, and fringed sagewort (*Artemisia frigida*) (NRCS 2013).

3.6 TREE, SAPLING, AND SHRUB COUNT

During SWCA's field survey, fourteen upland tree and shrubland areas were geographically referenced within the survey area. Table 5 summarizes the number of trees estimated to be impacted by the project as currently proposed. The NDPSC requires a 2:1 post- to pre-construction mitigation for all trees, saplings, and shrubs impacted during the construction of the proposed pipeline. Therefore, SWCA estimates approximately 30 2-year-old sapling individuals would need to be replanted in order to fulfill the 2:1 mitigation requirement.

Table 5. Tree, Sapling, and Shrub Count.

Woody Vegetation (WV) ID	Species	Type	Number of Trees*		Estimated Mitigation Commitment
			250-foot-wide Survey Corridor	100-foot-wide Construction ROW	
WV1	*Fraxinus pennsylvanica* *Shepherdia argentea*	Tree	1 30	0 0	0 0
WV2	*Ulmus pumila*	Tree	3	0	0
WV3	*Fraxinus pennsylvanica*	Tree	2	0	0
WV4	*Fraxinus pennsylvanica*	Tree	7	0	0
WV5	*Fraxinus pennsylvanica*	Tree	9	0	0
WV6	*Fraxinus pennsylvanica*	Tree	40	2	4
WV7	*Fraxinus pennsylvanica* *Acer negundo*	Tree	20 1	3 0	6 0

Woody Vegetation (WV) ID	Species	Type	Number of Trees*		Estimated Mitigation Commitment
			250-foot-wide Survey Corridor	100-foot-wide Construction ROW	
WV8	*Fraxinus pennsylvanica*	Tree	1	1	2
WV9	*Fraxinus pennsylvanica*	Tree	4	4	8
WV10	*Fraxinus pennsylvanica*	Tree	1	0	0
WV11	*Acer negundo*	Tree	1	0	0
WV12	*Acer negundo*	Tree	2	1	2
WV13	*Shepherdia argentea*	Tree	8	2	4
WV14	*Shepherdia argentea*	Tree	23	2	4
		Total	**153**	**15**	**30**

* Estimated value based off of the observed density of trees.
ROW = right-of-way

3.7 NOXIOUS WEEDS

North Dakota Century Code Chapter 63-01.1 and the North Dakota Department of Agriculture recognize 11 species as noxious weeds. The species include absinth wormwood (*Artemisia absinthium*), Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), leafy spurge (*Euphorbia esula*), musk thistle (*Carduus nutans*), purple loosestrife (*Lythrum salicaria*), Russian knapweed (*Acroptilon repens*), spotted knapweed (*Centaurea stoebe*), yellow toadflax (*Linaria vulgaris*), dalmatian toadflax (*Linaria dalmatica*), and salt cedar (*Tamarix ramosissima*). No noxious weeds were identified during the surveys.

3.8 WILDLIFE

Several wildlife species that may exist in McKenzie County are listed as threatened or endangered under the Endangered Species Act (ESA) (16 United States Code 1531 et seq.). According to the USFWS, listed species in McKenzie County, North Dakota, include the black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), whooping crane (*Grus americana*), piping plover (*Charadrius melodus*), interior least tern (*Sterna antillarum*), and pallid sturgeon (*Scaphirhynchus albus*). Candidate species include Sprague's pipit (*Anthus spragueii*). Proposed species include Dakota skipper (*Hesperia dacotae*), northern long-eared bat (*Myotis septentrionalis*), and rufa red knot (*Calidris canutus rufa*) (USFWS 2014). SWCA conducted a cursory threatened and endangered species survey concurrently with the wetland determination. Ecologists did not observe any primary (i.e., actual sighting) or secondary (tracks, scat, fur) indication of the presence of threatened or endangered species.

The proposed project would have no effect on black-footed ferret and gray wolf, interior least tern, whooping crane, and piping plover have the potential to occur within the project area as migrants. As a result, these species may be, but are not likely to be adversely, affected by the proposed project. Additionally, the proposed project occurs within the same watershed as Lake Sakakawea and therefore may affect, but is not likely to adversely affect the pallid

sturgeon or designated critical habitat for piping plover. The proposed project is not likely to jeopardize the Sprague's pipit, Dakota skipper, northern long-eared bat, and rufa red knot.

3.8.1 Black-footed Ferret

Federal Status: Endangered
Affects Determination: No effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2013a). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size were not observed during the field survey. In addition, this species has not been observed in the wild for more than 20 years. Therefore, the proposed project would have **no effect** on this species.

3.8.2 Gray Wolf

Federal Status: Endangered
Affects Determination: No effect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s, with only sporadic reports from the 1930s to present (Licht and Huffman 1996; USFWS 1978). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings within western North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountain region of north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 17 miles (28 kilometers [km]) from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2013b). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project would have **no effect** on the gray wolf.

3.8.3 Whooping Crane

Federal Status: Endangered
Affect Determination: May affect, is not likely to adversely affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and USFWS 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2013c). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and USFWS 2007; USFWS 2013c). McKenzie County, including the project area, is within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and USFWS 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and USFWS 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 0.6 mile (1 km) of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and USFWS 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland and wetlands >0.04 hectare) was observed within the survey area. In addition, the project area is located within the migratory corridor for the whooping crane, with the nearest sighting approximately 5 miles to the southwest of the westernmost bend of the pipeline (USFWS, M. Tarcha, unpublished data). Therefore, the proposed project **may affect, but is not likely to adversely affect** the endangered whooping crane.

3.8.4 Piping Plover

Federal Status: Threatened
Affect Determination: May affect, is not likely to adversely affect

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985a).

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 (USFWS 2002, 2012b). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2012b). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2012b).

Suitable shoreline habitat for breeding and nesting plovers does not occur within the project area and the Missouri River is a minimum of 16 miles north from the proposed survey area. It is unlikely but possible that migrating plovers may traverse the project area during their migration. Therefore, the proposed project **may affect, but is not likely to adversely affect** piping plovers.

3.8.5 Designated Critical Habitat of Piping Plover

Affect Determination: May affect, is not likely to adversely affect

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat including the shoreline of Lake Sakakawea in McKenzie County, North Dakota (USFWS 2002).

Since the proposed project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or the Missouri River, but is within the same watershed as Lake Sakakawea or the Missouri River, the proposed project **may affect, is not likely to adversely affect** designated critical habitat of the piping plover.

3.8.6 Interior Least Tern

Federal Status: Endangered
Affect Determination: May affect, is not likely to adversely affect

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2013d).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The

adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2013d).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone Rivers upstream of Lake Sakakawea (USFWS 1990a, 2013d). Approximately 100 pairs breed in North Dakota (USFWS 2013d). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990a, 2013d).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande river systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Critical habitat has not been designated for the species (USFWS 2013d). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2013d).

Suitable shoreline habitat for breeding and nesting terns does not occur in the project area, and the Missouri River is a minimum of 16 miles north from the survey area. It is unlikely that terns would visit the upland or wetland habitats present in the survey area. Therefore, the proposed project **may affect, but is not likely to adversely affect** endangered least terns.

3.8.7 Pallid Sturgeon

Federal Status: Endangered
Affect Determination: May affect, is not likely to adversely affect

The pallid sturgeon was listed as endangered in 1990 in the United States by the USFWS (1990b). The primary factor leading to the decline of this species is the alteration of habitat through river channelization, creation of impoundments, and alteration of flow regimes (USFWS 1990b). These alterations within the Missouri River have blocked movements to spawning, feeding, and rearing areas; destroyed spawning habitat; altered flow conditions which can delay spawning cues; and reduced food sources by lowering productivity (USFWS 2007a). 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 (USFWS 1990b).

The pallid sturgeon populations occur in the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). This population consists of approximately 136 wild adult pallid sturgeon (USFWS 2007a). Hatchery-reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to utilize the 15.5 miles (25 km) of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, the North Dakota Game

and Fish Department has caught and released pallid sturgeon in nets set in 80 to 90 feet of water between the New Town and Van Hook areas. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service to SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon is not present in the survey area and Lake Sakakawea is a minimum of 16 miles north from the project area. However, tributaries to the Missouri River are found within the project area. Potential pollution occurring as a result of construction activities, hydrostatic testing, and pipeline operations are concerns for downstream populations of endangered pallid sturgeon. Activities associated with the proposed project are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Therefore, the proposed project **may effect, but is not likely to adversely affect** pallid sturgeon.

3.8.8 Sprague's Pipit

Federal Status: Candidate
Affect Determination: Not likely to jeopardize

The Sprague's pipit is a small passerine, 10 to 15 centimeters in length, endemic to the Northern Great Plains (USFWS 2011). The Sprague's pipit requires large tracts of native prairie habitat, unplowed, throughout their life cycle. Because native grasslands are disturbance-dependent, Sprague's pipit prefers grassland habitats that are regularly disturbed. The frequency of disturbance required for habitat maintenance depends on how quickly grasses grow to an intermediate height (4 to 12 inches) following a disturbance event.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2011). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 m away from anthropogenic features such as roads, oil wells, and wind turbines (USFWS 2011). The USFWS has estimated that each new oil well and associated road in North Dakota results in potential impacts to approximately 51 acres of pipit habitat due to avoidance and habitat fragmentation (USFWS 2011). Because of increasing habitat fragmentation, especially by energy development, throughout the Sprague's pipit range, and the loss of native prairie habitat, the Sprague's pipit was listed as a Candidate Species under the ESA in 2010 (USFWS 2011).

In North Dakota, Sprague's pipit breeds throughout the state except for the easternmost counties. During the breeding season they prefer large patches of well drained, open native grassland with a minimum size of 358.3 acres (range = 170 to 776 acres). They have not been observed in areas smaller than 71.6 acres on their breeding grounds (USFWS 2011).

Native prairie habitat with grasses of intermediate height does occur within the project area. However, the habitat within and surrounding the project area has been previously disturbed by agriculture, roads, and oil and gas development. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding

grounds in the immediate project area, but may indirectly contribute to reduced use of any nearby suitable grassland habitat patches within 350 meters of the proposed project. Therefore, the proposed project **is not likely to jeopardize the** Sprague's pipit.

3.8.9 Dakota Skipper

Federal Status: Proposed
Affect Determination: Not likely to jeopardize

The Dakota skipper is a small butterfly with a 1-inch wingspan and is found primarily in undisturbed native tall grass and upland dry Northern mixed grass prairie areas with a high diversity of wildflowers and grasses (Committee on the Status of Endangered Wildlife in Canada 2003). The Dakota skipper appears to require a range of precipitation-evaporation ratios between 60 and 105 and a soil pH between 7.20 and 7.90 (McCabe 1981). Larvae feed on grasses, favoring little bluestem. Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower (*Echinacea angustifolia*). The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding (USFWS 2005). Suitable habitat does not exist within the proposed project area. It is not anticipated that construction activities would negatively impact the species as long as reclamation is conducted as soon as the construction phase is complete. In addition, the use of existing access roads to reach the proposed pipeline location reduces the potential fragmentation of suitable habitat. Lastly, the implementation of a noxious weed management program significantly reduces any potential impacts on the Dakota skipper and its habitat. Therefore, the proposed project **is not likely to jeopardize** this species. The use of best management practices and conservation guidelines (USFWS 2007b) during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

3.8.10 Northern Long-eared Bat

Federal Status: Proposed
Affect Determination: Not likely to jeopardize

On October 2, 2013, the USFWS proposed the northern long-eared bat for listing as endangered under the ESA (USFWS 2013e). This medium-sized bat ranges across the eastern and north central United States and all of the Canadian provinces (USFWS 2013e). Throughout most of this species' range, populations are patchily distributed. They emerge at dusk to fly through the understory of forested hillsides and ridges, feeding on moths, flies, leafhoppers, caddisflies, and beetles.

Most records of northern long-eared bats are from winter hibernacula surveys, with more than 780 hibernacula identified within the United States. No known hibernacula are located in North Dakota, due to either no suitable hibernacula present or a lack of survey effort (USFWS 2013f). This bat species occupies a wide range of rocky and forested habitats. Suitable winter habitat contains large caves and mines (USFWS 2013e). Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, under loose bark, and rock fissures (Jones and Choate 1978).

Northern long-eared bats are not known to occur in the project area. Suitable winter habitat for northern long-eared bats does not occur within the project area. Nearby trees and rocky outcrops can act as suitable summer day roosts. Due to the low likelihood of northern long-eared bat occurrence in the project area, the proposed project **is not likely to jeopardize** the species.

3.8.11 Rufa Red Knot

Federal Status: Proposed
Affect Determination: Not likely to jeopardize

The rufa red knot is a robin-sized shorebird that migrates long distances annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the southeast United States, the northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America (USFWS 2013g). During migration, rufa red knots use key staging and stopover areas to rest and feed. In North Dakota, the red knot is a very rare migrant (USFWS 2013g). There are no known records of rufa red knot in the project vicinity; however, this species could use habitat along Lake Sakakawea as a stopover during migration.

Potential habitat along the lake is approximately 16 straight-line miles from the proposed project. Potential spills and sedimentation occurring within the project area are concerns for downstream water quality and could indirectly affect suitable stopover habitat for the rufa red knot. Activities associated with the construction, production, or reclamation of the proposed project are not anticipated to adversely affect suitable stopover habitat for the rufa red knot. Therefore, the proposed project **is not likely to jeopardize** the rufa red knot.

3.8.12 Migratory Birds

Status: Not listed, protected under the Migratory Bird Treaty Act
Effects of Project: No adverse effects anticipated

Suitable habitat for migratory birds exists in the entire project area. Specifically, grassland nesting birds have the potential to occur and nest in the project area, especially during the migratory bird breeding season between February 1 and July 15. Suitable woodland nesting habitat also occurs in the project area. An active mallard (*Anas platyrhynchos*) nest was discovered within 10 feet of the proposed centerline, mapped as NST1 on Map 4 in Appendix A. The proposed action is unlikely to cause any adverse effects to migratory birds.

3.8.13 Bald Eagle

Federal Status: Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Effects of Project: No adverse effects anticipated

The bald eagle (*Haliaeetus leucocephalus*) feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat is typically any mature stands of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles are uncommon in North Dakota and are usually observed along the Missouri River (Gomes n.d.) and Yellowstone River. Bald eagles frequently migrate through the grassland habitats; however, no bald eagles or nests were

observed during the field surveys. Therefore, **no adverse effects** to bald eagles are anticipated.

3.8.14 Golden Eagle

Federal Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

Effects of Project: No adverse effects anticipated

The golden eagle (*Aquila chrysaetos*) prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs which provide suitable nesting habitat. Golden eagles may occur within or near the survey area; however, no golden eagles or nests were observed during the field surveys. Therefore, **no adverse effects** to golden eagles are anticipated.

3.8.15 Wildlife Observed

During the field survey, SWCA ecologists observed various wildlife species which utilize wetlands and other habitat within the survey area (Table 6). Common wildlife species may be affected both directly via incidents with construction equipment or indirectly through the temporary fragmentation of habitat as a result of construction activities.

Table 6. Wildlife Observed during Field Surveys at the Proposed Pipeline Route.

Common Name	Scientific Name	Observation Type
Ring-necked pheasant	*Phasianus colchicus*	Primary
Western meadowlark	*Sturnella neglecta*	Primary
Horned lark	*Eremophila alpestris*	Primary
Bobolink	*Dolichonyx oryzivorus*	Primary
Mallard	*Anas platyrhynchos*	Primary – Nest Located
Northern shoveler	*Anas clypeata*	Primary
Vesper sparrow	*Pooecetes gramineus*	Primary
American Robin	*Turdus migratorius*	Primary
Chipping sparrow	*Spizella passerina*	Primary
Yellow-rumped warbler	*Dendroica coronate*	Primary
Grasshopper sparrow	*Ammodramus savannarum*	Primary
Canada goose	*Branta Canadensis*	Primary
Savannah sparrow	*Passerculus sandwichensis*	Primary
Blue-winged teal	*Anas discors*	Primary
Red-winged blackbird	*Agelaius phoeniceus*	Primary
Gray partridge	*Perdix perdix*	Primary
Brewer’s blackbird	*Euphagus cyanocephalus*	Primary

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. SWCA ecologists recorded approximately 6.14 acres of wetlands within the survey area.
2. In total, approximately 0.92 acre of PEM wetland *may* be temporarily impacted by construction activities.
3. Five waterbodies were observed within the survey area. STR5 (Spring Creek) was crossed twice within the survey area. If flowing water is observed, SWCA recommends directional bores. If flowing water is not present SWCA recommends a 24-open cut technique (trenching, pipe installation, backfill, and restoration of the streambed contours) to be completed within 24 hours.
4. SWCA estimates 15 trees, saplings, and shrubs may be impacted. Therefore, approximately 30 2-year-old saplings may need to be replanted to fulfill the 2:1 mitigation requirement.
5. According to the recommendations of the North Dakota Forest Service, tree species selection for replacement should be accomplished through collaboration with a reputable area nursery. This will allow for species to be selected based on various factors including species hardiness and area soil type.
6. No threatened or endangered species were observed during the field survey. Suitable roosting and foraging habitat exists within the project area for the whooping crane, and there have been several previous sightings within 10 miles of the project area. SWCA recommends that if construction is to occur within whooping crane spring and fall migration periods, and a whooping crane is observed within ½ mile of the project, to stop construction and notify the USFWS.

   The other listed threatened and endangered species which occur in McKenzie County are not likely to be detrimentally impacted by construction activities.
7. Migratory birds and habitat were observed throughout the entire project area. An active migratory bird nest (mallard) was discovered within the 100-foot construction ROW. Other types of suitable migratory bird habitat exist throughout the surveyed areas. A 0.5-mile line-of-sight survey was conducted throughout the survey area.

   No active raptor nests or other species of raptor were observed. In order to reduce impacts to migratory birds, SWCA recommends conducting all construction outside of the migratory bird breeding season. If construction occurs during the bird breeding season, SWCA recommends to either mow, maintain, or completely remove vegetation within the project construction area, or conduct an avian survey of the project area no greater than 5 days before construction begins. If active nests are discovered, notify the USFWS.
8. No noxious weeds were discovered within the surveyed areas. However, given the time of year the surveys were conducted, little to no new plant growth had occurred. Weeds could begin to emerge later in the growing season within the project area. If noxious weeds are confirmed during construction activities, actions should be taken to

reduce the potential to spread any state listed noxious weed species, especially to native areas.

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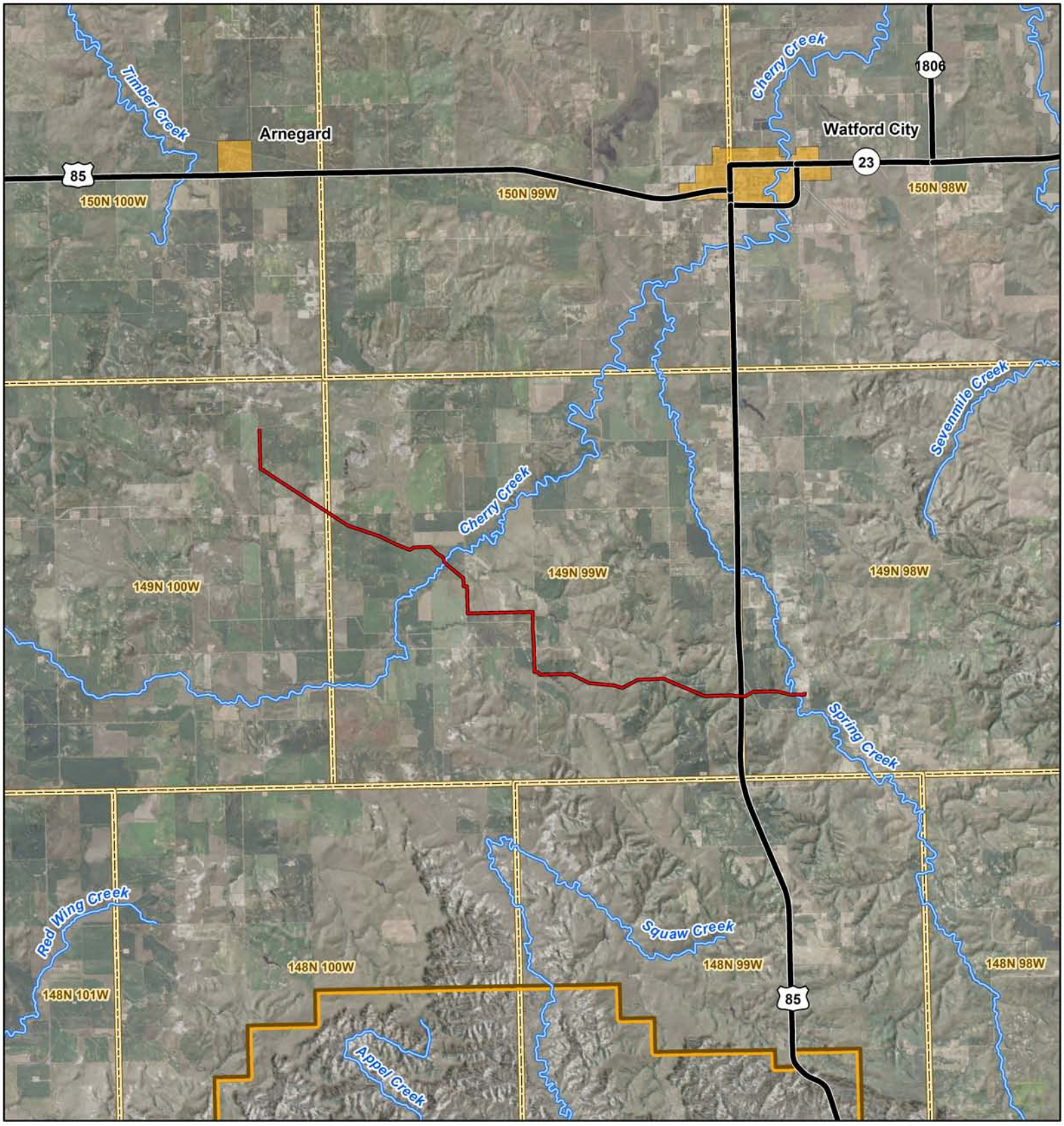
APPENDIX A

Vicinity Maps and Site Layout Maps



Targa Lateral

- Proposed Pipeline System
- Major Highway
- Stream
- City Limit
- Theodore Roosevelt National Park North Unit Boundary
- Township Boundary

SWCA®
ENVIRONMENTAL CONSULTANTS

Kilometers
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Miles
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Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
Township, Range: 149N, 100W
149N, 99W and 149N, 98W
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

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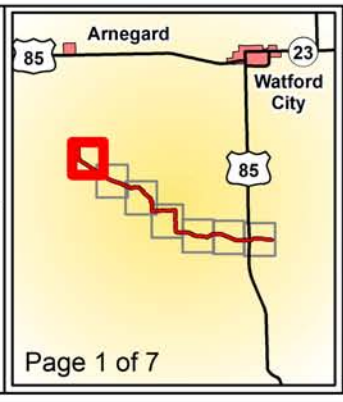

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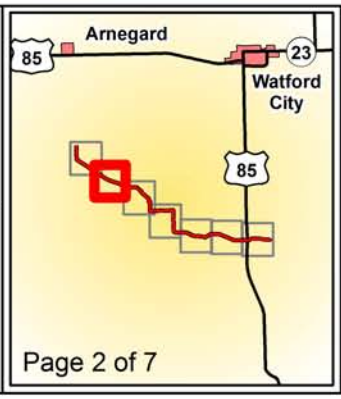
Source: North Dakota GIS Hub
Quadrangle: Arnegard (1979) and Stock Butte (1960)
Township, Range: 149N, 100W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

SWCA® ENVIRONMENTAL CONSULTANTS



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Source: North Dakota GIS Hub
Quadrangle: Stock Butte (1960)

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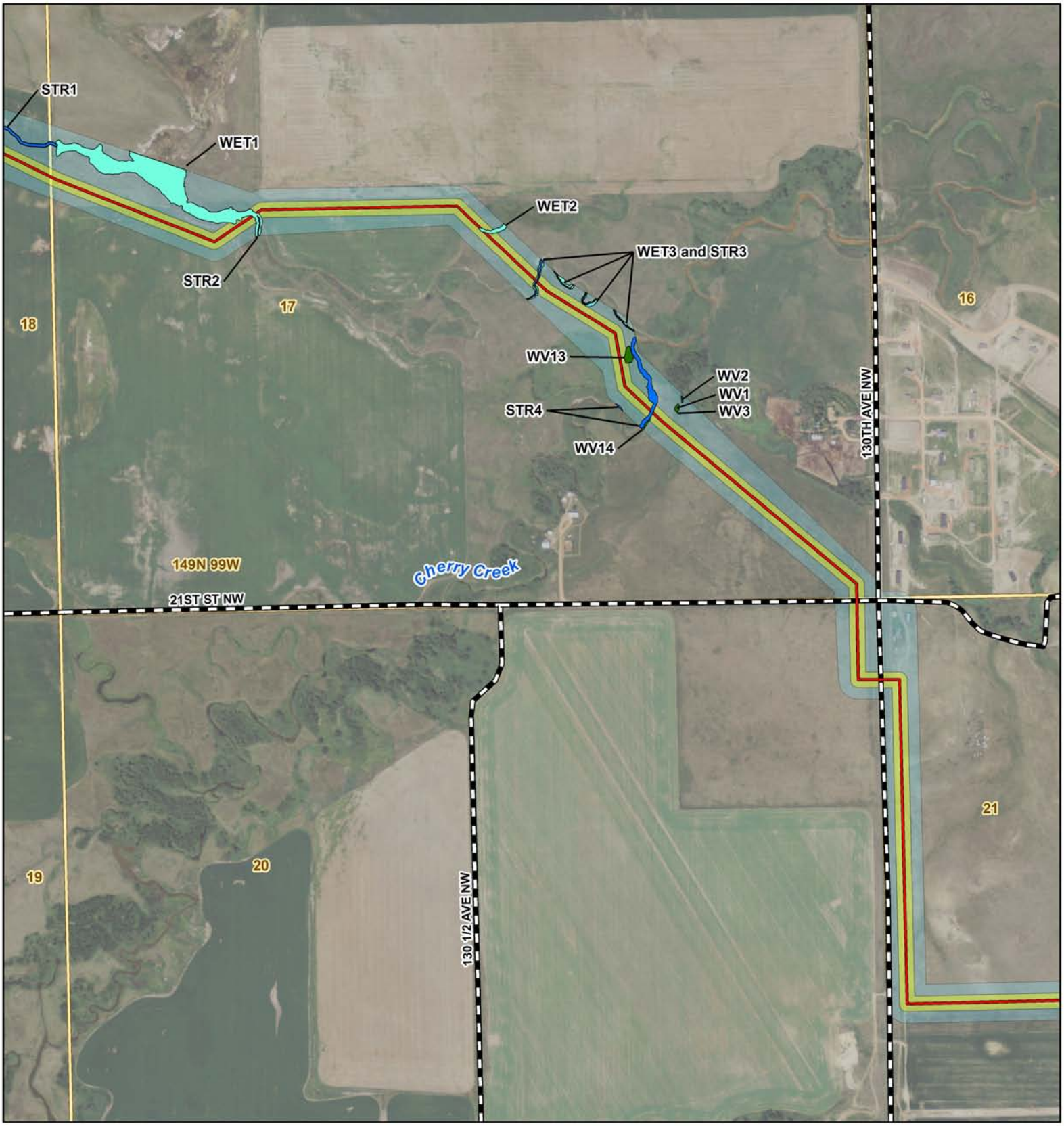
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N



Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

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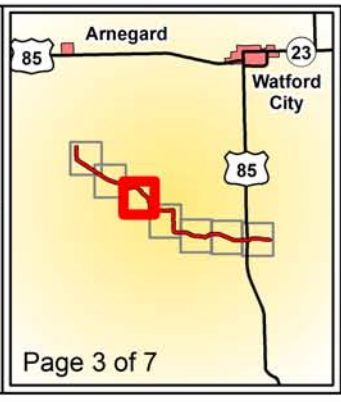

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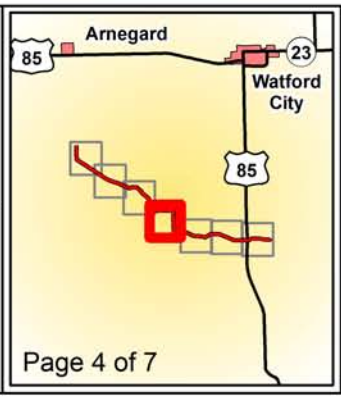
Quadrangle: Stock Butte (1960) and Tepee Buttes (1960)
Township, Range: 149N, 99W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

SWCA® ENVIRONMENTAL CONSULTANTS



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Quadrangle: Tepee Buttes (1960)

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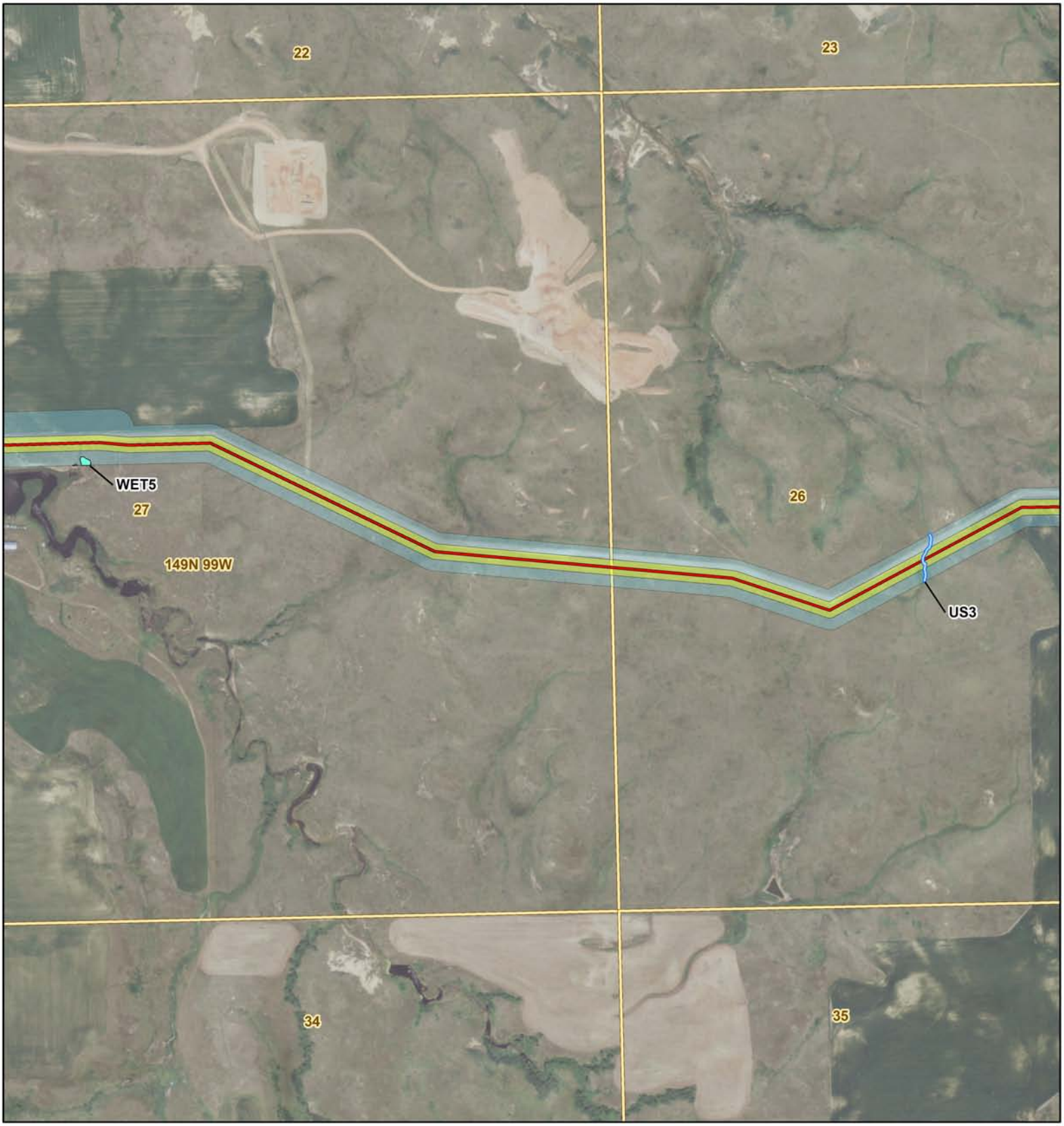
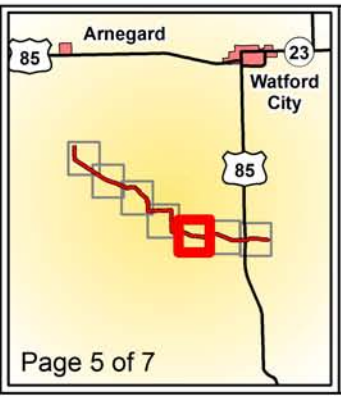
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N



Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

SWCA® ENVIRONMENTAL CONSULTANTS



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Quadrangle: Tepee Buttes (1960)

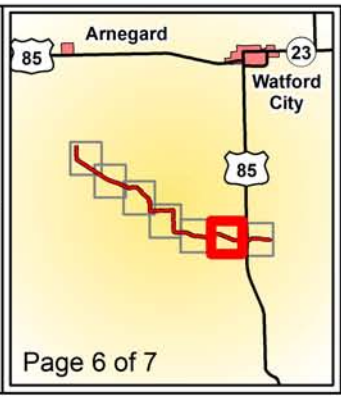
Township, Range: 149N, 99W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

SWCA® ENVIRONMENTAL CONSULTANTS



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Base Map: 2012 Aerial Imagery
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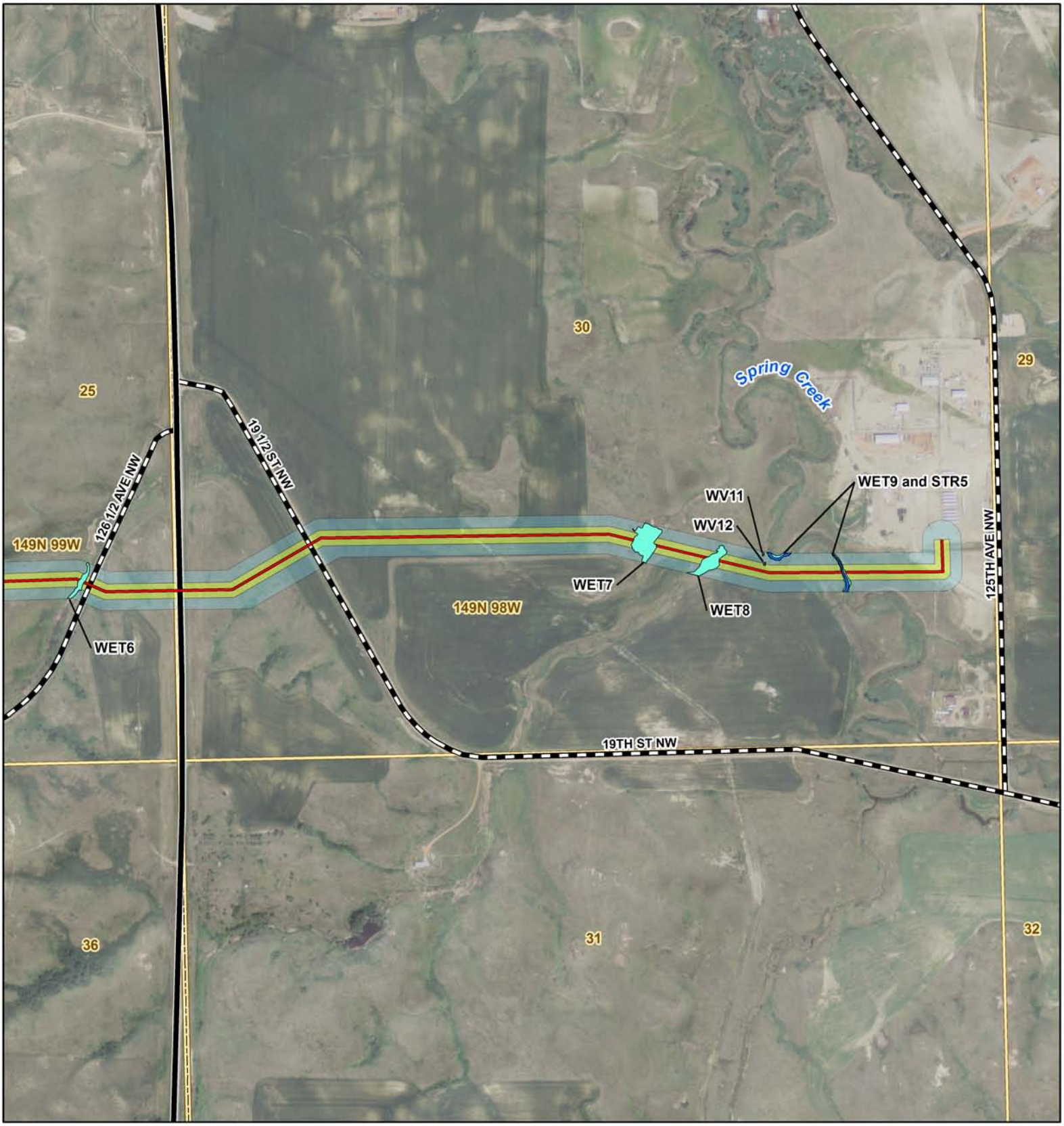
Quadrangle: Tepee Buttes (1960)

Township, Range: 149N, 99W

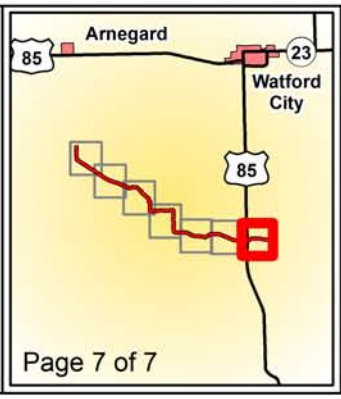
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N



Targa Lateral

- Nest
- Upland Swale
- Proposed Pipeline System
- U.S. Highway
- County Road
- Wetland
- Stream
- Woody Vegetation
- Proposed Construction Corridor
- Survey Area
- Township Boundary
- Section Boundary

SWCA® ENVIRONMENTAL CONSULTANTS



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Source: North Dakota GIS Hub
Quadrangle: Tepee Buttes (1960)

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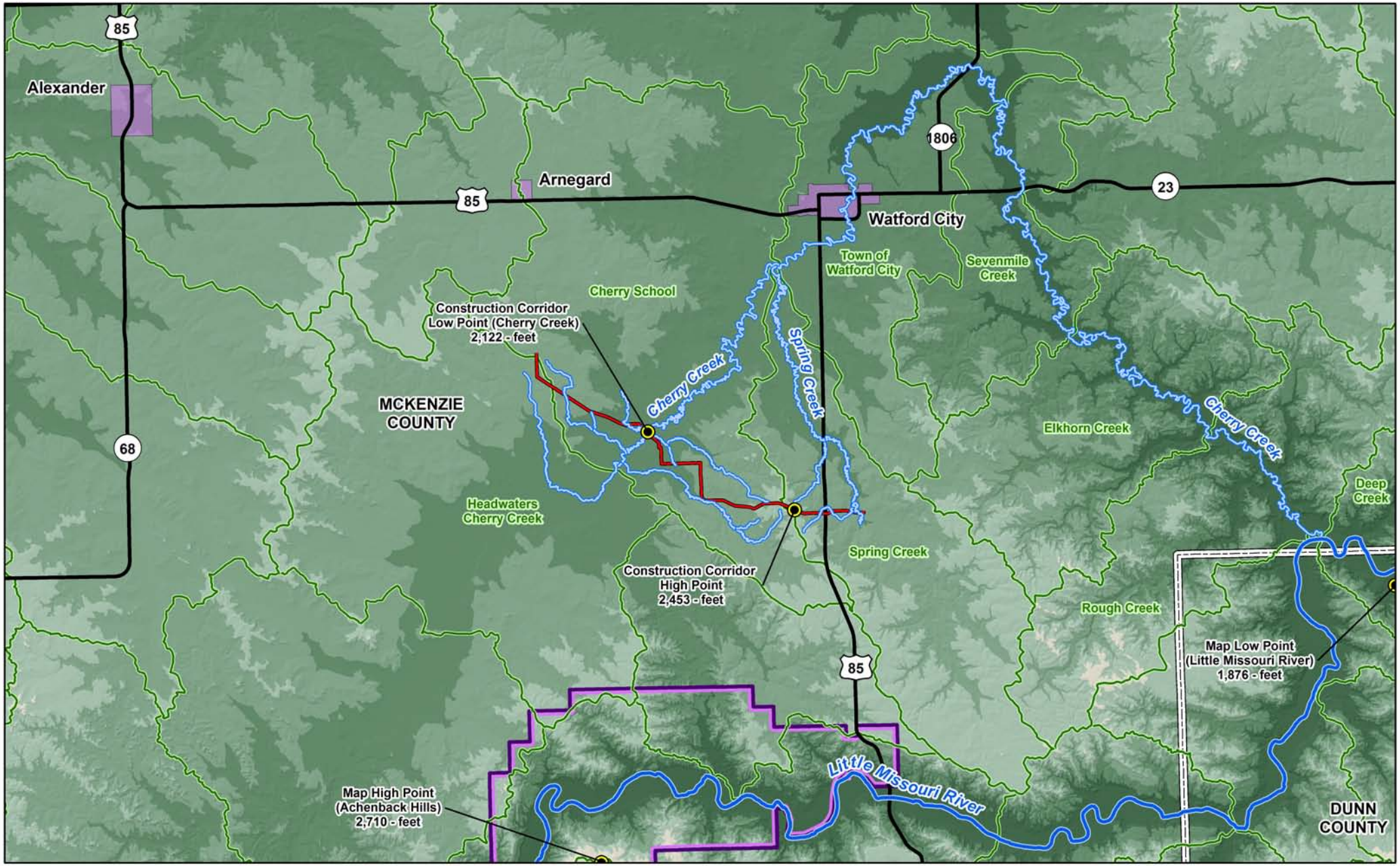
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N



Targa Lateral

- Proposed Pipeline System
- Flow Path
- Little Missouri River
- Major Highway
- Elevation Points
- Hydrologic Unit Boundary
- City Limit
- Theodore Roosevelt National Park North Unit Boundary
- County Boundary

Elevation (feet)

> 2,543.6 -	2,710.5
> 2,376.7 - <	2,543.6
> 2,209.8 - <	2,376.7
> 2,042.9 - <	2,209.8
1,876.0 - <	2,042.9

0 4 8 Kilometers

0 2 4 Miles

Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
Township, Range: 149N, 100W
149N, 99W and 149N, 98W
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

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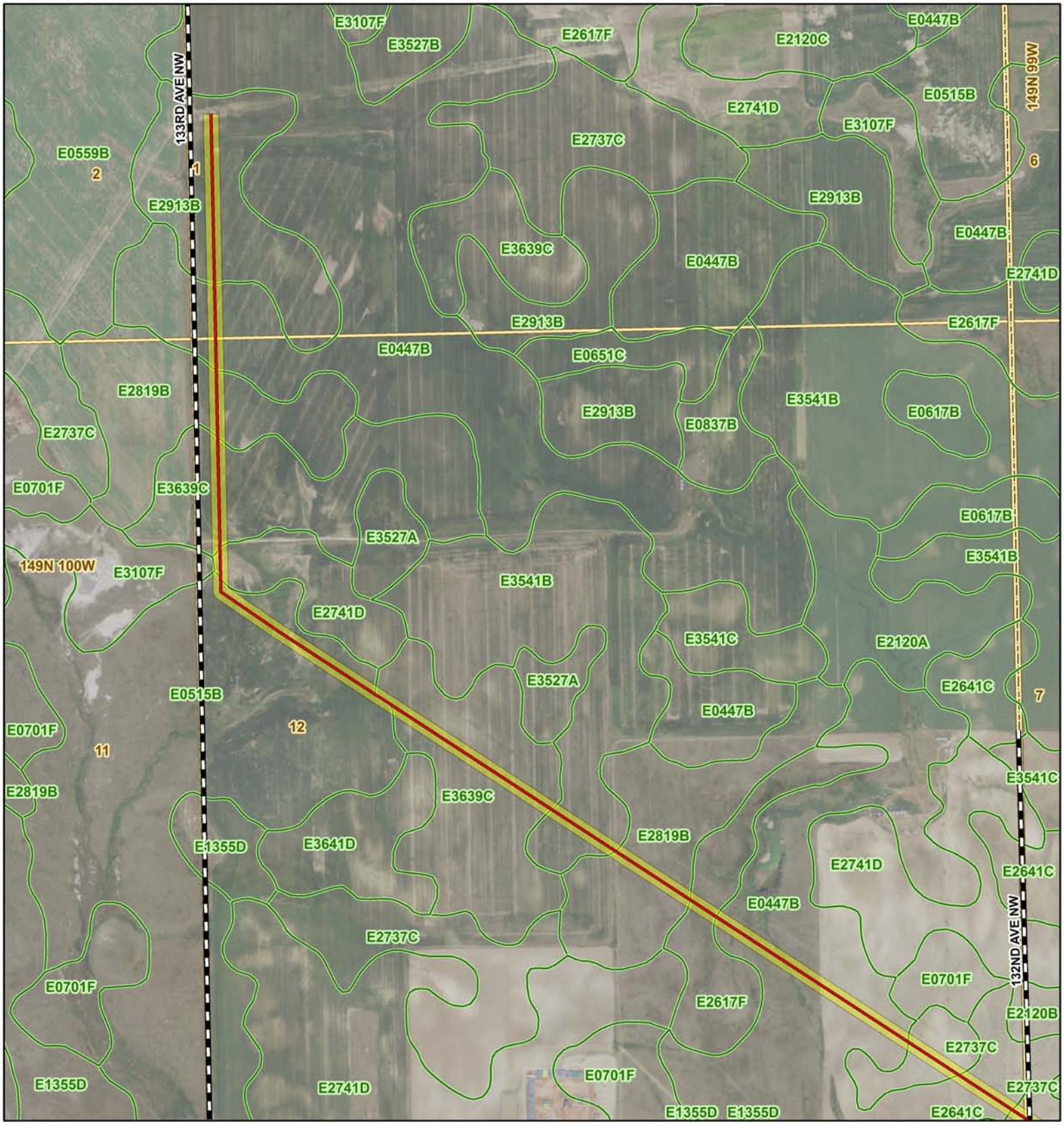
APPENDIX B

Survey Area Soils Series Map



Targa Lateral

- Proposed Pipeline System
- U.S. Highway
- County Road
- Proposed Construction Corridor
- Soil Unit Boundary
- Township Boundary
- Section Boundary

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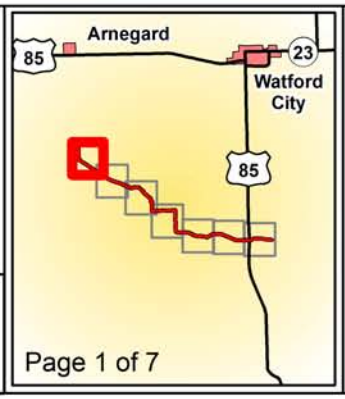
Fax: 701.258.5957
www.swca.com



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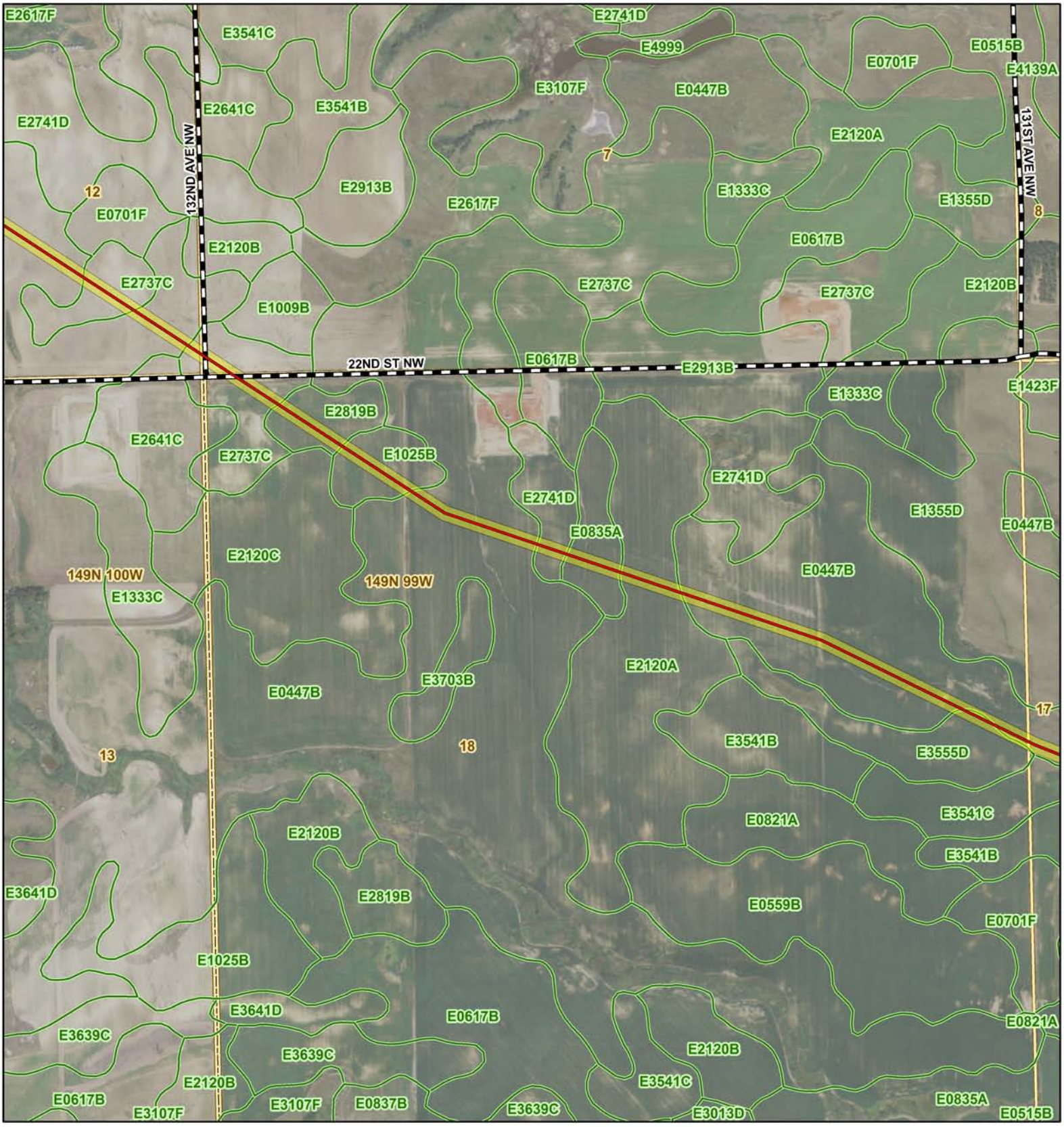
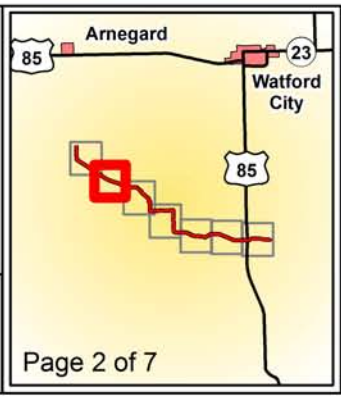
Township, Range: 149N, 100W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N



Targa Lateral

- Proposed Pipeline System
- U.S. Highway
- County Road
- Proposed Construction Corridor
- Soil Unit Boundary
- Township Boundary
- Section Boundary



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Source: North Dakota GIS Hub
Quadrangle: Stock Butte (1960)

Township, Range: 149N, 100W and 149N, 99W
McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

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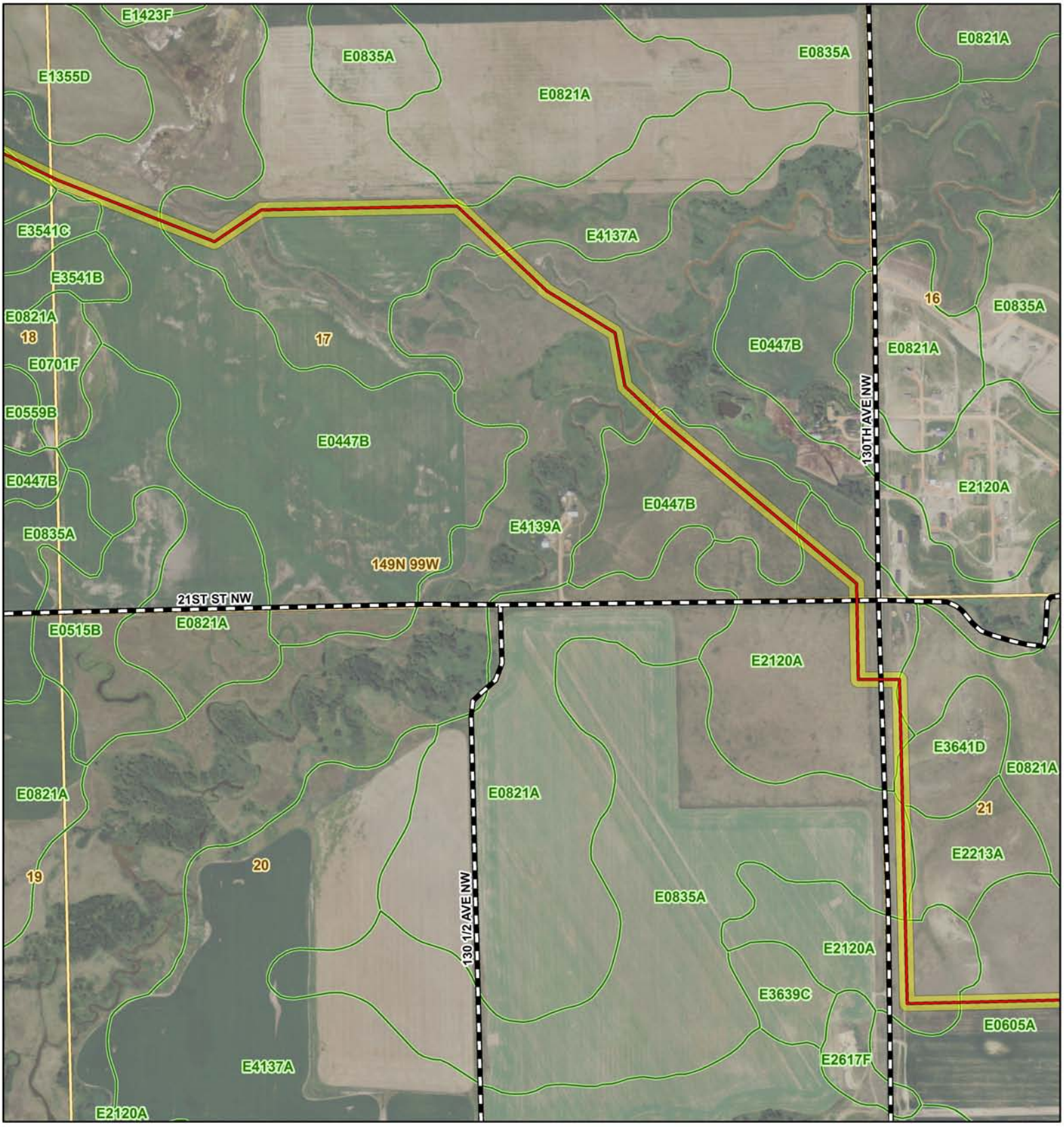
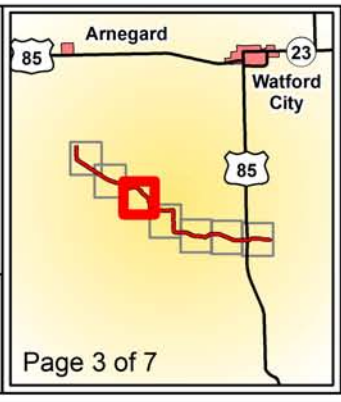


Targa Lateral

- Proposed Pipeline System
- U.S. Highway
- County Road
- Proposed Construction Corridor
- Soil Unit Boundary
- Township Boundary
- Section Boundary



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Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
Quadrangle: Stock Butte (1960) and Tepee Buttes (1960)
Township, Range: 149N, 99W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

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Suite 200
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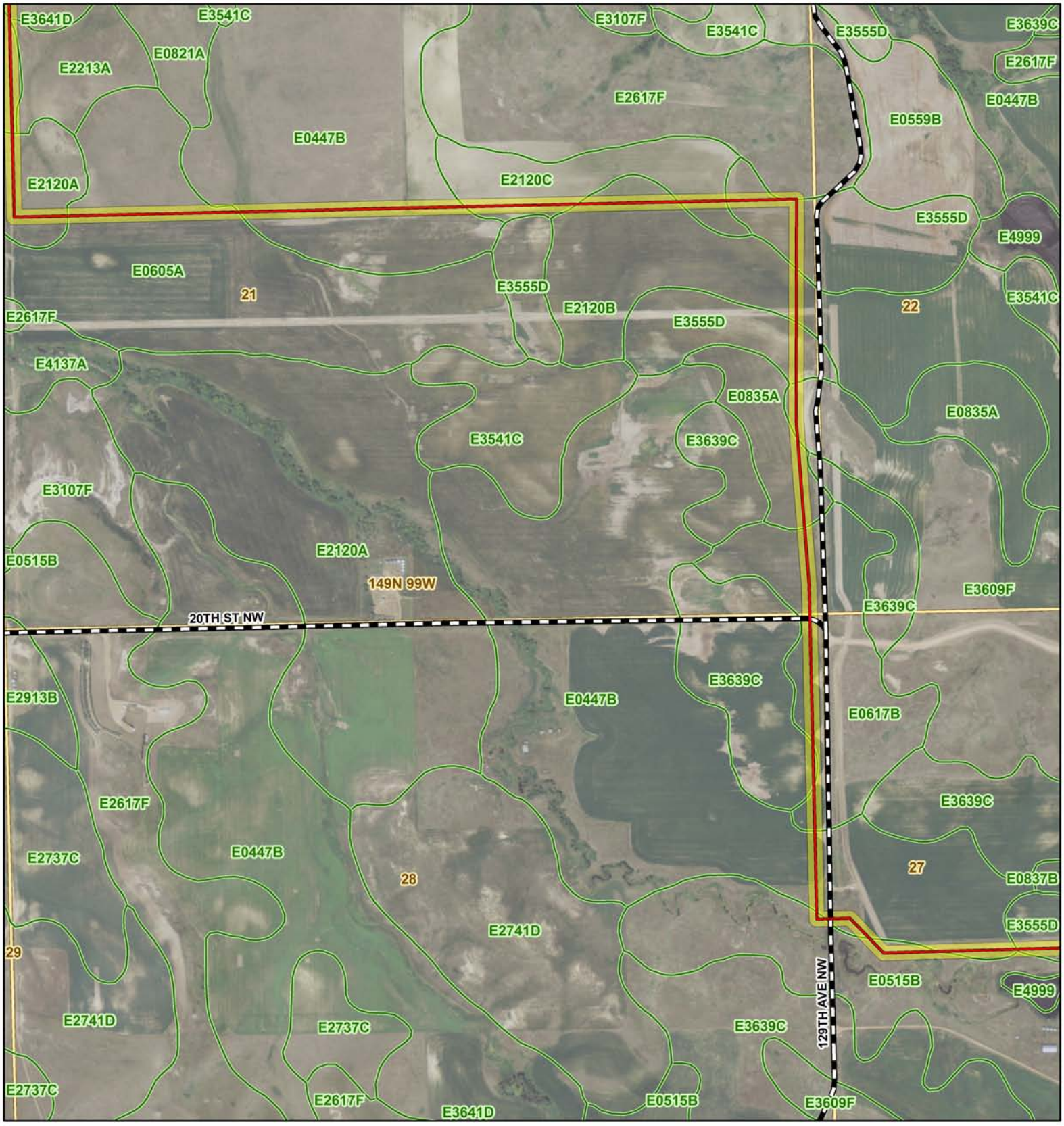
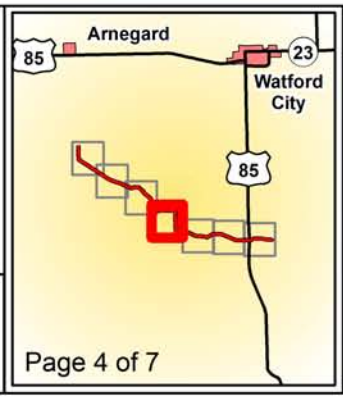
www.swca.com



Targa Lateral

- Proposed Pipeline System
- U.S. Highway
- County Road
- Proposed Construction Corridor
- Soil Unit Boundary
- Township Boundary
- Section Boundary



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Source: North Dakota GIS Hub
Quadrangle: Tepee Buttes (1960)

Township, Range: 149N, 99W

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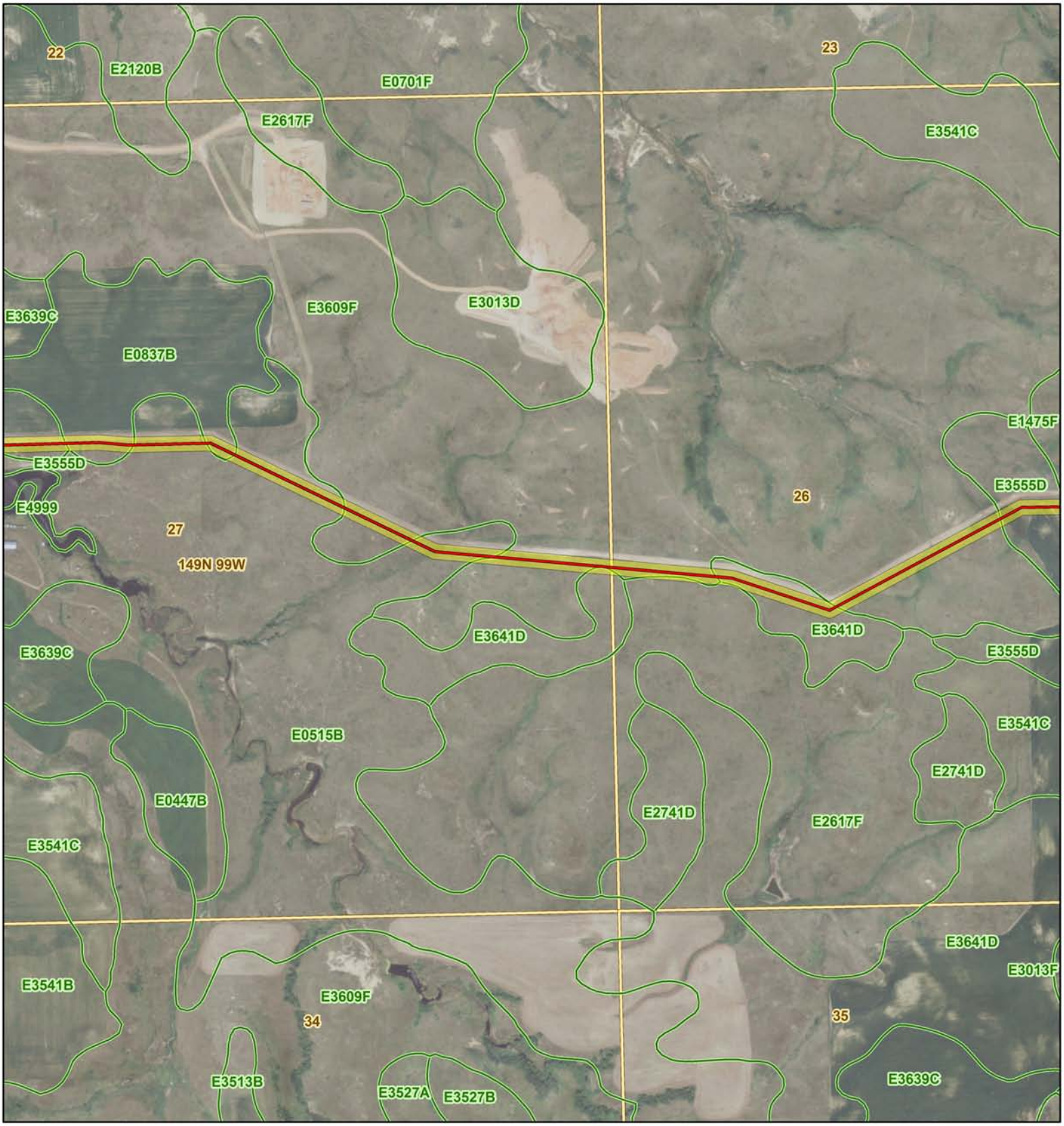
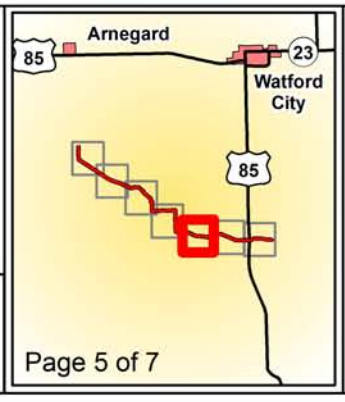


Targa Lateral

- Proposed Pipeline System
- U.S. Highway
- County Road
- Proposed Construction Corridor
- Soil Unit Boundary
- Township Boundary
- Section Boundary



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Feet
0 400 800

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Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
Quadrangle: Tepee Buttes (1960)

Township, Range: 149N, 99W

McKenzie County, North Dakota
Projection: NAD 1983 UTM Zone 13N

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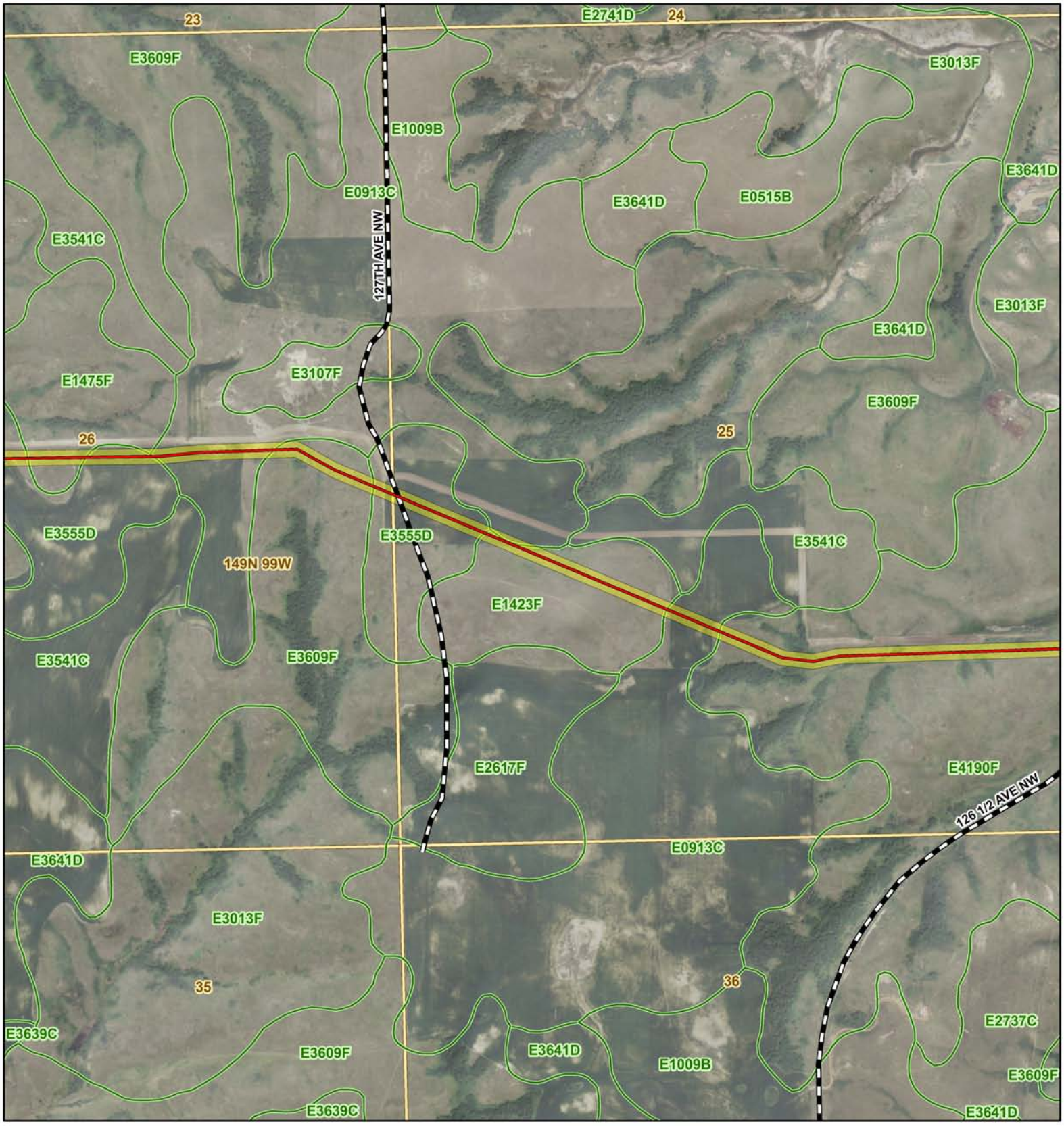

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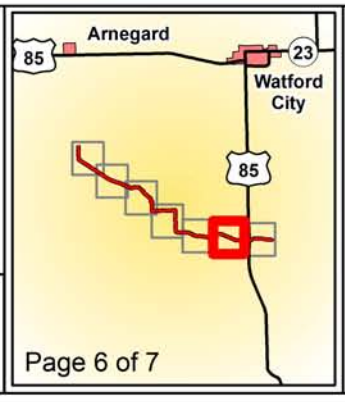

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Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
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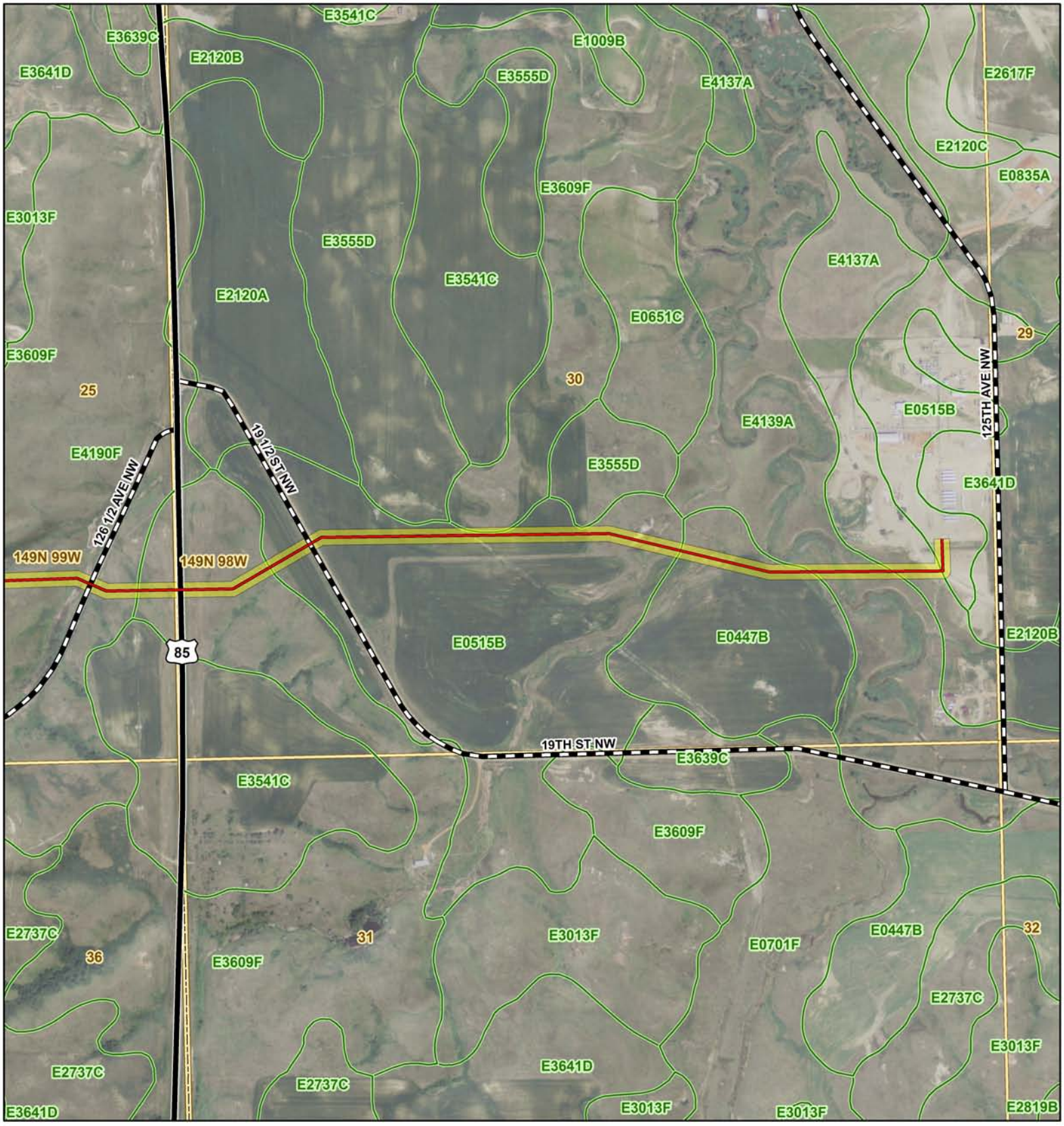

Targa Lateral

- Proposed Pipeline System
- U.S. Highway
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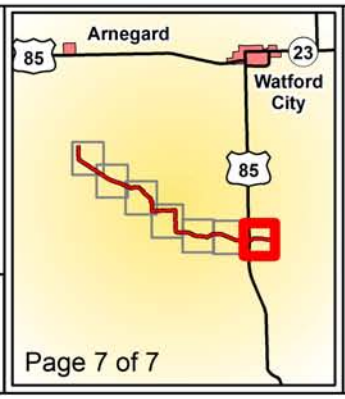

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Meters
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Feet
0 400 800

N

Base Map: 2012 Aerial Imagery
Source: North Dakota GIS Hub
Quadrangle: Tepee Buttes (1960)

Township, Range: 149N, 99W
and 149N, 98W
McKenzie County, North Dakota
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APPENDIX C
Photographs of Project Area

Figure C.1. Wetland (WET1), facing east (photo taken April 24, 2014).

Figure C.2. Seasonal wetland (WET2), facing east (photo taken April 24, 2014).

Figure C.3. Fringe wetland (WET3) associated with STR3, facing north (photo taken April 24, 2014).

Figure C.4. Permanent wetland (WET4), facing south (photo taken April 25, 2014).

Figure C.5. Seasonal wetland (WET5), facing south (photo taken April 25, 2014).

Figure C.6. Semipermanent wetland (WET6), facing north (photo taken April 25, 2014).

Figure C.7. Semi-permanent wetland (WET7), facing south (photo taken May 7, 2014).

Figure C.8. Semi-permanent wetland (WET8), facing north (photo taken May 7, 2014).

Figure C.9. Permanent fringe wetland (WET9) associated with STR5, facing North (photo taken May 7, 2014).

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Figure C.11. Ephemeral drainage (STR1), facing northwest (photo taken April 24, 2014).

Figure C.12. Intermittent stream (STR2), facing south (photo taken April 24, 2014).

Figure C.13. Intermittent stream (STR3), facing north (photo taken April 24, 2014).

Figure C.14. Perennial stream, Cherry Creek, (STR4), facing north (photo taken April 24, 2014).

Figure C.15. Intermittent stream, Spring Creek, (STR5), facing north (photo taken May 7, 2014).

Figure C.16. Upland Swale (US1), facing north (photo taken April 24, 2014).

Figure C.17. Upland Swale (US2), facing north (photo taken April 24, 2014).

Figure C.18. Upland Swale (US3), facing north (photo taken April 24, 2014).

Figure C.19. Woody vegetation consisting of green ash (*Fraxinus pennsylvanica*) and silver buffaloberry (*Shepherdia argentea*) (WV1), facing east (photo taken April 24, 2014).

Figure C.20. Woody vegetation consisting of green ash (*Fraxinus pennsylvanica*) (WV4), facing southeast (photo taken April 25, 2014).

Figure C.21. Woody vegetation consisting of green ash (*Fraxinus pennsylvanica*) and silver buffaloberry (*Shepherdia argentea*) (WV6), facing west (photo taken April 25, 2014).

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Appendix E

Cultural Resources Report

A Class I and Class III Cultural Resource Inventory of the ONEOK Bakken Pipeline, LLC, Targa Lateral Pipeline Project, McKenzie County, North Dakota

Prepared for

E3 Environmental, LLC

Prepared by

SWCA Environmental Consultants

May 2014

MANUSCRIPT DATA RECORD FORM

1. Manuscript Number:

2. SHPO Reference #:

3. Author(s): Craig Picka

4. Title: A Class I and Class III Cultural Resource Inventory of the ONEOK Bakken Pipeline, LLC, Targa Lateral Pipeline Project, McKenzie County, North Dakota

5. Report Date: May 21, 2014

6. Number of Pages: 78

7. Type – I, T, E, O: I

8. Acres: 350.99

9. Legal Location(s) (no quarter sections) with Historic Context Study Unit(s): Consult the Township tables in *The North Dakota Comprehensive Plan for Historic Preservation: Archeological Component* (SHSND 2008; available at http://history.nd.gov/hp/hpforms.html) for Study Unit assignments. Study Units: LM, CB, KN, HE, SM, GA, JA, GR, NR, SR, SO, SH, YE

COUNTY	TWP	RNG	SEC	SU
McKenzie	149N	98W	30	LM
McKenzie	149N	99W	7, 17, 18, 20, 21, 25, 26, 27, 28	LM
McKenzie	149N	100W	1, 12	LM

A Class I and Class III Cultural Resource Inventory of the ONEOK Bakken Pipeline, LLC, Targa Lateral Pipeline Project, McKenzie County, North Dakota

Submitted to:

State Historical Society of North Dakota

Prepared for:

E3 Environmental, LLC
871 Jefferson Avenue
St. Paul, Minnesota 55102

Prepared by:

Craig Picka

Principal Investigator:

William Harding

SWCA Environmental Consultants
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501

SWCA Cultural Resource Report Number 14-225

May 21, 2014

ABSTRACT

This report documents the results of a Class I and Class III cultural resource inventory conducted by SWCA Environmental Consultants (SWCA) on behalf of E3 Environmental, LLC (E3), in support of the ONEOK Bakken Pipeline, LLC, Targa Lateral Pipeline project. The pipeline would be located on privately owned lands in McKenzie County, North Dakota.

E3 retained SWCA to complete a Class I cultural resource inventory for the proposed project area. The only regulatory agencies to be involved are 1) the North Dakota Public Service Commission (NDPSC) under the North Dakota Energy Conversion and Transmission Facility Siting Act (excluding any applicable county or local requirements), and 2) the U.S. Army Corps of Engineers (USACE) through Section 404 of the Clean Water Act (CWA), which regulates discharge into waters of the U.S. regulated by the USACE. Therefore, SWCA's Class I and III inventory of the project area assists E3 in meeting the cultural resource requirements within the NDPSC's Certificate of Corridor Compatibility and Route Permit application. Additionally, SWCA's inventory assisted E3 in achieving compliance with Section 404 of the CWA, including the Nationwide Permit General Conditions pertaining to Section 106 of the National Historic Preservation Act and the Endangered Species Act.

The inventoried areas are depicted on the Arnegard (1979), Stock Butte (1960), and Tepee Buttes (1960), North Dakota, U.S. Geological Survey topographic quadrangles.

The Class I inventory was conducted on April 21, 2014, and the Class III inventory was conducted on April 24 and 25, and May 7 and 15, 2014. The Class III survey area consisted of a 250-foot survey corridor centered on the 10.67-mile-long proposed pipeline centerline. The survey corridor was widened in some places to allow for pipeline reroutes. A total of 350.99 acres were inventoried.

During the inventory, SWCA personnel revisited 10 previously recorded cultural resources (32MZ480, 32MZ481, 32MZ1561, 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, 32MZX364, and 32MZX1213) and newly recorded one isolated find (32MZX1399). The previously recorded resources include a prehistoric cultural material scatter (32MZ480); an historic homestead and cultural material scatter site (32MZ481); an historic transmission line site (32MZ1561); four cultural material scatters of unknown cultural or temporal associations (32MZX261, 32MZX262, 32MZX263, and 32MZX266); two historic quarries/mines (32MZX362 and 32MZX364); and an Archaic projectile point isolated find (32MZX1213). The newly recorded isolated find is an historic engine block isolated find (32MZX1399). Of these resources, 32MZ480, 32MZ481, 32MZ1561, 32MZX1213, and 32MZX1399 are recommended not eligible for the National Register of Historic Places, and therefore no further work is necessary. Site leads 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, and 32MZX364 remain unevaluated for the National Register of Historic Places. Although attempts were made to relocate the site leads within the project area, none were relocated during the current inventory. The site leads may be located within the documented site boundary outside the project area; therefore no further work is necessary. With the above stipulations, it is recommended that a determination of *No Significant Sites Affected* and *No Historic Properties Affected* be granted for the project to proceed as planned.

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INTRODUCTION

This report documents the results of a Class I and Class III cultural resource inventory conducted by SWCA Environmental Consultants (SWCA) on behalf of E3 Environmental, LLC (E3), in support of the ONEOK Bakken Pipeline, LLC, Targa Lateral Pipeline project. The pipeline would be located on privately owned lands in McKenzie County, North Dakota.

E3 retained SWCA to complete a Class I cultural resource inventory for the proposed project area. The only regulatory agencies to be involved are 1) the North Dakota Public Service Commission (NDPSC) under the North Dakota Energy Conversion and Transmission Facility Siting Act (excluding any applicable county or local requirements), and 2) the U.S. Army Corps of Engineers (USACE) through Section 404 of the Clean Water Act (CWA), which regulates discharge into waters of the U.S. regulated by the USACE. Therefore, SWCA's Class I and III inventory of the project area assists E3 in meeting the cultural resource requirements within the NDPSC's Certificate of Corridor Compatibility and Route Permit application. Additionally, SWCA's inventory assisted E3 in achieving compliance with Section 404 of the CWA, including the Nationwide Permit General Conditions pertaining to Section 106 of the National Historic Preservation Act and the Endangered Species Act.

The Class III inventory was conducted on April 24 and 25, and May 7 and 15, 2014. The Class III survey area consisted of a 250-foot survey corridor centered on the 10.67-mile-long proposed pipeline centerline. The survey corridor was widened in some places to allow for pipeline alignment reroutes. In total, 350.99 acres were inventoried. The inventoried areas are depicted on the Arnegard (1979), Stock Butte (1960), and Tepee Buttes (1960), North Dakota, U.S. Geological Survey topographic quadrangles (Figures 1a–1d). The legal locations of the project area subject to Class III inventory by SWCA are summarized in Table 1.

For the cultural resource investigation, William Harding served as Principal Investigator. Fieldwork was completed by SWCA archaeologists Scott Yost, Matthew Cox, Craig Picka, and Theresa Kilcullin. All field notes and photographs are on file at SWCA's Bismarck, North Dakota, office under project number 29408.

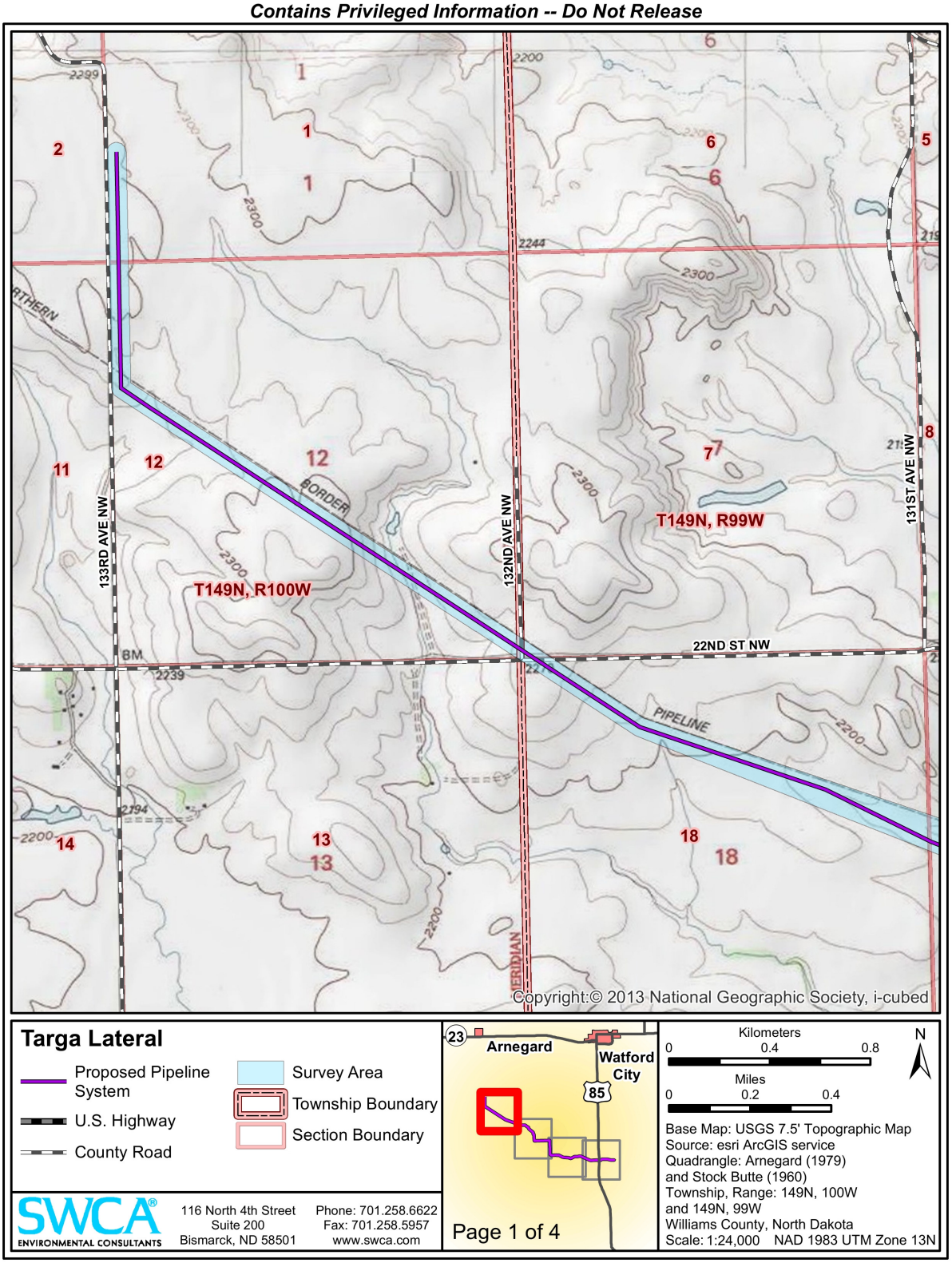

Figure 1a. Project area, map 1 of 4.

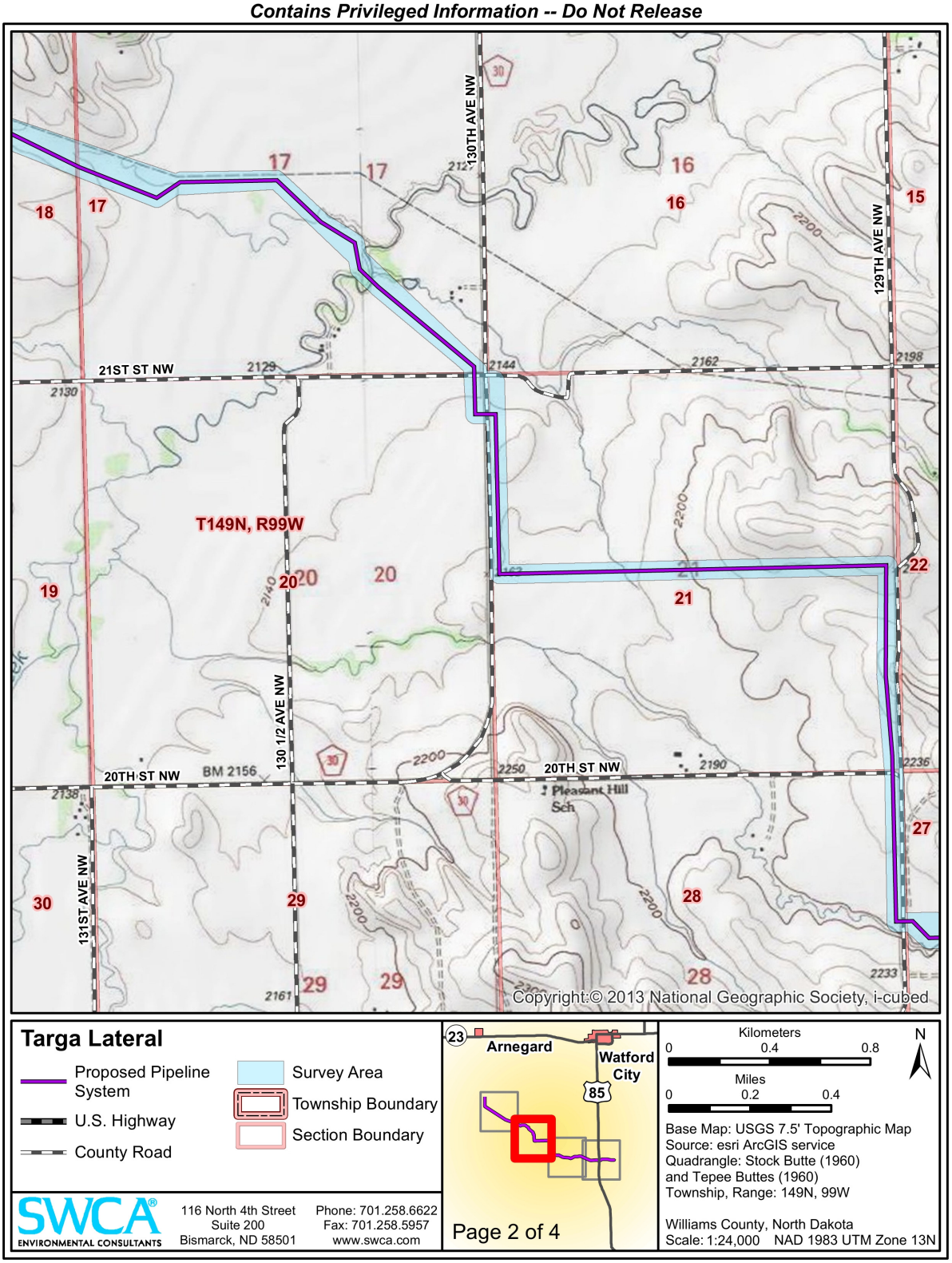

Figure 1b. Project area, map 2 of 4.

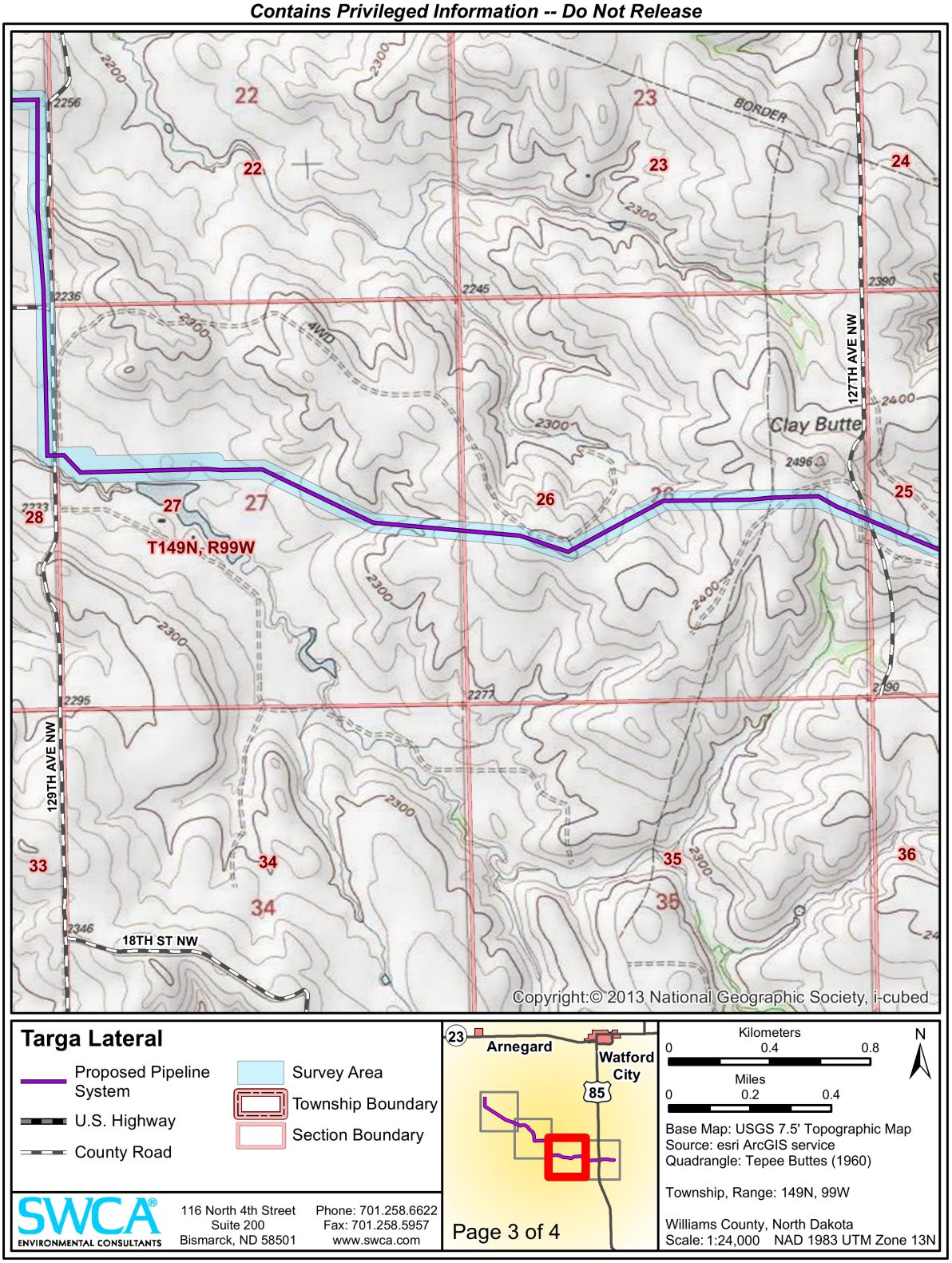

Figure 1c. Project area, map 3 of 4.

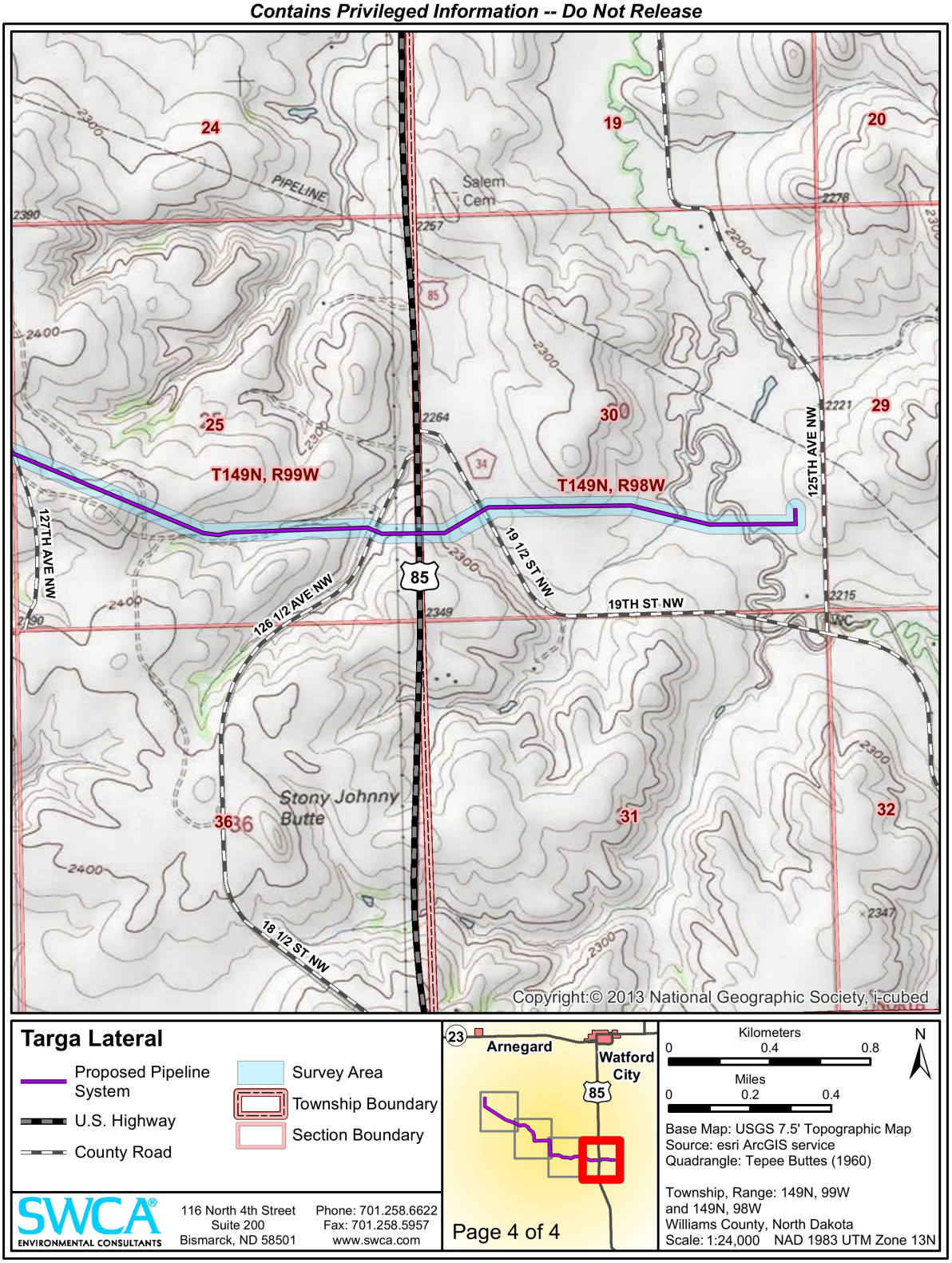

Figure 1d. Project area, map 4 of 4.

Table 1. Survey Area Legal Locations

Township	Range	Section	Legal
149N	98W	30	N½ S½, S½ S½
149N	99W	7	SW¼ SW¼ SW¼
		17	S½ SW¼ NW¼, NE¼ NW¼ SW¼, NE¼ SW¼, NW¼ SE¼, NE¼ SW¼ SE¼, SE¼ SE¼
		18	NW¼ NW¼, NE¼ NW¼, N½ SW¼ NE¼, SE¼ NE¼
		20	NE¼ NE¼ NE½
		21	W½ W½ NW¼, S½ S½ NW¼, S½ S½ NE¼, N½ N½ S½ , E½ E½ SE¼
		25	NW¼ SW¼, S½ NE¼ SW¼, NE¼ SE¼ SW¼, N½ S½ SE¼
		26	NW¼ SW¼, NE¼ SW¼, N½ N½ SE¼
		27	S½ NW¼, S½ SW¼ NE¼, NE¼ NW¼ SE¼, N½ NE¼ SE¼
		28	E½ E½ NE¼
149N	100W	1	SW¼ NW¼ SW¼, W½ SW¼ SW¼
		12	W½ NW¼ NW¼, SW¼ SW¼ NW¼, SW¼ SE¼ NW¼, NE¼ SW¼, NW¼ SE¼, NE¼ SW¼ SE¼, SE¼ SE¼

PROJECT SETTING

TOPOGRAPHY

The project area is located in the unglaciated Missouri Plateau section of the Great Plains physiographic province in west-central North Dakota (Fenneman 1931). The unglaciated Missouri Plateau section is characterized by old plateaus, terrace lands, local badlands, and isolated mountains (Fenneman 1931). Located on the Missouri Plateau, in the northwest Great Plains ecoregion, the general topography of the project area was largely unaffected by glaciations and consists of moderately dissected level to rolling plains with isolated sandstone buttes (Bryce et al. 1998) (Figure 2). The Missouri Plateau retains its original soils and complex stream drainage pattern, creating a mosaic of shortgrass prairie suited to grazing and agriculture (Bryce et al. 1998). More specifically, the project area is located within cultivated rolling grasslands overlooking numerous wetlands and some drainages, which lead toward the Little Missouri River. The elevation in the project area ranges from approximately 2,160 to 2,440 feet.

Figure 2. Project area overview depicting general topography, facing southeast.

CLIMATE

The climate for northwest North Dakota is temperate. Based on climatic data collected from Watford City, North Dakota, between 1971 to 2000, January is the coldest month with a mean daily temperature of 8.2 degrees Fahrenheit (°F), while July is the warmest month with a mean daily temperature of 68.6°F (National Climatic Data Center [NCDC] 2009). Temperature extremes on record range from -43°F at the coldest to 111°F at the warmest. On average, 141 days are frost-free (28°F or above); the average date of the first fall frost is September 25, and the average date of the last spring frost is May 6 (North Dakota Agricultural Statistics Service 2009). Per annum, Watford City receives 14.41 inches of precipitation (NCDC 2009). The wettest month is June, with an average of 3.05 inches of precipitation received; February is the driest, with only 0.39 inch of precipitation received on average. Thirty-five inches of snow are received annually, on average, with the highest accumulations (7.5 inches, on average) received in November (NCDC 2009). The highest monthly snowfall on record occurred in January 2009, at which time 22.3 inches of snow fell. Overall, northwest North Dakota, like much of the northwestern Great Plains, is characterized by a moderate to cool climate, with cold, dry winters and mild to warm, dry to moderately wet summers.

HYDROLOGY

The project area is located 6.3 miles north of the Little Missouri River and crosses Cherry Creek in the center of the alignment and Spring Creek at the east end of the alignment. Several unnamed drainages cross the project area and drain into Cherry Creek or Spring Creek, which then drain into the Little Missouri River.

GEOLOGY

In general, the geology of the project area is characterized by the Oahe Formation–River Sediment and Sentinel Butte Formation. The Holocene-aged Oahe Formation–River Sediment consists of a mixture of dark, obscurely bedded clay and silt (overbank sediment); generally overlying cross-bedded sand (channel sediment) on floodplains of modern streams, up to 30 feet (10 m) thick (Clayton 1980). The Paleocene-aged Sentinel Butte Formation consists of gray-brown silt, sand, clay, sandstone, and lignite; river, lake, and swamp sediment, up to 600 feet (200 m) thick (Clayton 1980).

SOILS

Fifteen soil series are present in the project area (Natural Resources Conservation Service 2013); however, the dominant soil type in the project area is clayey alluvium, found on the alluvial flats and alluvial fans. Table 2 summarizes the soils within the project area.

Table 2. Summary of Soil Series within the Project Area

Soil Series	Parent Material	Drainage	Slope	Landform
Daglum-Belfield complex	Clayey alluvium	Moderately well drained	0%–6%	Alluvial flats, alluvial fans
Zahl-Cabba-Maschetah complex	Fine-loamy till	Well drained	6%–70%	Ridges
Bradenburg-Cabba-Dogtooth complex	Loamy residuum weathered from porcellanite	Excessively drained	15%–70%	Ridges, knobs
Chama-Cabba-Sen silt loams	Fine-silty residuum weathered from siltstone	Well drained	6%–9%	Hills, ridges
Zahl-Cabba-Williams complex	Fine-loamy till	Well drained	9%–15%	Hills, ridges
Farnuf loam	Fine-loamy alluvium derived from sedimentary rock	Well drained	0%–9%	Alluvial flats, terraces; alluvial fans, ridges
Cabba-Chama-Shambo loams	Fine-loamy residuum weathered from sedimentary rock	Well drained	9%–50%	Ridges
Moreau-Barkof silty clays	Clayey residuum weathered from calcareous shale	Well drained	3%–6%	Pediments
Williams-Zahl loams	Fine-loamy till	Well drained	3%–9%	Rises; knolls
Savage-Grail silty clay loams	Clayey alluvium derived from sedimentary rock	Well drained	0%–2%	Alluvial flats
Chama-Sen-Cabba silt loams	Fine-silty residuum weathered from siltstone	Well drained	3%–6%	Pediments
Lawther silty clay	Clayey alluvium derived from sedimentary rock	Well drained	0%–2%	Alluvial flats

Soil Series	Parent Material	Drainage	Slope	Landform
Belfield-Grail clay loams	Clayey alluvium derived from sedimentary rock	Moderately well drained	0%–2%	Flats
Korchea-Fluvaquents complex, channeled	Stratified fine-loamy alluvium derived from sedimentary rock	Well drained	0%–2%	Floodplains on river valleys
Moreau-Wayden silty clays	Clayey residuum weathered from calcareous shale	Well drained	6%–9%	Ridges

Source: Natural Resources Conservation Service (2013)

FLORA AND FAUNA

The project area is situated within the Missouri Plateau ecoregion, characterized by a complex stream drainage pattern (Figure 3). Present vegetation includes such species as blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), needlegrass (*Nassella viridula*), little bluestem (*Schizachyrium scoparium*), and prairie sandreed (*Calamovilfa longifolia*) (Bryce et al. 1998).

Figure 3. Overview of the vegetation characteristic of the project area, facing northwest.

Approximately 160 wildlife species are resident or seasonal visitors to the greater Missouri River ecosystem, and hundreds of native fish species live in the mainstem and tributaries, including the Knife River. Some of the animal species that would have been common and available for human use in the Missouri River Valley area—both prehistorically and historically—include fur-bearing mammals such as beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), eastern cottontail (*Sylvilagus floridanus*), elk (*Cervus elaphus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*),

pronghorn (*Antilocapra americana*), and bison (*Bison bison*); and bird and waterfowl species such as mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), sharp-tailed grouse (*Tympanuchus phasianellus*), golden eagle (*Aquila chrysaetos*), and bald eagle (*Haliaeetus leucocephalus*) (Seabloom et al. 1978).

Several wildlife species that are listed as threatened or endangered under the Endangered Species Act either currently reside or once resided in McKenzie County. These include the gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), and black-footed ferret (*Mustela nigripes*) (U.S. Fish and Wildlife Service 2013). Additionally, the Dakota skipper (*Hesperia dacotae*) and Sprague's pipit (*Anthus spragueii*), both candidate species for listing as threatened or endangered, are also known to currently reside in McKenzie County (U.S. Fish and Wildlife Service 2013).

ENVIRONMENTAL CONSTRAINTS

Preservation of archaeological materials within or adjacent to the project area has been impacted largely by agricultural activities, such as cattle grazing or dryland farming, and natural erosion including ongoing residual, aeolian, and colluvial processes. Secondary sources of impact to archaeological resources include oil and gas development, road construction, and vehicle traffic. Oil and gas development has occurred adjacent to the project area, and is presently increasing as demand for domestic energy sources has grown in recent years. In some places, these varied land uses have resulted in increased ground visibility and removal of overburden, allowing for the identification of numerous sites and an interpretation of high site density. In other cases, though, it has simply removed the archaeological materials and resulted in the identification of low site densities. In combination, these factors may have disrupted the contexts of a moderate percentage of cultural materials.

CULTURAL/HISTORICAL OVERVIEW

PREHISTORIC CONTEXTS

The following discussion incorporates a variety of sources to develop a prehistoric overview for the work conducted for this project and includes information from the Little Missouri River Study Unit (LMRSU) in which the project area is located (Gregg and Bleier 2008). As of 2007, 2,329 archaeological sites were identified in the LMRSU, the majority of which were identified on ridges (35.8 percent); hills, bluffs, and knolls (21.2 percent); and terraces (17.8 percent) (Gregg and Bleier 2008).

Paleoindian Tradition (ca. 11,500–7,900 years before present [B.P.])

Although speculation exists regarding the possibility of earlier habitation of the Great Plains, the Paleoindian tradition is the oldest of the region, and, in general, is associated with a hunting and gathering adaptation (Gregg 1985). The Paleoindian tradition is subdivided here into six main complexes: Clovis, Goshen, Folsom, Hell Gap/Agate Basin, Alberta/Cody, and Parallel Oblique Flaked. In total, 30 Paleoindian archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008).

The Clovis complex (ca. 11,500–10,800 B.P.), defined by large, fluted lanceolate projectile points, is the earliest unequivocal complex in North America. Clovis artifacts have been found with megafauna, such as mammoth, in buried contexts in the Southwest and Great Plains (Grayson and Meltzer 2002); however, although megafauna were probably dietary constituents, it is debated to what degree Early Paleoindians pursued large game (Cannon and Meltzer 2004; Grayson and Meltzer 2002). Few Clovis sites have been recorded in the region and only one Clovis archaeological resource has been identified in the LMRSU (Gregg and Bleier 2008). In the South Dakota Badlands, the Lange-Ferguson site yields the best evidence for proboscidean exploitation (Hannus 1990). Here, modified mammoth bones are directly associated with a flake and three projectile points that were recovered from deposits similar to those containing mammoth, indicating that Clovis hunter-gatherers either killed the animals or scavenged their carcasses (Hannus 1990).

Goshen (ca. 10,900–10,100 B.P.) is a technological complex first identified at Hell Gap, Wyoming (Irwin 1967, 1971), but it is also found at Mill Iron, Montana, Carter-Kerr/McGee, Wyoming, and the Jim Pitts site, located in the South Dakota Black Hills (Sellet 2001). Goshen is poorly understood—the basally thinned, unfluted projectile points share affinities with both Clovis and Folsom, but are also similar to Southern Plains Plainview points. In stratified deposits, Goshen materials typically underlie Folsom (Frison et al. 1996). No Goshen material has been identified in the LMRSU (Gregg and Bleier 2008).

The Folsom complex (ca. 10,900–10,200 B.P.) is typified by distinctive fluted lanceolate projectile points. With most large grazers extinct by Folsom times and grasslands dominating the Great Plains, bison populations flourished, providing resources for Folsom hunters (Frison 1991). However, many high-elevation Folsom sites also demonstrate broad diets of diverse small prey (Hill 2007). Probable structures recorded at the Mountaineer and Barger Gulch sites in Colorado suggest long-term occupations in mountain settings (Stiger 2006; Surovell and Waguespack 2007). In North Dakota, there are numerous documented Folsom sites (Gregg 1985), including the Bobtail Wolf (32DU955A), Big Black (32DU955C), and Young-Man-Chief (32DU955D) sites (Root 2000; Shifrin 2000; William 2000). These sites are interpreted as camps, quarries, and lithic workshops where Knife River flint was procured and used for tool production. In the LMRSU, three Folsom archaeological resources have been identified (Gregg and Bleier 2008).

Both the Agate Basin (ca. 10,500–10,000 B.P.) and Hell Gap (ca. 10,000–9,500 B.P.) technocomplexes are typified by lanceolate projectile points with thick lenticular cross-sections (Frison 1991). Based on morphological similarities and stratigraphic evidence, Hell Gap is technologically descended from Agate Basin. Agate Basin and Hell Gap hunter-gatherers were probably specialized bison hunters. Sites like Agate Basin II (Hill 2001) and Casper (Todd et al. 1997) indicate more frequent extraction of marrow and within-bone nutrients, suggesting a greater focus on planning than previously evident. Some sites associated with this tradition have been recorded in North Dakota and South Dakota, but these mainly consist of isolated and surface finds (Gregg 1985).

Alberta (9800–9000 B.P.) is a poorly dated technology that probably descends from Hell Gap and is documented at the Hell Gap, Wyoming, and Hudson-Meng, Nebraska, sites (Agenbroad 1978; Frison 1991). Hudson-Meng is one of the largest documented bison kills

and suggests that Alberta people focused on bison hunting (Agenbroad 1978); however, more recent work suggests that humans were not responsible for killing the bison and that they died of a natural event (Todd and Rapson 1999). The Cody Complex (9200–8800 B.P.), which includes stemmed/shouldered Eden and Scottsbluff projectile points and the distinctive Cody knife, apparently arose from Alberta (Frison 1991). These sites are widespread across the northwestern and central Great Plains, with components at the Wyoming Horner I, Finley, and Medicine Lodge Creek sites (Frison and Todd 1986; Frison and Walker 2007) and the Mammoth Meadows, Myers-Hindman, and MacHaffie sites in Montana (Davis 1993). Such sites indicate that Cody adaptations were diverse and utilized large fauna as well as small prey and floral resources (Frison et al. 1996; Galvan 2007). Alberta/Cody sites have been recorded in North Dakota and South Dakota. In fact, Hudson-Meng contains a substantial amount of Knife River flint, showing a strong connection to the Missouri River region.

The Parallel Oblique Flaked complex is a catch-all grouping of Paleoindian projectile point types (Gregg 1985) including Angostura, Milnesand, Browns Valley, Lusk, Allen, and Frederick; these range in age from around 9400 to 7900 B.P. All types are lanceolate with parallel oblique flaking. Bison kill-butcheries became rare on the northwestern and northern Great Plains after approximately 8000 B.P. (Frison 1998), perhaps due to severe ecological deterioration that could no longer support large bison populations. Complex excavated and surface sites have been recorded in the Dakotas, including sites on the Missouri River. In the LMRSU, 14 archaeological resources defined under the general "Plano" category have been identified (Gregg and Bleier 2008).

Plains Archaic Tradition (ca. 8000–1500 B.P.)

The transition from Paleoindian to Archaic is archaeologically visible as an abrupt shift to large notched projectile points (Frison 1991), perhaps indicating a shift to atlatl propelled darts from hand-thrown spears. This transition is also associated with warming/drying trends that prompted diverse subsistence adaptations among hunter-gatherers (Carlson 1994). Ground stone appears in the Archaic, suggesting a greater focus on processing floral resources. In conjunction with the appearance of pithouses and storage pits in the western intermontane basins, this suggests a shift in subsistence base, a reduction in overall residential mobility, and more predictable seasonal rounds (Frison 1991). In the LMRSU, 241 Archaic archaeological resources have been identified (Gregg and Bleier 2008).

The Logan Creek/Mummy Cave complex (5700–4000 B.P.) is the earliest example of large side-notched projectile points on the northern Great Plains. The blending of the Logan Creek and Mummy Cave for this complex is due to varied nomenclature used among archaeologists regionally for similar archaeological complexes (Gregg 1985). Settlement types associated with this complex include bison kills, transient camps, and some stone circle sites. Twenty-three archaeological resources containing large side-notched projectile point varieties have been identified in the LMRSU (Gregg and Bleier 2008).

The Oxbow complex (5600–3500 B.P.), typified by side-notched, deeply concave-based projectile points, is concentrated in northern Montana, Alberta, and Saskatchewan (Hannus 1994) but is also quite common in North Dakota and South Dakota, with numerous sites along the Missouri River and its tributary system. Oxbow subsistence apparently centered on bison and sites include bison impoundments and jumps, encampments on stream terraces, stone

circles, and processing areas (Hannus 1994; Reeves 1969). However, numerous birds and small mammals were probably exploited (Aaberg et al. 2006). Some northern Great Plains sites further yield evidence of complex cultural behavior including bundle burials with elaborate grave goods (Bryan 1991). Fifteen Oxbow archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008), including three subsurface Oxbow projectile points that were found at 32MZ1184 (Borchert and Wermers 1994).

The McKean complex (ca. 4500–3400 B.P.) encompasses three distinct sub-phases—the McKean lanceolate, Duncan, and Hannah. The McKean complex is widespread across the Great Plains, and sites from this period can be found associated with bison kills, stone circles, lithic caching, and seasonal settlements (Frison 1991). Slab-lined pit hearths are common, as are ground stone artifacts suggesting a greater reliance on plant resources (Carlson 1994; Frison 1991). McKean complex sites often demonstrate evidence of lithic raw material exchange, including Swan River chert, Tongue River silicified sediment, and Knife River flint (Gregg 1985). In the LMRSU, 70 archaeological resources dating to the McKean complex have been identified (Gregg and Bleier 2008), including four McKean lanceolate points that were recovered from the Big Gulch-Chase site (32DU273) (Artz et al. 1983).

Pelican Lake (ca. 3000–2700 B.P.), typified by broad, thin, corner-notched projectile points, is likely a descendant of McKean and is found across the northern and central Great Plains (Frison 1991). This wide spatial distribution may indicate significant population growth in response to the favorable moist conditions of the Sub-Atlantic episode (Reeves 1983). Numerous communal bison kills, such as Head-Smashed-In (Frison 1991), indicate communal bison hunting, but this does not suggest it was an exclusive feature of their subsistence. Rather, Pelican Lake populations probably relied on a broad-based economy across diverse ecozones (Hannus 1994). Sixty-three Pelican Lake archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008). These include the Sunday Sage site (32BI22) (Simon and Borchert 1981a) and Ice Box Canyon Ridge site (32MZ38) (Simon and Borchert 1981b).

Plains Woodland Tradition (ca. 2000–450 B.P.)

Temporally overlapping with the Northwestern Plains Late Archaic, the Plains Woodland tradition is characterized by increased sedentism, garden horticultural activity, expanding regional exchange networks with eastern Woodland populations (Adena and Hopewell), and the elaboration of ceremonial activities and mortuary practices, specifically mound burials (Griffin 1967). Significant technological advances such as bow and arrow and ceramics use are also apparent (Gregg 1985); however, the fundamental subsistence strategies of the Plains Woodland did not drastically differ from their Archaic predecessors (Zimmerman 1985). It is assumed that this tradition saw the beginning of horticultural practices in the region. For the purposes of this study, the complexes that are classed as belonging to the Plains Woodland include Besant, Sonota, Laurel, Avonlea, Old Woman's, and Blackduck.

The Besant complex (ca. 2000–1500 B.P.), typified by small to medium-sized side-notched triangular projectile points, represents the earliest presence of ceramics in North Dakota, probably resulting from eastern woodland influence (Walde 2006). Besant ceramics are more common in the eastern half of the Dakotas; the vessels show a basic conoidal shape and suggest lump modeling manufacture with some coarse cording (Wood and Johnson 1973).

Besant sites show extensive use of Knife River flint (Reeves 1970). Site types include stone circle sites, habitations on stream and river terraces, and bison kills. Numerous communal kill sites, including the Ruby bison pound in Wyoming (Frison 1991), suggest that Besant people were sophisticated bison hunters. The Sonota complex (1850–1350 B.P.) appears to be a possible sub-complex of Besant, but differs in that burial mounds are common at Sonota sites (Reeves 1983; Wood 1967). These mounds include rectangular subfloor pits/tombs with dismembered bodies and, commonly, articulated bison remains (Johnson and Johnson 1998). The presence of associated exotic artifacts is often cited as evidence of Hopewell influence on Middle Plains Woodland populations (Johnson and Johnson 1998). In the LMRSU, 31 Besant/Sonota archaeological resources have been identified, including at the Sunday Sage site (32BI22) (Simon and Borchert 1981a) and at 32MZ333 (Floodman et al. 1982).

Sites from the Laurel complex (2100–850 B.P.) are generally found in the eastern portions of North Dakota, northern Minnesota, and southern Canada. Laurel pottery and mound building are fairly distinct, but lithics associated with this complex tend to be various and lack a particular style (Gregg 1985).

Avonlea complex (ca. 1800–1000 B.P.) sites occur across the northern Great Plains and are contemporaneous with Besant. This complex includes a variety of site types, including stone circles, bison kills, and rock shelter habitations (Reeves 1970). Avonlea represents the first regional complex to produce arrow points exclusively, suggesting a transition to bow and arrow technology (Frison 1988). Avonlea point types are small and indistinctly side-notched. Saskatchewan Basin Complex: Early Variant pottery is found at Avonlea sites (Byrne 1973). Avonlea subsistence in the north relied heavily on communal bison procurement, but in their southern range bison hunting was supplemented by smaller game (e.g., pronghorn), fish, and seasonal plant exploitation (Smith and Walker 1988). Avonlea sites are relatively rare in the Dakotas (Vickers 1994). In North Dakota, the Evans site (32MN301) contained Avonlea projectile points and ceramics (Schneider and Kinney 1978). Seven Avonlea-aged archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008).

Rare in North Dakota is the Old Woman's complex (A.D. 700–1300). This complex is contemporary with the Plains Village tradition, so it would seem likely that many associated sites would be granted the latter designation (Gregg 1985).

The Blackduck complex (A.D. 1150–450) derives from northern Minnesota and was concentrated in southern Manitoba. It is contemporary with both Avonlea and Old Woman's complexes, and with Extended and Terminal Middle Missouri traditions. Some evidence of possible Blackduck pottery has been found along the Missouri River, which suggests trade between the Missouri River villagers and the Blackduck people to the north (Joyes 1970).

Plains Village Tradition (ca. 1050–350 B.P.)

Lehmer (1971) defined the Plains Village tradition as possessing the following diagnostic traits: equal horticulture and hunting and gathering strategies; semi-permanent villages near the Missouri River floodplain; earthlodges; large storage and refuse pits; distinctive ceramics; abundant end scrapers and arrow points; bison scapula hoes; and a well-developed bone tool industry. The Plains Village Tradition is divided into the Middle Missouri tradition (A.D. 969–1500) and the Coalescent tradition (A.D. 1300–1650), discussed below. Twenty-three

Plains Village archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008).

Three primary Middle Missouri variants are recognized: Initial Middle Missouri (A.D. 969–1297), Extended Middle Missouri (A.D. 1075–1443), and Terminal Middle Missouri (A.D. 1300–1500) (Eighmy and LaBelle 1996). These represent a continuation and intensification of Northern Plains Woodland lifeways and their appearance coincides with the onset of the Medieval Warm Period (Bryson et al. 1970) when a moisture increase likely permitted horticulture in areas previously characterized by tenuous farming conditions (Wood 2001).

The Initial Middle Missouri Variant (IMMV) is thought to have developed as an outgrowth of the Great Oasis (Tiffany 2007) or via the arrival of eastern populations already exploiting a Plains Village lifeway (Lehmer 1971). The IMMV was concentrated in the southern portions of the Middle Missouri region and characterized by highly fortified villages of large, semi-subterranean rectangular houses (Lehmer 1971; Winham and Calabrese 1998). In the LMRSU, an Initial Middle Missouri deposit has been identified at 32MZ380D (Jorstad et al. 1986:179).

The Extended Middle Missouri Variant (EMMV) is concentrated in the northern portions of the Middle Missouri region (Lehmer 1971). EMMV groups resided in small villages of semi-subterranean rectangular houses; southern villages were more often fortified than those in the north (Wood 2001). It is unclear whether the EMMV replaced the IMMV or represents a contemporaneous offshoot of the IMMV. Origins aside, it is assumed that IMMV populations were eventually absorbed into EMMV populations. The final expression of this tradition was the Terminal Middle Missouri (Winham and Calabrese 1998). These sites were concentrated in a smaller geographic area along the Missouri River in southern North Dakota and characterized by fewer but much larger villages (Wood 2001). Sites again contained long, rectangular semi-subterranean houses but were highly fortified (Wood 2001). A continuation of the Middle Missouri Tradition is recognized historically as the Siuoan-speaking Mandan and Hidatsa (Wood 2001).

The Coalescent period is temporally divided into Initial (650–350 B.P.), Extended (500–300 B.P.), and Post-Contact Coalescent (300 B.P.–Historic period) (Johnson 1998; Lehmer 1971). The Coalescent Tradition is thought to represent a geographic movement of Central Plains Tradition village-dwelling populations to the Missouri River Valley in South Dakota (Blakeslee 1993). Central Plains Traditions might have migrated from Nebraska and Kansas in response to drought brought on by the Pacific climatic episode (Lehmer 1971). Similar to Middle Missouri Tradition groups, Coalescent populations practiced an economy split between mixed cultigen horticulture and bison hunting (Johnson 1998).

Initial Coalescent Variant sites are located on bluffs overlooking the Missouri River and its drainages in southern South Dakota. Populations lived in fortified villages consisting of subrectangular to circular/oval earthlodges and often surrounded by complex fortifications (Johnson 1998). Violence amongst Coalescent groups is evidenced at the Crow Creek site (39BF11) where approximately 486 individuals were killed in the village fortification ditch around 625 B.P. (Willey and Emerson 1993). Crow Creek is interpreted as evidence of internecine warfare amongst Initial Coalescent groups over land competition (Zimmerman

and Bradley 1993) or, conversely, as evidence of warfare between immigrant Coalescent groups and resident Middle Missouri Tradition peoples (Johnson 1998). The Extended Coalescent Variant apparently descended from the Initial Coalescent sometime in the fifteenth century A.D. Sites are concentrated along the Missouri River and its tributaries in central and northern South Dakota (Krause 2001). Extended Coalescent sites are far more abundant than during the Initial Coalescent and are characterized by a dispersed, unfortified village structure of circular earthlodges (Johnson 1998; Krause 2001; Lehmer 1971). In the LMRSU, the Connell Ranch site (32BI439) has been identified as an Extended Coalescent bison butchering site (Metcalf et al. 1988). The Extended Coalescent Variant evolved into the Post-Contact Coalescent during the Protohistoric and Historic and the Coalescent Tradition is recognized as the Arikara (Krause 2001). The last post-contact village was Like-a-Fishhook Village, occupied by the Arikara, Mandan, and Hidatsa; it was abandoned in 1886 when groups relocated to the Fort Berthold Indian Reservation (Smith 1972).

HISTORIC CONTEXTS

European Trade and Exploration (1738–1858)

Perhaps the earliest attempts at exploring the northern Great Plains came as a result of the ventures of Pierre Gaultier de Varennes Siure de la Verendrye (Dill 1983). His travels from New France into North Dakota led him as far as the Missouri River (somewhere near Bismarck), and led to subsequent expeditions by his sons, who went farther south into South Dakota (near Pierre) and west towards the Black Hills. While the elder la Verendrye met the Mandan, his sons encountered the Arikara and other tribes in South Dakota. Their reports heightened interest in the region and the possibilities that existed for trade with its inhabitants.

Following the la Verendryes, a modest fur trade developed in the region, but until the expedition of Captains Meriwether Lewis and William Clark returned successfully from their voyage up the Missouri, the region was considered a wild unknown (Schulenberg 1957). Lewis and Clark established winter quarters with the Hidatsa and Mandan near the Knife River (near present-day Stanton), founding Fort Mandan, the first permanent U.S. settlement in North Dakota. It was at their winter quarters that the pair secured the services of Charbonneau and his wife Sakakawea as guides to lead them through the Rocky Mountains (Works Progress Administration [WPA] 1938).

In 1807, Manuel Lisa established a short-lived post at the mouth of the Bighorn, and by 1809 his St. Louis Missouri Fur Company was building posts among most of the tribes all along the Missouri River. Other notable companies, such as the Northwest Company, Hudson Bay Company, the Columbia Fur Company, and the American Fur Company, soon followed suit (Schulenberg 1957). The life of these posts tended to be short, but they did much to influence the tribes who frequented the Missouri River in both North and South Dakota. Fort Union—at the confluence of the Yellowstone and Missouri Rivers—was the last of the great posts, and its waning during the late 1850s saw the fur trade in the Dakotas in its last throes.

In addition to the tribes that arose from the Middle Missouri and Coalescent traditions (Mandan, Hidatsa, and Arikara), the northern Great Plains and the Missouri River were also used by countless other tribes since before European contact.

The Assiniboine were known to frequent the northern Missouri River (mainly near the confluence with the Yellowstone), and were active in the fur trade throughout the eighteenth and nineteenth centuries. As well, the Cheyenne were pushed westward by the Chippewa during the middle of the eighteenth century and took up at least a temporary settlement period on the Missouri River. At least one earthlodge village has been attributed to the Cheyenne in eastern North Dakota, and some Cheyenne villages on the Missouri River were located between the Mandan to the north, and the Arikara to the south, where they built earthlodges and pursued horticulture and buffalo hunting (Schlesier 1968).

The Plains Cree and Plains Chippewa also frequented the northern Missouri—mainly near the confluence with the Yellowstone, but also near Fort Clark. Both tribes traded actively with the Mandan and Hidatsa. The Crow, although more westerly in their territory, were related to the Hidatsa and would often trade and visit with the Missouri River tribes (Schulenberg 1957).

Based on linguistic evidence, the Sioux (or Dakota) originated from the southwest Great Lakes region (DeMallie 2001a). The timing of the migration is unclear, but ceramic evidence suggests that the Dakota were living on the plains several centuries before the arrival of Europeans (Hanson 1998). Based on linguistics, it is thought that the Assiniboine split from the Sioux sometime before the mid-seventeenth century (Hanson 1998). The Teton Dakota are divided into seven sub-tribes, including the Oglala, Brule, Sans Arc, Hunkpapa, Blackfeet, Miniconjou, and Two Kettles (Hanson 1998). According to DeMallie (2001a), by the mid-eighteenth century, the Teton Dakota hunted bison in the area east of the Missouri River, their movements limited in part by the Arikara stronghold along the Missouri River. However, a series of smallpox epidemics from 1771 to 1781 devastated the Arikara villages (Johnson 1998) and permitted the Teton Dakota to move west of the Missouri River. Like the Teton Dakota, the Yankton and Yanktonai Dakota occupied the prairies east of the Missouri River and north into Minnesota in the mid-seventeenth century (DeMallie 2001a). By the mid-nineteenth century, the Yankton and Yanktonai occupied the prairies east of the Missouri River from the mouth of the Big Sioux River in the south to the Red River in the north (DeMallie 2001b).

Native American Reservations, Allotment, and Reorganization (1860–1936)

The Reservation Period began in the 1860s and continues into today. This time period contains numerous accounts of government actions to stop tribal ceremonialism, forced boarding school education of Native American children, and attempts at termination and relocation to solve the "Indian Problem" in the Dakotas. Disease, traders, missionaries, and new technology had significant impacts on the Native American people living in the region. Populations declined dramatically due to the introduction of infectious diseases, such as smallpox (Limerick 1987). Many Americans, hungry for land, believed that the Native Americans did not need the vast expanses of prairie that were under their control, and wanted to see the government open up the land for settlement. This sentiment was in many ways echoed by the federal government which also believed it was appropriate for native peoples to learn skills and adopt lifestyles familiar to Euro-Americans (e.g., large-scale farming, blacksmithing, and construction) (Hoxie et al. 2001). Native Americans within and near the project area were no exception to this general trend, which resulted in circumscription of

Native American peoples onto bounded reservations, which opened up lands for Euro-American settlement of previously native-occupied territory (Limerick 1987).

Relocation of Native American peoples to the new reservations followed treaty ratification, but was a slow process. With the passage of the Fort Laramie Treaty in 1851, the U.S. Government established several forts along the Missouri River. One of these forts, Fort Berthold, was occupied by U.S. Calvary from 1864, until its destruction by Sioux Warriors in 1867 (North Dakota Department of Public Instruction [NDDPI] 2002). The fort was then re-established 18 miles downriver and become known as Fort Stevenson, located in the modern day town of Garrison, North Dakota. The Three Affiliated Tribes and other Native American societies were transformed by the presence of the U.S. military and steamboats carrying settlers and supplies into this region (NDDPI 2002). The presence of Indian agency personnel residing on the reservation after 1868, day schools being opened on reservations, and the establishment of the Fort Berthold Indian Reservation under the Executive Order of 1870 forever changed the Three Affiliated Tribes (NDDPI 2002). By 1888, under the policy of allotment in severalty, most of the residents of Like-A-Fishhook Village were encouraged to set up residences elsewhere on the reservation, one of them becoming Elbowoods. Elbowoods was located on the northeast side of the river and served as the center for the reservation until its destruction during the construction of the Garrison Dam (NDDPI 2002).

The result of the debate over the "Indian Problem" continued, and not just in North Dakota, but across the United States. At the end of the nineteenth Century, the United States formally adopted a policy of allotment in severalty, a policy epitomized in the General Allotment Act of 1887 (also known as the Dawes Act). With the pressure on government officials from settlers who wanted reservation land open for settlement and social groups promoting the "civilization" of Native Americans, allotment in severalty was a solution that seemed to please all parties (with the exception perhaps of the Indians themselves who were not often consulted on Indian Policy). For expansionists, it allowed for additional Euro-American settlement by freeing up non-allotted lands for homesteading. For those sympathetic to the Indian cause, the belief in the civilizing effect of private property and commercial enterprise made allotment seem like a favorable way to end the "savage" ways of the western Indian (Limerick 1987).

Others were less favorable towards the idea of allotment. A delegation of Creek Indians was sent to address the House of Representatives in 1882, with regards to the U.S. allotment policy. The Creek delegation presented evidence that among many tribes for whom allotment in severalty had already taken place, populations had decreased, the amount of land being farmed had diminished, and overall the lives of the Indians had been worsened (U.S. House of Representatives 1882). Although voices of dissent were present, they were too few, when compared to the strong voices of allotment supporters. The Dawes Act was initially seen as a great success, and the policy soon began to spread to the other tribes across the country.

The concept of allotment and the "civilizing" of the American Indian preceded the Dawes Act by several centuries. The discourse of some of the earliest treaties, enacted under colonial governments in the seventeenth century, includes the idea of introducing Native Americans to a sedentary lifestyle, Christianity, and the benefits of agriculture (Miles 1999). Although mention of individually allotted land did appear in discussions of Indian Policy in both

colonial governments and in early United States Policy, it was not until the middle of the nineteenth century that allotment was included in any treaties or acts with Indian groups. The earliest treaties to include allotment policies were formed in the 1830s, during President Andrew Jackson's administration. Initially, these policies were voluntary, with title to the land being offered with brief trust periods during which the land was tax exempt. In most cases, these treaties included language allowing the government to revoke the patents, should the holder break certain conditions associated with their "Americanization," such as excessive drinking, or practicing traditional religious practices (Froehling 1993).

The act establishing allotments on the Fort Berthold Indian Reservation was signed on December 14, 1886, almost 2 months before the passing of the Dawes Act. The Act of December 14, 1886, signed by federal representatives, and representatives of the Gros Ventres, the Mandan, and the Arikara, states that the tribes had:

> vastly more land in their present reservation than they need or will make use of, and are desirous of disposing of a portion thereof in order to obtain the means necessary to enable them to become wholly self-supporting by the cultivation of the soil and other pursuits of husbandry. (Kappler 1904)

Under the articles of the Act of December 14, 1886, the Arikara, Gros Ventres, and the Mandan ceded large portions of their reservation to the U.S. Government for an annuity to help support the tribes. The Act also called for the survey of the former reservation and the allotment of the land to individuals and families of the three tribes. The distribution of the allotments provided 160 acres to each head of family, 80 acres to each single person over 18 years of age, 80 acres to every orphan child under 18 years of age, and 40 acres to each other person under 18 years of age (Kappler 1904). Each head of household chose the location of their allotment and the allotments of their children. The allotments of orphans were selected by an Indian Agent. Unlike many allotment acts which opened all non-allotted land to immediate non-native settlement, the Act of December 14, 1886, left all non-allotted lands in trust for a period of 25 years. The purpose of this trust was to provide for future generations of Mandan, Arikara, and Gros Ventres to receive allotments on their former reservation (Kappler 1904).

The titles to the allotted lands were also held in trust by the U.S. Government. While allotments were chosen by, and under the control of, the individual head of household, the actual land patent was held in trust by the U.S. Government for 25 years. At the end of the 25-year trust period, a fee patent would be issued to the allottee and the land would officially become taxable private property. This trust period was meant to allow the Native Americans to establish themselves on their land before it became taxable property, and to prevent the immediate sale of the land to Euro-American settlement. If the head of household passed away before the end of the trust period, the allotted land would be divided evenly amongst his or her heirs (Kappler 1904).

The trust period was meant to prevent the dispossession of the allotted lands, but beginning in the early twentieth century, additional legislation regarding allotment lands was passed that allowed land to be removed from trust before the 25-year trust period had elapsed. The first of these acts was passed on May 27, 1902. This act allowed for the sale of inherited land, which required the removal of the land from the trust. Inheritance was not determined by the will of

the deceased, but by territorial law, which stated that inherited land was divided evenly among the heirs (Froehling 1993; Kappler 1904). The death of the original allottee sometimes resulted in more than 10 heirs to a property. Dividing this land evenly among the heirs resulted in parcels so small that they were useless for farming, or for leasing. Even when considered together, the land was rarely sufficient to meet the needs of the family, and so land sale was the most economic option for the use of the land. In the short term, the sale of inherited land was a favorable solution for both the government and the allottees, but it resulted in further alienation of Native American land, and scattered families far afield, as the loss of the land forced them to leave the area in search of employment.

A second act that impact Native American land sales was the Burke Act, passed in 1906. The Burke Act allowed an allottee to remove land from the trust and the issuance of a fee patent if the allottee was proven to be "competent" (Froehling 1993). There were no set standards or guidelines to measure "competency," leaving the agent in charge, or the "boss farmer" to determine competency based on whatever criteria they saw fit. Like many of the regulations regarding allotment, the idea was intended (at least on the surface) to be beneficial to the Native Americans. The Burke Act would allow the allottees to free themselves of any government restrictions on their land, and become free farmers like their neighbors. The result, similar to the inherited land act, was that large acreages of land were sold off for quick cash, often to pay off debts incurred to local merchants.

In 1907, an additional decision by congress allowed for the sale of land of allottees determined to be "non-competent" by the Indian Agent (Froehling 1993). The land would be sold, and an annuity provided for the original allottee. As with the determination of competency, there were no set criteria for determining someone as non-competent and the decision was left entirely at the discretion of the agent.

In 1910, another act was passed to create allotments of the remaining open lands within the boundaries of the former reservation. This act made provisions for the establishment of additional allotments based on the non-surveyed lands held in trust by the U.S. Government within the former Fort Berthold Indian Reservation. New allotments were established as well as additional land added to already existing allotments. The area selected for these new allotments was limited to the area south and west of the Missouri River or located in select townships north and east of the Missouri River. The Act of 1910 allowed the U.S. Government the right to remove some land from allotment for establishing schools, a government operated ranch to provide for the three tribes, and any land containing coal deposits. The Act of 1910 removed the last of the non-allotted land held in trust by the government. After the new allotments were established, all remaining land was open to U.S. settlement under the various Homestead Acts (Kappler 1929).

Between 1895 and 1929, 3,401 allotments were made as part of the various allotment policies affecting the Mandan, the Arikara, and the Gros Ventres. Although the allotment of Fort Berthold was initiated under the Act of 1886, the first allotments were not distributed until 1900. In 1900, 949 allotments were established, almost all of which were located along the Missouri River. In 1910, another 765 were established, both along the river, and in the neighboring foothills. In 1912 and 1913, under the revised allotment Act of 1910, 1,131 allotments were established. Most of these were located on open range land rather than along

the river. Although U.S. settlement was allowed under the Act of 1910, an additional 556 allotments were established in the 1920s, mostly for children who had not previously received allotments (McCullough 1948). The United States Policy of Allotment in Severalty officially ended with passing of the Indian Reorganization Act in 1934.

The Mandan, the Arikara, and the Gros Ventres reorganized in 1936 as the "Three Affiliated Tribes." The tribes live in different portions of the reservation, but act under a single governing council. During the 1930s and 1940s, agriculture and stock raising were the two largest industries on the Fort Berthold Indian Reservation. Many Native Americans living on Fort Berthold supplemented ranching and farming with the hunting of wild game, working for the Indian Agency, or leasing lands to non-native ranchers and farmers. Renting and leasing land was an important source of income for most households on the reservation. Lease agreements took a variety of forms but included both sharecropping and fee rentals. Between 1942 and 1945 more than one-third of the annual income for households on the reservation was generated through rental and lease agreements.

In the LMRSU, 34 Hidatsa, 1 Sioux, and 15 unspecified historic Native American archaeological resources have been identified (Gregg and Bleier 2008).

The Homestead Boom and the Ethnic Settlement of North Dakota (1868–1915)

Even outside of the reservation lands, where open public land was available for settlement, the true rush for homesteads in North Dakota did not take place until 1885 and was spurred by the extension of the Northern Pacific Railroad across the Red River from Minnesota (WPA 1938). The first homestead in North Dakota was filed in 1868, which was the only homestead filed until 1871. The earliest settlers in were a mixture of American-born settlers from diverse locations across the United States. Midwestern farmers, struggling on small rented lands in the Midwest, eyed the open plains, looking for the opportunity to claim their own lands. Single men, looking for an escape from hard labor in mines, oil fields, and factories, looked to the plains for new opportunities on farms, ranches, or working on the railroads (Hudson 1976).

The Great Dakota Boom from 1878 to 1885 represented the first wave of large-scale settlement in North Dakota. The "boom" was driven by several factors including the expansion of the railroad into the state, increased industrialization and population pressure in the eastern states, and improved technologies in processing "spring wheat," a crop that was well adapted to conditions on the northern plains. In 1873, the bankruptcy of Northern Pacific forced them to sell off most of their land holdings in the state, which, combined with the land available through the Homestead Act, made the northern Great Plains an enticing location for settlers from the East Coast and the Midwest (Wilkins and Wilkins 1977).

The land west of the Missouri River did not see much settlement prior to the 1890s, and the major settlement of this region did not start in any great numbers until between 1900 and 1910. In general, those homesteaders who selected lands along the Missouri River were able to do some crop farming, but the majority of homesteads were arranged as ranch operations for sheep or cattle. These areas were far from uninhabited, with many of the Plains Indians settled on reservations near the river, stage lines extending to mining operations in the Black Hills and Montana, and cowboys and cattlemen driving herds from Texas to pasture on the

plains grassland. Initially, settlement in the western part of the state was limited to areas along the river, where steamboat access could provide supplies, and a means of transporting crops and herds for sale in larger markets. When the railroads crossed the Missouri into the western part of the state, North Dakota saw a second homestead boom, from 1898 to 1915, driven by settlers seeking the last available free homestead land.

In addition to the homesteading, which brought an increasing number of people to western North Dakota, the discovery of large deposits of lignite coal further boosted interest in the development of northwestern North Dakota, and the surrounding area (WPA 1938). Although slow at first, the mining industry started to flourish during the 1930s; to this day it remains a major focus of activity which drives the economy of both the county and the state.

Ethnic Settlement

Unlike the first wave of settlement (1878–1885), which consisted primarily of Americans and Canadians of British, Scottish, and French descent resettling from the Midwest and the eastern states, the second wave (1898–1915) was dominated by foreign-born settlers arriving in large numbers from across Europe. Motivated by the lack of available land in most European countries, along with economic systems that equated land with status, the United States and their new liberal land policies attracted many Europeans to immigrate to the United States. Helping fuel this immigration, U.S. railroad companies actively advertised in Europe to entice settlers to purchase available land grants and settle along newly created rail lines (Hoover 2005; Hudson 1976). Environmental conditions in the northern Great Plains were not attractive to all European immigrants, but immigration from across northern Europe resulted in many communities dominated by large ethnic populations, bringing with them their traditional agricultural practices, architecture, and cultural traditions. Unlike the first wave of settlers, the immigrants from eastern Europe tended to settle in cultural homogenous communities preserving the language and cultural practices of their homeland.

German-Russians

One of the largest ethnic groups in the Great Plains, the German-Russians established communities across the Great Plains including the Dakotas, Nebraska, Colorado, and Montana. The German-Russians emigrated to the United States from two different regions of eastern Russia: the Volga region, and the region to the north of the Black Sea (Hudson 1976). Originally from large agricultural communities in Germany, these groups first emigrated to Russia in 1763, when the German-born Empress Catherine the Great invited the Germans to develop the largely empty Russian Steppes, granting them limited autonomy, and exemption from military service. The Germans established small close-knit communities in Russia which allowed them to retain many of their cultural traditions (Baltensperger 1983; Hoover 2005).

In 1871, Czar Alexander II withdrew many of the privileges granted to the German settlers including forcing them into military service. As a result, many of the Germans chose to leave Russia to settle in the newly opened American West. The German-Russians attempted to create the same close-knit communities they had left in Russia, establishing small towns across the American West. The Volga Germans mostly settled in Kansas and Nebraska, while the Black Sea Germans settled in North Dakota and South Dakota (Koop 1986). Within their close communities, the German-Russians maintained many of their traditions, something which occasionally set them apart from neighboring communities.

Although ethnically German, the German-Russian settlers were religiously diverse, including Catholics, Lutherans, Mennonites, and Hutterites (Hoover 2005). The German-Russians represent the largest European ethnic group to settle in Dunn County, North Dakota. German-Russian settlers moved into North Dakota in large numbers after 1880, although it took them somewhat longer to settle as far northwest as Dunn County. Settlers would often relocate several times throughout the Midwest and even in eastern or southern North Dakota before finally moving to permanent homesteads in the northwestern part of the territory. The strong sense of community felt by the German-Russians and the frequent re-migration across North Dakota meant that most German-Russians had families and friends in all of the neighboring communities (Hudson 1976).

The similar environment of the Russian steppe provided a level of experience most ethnic groups in the area did not have. This can be seen in their architectural styles, which made use of available resources to build sturdy homes without an ample supply of lumber. The German-Russian architecture used a combination of clay mixed with straw and manure, rammed earth blocks, and timber, when available, to build strong, multiple-room homes. Another method used clay bricks known as Batsa. The use of Batsa continued even after the German-Russians adopted American architectural styles, using the clay bricks as wall insulation between wood-framed walls (Koop 1986).

Scandinavians

Settlers from Sweden, Denmark, and Norway were present in large numbers in northwestern North Dakota. By 1910 there were nearly 30,000 Swedes in North Dakota, and four times as many Norwegians (Hudson 1976). Scandinavian immigration after 1850 was driven by overcrowding in the rural parts of those countries, and encouraged by United States commercial interests, specifically by railroad companies looking to populate towns in the ever expanding American West. Most Scandinavians moved first to the Midwest, settling in Wisconsin or Illinois, before moving on to establish homesteads in North Dakota during the "Dakota Boom" of the 1870s and 1880s (Hoover 2005; Hudson 1976). Unlike the German-Russians, who settled in large groups forming whole communities, most Scandinavian settlements grew over time, with a few settlers moving to an unsettled area, and writing letters to friends and family to encourage additional settlers (Hudson 1976).

The single-pen gable roofed style was common for both Norwegian and Swedish settlers, who prior to coming to America were united under one crown, as the United Kingdoms of Sweden and Norway, from 1814 to 1905. Availability of materials often dictated the form that Scandinavian homes took in North Dakota; in areas lacking timber resources, sod built structures were often constructed, and even in areas with limited timber, sod roofs were common features on both log and wood-framed houses. The quality of timber available for home construction made some types of traditional log notching difficult, and what dominated Scandinavian-American homes was dovetail notching with the spaces between logs filled with some type of mortar.

Other Ethnic Groups

While Scandinavian and German-Russians represented the two largest ethnic groups in western North Dakota, ethnic groups from other parts of the world were present, albeit in smaller numbers. Canadian immigrants, particularly from Ontario, moved to North Dakota in

large numbers between 1875 and 1880, with the largest groups settling in the northeast and north-central portions of the state along the Canadian border. Most of these settlers were the children of immigrants themselves, their families having arrived from Great Britain a generation before. Germans, Bohemians, Luxembourgians, and Icelanders also settled in North Dakota, though most never settled in concentrated communities (Hudson 1976).

Agricultural Development and the Growth of North Dakota Farming (1890–1920)

The dominant crop grown in North Dakota during the early years of settlement was spring wheat. Spring wheat is a dark, coarse grain that was easy to grow in drier climates, but was difficult to process for use in a form appealing to most consumers (Danborn 1998). Towards the end of the nineteenth century, a new way of processing spring wheat into what was known as Minnesota patent flour was developed. This new process significantly increased demand for this hardy crop. Many of the agricultural practices used to develop the crop were similar to growing other forms of wheat, and the farming practices already in place across the Midwest were adopted by new settlers in North Dakota. Distinctive to spring wheat farming, many believed that using broadcast seeders was more favorable to the crop than using the more traditional grain drills. Other equipment used to produce spring wheat was similar to other crops in the region, including plows, cultivators, seeders and harvesters (Coulter 1910).

Demand for wheat and other agricultural projects increased dramatically across the country during the first decades of the twentieth century. Between 1910 and 1914, increased demand fueled by the growth of urban populations across the United States and increased immigration and settlement due to the westward expansion led to dramatic increases in prices on agricultural products. Declining production in Europe during World War I encouraged the federal government to heavily promote increases in agricultural production (Opie 2004; Wilkins and Wilkins 1977). The government fixed wheat prices during the war, which encouraged farmers to expand their holdings and increase their crop yields. By the 1920s, North Dakota was one of the largest producers of wheat in the United States (Etulain and Malone 1989). These practices would come to haunt the American farmer in the 1920s, when dramatic decreases in crop values would result in harsh economic conditions across the Great Plains (Wilkins and Wilkins 1977).

Confined-Range Ranching on Fort Berthold (1891–1953)

While agriculture played an important role across the state, the land west of the Mississippi was dominated by ranching and livestock production. Following the Civil War, the growth of urban populations in the east resulted in an increased demand for beef production. The restriction of Native American tribes to reservations opened up vast tracts of grassland in the Great Plains and the expansion of the railroad into these areas facilitated the transportation of livestock to larger markets (McLaughlin 1994; Wilkins and Wilkins 1977). Taking advantage of these favorable conditions, several large ranches were established in central and western North Dakota. Two of the largest operations along the Missouri River in North Dakota were the Birdhead Ranch and the Long × Ranch (McLaughlin 1994).

By the turn of the century, the expansion of homestead settlement had reached the areas west of the Missouri. Homesteaders and ranchers were immediately at odds over the use of land, with homesteaders fencing off and restricting access to what was once open range land.

Between 1900 and 1910, the number of farms west of the Missouri increased from 5,096 to 28,826. With open range land in diminishing quantity, the undeveloped lands on the Fort Berthold Indian Reservation, which had access to water, abundant grasses, and trees for shelter along the Missouri River, became increasingly attractive to the eyes of American ranchers; however, the boundaries of the reservation were protected, and not open to Euro-American settlement (McLaughlin 1994).

Some ranchers had begun illegally grazing livestock on reservation lands during the nineteenth century, but by the end of the century, ranchers had found a way of legally grazing their livestock on the reservation. The Act of February 28, 1891 (26 Stat. 794) was an amendment of the Dawes Act which allowed Indian allottees who were unable to use lands due to age or disability to lease their lands with the approval of the tribal authority. Over the next few years, some of the restrictions on the use of this land were relaxed, but the leasing was still managed by the BIA with the funds used to support government programs on the reservation (McLaughlin 1994; Parker 2011). Ranchers took advantage of these leased lands to continue the practice of open ranching, a method that was becoming impossible outside of the reservation boundaries.

The grazing of livestock on the Fort Berthold by Euro-American ranchers was not the same as the open range ranching of the past. In many ways the methods used in what is referred to as "confined-range ranching" borrowed elements from both open range grazing and ranch farming. Similar to open range ranching, seasonal crews were used to herd and tend livestock on the leased reservation lands; and livestock was allowed to graze in common lands, with several round-ups a year to keep track of cattle for breeding, and for sale (McLaughlin 1994). During round-ups, cattle were kept in large corrals established at seasonal line camps on the reservation. Unlike the open range ranching of the past, grazing was limited to broad leasing areas on the reservation; leasing areas that were fenced to avoid livestock from wandering onto privately owned land.

In 1916, the Office of Indian Affairs divided the Fort Berthold Indian Reservation into three grazing units and changed the leasing costs to a rate per acre, rather than per head of cattle. This type of ranching continued until the Office of Indian Affairs made changes in the mid-1930s and persisted in a similar fashion until the 1950s. Over the years, ranchers saw many benefits of using leased reservation lands. The use of cheap leases on prime grassland on the reservation allowed many ranchers to better weather the difficult years of the 1920s and 1930s, with many of the original ranchers becoming successful and prominent businessmen in the state. Leased grazing, while certainly beneficial to Euro-American cattlemen, and to the Office of Indian Affairs and BIA offices that provided for Fort Berthold, was not entirely favorable for those living on the reservation. Overgrazing became a serious concern for those on the reservation, and while they had limited means to control overgrazing through restrictions on herd sizes, many of these were overlooked by Euro-American ranchers and the government (McLaughlin 1994; Parker 2011). The Native Americans themselves grazed livestock on their reservation lands, kept separate from the lands leased by Euro-American ranchers, and conflicts between the two occasionally occurred. The construction of Garrison Dam in 1953 flooded most of the prime grazing lands along the river, and put a stop to confined-ranged grazing on leased lands. What little pasture land remained along the river

was subdivided and allocated to Native American stockmen to compensate for losses caused by flooding (McLaughlin 1994).

Depression, Recovery, and the Damming of the Missouri River (1921–1953)

Economic decline came early to North Dakota, with many farmers seeing troubles as early as 1921. North Dakota famers were heavily dependent on wheat production, which led to great prosperity during World War I when the price of wheat was fixed by the federal government. During these prosperous years, many farmers mortgaged their properties and invested their prosperous earnings on expanding the land they had under cultivation. Following World War I, with demand low and the federal government releasing control of wheat prices, the price of wheat plummeted, falling from more than $2.00 per bushel in 1920 to less than $1.00 per bushel in 1921 (Opie 2004). Prices continued to fall during the 1920s and farmers across the Midwest and Plains states found themselves in deep financial distress. With farmers unable to pay their mortgages, banks across the state began to fail, adding to the economic turmoil. By the time drought and the effects of the Great Depression began to ravage the rest of the United States, the situation in North Dakota was already dire (Wilkins and Wilkins 1977).

During the years of early settlement across North Dakota, farmers formed cooperatives. Cooperatives helped farmers pool their resources to purchase or rent expensive equipment, share the use of grain elevators, and to help stabilize prices. While these cooperatives had helped support farmers during the first decade of the twentieth century, they were incapable of buoying the losses caused by the falling prices in the 1920s. Many established cooperatives that had thrived during the boom years, failed during the 1920s and 1930s, including the Equity Cooperative Exchange which went bankrupt in 1923 and the North Dakota Wheat Growers Association which closed in 1931 (Wilkins and Wilkins 1977). Many farmers were forced to abandon their lands, moving to urban areas to find work. Other farmers, anticipating better times ahead, purchased failing farms to expand their holdings. Fearing a mass acquisition of farming land by outside corporate interests, the state government passed the Anti-Corporate Farming Act of 1932, which prohibited corporations from engaging in farming and agriculture in the state. While this act prevented outside corporate farms from acquiring these failed farms, it did not prevent family farms from acquiring massive holdings (Hoffman and Libecap 1990; Leahy 2003; Wilkins and Wilkins 1977). North Dakota's agricultural industry did not recover until the 1940s when wartime demand for crops increased prices, creating resurgence in agricultural activity.

Pick Sloan and the Development of the Missouri River (1940–Present)

Following the Great Depression, new demands for power, irrigation, economic development, and flood control in the northern Great Plains focused greater attention on the Missouri River. Starting in the early 1940s, a series of legislative measures and agency plans were developed to address the difficult task of harnessing the Missouri River. Initial efforts were directed towards establishing a Missouri Valley Authority (MVA), similar to the successful Tennessee Valley Authority which had created dams that provided rural electrification for the southern states. The concept of an MVA did not meet with a favorable response from the local citizens or government officials, who feared losing control of the Missouri River to the federal government. After several attempts to resurrect the plan, the idea of an MVA was lost (Harvey 1996; Linenberger 1998). Nevertheless, continued flooding along the river and the

lack of electricity on rural farms eventually drove the communities on the river to embrace some kind of federal actions to manage the river. Two separate plans were proposed to legislation.

The first plan presented to legislation was the Pick Plan, named after Lewis Pick, the director of the Missouri River Office of the USACE. It focused on flood control and navigation improvement, calling for the USACE to construct 1,500 miles of levees, five multi-purpose dams and reservoirs along the mainstem of the river, and other dams on various tributaries of the river (Harvey 1996; Linenberger 1998). Pick's plan conflicted with the alternate plan proposed by William Glenn Sloan, director of the Billings, Montana, office of the U.S. Bureau of Reclamation. Sloan's Plan, which had been several years in the making, was initially created in response to the severe droughts during the 1930s. Following the droughts, the Dakotas, Wyoming, and Montana appealed to the U.S. Bureau of Reclamation to construct irrigation works. Sloan created a plan, focusing primarily on providing irrigation and hydroelectric power, calling for the creation of dams and reservoirs on tributaries in the upper Missouri Basin (Harvey 1996).

In October 1944, representatives from the USACE and the U.S. Bureau of Reclamation met and agreed on a combined plan, called the Pick-Sloan Plan. Six intents for the management of the Missouri River were created under this plan. These intents included providing hydroelectric power, flood control, and surplus water supply; facilitating navigation; and supplying areas for public use, including fish and wildlife and recreation (Ferrell 1993). President Franklin D. Roosevelt signed the act on December 22, 1944. Under this plan, both agencies would have influence over hydroelectric power; the U.S. Bureau of Reclamation would have responsibility for all irrigation issues, and the USACE would have responsibility over the mainstream dams (Billington et al. 2005). The development of the mainstem system of dams was authorized under the Pick-Sloan Flood Control Act of 1944 (Public Law 78-534) (Ferrell 1993). Along with the previously constructed Ft. Peck Reservoir in Montana, five dams were to be constructed and overseen by the USACE. The dams to be constructed included Gavin's Point (located immediately west of Yankton, South Dakota), Ft. Randall (located just north of the Nebraska-South Dakota border), Big Bend (located immediately upstream from the tail waters of Ft. Randall), Oahe (located upstream from Pierre, South Dakota), and Garrison (located north of Stanton, North Dakota (Figure 4).

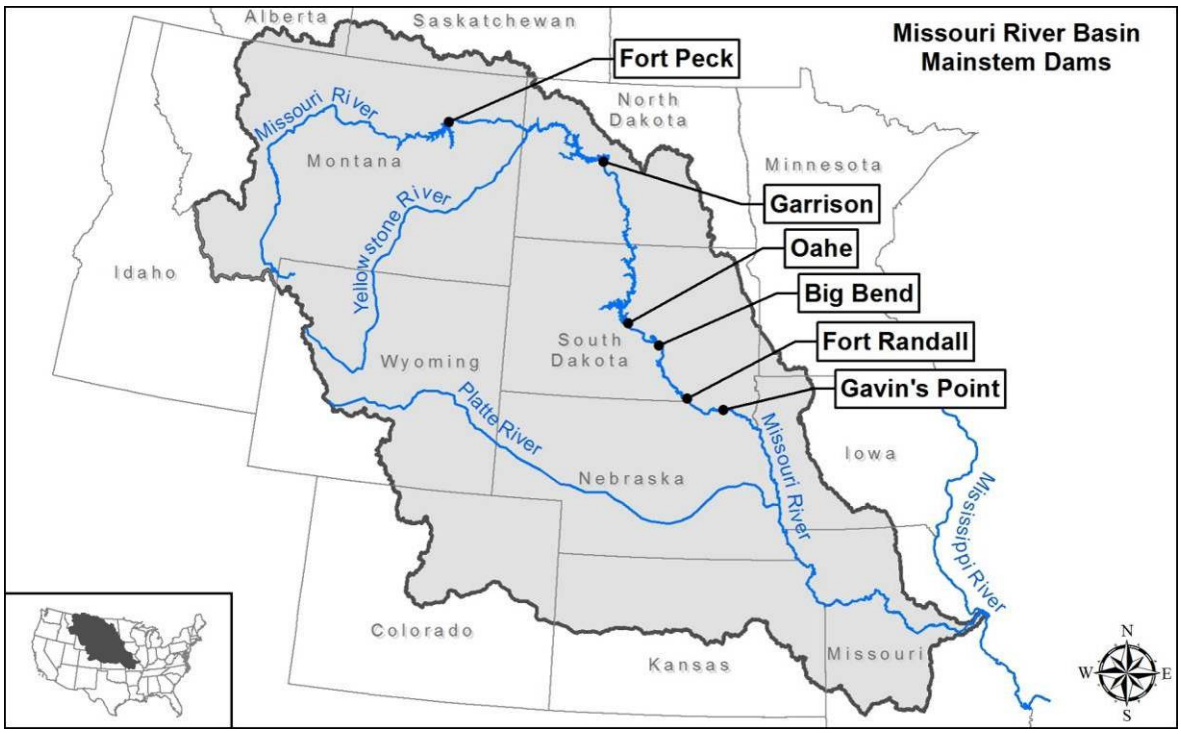

Figure 4. Missouri River mainstem dams.

The creation of the Pick-Sloan reservoirs displaced thousands of Native Americans from their lands along the Missouri River. By some counts, the five mainstem dams displaced approximately 900 Native American families. All the mainstem dams in North and South Dakota (except Gavin's Point Dam) flooded some of the most productive tribal lands. Garrison Dam/Lake Sakakawea, completed in 1953, inundated more than 152,360 acres, a quarter of the Fort Berthold Indian Reservation, and forced the relocation of over half of the reservation population (Morris 1990). The BIA reported in 1948 that 257 of the 357 homes in the Fort Berthold Indian Reservation would be destroyed by the project (McCullough 1948). The inundation also cost the tribe the majority of its timber and wild game resources—most of which relied on the natural bottomlands of the Missouri River. Similarly, the Oahe Reservoir inundated hundreds of thousands of acres at the Standing Rock and Cheyenne River Reservations. The Big Bend and Fort Randall Dams were also significant in impacting Native American families on the Yankton, Lower Brule, and Crow Creek Reservations; the dams flooded over 20,000 acres of tribal land, with the majority (approximately 17,000 acres) of those on the Crow Creek and Lower Brule Reservations, where over 120 families were displaced against their will (Lawson 1982).

Although the Three Affiliated Tribes living on the Fort Berthold Indian Reservation were not included in the initial discussions about the dam, they demanded that the federal government compensate them for the land that would be lost when the dam was completed. They requested that the government provide them with an equivalent acreage of land to what would be lost from the flooding, permission to graze their cattle on USACE lands along the banks of the lake, 20,000 kilowatt/hours per year of electricity generated by the dam, and first right to collect timber felled during the flooding (Griffen 1996). Their requests were rejected, although the federal government provided some compensation for their loss. They were given

$5,105,625 for lost lands (approximately $33 per acre), were denied grazing access to the lands adjacent to the lakes, did not receive any free electricity, and were not allowed to collect fallen timber (Griffen 1996). The tribes would eventually get an additional 7.5 million dollars in compensatory funds, but overall, the deal fell far short of what they had requested.

The USACE has continued to develop its relationship with the tribes. In 1987, the Joint Tribal Advisory Committee released its final report concerning the impact that the Pick-Sloan Plan had on the tribes. The tribes within the Omaha district soon afterward requested an "Indian Desk" at the USACE. In 1992 this request was fulfilled and the USACE developed a position for a full-time Native American liaison (USACE 2013).

Development of Transportation (1864–Present)

Early settlement in North Dakota followed along the expansion of the rail lines, with the railroad companies establishing towns to support the settlement of the vast expanse of the Great Plains. By the early twentieth century, little had changed, and the railroad continued to dominate settlement and transportation across the state, with settlers reliant upon the railroads for importing supplies, and for exporting products of their farms and ranches to more lucrative markets. At the same time, the system of roads and trails, in place before a single track of rail was placed in North Dakota, continued to operate, albeit marginalized by the expanding rail networks (Wilkins and Wilkins 1977).

As early as 1848, officials in Washington were beginning to consider the possibility of creating a network of railroads across the country. Three routes were initially proposed for alignments crossing from the Atlantic Ocean to the Pacific Ocean. The northernmost route proposed crossed the Great Plains from Minnesota to Oregon crossing through Fort Union in the Dakota Territory. Congress authorized the northern route and in 1864, President Lincoln signed a charter for the Northern Pacific Railroad (Northern Pacific). To help fund the railroad project, the Northern Pacific received a massive land grant from the government, amounting to 40 sections per mile through the Dakota Territory (Tweton and Jelliff 1976).

Although Washington had interest in completing the northern route, finding investors to back the 2,000-mile journey proved more difficult. Northern Pacific was unable to secure sufficient financial backing until 1869, the same year that the Union Pacific Railroad completed their transcontinental route. Financial troubles continued to plague the railroad and by 1873, with the line completed from Duluth to Bismarck, the investment company funding the construction was bankrupt. In 1875, the Northern Pacific reorganized under the leadership of Frederick Billings, and with strong revenues from the completed part of the line, the Northern Pacific was able to secure the financial support to continue construction, completing its path to the Pacific in 1881. Between 1881 and 1887, the Northern Pacific continued to expand its operations in North Dakota building several branch lines to reach the important agricultural and population centers across the state (Tweton and Jelliff 1976).

The second major railroad to begin construction in North Dakota was the Great Northern Railroad. Starting as the St. Paul and Pacific Railroad in 1857, Congress supplied a similar grant to the railroad company and construction began heading west from St. Paul, Minnesota. Like the Northern Pacific, the St. Paul and Pacific had trouble securing the financial support for the project, going bankrupt in 1872. Under the direction of James J. Hill, the St. Paul and

Pacific began construction again in 1878. Rather than building straight west, Hill expanded branch lines across North Dakota and Minnesota and by the 1890s, Hill's railroad had more miles of track in North Dakota than the Northern Pacific. The railroad finally reached the Pacific Ocean in 1893 and the name was changed to the Great Northern Railroad (Tweton and Jelliff 1976).

A third railroad, the Minneapolis, St. Paul & Sault St. Marie, or the "Soo," built a track across North Dakota in 1883. The primary focus of the Soo was to access grain farmers in the northern part of the state, providing connections for agricultural goods to both the Northern Pacific and the Great Northern rail lines. With the three railroads completed, North Dakota settlers had a means to transport wheat crops to milling centers in Minnesota or to larger markets across the country. The railroad also supplied a means to support expanded settlement across the state, with important depots at Grand Forks, Bismarck, and Fargo becoming prominent buildings driving economic activity (Tweton and Jelliff 1976; Wilkins and Wilkins 1977).

Although railroads supported the expanded settlement during the Dakota Boom, the state was also crossed by a series of roads and trails that expanded into a broad network during the twentieth century. Some of the earliest roads in the state were developed by the military, connecting forts established to monitor the activities of Native Americans, and to protect Euro-American interests in the area. These roads were heavily travelled by the military, by postal carriers, and by early settlers. In the winter months, when snow covered much of the state, these trails were often travelled by sled (Carlson and Sprunk 1979). When North Dakota became a state in 1889, the state constitution made it a requirement to have a two-thirds majority for the approval of state road construction. This meant that the responsibility for road construction was mostly left to the counties. Early roads mostly followed the local topography, providing the most direct route between destinations. Later roads, established during the settlement booms, generally followed section lines. In 1899 in an effort to regulate road construction and provide some standards, the state legislature declared that section roads would be considered public land and that the roads should measure at least 33 feet (2 rods) wide (Carlson and Sprunk 1979).

Leaving the counties responsible for road construction proved sufficient until the arrival of the automobile in the early twentieth century. The automobile increased the demand for roads across the state, and demanded that the existing roads be better maintained to remain passable. Access to funding became the determining factor in road construction, with roads often built disproportionally to the actual demand. Lack of funding in some areas led to lapses in maintenance leading to washouts, collapsed bridges, and heavy rutting. The poor conditions of roads across the state attracted the attention of A. L. Fellows, the state engineer, who voiced his concern about road conditions in 1906. However, it would take several years before that concern turned into action (Carlson and Sprunk 1979).

In 1909, State Senator George A. Welch introduced a bill that would allow North Dakota to receive federal funding for the construction of "demonstration" roads. These roads were federally funded experiments that tested new road building materials and engineering methods. These demonstration roads were only constructed in Bismarck, but it was the beginning of a state-level interest in road conditions that would continue throughout the early

twentieth century (Carlson and Sprunk 1979). In 1911, the state authorized the State Engineer's office to provide plans for road construction to any county that requested it, and in 1913, the State Engineer was tasked with approving all bridge designs prior to construction. The year 1913 also marked the creation of the South Dakota State Highway Commission. The Commission was established to give the State Engineer the authority to oversee all road construction. It also required that maps be created that showed the location of all roads, culverts, and bridges (Carlson and Sprunk 1979).

The federal government also took steps to assist the states in road construction. In 1916, the Federal Aid Road Act made funding available for creating and maintaining roads. Funding through this act was limited at first, but in the 1920s, interest in developing a federal highway system resulted in additional federal allocations. Due to an ambitious and perhaps exaggerated assessment of the number of roads in North Dakota, it received a disproportionate amount of federal funding in the 1920s (Carlson and Sprunk 1979). The state ranked 36th (out of 48) in population, but 16th in road funding. As a result of this funding, the state proposed the creation and improvement of an extensive series of paved, graveled, and graded roads. Most of these roads were concentrated in the eastern and central portions of the state. In the western counties such as Dunn, Mercer, and McKenzie, most roads remained little more than rutted two-tracks.

In 1924, the Rand McNalley Company created an Auto-trails map, attempting to provide an easier means of navigating the highway systems across the country. The Auto-trails used blazed markers to identify highways that could be followed between destinations. To many early twentieth century motorists, driving was as much about recreation as it was transportation, and as such, the early auto trails were intended to enhance the driving experience. Roads did not always take the most direct routes between cities, but would wind through scenic locations and historical landmarks. The intent was also to improve tourism across the country. The Auto-trail system was quickly replaced in 1925 when congress passed the Federal Highway Act which established a numbered highway system, most of which followed similar alignments to the old Auto-trail system (Wilkerson 2000). Several of the numbered highways continued to use their Auto-trail names.

During the Great Depression, road projects at the local level dropped significantly. Federal assistance helped buoy the losses of local funding with New Deal Programs continuing to provide support for road and bridge projects. The lack of local funding for road projects continued through World War II. Coupled with the lack of available labor during the war, many of North Dakota's roads fell into disrepair. During the 1940s, the government began to crack down on several states, including North Dakota, for the conditions of its roads, threatening to cut off funding if the existing roads were not better maintained. In an effort to assert more control over road projects across the country, the Federal Highway Act passed in 1944 changed the approach to funding road construction, setting aside money specifically to maintain a federal highway system (Carlson and Sprunk 1979).

BACKGROUND RESEARCH

As part of the initial phase of this investigation, SWCA conducted a Class I background search of archaeological and historical literature and records for the project area and

surrounding 1-mile radius on April 21, 2014. Researchers searched relevant records holdings at the State Historical Society of North Dakota and other available sources for information regarding previously recorded historic and prehistoric sites located within the project area.

Results of the background search identified 22 previously recorded cultural resources located in the 1-mile study area surrounding the project area (Table 3). The cultural resources consist of two prehistoric cultural material scatter sites (32MZ474 and 32MZ480); one historic homestead site (32MZ481); one depression site of unknown cultural or temporal affiliation (32MZ1417); one historic transmission line site (32MZ1561); one cairn site of unknown cultural or temporal affiliation (32MZ2201); one historic windmill site (32MZ2655); five cultural material scatter site leads of unknown cultural or temporal affiliation (32MZX261, 32MZX262, 32MZX263, 32MZX265, and 32MZX266); four historic quarry/mine site leads (32MZX362, 32MZX363, 32MZX364, and 32MZX365); and six prehistoric isolated finds (32MZX955, 32MZX959, 32MZX1213, 32MZX1224, 32MZX1225, and 32MZX1226). The isolated finds, along with 32MZ474, 32MZ480, 32MZ1417, 32MZ1561, and 32MZ2655, are not eligible for the National Register of Historic Places (NRHP). The remaining sites and site leads are unevaluated for the NRHP.

Table 3. Previously Recorded Resources

Site Number	Legal Location	Site Type	Cultural Affiliation	NRHP Eligibility
32MZ474	S¼ NW¼ SW¼ Section 29, T149N, R98W	Cultural material scatter	Archaic	Not Eligible
32MZ480	SE¼ SE¼ NE¼ Section 18, T149N, R99W	Cultural material scatter	Unknown Prehistoric	Not Eligible
32MZ481	SW¼ NW¼ NW¼, NW¼ SW¼ NW¼ Section 12, T149N, R100W	Homestead	Historic	Unevaluated
32MZ1417	NW¼ NW¼ SW¼ Section 30, T149N, R98W	Depression	Period Unknown	Not Eligible
32MZ1561	For full listing of legal locations, refer to North Dakota State Historical Society Site Form	Transmission line	Historic	Not Eligible
32MZ2201	SE¼ SW¼ NE¼ Section 11, T149N, R100W	Cairn	Period Unknown	Unevaluated
32MZ2655	NE¼ NE¼ NE¼ Section 14, T149N, R100W	Windmill	Historic	Not Eligible
32MZX261	SE¼ SW¼ NW¼ Section 12, T149N, R100W	Cultural material scatter site lead	Period Unknown	Unevaluated

Site Number	Legal Location	Site Type	Cultural Affiliation	NRHP Eligibility
32MZX262	SW¼ NW¼ SE¼ Section 12, T149N, R100W	Cultural material scatter site lead	Period Unknown	Unevaluated
32MZX263	NW¼ SE¼ SE¼ Section 12, T149N, R100W	Cultural material scatter site lead	Period Unknown	Unevaluated
32MZX265	SW¼ SW¼ NE¼ Section 23, T149N, R99W	Cultural material scatter site lead	Period Unknown	Unevaluated
32MZX266	SW¼ SW¼ SW¼ Section 7, T149N, R99W	Cultural material scatter site lead	Period Unknown	Unevaluated
32MZX362	Section 7, T149N, R99W	Quarry/mine site lead	Historic	Unevaluated
32MZX363	Section 8, T149N, R99W	Quarry/mine site lead	Historic	Unevaluated
32MZX364	Section 1, T149N, R100W	Quarry/mine site lead	Historic	Unevaluated
32MZX365	NE¼ Section 2, T149N, R100W	Quarry/mine site lead	Historic	Unevaluated
32MZX955	SW¼ SW¼ SW¼ Section 8, T149N, R99W	Chipped stone isolated find	Unknown Prehistoric	Not Eligible
32MZX959	SE¼ NE¼ SE¼ Section 30, T149N, R98W	Chipped stone isolated find	Unknown Prehistoric	Not Eligible
32MZX1213	NE¼ SE¼ SW¼ Section 30, T149N, R98W	Chipped stone isolated find	Archaic	Not Eligible
32MZX1224	SE¼ SE¼ SW¼ Section 30, T149N, R98W	Chipped stone isolated find	Unknown Prehistoric	Not Eligible
32MZX1225	SE¼ NE¼ SW ¼ Section 30, T149N, R98W	Chipped stone isolated find	Unknown Prehistoric	Not Eligible
32MZX1226	SE¼ NE¼ NW¼ Section 30, T149N, R98W	Chipped stone isolated find	Unknown Prehistoric	Not Eligible

NRHP = National Register of Historic Places

Based on the background research results, 16 previous cultural resource projects were conducted within the 1-mile buffer surrounding the project area between 1981 and 2014. Projects within the area were in support of oil and gas (well pads, pipelines, and access roads), road improvement, transmission lines, and a waterline. A bibliographic listing of previous archaeological and historical studies for project lands and the 1-mile study area in McKenzie County, North Dakota, is provided in Appendix A.

FIELDWORK METHODS

Fieldwork was designed so that project archaeologists could collect all appropriate and necessary data for the completion of the project report, to convey Class I and Class III Cultural Resource Inventory results and recommendations, and to ensure accurate completion of site forms for all resources encountered.

In accordance with the scope of work, archaeologists surveyed the inventory area using parallel linear transects with spacing not exceeding 30 m. The ground surface was examined for artifacts, features, or other evidence of cultural occupation. Cut banks, eroded surfaces, and other areas with significant exposure were examined intensively throughout fieldwork. In areas with high vegetation cover and high probability of cultural resources, survey transects were reduced to 10 m to maintain adequate visibility. Ground visibility during the project ranged from 5 to 10 percent, with up to 100 percent visibility in agricultural fields. No snow cover was present at the time of inventory.

Where cultural resources were located, project archaeologists made an intensive effort to fully and accurately establish the extent and boundaries of new and previously recorded sites. As such, sites were mapped using sub-meter accurate Trimble Global Positioning System (GPS) units. When detailed mapping or remapping was required, all linear site features, such as site boundaries, roads, and fence lines were plotted. Point features, such as the site datum, cultural features, artifact concentrations, diagnostic artifacts and tools, and other necessary data, were mapped with the Trimble GPS unit for post-processing into ArcMap 10 shapefiles, and for plotting onto associated U.S. Geological Survey 7.5-minute quadrangles. This methodology was used to ensure accuracy and to produce required location maps of all sites and resources.

In addition to site mapping, project personnel photographed sites in overview and other aspects of the site for additional data collection needs. Associated features and diagnostic artifacts were described, measured, recorded with GPS, and photographed, as appropriate. Field personnel noted environmental setting, context, topography, and geographical location for each cultural resource. No collection or subsurface testing was conducted during the inventory.

SITE EVALUATION

SWCA evaluated sites and their significance, as defined by criteria set forth in Title 36 Code of Federal Regulations 60.4 (National Park Service 1991), which states:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B) That are associated with the lives of persons significant in our past; or

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

D) That have yielded, or may be likely to yield, information important in prehistory or history.

Not eligible sites have lost integrity and are unlikely to contribute further data significant to knowledge of prehistory or history.

Prehistoric Archaeological Sites

Prehistoric lithic scatters/campsites (sites without any structures or association with known significant events or persons) recorded for the project generally will not contain NRHP discussion for Criteria A, B, and C. Instead, for NRHP recommendation purposes, these properties will be discussed for their potential to yield information significant to prehistory or the archaeological record under NRHP Criterion D. Special cases generally apply to Criterion A, where a prehistoric site type (such as a stone circle site) may not be recommended eligible for the NRHP from an archaeological perspective, but may be considered important to cultures of Native American peoples.

Evaluation of the significance of archaeological sites under Criterion D considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site (construction techniques, building materials, structural integrity); and the age range reflected by the site assemblage. Sites considered to be significant generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions about human lifeways contain associated features, structures, and/or relatively intact and dateable artifacts.

Historic Archaeological Sites or Components

Historic sites containing or consisting of preserved features or structures are evaluated primarily under Criteria A, B, and C. Historic trash scatters lacking associated features or structures are primarily evaluated under Criterion D. In general, these types of sites represent ephemeral prospecting or stock management activities, but they lack identifiable or important association with specific persons or events of regional or national history (Criteria A and B), and they lack the formal and structural attributes necessary to qualify as eligible under Criterion C. The evaluation of significance of historic archaeological sites under Criterion D focuses on the capacity of the sites or components to yield significant information regarding knowledge of history during the period(s) of site significance. Evaluation of the significance of historic sites considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site; construction techniques; building materials; structural integrity; and the age range reflected by the site assemblage.

Historic sites considered to be significant under Criterion D generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions contain associated features, structures, and relatively intact and datable artifacts. Significant sites are those that could impart information not available solely from historical documents. Although archival research may provide an essential form of information, often historical records are inaccurate or incomplete. For example, examination of construction techniques or household assemblages can provide information on economic slumps, reuse of structures for other than original purposes, and re-occupation cycles. As a result, insight may be gained into questions about human lifeways that are often asked in archaeology, but rarely specified directly in historical documentation.

Non-Archaeological Historic Sites or Components

Non-archaeological historic sites or sites with non-archaeological components are those primarily assessed for NRHP eligibility under Criteria A, B, and C, rather than Criterion D and typically are not subject to subsurface testing. Individual segments of significant historic sites are evaluated as contributing or non-contributing in terms of physical and environmental integrity. Examples of historic site types include linear historic features, such as transportation routes and water conduits, standing building and structure sites, and potentially extend to any historic feature on an otherwise archaeological site, such as Traditional Cultural Property features. Historic and ethnographic sites evaluated for potential contribution to history or cultural traditions for reasons beyond their possible future research value tend to have different evaluation and management considerations than archaeological sites. Typically, the integrity of historic sites is addressed using the guidelines presented in National Register Bulletin 15 (National Park Service 1991), which defines the seven elements of integrity as location, design, setting, materials, workmanship, feeling, and association. As such, properties are basically evaluated in consideration of their physical integrity and the integrity of their surroundings. Traditional Cultural Properties are also considered under the guidelines of National Register Bulletin 38 (Parker and King 1998).

INVENTORY RESULTS AND RECOMMENDATIONS

During the inventory, SWCA personnel revisited 10 previously recorded cultural resources (32MZ480, 32MZ481, 32MZ1561, 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, 32MZX364, and 32MZX1213) and newly recorded one isolated find (32MZX1399). Each cultural resource is discussed in detail below. Copies of the North Dakota Site Forms are provided in the detached Appendix B, and resource location maps are provided in Appendix C.

NEWLY RECORDED ISOLATED FIND

32MZX1399

32MZX1399 is an historic isolated find consisting of a General Motors V12 block engine with a maker's mark of GM D49 836010-3. The engine has an attached alternator which is a Delco-Remy, model number 738G, which dates to around the 1930s. The engine is in

relatively good shape, with some corrosion to the metal. The isolated find is nestled in a small valley on the edge of an agricultural field with a creek running to the south. Vegetation in the area consists of mixed prairie grasses, including crested wheat, yarrow, fringed sagebrush, smooth brome, and prickly pear cactus, resulting in a bare ground visibility of 10 percent at the time of survey. Surface soils consist of dark brown silt clay loam.

By definition, isolated finds are considered to lack the historic integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

PREVIOUSLY RECORDED SITE

32MZ1561

Site Type:	Transmission Line
Association:	1949 Historic
Site Size:	250 by 20 feet (5,000 square feet)
NRHP Recommendation:	Not Eligible
Management Recommendation:	No Further Work

Site Description and Previous Recording

32MZ1561 is the historic Williston to Charlie Creek segment of the Western Area Power Administration (WAPA) electrical transmission line. This segment of the site is located immediately west of Highway 85 and runs parallel with the north/south-trending highway (Figures 5 and 6). The site consists of a series of wood H-frame pole structures that support three 115-kilovolt (kV) transmission lines and occasional ground wires. Vegetation in the area consists of mixed prairie grasses allowing for a bare ground surface visibility of 20 percent at the time of survey. Soils in the area consist of gray-brown silt clay loam. Sections of the site have been previously recorded by B. Fandrich, T. Lyons, and T. Gonzales on September 27, 2001; J. Boughton and S. Owens on August 30, 2005; M. Kinsey on October 10, 2012; and S. Miller and K. A. Kellerhals on November 29, 2012. The segment that the survey area crosses was originally recorded by Fandrich et al. (2001). All previous recommendations deemed 32MZ1561 not eligible for the NRHP.

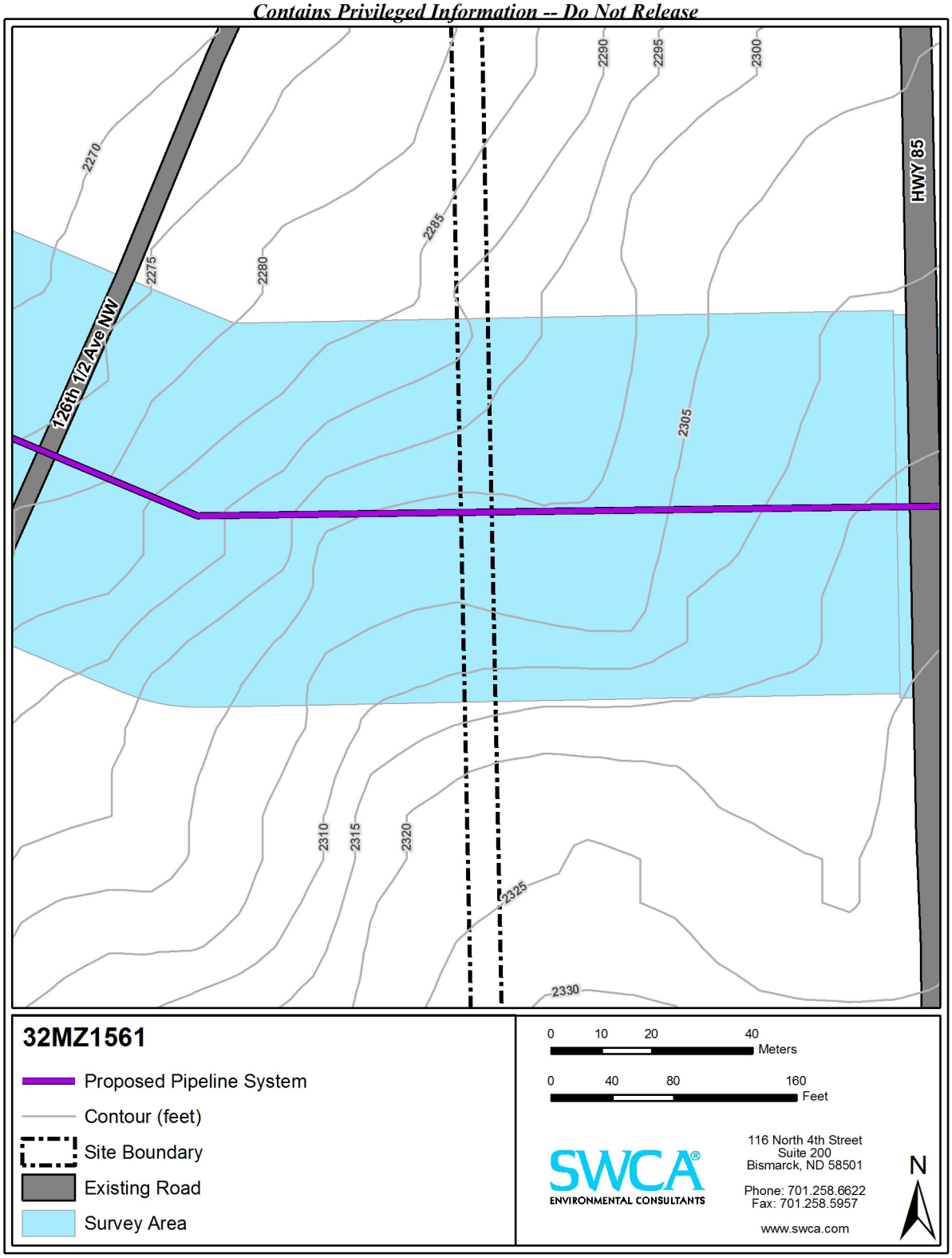

Figure 5. 32MZ1561, site sketch map.

Figure 6. 32MZ1561 site overview, facing west.

Survey Results

SWCA revisited 32MZ1561 on April 25, 2014. The site is the WAPA transmission line consisting of H-frame wood pole structures that support three 115-kV transmission lines. 32MZ1561 runs parallel to the west of Highway 85. There has been no change to this segment of the site since the original recording. Impacts to the site area include agricultural practices and the continuous traffic from neighboring Highway 85. Vegetation in the area consists of mixed prairie grasses and harvested agricultural field resulting in a bare-ground visibility of 10 percent at the time of survey. Surface soils consist of gray-brown clay loam.

Historic Background

The WAPA transmission line was built in 1949–1950 for the construction of the Garrison Dam. The Williston to Charlie Creek segment runs from the Fort Peck Dam in Montana to the Garrison Dam in North Dakota. The line was energized in 1951, and helped to provide power for the construction of the Garrison Dam, which had begun 4 years earlier in 1947. Upon completion of the dam in 1954, power was then able to flow in either direction depending on need and system configuration. WAPA took over the operation of the transmission line in 1970, and is still in charge of the line today (Fandrich et al. 2001).

NRHP Eligibility Recommendation

32MZ1561 is the historic Williston to Charlie Creek segment of the WAPA electrical transmission line. Previous recordings recommended the site not eligible for the NRHP under Criteria A, B, C, and D. The site is associated with the construction of the Garrison Dam; however, the site was not energized until 4 years after construction began for the dam, meaning the site served a subsidiary role in the construction of the dam. The site did serve as a power source for the development of the region in the 1950s, but that was not the original

function of the line and the power contribution is again subsidiary. Therefore, the site is recommended not eligible for inclusion in the NRHP under Criterion A. There is no significant association between the site and any person or persons significant to the history of the area or region, therefore the site is recommended not eligible under Criterion B. The architectural features of the site, i.e., the wood H-frame poles, are not unique features, therefore, SWCA recommends the site not eligible under Criterion C. Additionally, there is no potential for the site to yield further information. SWCA therefore recommends the site not eligible under Criterion D.

Management Recommendation

No further work is recommended.

SITES NOT RELOCATED

32MZ480

Site Type:	Cultural Material Scatter
Association:	Unknown Prehistoric
NRHP Recommendation:	Not Eligible
Management Recommendation:	No Further Work

Site Description and Previous Recording

32MZ480 is a prehistoric cultural material scatter consisting of faunal remains and chipped stone artifacts. The site is located in a harvested agricultural field on a low interfluvial rise between two gullies (Figure 7). Sparsely wooded intermittent streams are located approximately 600 m southwest and 300 m east. Vegetation in the area consists of harvested wheat for a bare-ground surface visibility of 40 percent at the time of survey. Soils in the area consist of light brown clay loam. The site was originally recorded by Matthew Root of the University of North Dakota Archeological Research station (UNDAR) on June 16, 1980, during an inventory for a pipeline. The original recording stated that the site consisted of a thin scatter of chert and Knife River Flint artifacts. All surface materials were collected and six shovel tests were conducted, all of which yielded negative results for subsurface deposits. The site was recommended not eligible for the NRHP due to no intact subsurface cultural deposits.

Figure 7. 32MZ480 site overview, facing east.

Survey Results

SWCA revisited 32MZ480 on April 24, 2014. Attempts were made to relocate the site, however, the site location has been impacted by agriculture and artifact collection during the original recording. No features or artifacts were observed within the inventoried area. The site was revisited a second time during pipeline reroute surveys on May 15, 2014, and yielded similar results.

NRHP Eligibility Recommendation

32MZ480 is a prehistoric cultural material scatter consisting of faunal remains and chipped stone artifacts. During the original recording, the site was recommended not eligible for the NRHP due to the lack of subsurface cultural deposits. The site is not associated with a significant event or period of time, nor is there any connection between material at the site and any person or persons significant to the history of the area or region. Therefore, the site is recommended not eligible for inclusion in the NRHP under Criteria A and B. No structures or features are present; therefore, SWCA recommends the site not eligible under Criterion C. Additionally, the site occurs in a plowed agricultural field and lacks physical integrity. The site does not contain an intact, buried cultural component, as shown with shovel testing during the original site recording. SWCA therefore agrees with the original recommendation that the site is not eligible under Criterion D.

Management Recommendation

No further work is recommended.

32MZ481

Site Type:	Homestead and Cultural Material Scatter
Association:	1908–1920 Historic
NRHP Recommendation:	Not Eligible
Management Recommendation:	No Further Work

Site Description and Previous Recording

32MZ481 is a homestead and cultural material scatter site consisting of four depressions and a cultural material scatter. The site is located within an agricultural field on a small terrace spur with an earthen dam and small reservoir located immediately east of the site (Figure 8). Vegetation in the area consists of harvested wheat for a bare ground surface visibility of 40 percent at the time of survey. Soils in the area consist of brown silt clay loam. The site was originally recorded by Dennis Toom of UNDAR on June 16, 1980, during an inventory for a pipeline. The initial recording listed four depressions and cultural material concentrations consisting of bottles, bottle fragments, ceramics, metal scrap, window glass, metal cans, wood, and a wagon tongue (some of which were collected) within undisturbed prairie. Depression 1 is a root cellar measuring 11 ft in diameter, Depression 2 is a dugout measuring 28 by 25 ft, Depression 3 is a dugout measuring 16½ by 16½ ft, and Depression 4 is an outhouse pit measuring 8½ by 7 ft. The site was left unevaluated for the NRHP.

Figure 8. 32MZ481 site overview, facing north.

Survey Results

SWCA revisited 32MZ481 on April 24, 2014. Attempts were made to relocate the site, however, the site location has been impacted by plowing since the original recording. No features or artifacts were observed within the inventoried area.

Historic Background

SWCA conducted historical research of the site location using the Bureau of Land Management (BLM) General Land Office (GLO) records. A Sale-Cash Entry had been issued to Benjamin D. Crickette on June 24, 1912, for the S½ NW¼ and N½ SW¼ of Section 12, T149N, R100W (BLM 2014 [1912]:Accession number 279037). A search of U.S. Census records revealed no results for a Benjamin D. Crickette residing in McKenzie County. It is unknown through available records if the artifacts observed at the site are connected to him. No further information was available for Benjamin D. Crickette.

NRHP Eligibility Recommendation

32MZ481 is a homestead and cultural material scatter site consisting of two dugout depressions, an outhouse pit, and a root cellar depression along with concentrations of historic cultural material consisting of bottles, bottle fragments, ceramics, metal scrap, window glass, metal cans, wood, and a wagon tongue. The original recording left the site as unevaluated for the NRHP. The site is not associated with a significant event or period of time, nor is there any connection between material at the site and any person or persons significant to the history of the area or region. Therefore, the site is recommended not eligible for inclusion in the NRHP under Criteria A and B. Any structures or features are no longer present; therefore, SWCA recommends the site as not eligible under Criterion C. Additionally, the site occurs in a plowed agricultural field and lacks physical integrity. The features have been plowed over since their initial recording and there is no potential for intact subsurface cultural deposits. Recordation exhausts its research potential. SWCA therefore recommends the site as not eligible under Criterion D.

Management Recommendation

No further work is recommended.

SITE LEADS AND ISOLATED FIND NOT RELOCATED

Six previously recorded site leads consisting of four cultural material scatters of unknown cultural or temporal associations (32MZX261, 32MZX262, 32MZX263, and 32MZX266) and two historic quarries/mines (32MZX362 and 32MZX364) as well as an Archaic projectile point isolated find (32MZX1213) were within project survey areas. Although attempts were made to relocate the site leads and isolated find within the project area, none were identified during the current inventory. The isolated find is not eligible for the NRHP and the site leads remain unevaluated for the NRHP. The site leads may be located within the documented site boundary outside the project area.

CONCLUSIONS

SWCA conducted a Class I and Class III cultural resource inventory on April 21, 24, 25, and May 7 and 15, 2014, on behalf of E3 in support of the Targa Lateral Pipeline project.

For the project, SWCA inventoried a 250-foot survey corridor centered on the 10.67-mile-long proposed pipeline centerline. In some places the survey area was widened to accommodate pipeline alignment reroutes. In total, 350.99 acres were inventoried.

During the inventory, SWCA personnel revisited 10 previously recorded cultural resources (32MZ480, 32MZ481, 32MZ1561, 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, 32MZX364, and 32MZX1213) and newly recorded one isolated find (32MZX1399). The previously recorded resources include a prehistoric cultural material scatter (32MZ480); an historic homestead and cultural material scatter site (32MZ481); an historic transmission line site (32MZ1561); four cultural material scatters of unknown cultural or temporal associations (32MZX261, 32MZX262, 32MZX263, and 32MZX266); two historic quarries/mines (32MZX362 and 32MZX364); and an Archaic projectile point isolated find (32MZX1213). The newly recorded isolated find is an historic engine block isolated find (32MZX1399). Of these resources, 32MZ480, 32MZ481, 32MZ1561, 32MZX1213, and 32MZX1399 are recommended not eligible for the NRHP, and therefore no further work is necessary. Site leads 32MZX261, 32MZX262, 32MZX263, 32MZX266, 32MZX362, and 32MZX364 remain unevaluated for the NRHP. Although attempts were made to relocate the site leads within the project area, none were relocated during the current inventory. The site leads may be located within the documented site boundary outside the project area, therefore no further work is necessary. With the above stipulations, it is recommended that a determination of *No Significant Sites Affected* and *No Historic Properties Affected* be granted for the project to proceed as planned.

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APPENDIX A
List of Previous Studies

Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota.

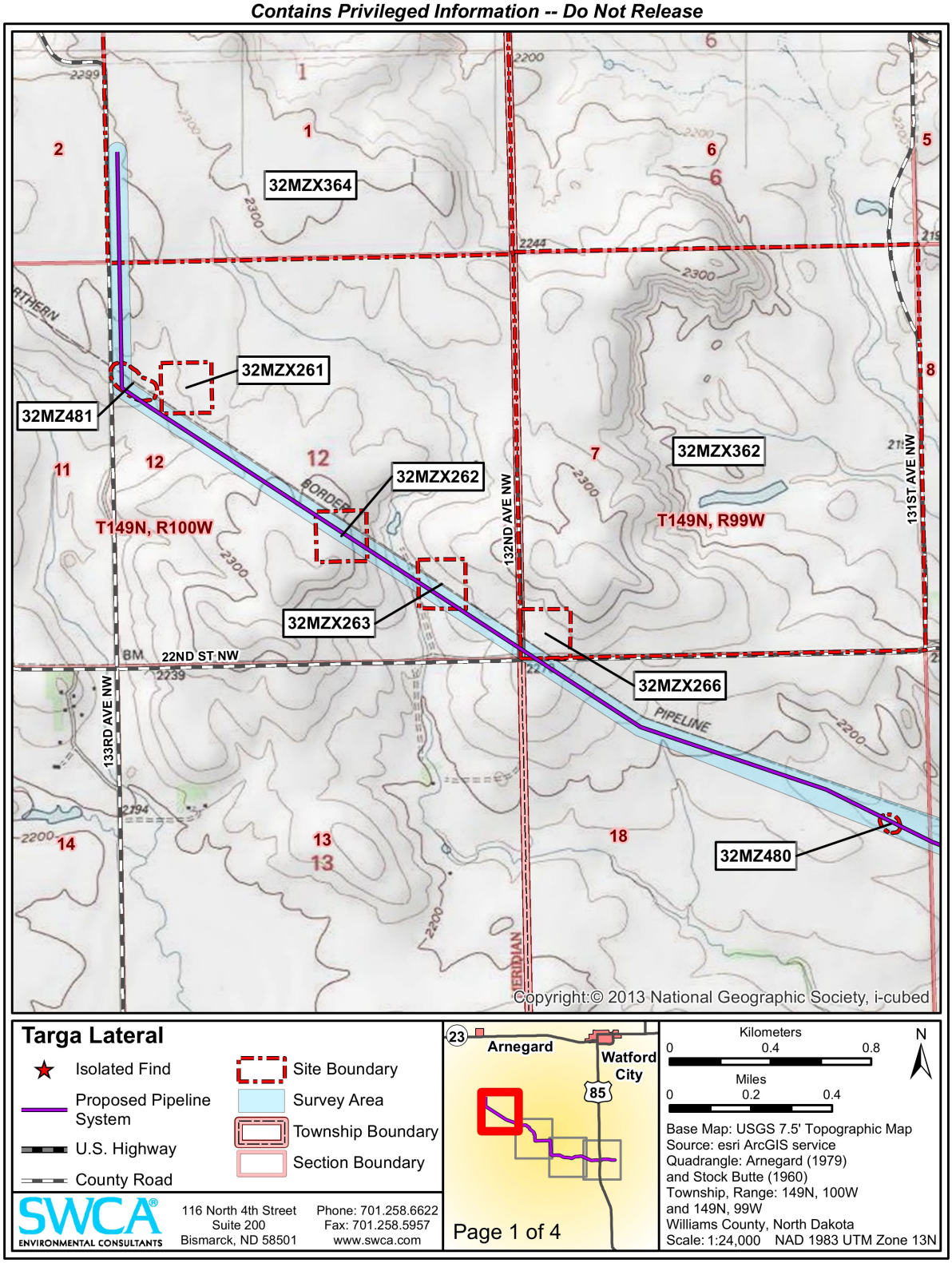
Manuscript Number	Title	Authors	Year
001745	McKenzie County Road Improvement Survey	C. Sheldon and A. Simon	1981
003455	Archaeology of the Northern Border Pipeline, North Dakota: Vol. 2, Pts. 1-3 Survey and Background Information, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, &Williams Co., ND	M. Gregg	1983
005749	Amerada Hess Corporation, 10 Inch Natural Gas Pipeline project Cultural Resources Inventory McKenzie and Williams Counties, North Dakota and Final Report	B. Olson	1992
006051	McKenzie Electric Cooperative, Inc. 1993-1994 Construction Routes in Dunn and McKenzie Counties, Class III Cultural Resource Inventory	J. Borchert	1993
007224	Schwartz Construction Proposed Extraction Locations in McKenzie Co., ND	D. Porter and D. Klinner	1998
007684	Grassy Butte: A Class III Cultural Resource Inventory, McKenzie Co., ND	W. Bluemle	2000
008884	Williston to Charlie Creek: A Cultural Resource Inventory Along the Western Area Power Administration 115KV Transmission line From the Williston Substation to the Charlie Creek Substation, Williams and McKenzie Counties, ND	B. Fandrich	2004
009076	McKenzie County water Resource District Phase II: Results of the Class II and III Cultural Resource Inventory of a Regional Water System in Portions of McKenzie Co., ND, within the Little Missouri River, Yellowstone River and Garrison	J. Morrison	2002
010710	Northern Border Connection of the Saddle Butte Pipeline: A Class III Cultural Resource Inventory, McKenzie Co., ND	W. Burns	2009
011276	Highway 85 From ND Highway 200 to ND Highway 2: A Class III Cultural Resource Inventory, McKenzie and Williams Counties, ND	A. Leuchtmann	2009
012263	A Class I and Class III Cultural Resource Inventory of the Bear Paw Energy Natural Gas Liquids Garden Creek Pipeline, Private Lands, McKenzie Co., ND	C. Riordan, J. Cooper, S. Lechert, and S. Slessman	2011
012312	WBI Holding's Garden Creek Pipeline: A Class III Cultural Resources Inventory in McKenzie Co., ND.	P. Metzger and W. Bluemle	2011
013099	BakkenLink Pipeline: A Class II and Class III Cultural Resource Inventory in Billings, Stark, McKenzie and Williams County, North Dakota	A. Kulevsky and E. Stine	2012

Manuscript Number	Title	Authors	Year
013515	Addendum I To: BakkenLink Pipeline: A Class II and Class III Cultural Resource Inventory in Billings, Stark, Dunn, McKenzie, and Williams County, North Dakota	A. Kulevsky	2012
014047	A Class III Cultural Resource Inventory of the Proposed Bear Den Project, McKenzie and Dunn Counties, North Dakota	S. Chandler and J. Mueller	2013
014614	WBI Energy's Garden Creek II Pipeline: A Class II and Class III Cultural Resource Inventory in McKenzie County, North Dakota	B. Bluemle	2014

APPENDIX B
(Detached)
North Dakota Site Forms

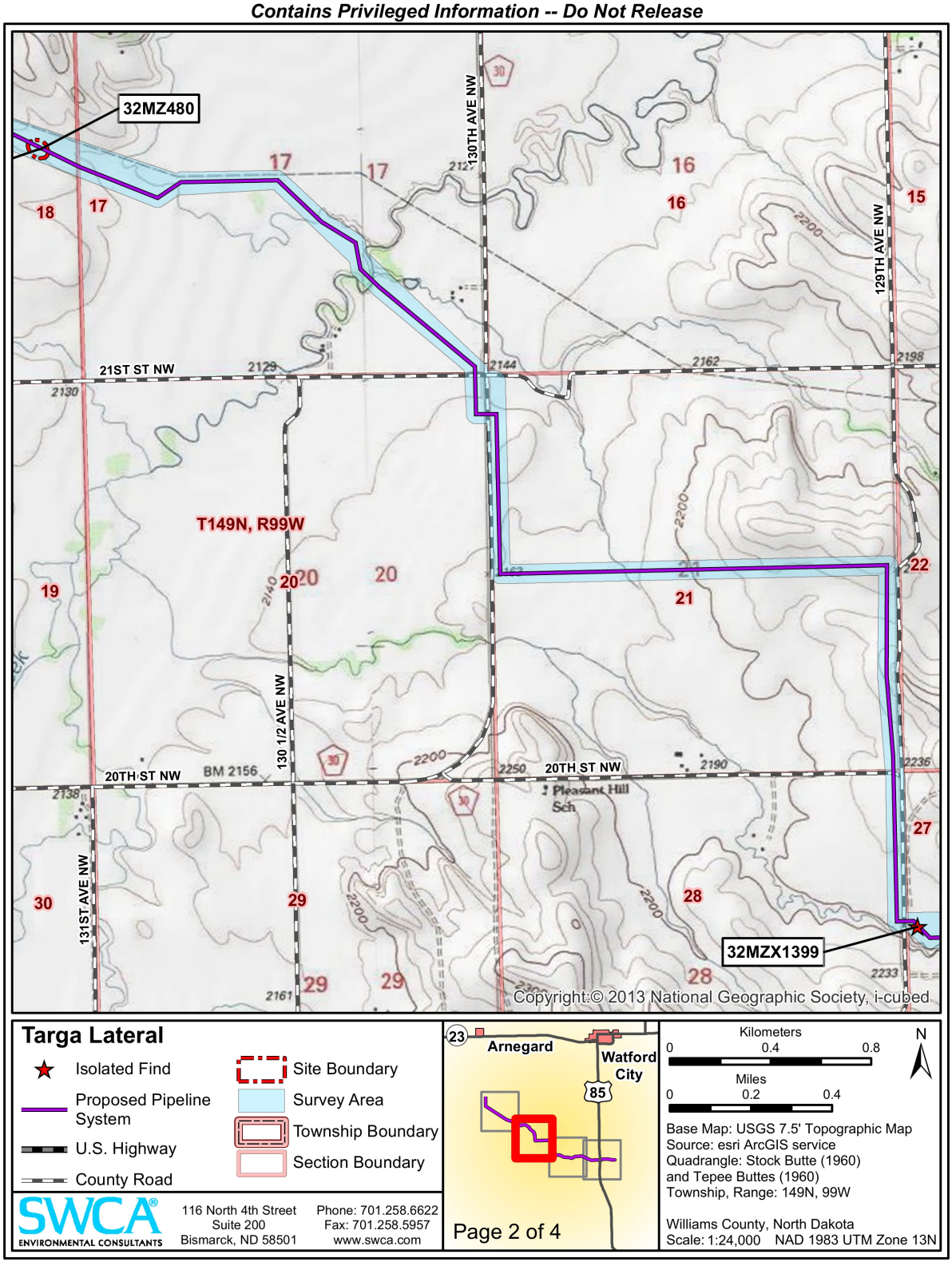
APPENDIX C
Resource Location Maps

Contains Privileged Information -- Do Not Release



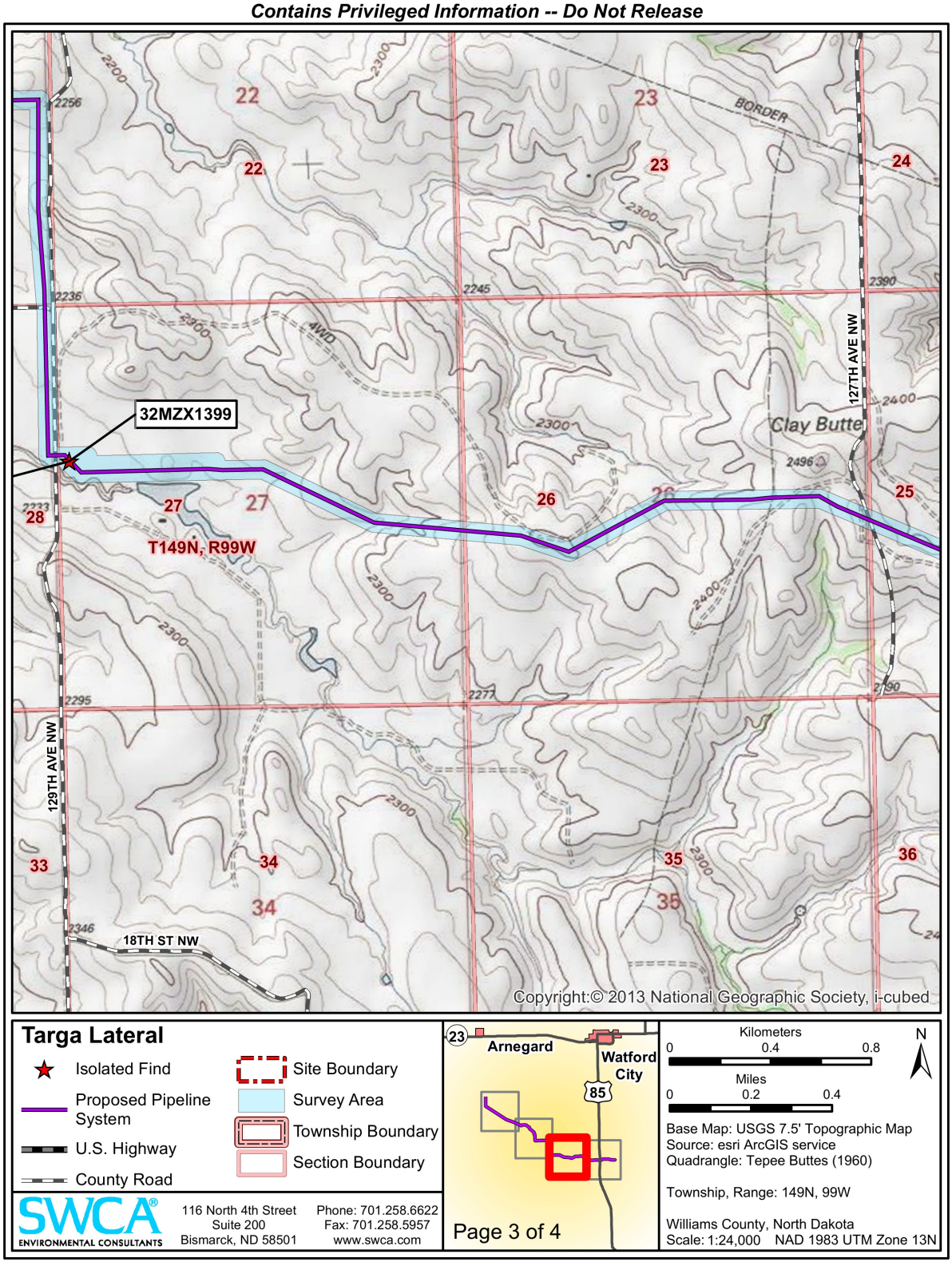
Resource location map 1 of 4, 1:24,000-scale.

Contains Privileged Information -- Do Not Release



Resource location map 2 of 4, 1:24,000-scale.

Contains Privileged Information -- Do Not Release



Resource location map 3 of 4, 1:24,000-scale.

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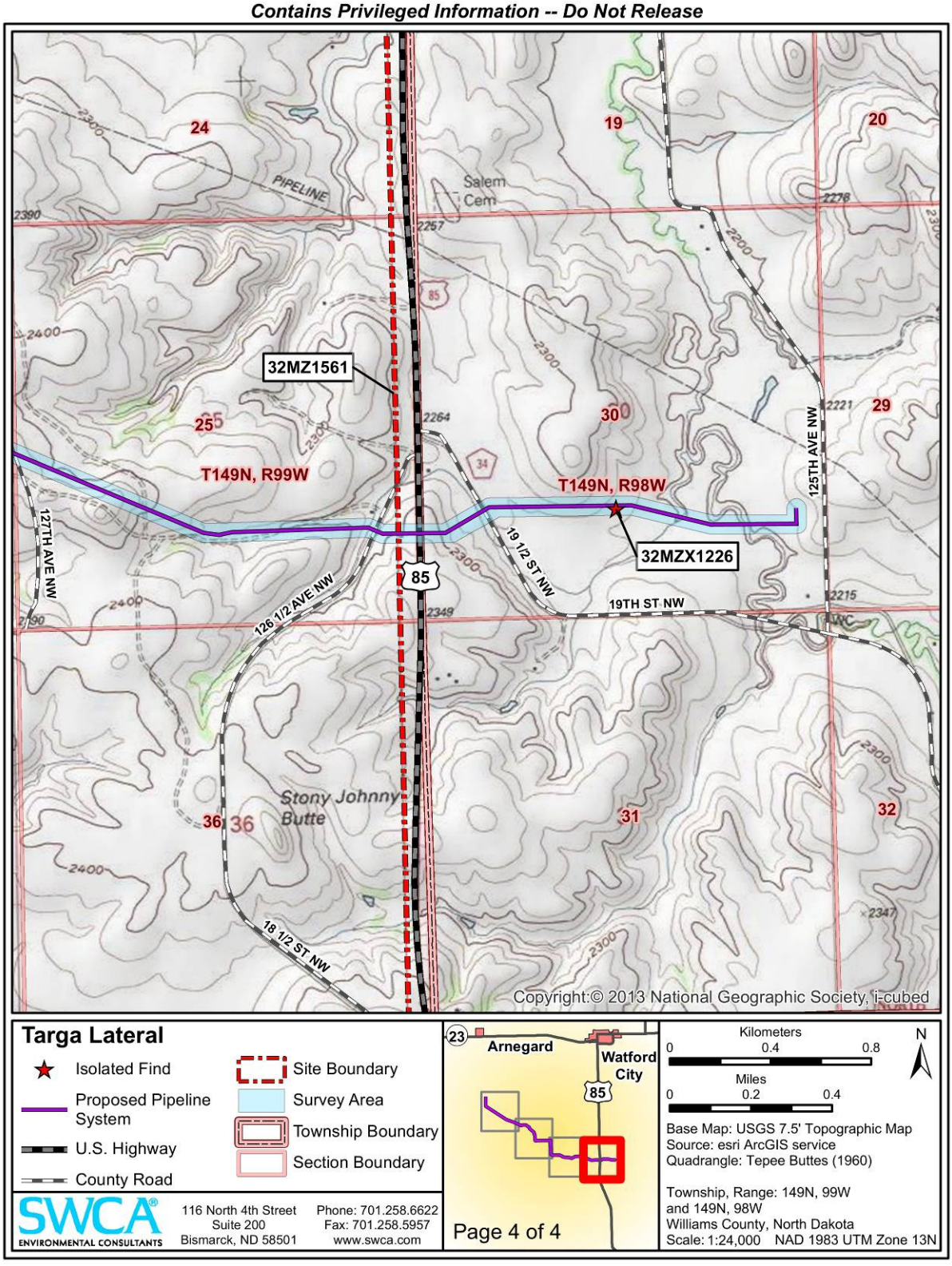

Resource location map 4 of 4, 1:24,000-scale.

Appendix F

10-Year Plan

ONEOK Bakken Pipeline, L.L.C. ("OBPL") hereby submits its ten-year plan pursuant to North Dakota Century Code § 49-22-04 and North Dakota Administrative Code Chapter 69-06-02.

SECTION A: Existing Energy Conversion Facilities

OBPL has no existing energy conversion facilities in North Dakota.

SECTION B: Energy Conversion Facilities Under Construction

OBPL has no energy conversion facilities under construction in North Dakota.

SECTION C: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Ensuing Five Years

OBPL has no proposed energy conversion facilities on which construction is intended within the ensuing five years in North Dakota.

SECTION D: Proposed Energy Conversion Facilities During the Next Ten-Year Time Period

OBPL has no proposed energy conversion facilities during the next ten-year time period in North Dakota.

SECTION E: Existing Transmission Facilities (Electric)

OBPL has no existing electrical transmission facilities in North Dakota.

SECTION F: Existing Transmission Facilities (Pipeline)

Part I – Stateline Natural Gas Liquids ("NGL") Pipeline

1. Location. OBPL owns an NGL pipeline for the transportation of y-grade NGLs originating at the Stateline 1 and Stateline 2 Gas Plants (collectively "Stateline Plants") owned and operated by ONEOK Rockies Midstream, L.L.C. ("ORM") and located in Township 155 North, range 103 West, Section 21 in Williams County, and proceeding due west and south to Township 153N, Range 104W, Section 10. At this

point the pipeline crosses the state line into Montana where it can deliver into the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

2. Type and Capacity. The design specifications for this facility are as follows:

   Product Type: - Y-Grade NGLs (Ethane, propane, butane and iso-butane mix, and pentanes and heavier NGLs)
   Length of Facility in Miles: 13.19 miles (total line length is approximately 55.16 miles including the Montana portion)
   Pipe Size: 10.75 inches
   Maximum Design Operating Pressure: 1,440 psig
   Maximum Design Flow Rate: 2,300 gpm
   Compressor or pumping station specifications, including type, horsepower, output pressure and capacity: None – Injection pressure at the Stateline Plants is adequate to move the product through the pipeline.
   Minimum Cover Over Pipe: 48 inches

3. In-Service Date for Pipeline: October 22, 2012

4. Retirement: There is no projected retirement date during the next ten-year period for this pipeline.

Part II – Garden Creek NGL Pipeline

1. Location. OBPL owns an NGL pipeline for the transportation of y-grade NGLs originating at the Garden Creek 1, Garden Creek 2 (coming online in 2014) and Garden Creek 3 (coming online in 2015) Gas Plants (collectively "Garden Creek Plants") owned and operated by ORM and located in Township 151 North, Range 98 West, Section 35 in McKenzie County, and proceeding due west and south to Township 150 N, Range 99 West, Section 17 to bypass Watford City, then south and west to angle into existing pipeline corridors in Township 148 North, Range 103 West, travel south and west to pass near the Grasslands Gas Plant and through Section 34, Township 148 North, Range 105 West, McKenzie County. At this point, the pipeline crosses the state line into Montana where it can deliver into the ORM Riverview Rail Facility near Sidney, Montana or continue southward on the pipeline.

2. Type and Capacity. The design specifications for this facility are as follows:

   Product Type: - Y-Grade NGLs (Ethane, propane, butane and iso-butane mix, and pentanes and heavier NGLs)
   Length of Facility in Miles: 54.8 miles (total line length is approximately 64.18 miles including the Montana portion)
   Pipe Size: 10.75 inches
   Maximum Design Operating Pressure: 1,440 psig
   Maximum Design Flow Rate: 2,100 gpm

Compressor or pumping station specifications, including type, horsepower, output pressure and capacity: None – Injection pressure at the Garden Creek Plants is adequate to move the product through the pipeline.
Minimum Cover Over Pipe: 48 inches

3. In-Service Date for Pipeline: January 20, 2012

4. Retirement: There is no projected retirement date during the next ten-year period for this pipeline.

SECTION G: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years (Electric)

OBPL has no proposed electric transmission facilities on which construction is intended within the ensuing five years in North Dakota.

SECTION H: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years (Pipeline)

Part I – Targa Lateral NGL Pipeline

1. Location: OBPL plans to build an approximately 10-mile NGL pipeline for the transportation of Y-grade NGLs originating at the Little Missouri Plant owned and operated by Targa Badlands LLC and located in Township 149 North, Range 98 West, Section 30 in McKenzie County, and proceeding North West to Township 149 N, Range 100 West, Section 1 where it will tie into the Garden Creek NGL Pipeline. OBPL anticipates filing an application with the PSC for Corridor Certificate and Route Permit for the Targa Lateral Pipeline.

2. Type and Capacity. The design specifications for this facility are as follows:

   a. Product Type: Y-Grade NGLs (Ethane, propane, butane and iso-butane mix, and pentanes and heavier NGLs)
   b. Length of Facility in Miles: 10 miles Pipe Size: 6.625 inches
   c. Maximum Design Operating Pressure: 1,440 psig
   d. Maximum Design Flow Rate: 290 gpm
   e. Pumping station specifications, including type, horsepower, output pressure and capacity: None anticipated – Injection pressure at the plant is assumed to be adequate to move the product through the pipeline.
   f. Minimum Cover Over Pipe: 48 inches

3. In-Service Date for Pipeline: First Quarter 2015

Part II – Lonesome Creek NGL Pipeline

1. Location: OBPL plans to build a NGL pipeline for the transportation of Y-grade NGLs originating at the Lonesome Creek Gas Plant to be owned and operated by ORM

and for which ORM requested a Certificate of Site Compatibility in Township 150 North, Range 101 West, Section 36 in McKenzie County, and into the Garden Creek NGL Pipeline.

2. Type and Capacity. The design specifications for this facility are as follows:

   a. Product Type: Y-Grade NGLs (Ethane, propane, butane and iso-butane mix, and pentanes and heavier NGLs)
   b. Length of Facility in Miles: Route yet to be determined
   c. Pipe Size: Hydraulics yet to be confirmed.
   d. Maximum Design Operating Pressure: 1,440 psig
   e. Maximum Design Flow Rate: Capacity yet to be determined
   f. Pumping station specifications, including type, horsepower, output pressure and capacity: None anticipated – Injection pressure at the Lonesome Creek Plant is assumed to be adequate to move the product through the pipeline.
   g. Minimum Cover Over Pipe: 48 inches

3. In-Service Date for Pipeline. First Quarter 2016

4. Retirement. There is no projected retirement date during the next ten-year period for this pipeline.

SECTION I: Proposed Transmission Facilities during the Next Ten-Year Time Period (Electric and Pipeline)

If producer drilling activity in the Bakken/Three Forks continues at current levels, it is possible that OBPL may need to build additional NGL transportation capacity in Western North Dakota sometime within the five-year period.

SECTION J: Regional Coordination

OBPL has regional coordination with other processors of associated NGLs, however OBPL does not have contact with other pipelines due to confidentiality concerns and potential antitrust issues.

SECTION K: Environmental Information

OBPL recognizes the various federal, state and municipal regulatory agencies within the state of North Dakota that have environmental compliance authority over the operations and maintenance aspects of its existing Stateline NGL Pipeline and Garden Creek NGL Pipeline. In its effort to ensure regulatory compliance, OBPL commits to developing and fostering an ongoing working relationship with each of these agencies. OBPL will continue risk mitigation collaborations and community right-to-know reporting with the Local Emergency Planning Commissions. OBPL is committed to maintaining a strong safety record and is well prepared to meet any emergency and mitigate the impact of a pipeline failure.

OBPL is also committed to environmental compliance during the execution of any future expansion or routine growth project. OBPL commits to actively seek the approval of and comply with the conditions of all federal, state and municipal agencies having jurisdictional authority over the construction and installation of new facilities.

SECTION L: Projected Demand for Service

Crude oil prices and technology will sustain the long-term production of Bakken Shale / Three Forks crude oil and the production of natural gas associated with such production. The processing of the associated natural gas will provide a source of NGL supply to OBPL, which in turn can provide access to NGL markets.

Appendix G

Landowner Waivers

Landowner Waivers Pending