North Dakota Public Service Commission
Consolidated Application

Certificate of Corridor Compatibility and Route Permit

Wild Basin to Johnsons Corner Crude Oil Pipeline

Prepared for:

Oasis Midstream Services, LLC

Prepared by:

E3 Environmental, L.L.C.

November 2015

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Enhancing Execution with Experience

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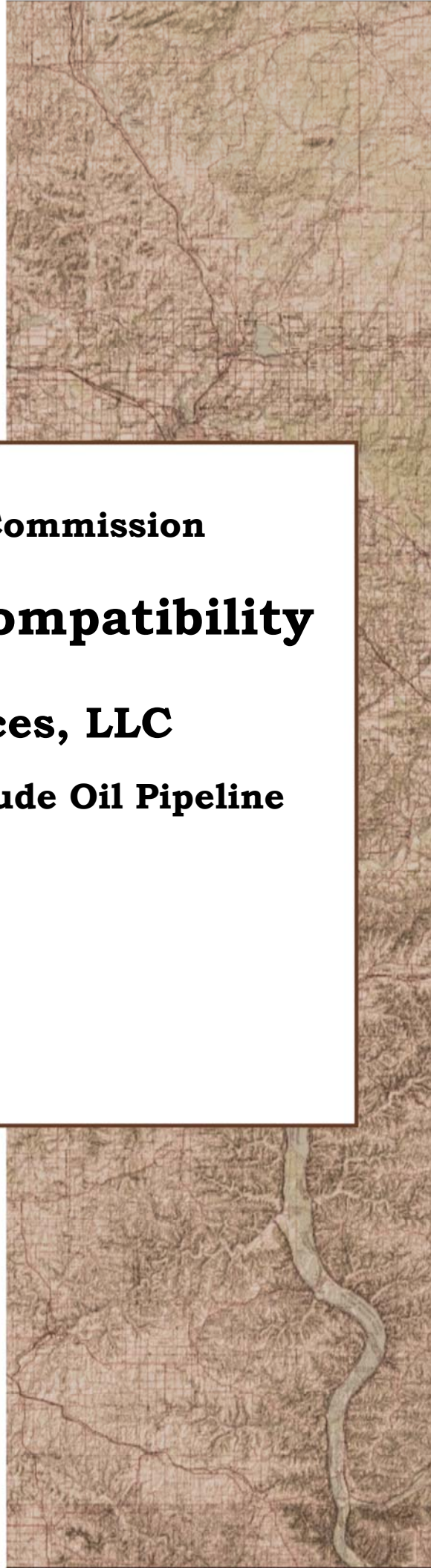

Authority	List of Contents Required by 69-06-05-01: Application for Transmission Facility Permit	Section(s)
2.a.(1)	Type of facility proposed	1.0
2.a.(2)	Purpose of facility	1.2
2.a.(3)	Technology to be deployed	1.1.1
2.a.(4)	Type of product to be transmitted	1.1.1
2.a.(5)	Source of product being transmitted	3.0
2.a.(6)	Final destination of product being transmitted	1.2
2.a.(7)	Size and design detail and any alterative size and design	1.0
2.a.(7)(a)	The width of right-of-way	N/A – Refer to Route Permit
2.a.(7)(b)	The approximate length of facility	1.0
2.a.(7)(c)	The estimated span length for electric facilities	N/A
2.a.(7)(d)	The anticipated type of structure for electric facilities	N/A
2.a.(7)(e)	The voltage for electric facilities	N/A
2.a.(7)(f)	The requirement for and general location of any new associated facilities	1.4
2.a.(7)(g)	The estimated distance between pipeline surface structures	1.1.3
2.a.(7)(h)	The pipe size	1.1.2
2.a.(7)(i)	The maximum design for pipeline operating pressure and temperature	1.1.2
2.a.(7)(j)	The maximum design pipeline flow rate	1.1.2
2.a.(7)(k)	The number and general location of compressor or pumping stations	1.4
2.b.	Time schedule	1.5
2.b.(1)	Obtaining the certificate of corridor compatibility	1.5.1
2.b.(2)	Obtaining the route permit	1.5.2

2.b.(3)	Completing right-of-way acquisition	N/A – Refer to Route Permit
2.b.(4)	Starting construction	1.5.3
2.b.(5)	Completing construction	1.5.3
2.b.(6)	Testing operations	1.5.3
2.b.(7)	Commencing operations	1.5.3
2.c.	A copy of each evaluative study or assessment of the environmental impact of the proposed facility submitted to the agencies listed in section 69-06-01-05 and each response received	2.3, Appendix C
2.d.	Need for the facility	3.0
2.e.	Description of alternatives	4.2
2.f.	Corridor width	4.1
2.g.	Study area to enable the Commission to evaluate the factors in the Century Code section 49-22-09;	2.1, 4.2
2.h.	Discussion of factors in Century Code 49-22-09 to aid Commission's evaluation	2.2, 4.2
2.i.	A discussion of the applicant's policies and commitments to limit the environmental impact of its facilities, including copies of the board resolutions and management directives	4.6
2.j.	Map of criteria that led to route location	Appendix B
2.k.	Discuss relative value of each criteria and how the location was selected; how operation will affect criteria	4.3, 4.4, 4.5
2.l.	Mitigating measures	5.0
2.m.	Qualifications of each person involved in location study	6.0
2.n.	Map identifying criteria that led to the route location and new facilities	Appendix B

2.o.	8 ½ X 11 black and white map suitable for newspaper publication	Located in digital copy of Consolidated Application
2.p.	Discussion of present and future natural resource development in the area	4.3, 4.4
2.q.	Maps and GIS data for the project meeting the PSC requirements	Appendix B, electronic GIS data located in digital copy of Consolidated Application

Authority	List of Contents Required by 69-06-08-02: Transmission Facility Corridor Criteria	Section(s)
1	**Exclusion Areas**	4.3
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1.b.	Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves	2.3.2, 2.3.3, 2.3.5, 4.3.2
1.c.	County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.	2.3.3, 4.3.3
1.d.	Areas critical to the life stages of threatened or endangered animal or plant species.	2.2.1, 2.3.1, 2.3.2, 2.3.3, 4.3.4
1.e.	Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	2.2.1, 2.3.1, 2.3.2, 2.3.3, 4.3.5

1.f.	Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	4.3.6
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3.b.(4)	Wetlands, woodlands, and wooded areas.	2.2.2, 2.2.3, 4.5.2
3.b.(5)	Radio and television reception, and other communication or electronic control facilities.	4.5.2
3.b.(6)	Human health and safety.	4.5.2
3.b.(7)	Animal health and safety.	2.2.1, 2.3.1, 2.3.2, 2.3.3, 4.3.4, 4.5.2
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APPENDICES

INTRODUCTION

Oasis Midstream Services, LLC (Oasis), owns and operates various pipeline assets throughout Montana and North Dakota. Oasis is proposing the Wild Basin to Johnsons Corner Crude Oil Pipeline Project (Project), which would be located in McKenzie County, North Dakota. The Project scope includes a new 10.75-inch outside diameter crude oil mainline and one lateral pipeline totaling approximately 19 miles in length. The mainline would originate at the Wild Basin Gas Processing and Crude Handling Facility and extend southeast to terminate at the Tesoro Johnsons Corner Station which is located approximately 2.8 miles east of Johnsons Corner North Dakota. Lateral 1 would transport crude from the mainline to the proposed Dakota Access Pipeline (DAPL) Johnsons Corner Terminal facility that will be located approximately 0.8 miles east of Johnsons Corner. Additionally, three aboveground storage tanks will be constructed at the Wild Basin Gas Processing and Crude Handling Facility providing 200,000 barrels of storage capacity. Refer to the maps in Appendix B for an overview of the Project.

Oasis 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,
- North Dakota Administrative Code, Chapter 69-06-05, Transmission Facility Permit.

SECTION 1: DESCRIPTION

1.1 TYPE AND SIZE OF FACILITY

1.1.1 TYPE

The proposed Project would result in a new crude oil transmission pipeline. The steel pipeline would meet U.S. Department of Transportation (DOT) regulations, specifically the design criteria outlined in 49 CFR part 195 subpart C, constructed per 49 CFR part 195 subpart D, and operated and maintained per 49 CFR part 195 subpart F.

1.1.2 SIZE

The Project pipeline specifications are the following:

- 10.75-inch outside diameter steel pipe
- 0.250-inch wall thickness (minimum)
- Normal Operating Pressure: 500 pounds per square inch gauge (psig)
- Maximum Operating Pressure: 1,480 psig
- Normal Throughput: approximately 50,000 barrels per day (bpd)
- Maximum Throughput: approximately 75,000 bpd
- Maximum Operating Temperature: 120 degrees Fahrenheit

1.1.3 LENGTH

The proposed Project is approximately 19 miles in length. The Mainline is approximately 18.3 miles and Lateral 1 is approximately 0.9 miles in length.

1.2 PURPOSE OF FACILITY

The purpose of the Project is to transport crude oil from the Wild Basin Gas Processing and Crude Handling Facility where the crude is housed in above ground storage tanks to third party pipeline interconnects near Johnsons Corner (Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility). From these facilities, the product will be transported via interconnecting pipelines for distribution to refineries across the United States.

1.3 LOCATION

The Project would be located in McKenzie County, North Dakota. Crude would be transported from the Wild Basin Gas Processing and Crude Handling Facility near Watford City, North Dakota to facilities located east of Johnsons Corner, North Dakota. Project maps are provided in Appendix B.

1.4 ABOVEGROUND FACILITIES

The Project would include the construction of three additional aboveground tanks at the Wild Basin Gas Processing and Crude Handling Facility. One tank would have 100,000 barrels of storage capacity and two tanks would have 50,000 barrels of storage capacity. The addition of these tanks will bring the total storage capacity at the Wild Basin Gas

Processing and Crude Handling Facility to approximately 200,000 barrels. The additional storage volume is required to support the transmission line. Two block valves would also be installed as part of the Project. These aboveground appurtenances would be designed to and installed at locations that will meet DOT regulations. Oasis would also improve and expand an existing two-track road to allow permanent access to a block valve location on Lateral 1. Refer to Appendix A for engineering schematics of these facilities and Appendix B for maps providing the location of the planned aboveground facilities.

1.5 PROJECT SCHEDULE

1.5.1 CERTIFICATE OF CORRIDOR COMPATIBILITY

Oasis seeks a Certificate of Corridor Compatibility by or before April 2016.

1.5.2 ROUTE PERMIT

Oasis seeks a Route Permit by or before April 2016.

1.5.3 CONSTRUCTION SCHEDULE

Oasis has scheduled construction activities to commence during the second quarter of 2016 and will require approximately four months to complete. Commissioning and restoration activities would commence immediately after construction is complete.

1.5.4 ADDITIONAL PROJECT PERMITS OR AUTHORIZATIONS

The Project will be constructed in compliance with applicable federal, state and local laws, regulations or plans. Oasis will obtain necessary permits or approvals for the construction and operation of the Project. Appendix H contains a comprehensive list of permits or authorizations Oasis is pursuing.

SECTION 2: STUDIES

2.1 CORRIDOR

Oasis 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 were also considered during the selection process. Oasis' process of selecting a corridor to locate the Project within was influenced by the opportunity to parallel or co-locate within other utility corridors.

The proposed corridor is a one-mile-wide area centered upon a proposed alignment (*i.e.*, one-half mile on either side of the proposed alignment) (Corridor), this alignment was selected utilizing web-based mapping tools. The Corridor is illustrated on the maps in Appendix B.

A comprehensive desktop analysis of the Corridor included consultations with the federal and state agencies identified below. These consultations were conducted for the purpose of environmental resource assessment as stipulated by the PSC's siting requirements for a Transmission Facility Corridor. Consultation letters were distributed on July 28, 2015. Following design modifications, portions of the Project were located outside of the Corridor. As such, agency consultations were distributed with the revised Corridor on October 1, 2015. The results of the environmental analysis are summarized in Section 2.2 of this document. Records of the agency consultations 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 Department of Trust Lands (NDDTL)
- 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 mainstream and its tributaries. Some of these animal species include fur-bearing mammals (*e.g.* beaver, muskrat, moose, eastern cottontail, elk, moose and mule deer), birds and waterfowl species (*e.g.*, mallard, Canada goose, sharp-tailed grouse and golden and bald eagles). Species classified as threatened or endangered by the Endangered Species Act (ESA) may occur within McKenzie County.

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

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 14 waterbodies, 44 waterways, and approximately 59 wetland features within the Corridor. Oasis commissioned 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

The density of the woody cover in this region is generally sparse, and typically associated with significant topographic relief such as defined banks or incised drainage channels or agricultural windrows. Oasis commissioned field studies to inventory the Project survey corridor for woody vegetation. The Survey Corridor was typically a 250 foot corridor centered upon the pipeline alignment. The results of these studies are documented in Appendix D and proposed mitigation measures are detailed in the Route Permit Application.

2.3 AGENCY CONSULTATIONS

2.3.1 U.S. FISH AND WILDLIFE SERVICE

The USFWS administers several programs designed to identify and protect special status plant and animal species, critical habitats and lands managed by the agency including the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Act (BGEA). Additionally the USFWS administers National Wildlife Refuges and Waterfowl Production Areas (WPAs) as well as wetland and grassland easements throughout North Dakota. E3 Environmental, LLC (E3), on behalf of Oasis, sent a Project consultation letter with maps of the Corridor on July 28, 2015, and the revised Corridor on October 1, 2015. A response from the USFWS is pending. Refer to Appendix C for a record of this consultation.

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
- Least tern (*Sternula antillarum*) – Endangered
- Pallid sturgeon (*Scaphirhynchus albus*) – Endangered
- Gray wolf (*Canis lupus*) – Endangered
- Red knot (*Calidris canutus rufa*) - Threatened
- Piping plover (*Charadrius melodus*) – Threatened, and final designated critical habitat

- Dakota skipper (*Hesperia dacotae*) – Threatened, and proposed critical habitat
- Northern long-eared bat (*Myoyis septenrionnalis*) - Threatened

E3 reviewed available information describing 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.

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 the Project is located within the migratory corridor for the whopping crane and potential foraging habitat exists within the Corridor.

Least tern: Lake Sakakawea and the Missouri River, located approximately 12 miles to the east of the Project, provide suitable breeding and nesting habitat for least terns. However, the Corridor does not contain the sandbars and riverbanks necessary for nesting and impacts to the interior least tern are not anticipated.

Pallid sturgeon: The preferred habitat of the pallid sturgeon 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 requires extensive micro habitat diversity. The species inhabits the Missouri and Mississippi Rivers from Montana to Louisiana. In North Dakota, reaches of the Missouri River system have been cited as providing suitable habitat for the pallid sturgeon; however much of the habitat has been compromised from channelization, installation of impoundments, and altered flow regimes. Potential suitable habitat is not present in the Corridor; therefore impacts to the pallid sturgeon are not anticipated.

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 known Minnesota and Manitoba populations. This species is not tolerant of human disturbance and would tend to avoid interaction with humans. The activities associated with construction and later operations would likely serve as a deterrent to this species. Therefore, impacts to the gray wolf are not anticipated.

Red knot: North Dakota is a possible migration stopover in spring and autumn for the rufa red knot, particularly within Lake Sakakawea and its major tributaries. The rufa red knot migrates between breeding grounds in Canada and wintering grounds in South America. A significant factor threatening the rufa red knot is the loss or modification of its habitat due to beach erosion and shoreline protection efforts. Migratory behavior and habitat requirements of this species are poorly understood particularly for those

populations occupying the midcontinent flyways. Inland stopovers include the Mississippi Valley, Great Lakes, and Great Plains. Because the species is likely to utilize the Corridor as a possible stopover and not permanent habitat, impacts to the rufa red knot are not anticipated.

Piping plover: The piping plover is a small shorebird that 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. Lake Sakakawea and the Missouri River, located approximately 12 miles to the east of the Project, provide suitable breeding and nesting habitat for least terns. However, the Corridor does not contain the sandbars and riverbanks necessary for nesting and impacts to the piping plover are not anticipated.

Dakota skipper: Dakota skippers require untilled, high-quality prairie. Habitat preferred by the skipper is wet-mesic prairie with little topographic relief on near-shore glacial lake deposits and in rolling native-prairie terrain over gravelly glacial moraine deposits. Larvae feed on grasses, favoring little bluestem (*Schizachyrium scoparium*). Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower (*Echinacea angustifolia*). This species is not known to disperse widely and has low mobility, dispersing a maximum of 0.6-mile. The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding. To date, no Dakota skippers have been identified within the Corridor and the nearest critical habitat identified by the USFWS is located approximately 20 miles northeast of the Project in McKenzie County. However, the Corridor intersects areas that desktop and field reviews suggest are potential marginal Dakota skipper habitat. Refer to the Route Permit Application for further analysis.

Northern long-eared bat: The northern long-eared bat roost underneath bark, in cavities, or in crevices of both live and dead trees. Populations have also been found in cool environments such as caves and mines and prefer to spend winter hibernating in locations with high humidity and no air currents. Breeding occurs in late summer or early fall in maternity colonies where females give birth around the same time, which may occur anywhere from late May to late July. Most records of northern long-eared bats are from winter hibernacula surveys, and no known hibernacula are located in North Dakota; however, because the northern long-eared bat occurs in similar habitats to other *Myotis* species, suitable habitat does exist within the Corridor in the form of green ash and elm riparian woodlands. Refer to the Route Permit Application for further analysis.

2.3.1.2 MIGRATORY BIRD TREATY ACT CONSULTATION

The management of MBTA concerns correspond with the regional timing associated with annual phenology of migratory species. In North Dakota, species protected under the MBTA are present throughout the year. However, it is generally acknowledged that the majority of protected species seasonally present in North Dakota nest from February 1st through July 15th annually. During this nesting period, birds are more vulnerable to

human activities. The proposed Project construction is scheduled to commence the second quarter of 2016 and take approximately four months to reach completion. Due to the Project schedule and phenology of resident birds, MBTA mitigation may be required. Should mitigation be required, Oasis would continue to consult with agencies as necessary and would develop MBTA mitigation 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.

2.3.1.4 U.S. FISH AND WILDLIFE SERVICE MANAGED LANDS

The USFWS administers National Wildlife Refuges and WPAs as well as wetland and grassland easements throughout North Dakota. A desktop 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) has been completed for the Corridor. Desktop analysis indicates no USFWS managed lands are located within the Corridor.

2.3.2 NORTH DAKOTA GAME AND FISH DEPARTMENT

The NDGFD has oversight of the State's game species. E3, on behalf of Oasis, sent a Project consultation letter with maps of the Corridor on July 28, 2015, and the revised Corridor on October 1, 2015 requesting information regarding the presence or absence of State Conservation Priority Species within the Corridor. Each response is outlined below. Refer to Appendix C for a copy of the correspondence.

Consultation letter dated July 28, 2015:

The NDGFD provided a written response on August 26, 2015 indicating they do not believe the Project would have significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided the following recommendations are implemented where appropriate. The NDGFD'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. The Department recommended steps be taken to protect any wetlands that cannot be avoided and that no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas.

Consultation letter dated October 1, 2015:

The NDGFD provided a written response on October 30, 2015 indicating the response dated August 26, 2015 remain applicable and provided no additional comments.

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.

E3, on behalf of Oasis, sent a Project consultation letter with maps of the Corridor on July 28, 2015, and the revised Corridor on October 1, 2015 to the NDPRD seeking confirmation regarding the presence or absence of managed lands, ecological resources, rare species or their critical habitats within the Corridor. Each response is outlined below. Refer to Appendix C for a copy of the correspondence.

Consultation letter dated July 28, 2015:

The NDPRD responded on August 14, 2015 and confirmed there are no documented occurrences of species or ecological communities of concern within the Corridor.

Consultation letter dated October 1, 2015:

The NDPRD responded on October 20, 2015 and confirmed there are no documented occurrences of species or ecological communities of concern within the Corridor.

2.3.4 NORTH DAKOTA DEPARTMENT OF TRUST LANDS, MINERALS AND SURFACE MANAGEMENT

The NDDTL 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, state trust land is crossed by the Corridor.

NDDTL Surface Management Division

E3, on behalf of Oasis, sent a Project consultation letter with maps of the Corridor on July 28, 2015, and the revised Corridor on October 1, 2015 to the NDDTL Surface Management Division requesting comments regarding the presence of School Trust Lands within the Corridor. Each response is outlined below. Refer to Appendix C for a copy of the correspondence.

Consultation letter dated July 28, 2015:

The NDDTL responded on July 29, 2015 confirming the absence of state trust land tracts within the Corridor as depicted in the consultation map.

Consultation letter dated October 1, 2015:

The NDDTL responded on October 3, 2015 confirming the absence of state trust land tracts within the revised Corridor as depicted in the consultation map.

NDDTL Minerals Management Division

E3, on behalf of Oasis, sent a Project consultation letter with maps of the Corridor on July 28, 2015, and the revised Corridor on October 1, 2015 to the NDDTL Minerals Management Division requesting comments regarding the presence or absence of State Mineral Trust lands within the Corridor. Each response is outlined below. Refer to Appendix C for a copy of the correspondence.

Consultation letter dated July 28, 2015:

The NDDTL responded on July 28, 2015 confirming the presence of Mineral Trust land tracts within the Corridor as depicted in the consultation map. Refer to Appendix C for a copy of the correspondence.

Consultation letter dated October 1, 2015:

The NDDTL responded on October 1, 2015 confirming the presence of Mineral Trust land tracts within the Corridor as depicted in the consultation map. The NDDTL also indicated they do not own any interest in Township 150 Range 96 Section 21 as depicted on the consultation map. This area does not fall within the Corridor and will have no impact on the Project. Refer to Appendix C for a copy of the correspondence.

2.3.5 NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

The NDSHPO is responsible for managing the historic and archaeological resources of the state; as such, the NDSHPO maintains records of all previously recorded cultural resources within the state.

In September of 2015, a Class I cultural resources inventory (literature review) was conducted of records from the State Historical Society of North Dakota to identify previously completed cultural resource investigations and recorded cultural resources within one mile of the Corridor. The Class I cultural resources inventory identified 14 recorded cultural resources within the Corridor. The cultural resources consist of five sites (32MZ772, 32MZ782, 32MZ793, 32MZ2672, 32MZ2697) and nine isolates (32MZx184, 32MZx187, 32MZx415, 32MZx1119, 32MZx1173, 32MZx1190, 32MZx1214, 32MZx1228, 32MZx1229). Three of the previously recorded sites are not eligible for the National Register of Historic Places (NRHP), two are unevaluated, and as isolates, the remaining resources are not eligible for the NRHP.

To augment this Class I, a Class III field investigation was conducted, the details of this effort are included in the Route Permit Application. The full cultural resources report is privileged and not included in this Application. Refer to Appendix E for guidance from the NDSHPO on the cultural resource report submittal and the Cultural Resources Report Abstract.

2.3.6 NORTH DAKOTA DEPARTMENT OF HEALTH

The North Dakota Department of Health (NDDoH) administers regulatory programs that monitor and enforce compliance with state and Federal laws related to air and water

quality. Oasis is currently engaged at various stages in the permitting process with the NDDoH with respect to air emissions and water discharges.

2.3.6.1 NDDOH POLLUTION DISCHARGE ELIMINATION SYSTEM

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

Construction Stormwater: Oasis would implement industry standard BMPs, which would be designed to manage run-off and trench dewatering discharges in a manner that would minimize exposure to chemicals, waste, and petroleum products, as well as describing erosion control measures designed to minimize off-site transfer of sediments.

Hydrostatic test water discharges: Oasis would be seeking 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

The Project would transport product from formations in the Williston Basin. The development of hydrocarbon production in the Williston Basin has increased significantly in recent years due to advancements in deep horizontal directional drilling techniques and subsequent oil extraction in the Bakken and Three Forks Shale formations. The total recoverable amount of Bakken Shale and Three Forks oil reserves are subject to interpretation and speculation. Studies conducted by the North Dakota Department of Mineral Resources and the USGS in 2010 estimated mean undiscovered volumes of 3.65 billion barrels of recoverable crude oil reserves may be available in North Dakota's deep shale formations. From March of 2007 to July of 2015, oil production in North Dakota has surged. In March of 2007, North Dakota produced 118,000 barrels of oil per day. That figure has increased to 1,201,920 barrels per day in July of 2015. In 2007, North Dakota accounted for roughly 2.5 percent of all the oil produced in the United States. In 2013, North Dakota accounted for roughly 11 percent of all the oil produced in the country.

A major constraint in transporting hydrocarbons from North Dakota to 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 crude oil, natural gas and natural gas liquids. 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 would provide firm, reliable transport of 50,000 bpd of crude oil from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. From these facilities, the product would continue through interconnecting pipelines to refineries across the United States.

SECTION 4: CORRIDOR LOCATION AND CRITERIA EVALUATION

Oasis 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

Oasis 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, which included socioeconomic, environmental, logistics, engineering, and financial considerations. The Corridor described in this application provides Oasis with the opportunity to utilize existing assets, and minimize landowner and environmental impacts.

Oasis 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 the field studies 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 would provide firm, reliable service for 50,000 barrels of crude oil per day from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. From these facilities, the product would continue through interconnecting pipelines and become available for transport to refineries across the United States. Oasis 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

This alternative would leave the region constrained by limited transport capacity for safe and reliable transmission of crude oil products to markets. A no action alternative could result in the curtailment of crude oil production. For these reasons, Oasis rejected a *No Action Alternative*.

4.2.1.2 Trucking Alternative

This alternative was reviewed and eliminated due to the volume of crude oil to be transported. The normal daily throughput of the proposed Project would be approximately 50,000 barrels or 2,100,000 gallons of crude oil. The average load for a truck carrying crude oil is approximately 178 barrels (approximately 7,500 gallons) per truck. Thus, it would require 280 trucks per day, an average of 11.6 trucks every hour for 24 hours a day to transport the volume of product. This level of truck activity is not logistically feasible as it would cause significant amounts of heavy vehicle traffic for area residents, as well as additional wear and tear on the infrastructure. Disruption in the trucking capacity due to seasonal load restrictions on roads, inclement weather or road repairs would cause a delay in delivering this valuable resource to market. This alternative is not desirable; therefore, Oasis rejected a *Trucking Alternative*.

4.2.1.3 Rail Alternative

A Rail Alternative was also evaluated as a surface transportation alternative. However, this alternative was determined not feasible because of 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, Oasis rejected a *Rail Alternative*.

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

Oasis 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

Oasis is aware of possible future developments in the vicinity of the Project; however, the Project will not conflict with any known developments planned in the area.

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

Oasis has consulted with federal and state agencies to identify possible environmental resources within the Corridor and any related agency concerns. A complete record of these consultations is provided in Appendix C.

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

A proposed corridor may contain exclusion areas; however, 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	50 Percent or More of Corridor	Section Providing Discussion of Resource
Federal			
National Parks or Memorial Parks	No	No	4.3.1
Historic Sites, or Landmarks	No	No	4.3.1
Natural Landmarks or Monuments	No	No	4.3.1
Wilderness Areas	No	No	4.3.1
State			
Historic Sites, Monuments, or Historical Markers	No	No	4.3.2
Archaeological Sites	Yes	No	4.3.2
Parks	No	No	4.3.2
Nature Preserves	No	No	4.3.2
County			
Parks	No	No	4.3.3
Recreation Areas	No	No	4.3.3
Municipal Parks	No	No	4.3.3
Other			
Areas Critical to the Life Stages of Threatened and Endangered Animal or Plant Species	No	No	4.3.4
Areas where Animal or Plant Species that are Unique or Rare to this State would be Irreversibly Damaged	No	No	4.3.5
Areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	No	No	4.3.6
Areas within 30 feet on either side of a direct line between (ICBM) launch or launch control facilities to avoid microwave interference.	No	No	4.3.7

4.3.1 FEDERAL RESOURCE REVIEW

Oasis has initiated consultations with appropriate federal agencies and conducted a comprehensive review of published information. Oasis concluded no national or memorial parks, natural landmarks, historic sites listed on the NRHP, monuments, or wilderness areas would be crossed or affected by the Project.

4.3.2 STATE RESOURCE REVIEW

Oasis has initiated consultations with appropriate state agencies and conducted a comprehensive review of published information. Oasis confirmed the absence of state parks, monuments, historical markers, or nature preserves within the proposed Corridor.

Oasis commissioned a Class I inventory of the Corridor. These efforts identified previously recorded historic properties and cultural resources. Oasis confirmed the presence of 14 previously recorded archaeological sites within the Corridor (cultural resources not listed on the NRHP). Refer to Section 2.3.5 for more information on these resources, Section 2 for a comprehensive discussion of Oasis agency consultations, and Appendix C for a record of the consultations. Mitigation details are discussed in the Route Permit Application.

4.3.3 COUNTY RESOURCE REVIEW

Oasis has confirmed through a combination of agency consultations and review of publicly available information the absence of county parks or recreation areas, municipal parks, or parks owned by other subdivisions of government bodies within the proposed Corridor. Refer to Section 2 of this document for a comprehensive discussion of Oasis consultations, and Appendix C for documentation of agency consultations.

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

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

Refer to Appendix C for documentation of the agency consultations, and Section 2 of the Route Permit Application 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

Oasis has engaged in federal and state agency consultations, 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, Oasis has confirmed the absence of protected species and/or their critical habitats. Refer to Appendix C for supporting documentation of agency consultations.

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

Based upon information compiled by the University of Wyoming regarding current and historic missile site locations, which was comprised of both tabular data describing these sites and supported with additional aerial imagery for each Minot Air Force Base ICBM site, Oasis has confirmed the absence of ICBM launch or launch control facilities located within 1,200 feet of 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

The University of Wyoming provided tabular data describing the location of historic missile sites; this data was supported by aerial imagery for each Minot Air Force Base

ICBM Site. Upon review of this data, it was confirmed that the Corridor does not contain areas within 30-feet of direct lines between ICBM launch or launch control facilities.

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

Avoidance areas are geographic areas that may 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; however, avoidance 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 avoidance areas within the proposed Corridor.

Avoidance Area	Within Corridor	50 % or More of Corridor	Section Providing Discussion of Resource
Federal			
Historic Districts	No	No	4.4.1
Wildlife Areas	No	No	4.4.1
Wild, Scenic or Recreational Rivers	No	No	4.4.1
Wildlife Refuges	No	No	4.4.1
Grasslands	No	No	4.4.1
State			
Wild, Scenic, or Recreational Rivers	No	No	4.4.2
Game Refuges or Game Management Areas	No	No	4.4.2
Forests or Forest Management Areas	No	No	4.4.2
Grasslands	No	No	4.4.2
Other			
Other Historic Resources not meeting Exclusion Areas criteria	No	No	4.4.3
Areas of Known Geologic Instability	Yes	No	4.4.4
Areas within 500 Feet of a Residence, School, or Place of Business	Yes	No	4.4.5
Reservoirs and Municipal Water Supplies	No	No	4.4.6
Water Sources for Organized Rural Water Districts	Yes	No	4.4.7
Irrigated Land (not applicable to underground facilities)	N/A	N/A	4.4.8
Areas of Recreational Significance which are not designated as Exclusion Areas	No	No	4.4.9

4.4.1 FEDERAL RESOURCE REVIEW

Oasis conducted agency consultations and a comprehensive review of publicly available information. 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 consultations.

4.4.2 STATE RESOURCE REVIEW

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

4.4.3 HISTORICAL RESOURCES NOT MEETING EXCLUSION AREA CRITERIA

Oasis conducted a review of publicly available information, initiated project specific agency consultations, and augmented agency review with field studies. Through these efforts, Oasis has concluded there are no historic resources not meeting exclusion area criteria within the Corridor. Refer to Appendix C for documentation of agency consultations and Appendix E for additional Cultural Resource information.

4.4.4 AREAS OF KNOWN GEOLOGIC INSTABILITY

Geologic instability generally refers to surface geology and areas where landslides have occurred. The North Dakota Geological Survey (NDGS) landslide mapping data was consulted for information regarding areas of landslides near the Project Area. Review of landslide deposit data from the North Dakota Geological Survey indicated the presence of 12 landslide deposits within the Corridor. These areas consist of a variable mixture of strata and deposits that have slid to the base of steep slopes. Most of the landslides in this area are hundreds, if not thousands of years old.

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 a review the U.S. Geological Survey abandoned mine data, no mining activities are located in the Corridor. Refer to the maps in Appendix B for the location of landslide deposits within the Corridor.

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

Aerial photography was utilized to identify structures located within the Corridor. Approximately 25 potentially occupied structures were identified within the Corridor. Refer to the Route Permit Application regarding potentially occupied structures within 500 feet of the Route.

4.4.6 RESERVOIRS AND MUNICIPAL WATER SUPPLIES

Oasis has confirmed the absence of reservoirs and municipal water supplies within the Corridor. Fourteen wells were identified within the Corridor; these wells are used for domestic, stock or observation purposes. Refer to the maps in Appendix B for the location of the wells.

4.4.7 WATER SOURCES FOR ORGANIZED RURAL WATER DISTRICTS

Oasis has confirmed the Johnsons Corner Christian Academy Well Head Protection Area is located within the Corridor, however there are no wells located within the Corridor. Refer to the maps in Appendix B for the location of this resource.

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

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

4.5 SELECTION CRITERIA (NDAC 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, Oasis believes the Project would successfully avoid or minimize these effects to the maximum extent practicable.

4.5.1 AGRICULTURAL IMPACT

Agricultural Production: The Corridor contains approximately 12,371 acres of private land. According to land cover data maintained by the USGS, approximately 3,318 of these acres are categorized as agricultural vegetation. An additional 8,363 acres are classified as shrub land or grasslands. Refer to Appendix B for maps depicting land cover within the Corridor.

Family Farms and Ranches: The Project would have no permanent impacts to lifestyle or farm/ranch operations once construction has been completed. The Corridor contains approximately 12,371 acres of private land. According to land cover data maintained by the USGS, approximately 3,318 of these acres are categorized as agricultural vegetation. An additional 8,363 acres are classified as shrub land or grasslands. Refer to Appendix B for maps depicting land cover within the Corridor.

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

Surface Drainage: Standard construction techniques would be employed; significant modifications to surface drainage patterns are not anticipated. Care would be taken throughout the construction process to minimize environmental impacts, including modification of drainage patterns. During restoration, those areas that were disturbed during construction would be restored, the local topography would be restored to its original contours, vegetation would be reestablished and impacts shall be minimal and temporary. Industry standard BMPs would be implemented and permanent impacts to surface drainage would be minimized to the maximum extent possible.

Ground Water: Well data, recorded by the State Water Commission, has been reviewed for the Project Area. Well data indicates groundwater in upland areas is located more than 20 feet below the surface. Typical subsurface excavations associated with the Project would not extend to more than ten feet below the ground surface. At that depth, the Project would not intersect the groundwater table, nor would the Project alter recharge rates or the infiltration, permeability, or percolation of water into the groundwater reservoir. Additionally, construction would 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 temporarily 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 of the proposed Project would 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 would 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. Once constructed and in-service, normal pipeline operations are not audible.

Visual Effect on Adjacent Areas: The Project would include three aboveground tanks and two block valves. Each valve assembly occupies approximately 0.04 acres with exposed piping and appurtenances that may be up to six feet in height. These facilities would be enclosed within chain-link fences with security wires to protect against vandalism. The location of each would be clearly marked with a small placard that details ownership and contact information. These features are common throughout the landscape and are not obtrusive. No other permanent aboveground features are to be installed as a part of the Project.

Extractive and Storage Resources: This Project would 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. Oasis commissioned field surveys to identify and record the locations of these resources along the proposed Route. Refer to Section 2 in this document for a comprehensive discussion of the field studies results, as well as Appendix C for copies of the consultations. Mitigation details are discussed in the Route Permit Application.

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

Human Health and Safety: Oasis' Health and Safety Policy meets or exceeds federal and state laws, rules and regulations, and is enforced equally with respect to both Oasis and contractor employees. The implementation of this policy promotes a safe and healthy workplace during construction and operation of all Oasis assets. In addition, the operation of the pipeline would 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 would not be displaced by the Project and no measurable impact to the viability of these populations would occur. Oasis does not anticipate species of special concern to experience direct impacts due to construction or operation of the proposed Project.

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

4.6 POLICY CRITERIA

4.6.1 POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

Oasis 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. Oasis would 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 Oasis are required to conduct their work in compliance with environmental conditions, permit authorizations, and applicable regulations, and would be held accountable for their actions in that regard.

4.6.2 LOCATION AND DESIGN

The Project would be located in McKenzie County, North Dakota and result in a mainline transmission pipeline originating at the Wild Basin Gas Processing and Crude Handling Facility near Watford City, North Dakota and terminate at the Tesoro Johnsons Corner Station which is located approximately 2.8 miles east of Johnsons Corner North Dakota. Lateral 1 would transport crude from the mainline to the proposed Dakota Access Pipeline (DAPL) Johnsons Corner Terminal facility that will be located approximately 0.8 miles east of Johnsons Corner. Refer to the Project maps provided in Appendix B.

The Project would be approximately 19 miles in length constructed of steel, and would be a nominal 10.75-inch outside diameter pipe. The pipe installed would have a nominal wall thickness of 0.250 inches (minimum) denoted as API Code 5L specification PSL2 Grade X52 pipeline pipe. The maximum operating pressure of the pipeline would be 1,480 psig.

The proposed pipeline would meet US Department of Transportation regulations, specifically the design criteria outlined in 49 CFR part 195 subpart C, constructed per 49 CFR part 195 subpart D, and operated and maintained per 49 CFR part 195 subpart F.

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 would be primarily comprised of a specialized workforce. The primary labor force would be contracted, supplying specialized skilled labor. The workforce is anticipated to reach a peak of approximately 100 personnel.

4.6.4 ECONOMIES OF CONSTRUCTION AND OPERATION

Oasis would invest approximately $13 million in North Dakota to develop this Project. Once constructed and in-service, the continued costs of maintenance and operation of the proposed pipeline are minimal.

4.6.5 USE OF CITIZEN COORDINATING COMMITTEES

Oasis has established and maintains a good relationship with the local community officials and the local population. These relationships provide multiple grass roots communication channels to inform local residents regarding the developments associated with the Project.

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

The proposed Project would interconnect with one existing and one proposed facility. The products currently handled, transferred, and shipped at the existing facility are currently delivered to markets located in and out of the state.

4.6.7 LABOR RELATIONS

Oasis 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

Oasis owns and operates all of the affected facilities; thus, coordination would be seamless and executed from within Oasis' internal management systems.

4.6.9 MONITORING OF IMPACTS

Oasis 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. Oasis would monitor landowner concerns through its right-of-way (ROW) department and would respond to all reasonable requests. In a similar manner, Oasis would monitor community concerns and would respond to all reasonable concerns brought to its attention by local community leaders. Oasis would select a contractor for construction of the Project and

would coordinate the oversight responsibilities for construction activities with this contractor throughout the Project. Environmental responsibilities would be coordinated in the same manner.

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

Oasis chose the preferred Project alignment in an effort to maximize the use of existing utility corridors. Approximately 67% (13 miles) of the Project is co-located with existing utility corridors. Refer to Appendix B for maps depicting portions of the Project which are collocated with other utilities.

4.6.11 OTHER EXISTING OR PROPOSED TRANSMISSION FACILITIES

Appendix F contains Oasis' 10-Year Plan, which contains details regarding existing and planned Oasis 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 meets the citing criteria, and provides Oasis with the opportunity to utilize existing assets, and minimize 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 would 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 would allow routing options that would 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 would effectively mitigate the impacts of construction along with the final approved route. Standard pipeline construction techniques would involve temporary impacts, but long term or permanent impacts would be avoided through implementation of modern construction techniques, adherence to permit requirements, and avoidance of sensitive features identified during routing studies.

Oasis and its affiliates own and operate other 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 would allow Oasis to draw upon existing pipeline and facility assets in the region.

5.2 CONSTRUCTION

The proposed construction of the Project would 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 four months to complete. Construction techniques would 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 would immediately follow pipeline construction. Final grading would restore the original contours of the

land. Disturbed areas would be prepared for re-seeding and restoration would be coordinated to meet landowner specifications.

5.3 OPERATION

Once put into service, the proposed Project would operate continuously, delivering crude oil from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. 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 would conform to applicable DOT requirements, which include regular pipeline monitoring and periodic inspection; additionally, routine maintenance of the ROW would likely be required to remain in compliance.

SECTION 6: LIST OF PREPARERS

David Copeland, Regulatory Specialist
Oasis Petroleum, N.A., 1001 Fannin, Suite 1500, Houston, TX 77002

M.A. Legal Studies, Environmental Law, Texas State University – San Marcos, Texas; and B.S. Business Management, Oklahoma State University – Stillwater, OK. Mr. Copeland has 5 years of regulatory compliance experience, which includes Texas damage prevention rules for underground oil and gas facilities, DOT pipeline safety regulations, as well as Texas' own pipeline safety rules. Mr. Copeland's expertise includes technical writing for state and federal drilling permits, and conditional use permits for county ordinances.

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 20 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, and 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 10 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.

Melissa Schmit
Consultant
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

B.A. in Environmental Studies and Geography, Gustavus Adolphus College; and J.D., Hamline University School of Law. Ms. Schmit has eight years of environmental consulting experience. Ms. Schmit has pursued a career focused on regulatory compliance and supports energy clients by providing regulatory review and permitting services. Ms. Schmit's experience includes authoring technical reports in compliance

with NEPA requirements for a variety of infrastructure projects across the Midwest and coordination with federal, state, and local agencies.

Jon Knudsen
Wildlife Biologist
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

M.S. Biology, Idaho State University – Pocatello, ID; and B.S. Zoology, University of Wisconsin – Madison, WI. Mr. Knudsen has 10 years of environmental consulting and biological monitoring experience, which includes horizontal project management of oil, gas, wind, and mining projects in Colorado, Wyoming, Montana, and North Dakota. His expertise includes surveying sensitive species, writing technical reports, and consulting with regulatory agencies to ensure clients are in compliance with associated rules and regulations. In addition, Mr. Knudsen specializes in training energy development companies on wildlife-related issues, including the Endangered Species Act and Migratory Bird Treaty Act.

Garrett Knudsen, RPA
Senior Cultural Resource Specialist
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

Ph. D. (candidate), Faculty of Archaeology and Anthropology, University of Cambridge, M.A. Anthropology, Idaho State University – Pocatello, ID; and B.S. Anthropology and Zoology, University of Wisconsin – Madison, WI. Mr. Knudsen is a Secretary of Interior qualified archaeologist with over 15 years of experience in cultural resource management, heritage preservation, and environmental compliance for private and public clients in the transportation, energy, and mining industries. Mr. Knudsen's regions of expertise include greater western North America; Midwest, Great Plains, Southwest, California, Texas, Great Basin, Plateau, Northwest Coast, and Alaska. He is also a specialist in archaeological landscapes, remote sensing, human skeletal remains, and predictive models.

E3 ENVIRONMENTAL
Enhancing Execution with Experience

North Dakota Public Service Commission

Application for Route Permit

Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner Crude Oil Pipeline

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

November 2015

Authority	List of Contents Required by 69-06-05-01: Application for Transmission Facility Permit	Section(s)
2.a.(1)	Type of facility proposed	1.1
2.a.(2)	Purpose of facility	1.2
2.a.(3)	Technology to be deployed	1.1
2.a.(4)	Type of product to be transmitted	1.1
2.a.(5)	Source of product being transmitted	3.0
2.a.(6)	Final destination of product being transmitted	1.2
2.a.(7)	Size and design detail and any alterative size and design	1.3
2.a.(7)(a)	The width of right-of-way	1.5
2.a.(7)(b)	The approximate length of facility	1.3.1
2.a.(7)(c)	The estimated span length for electric facilities	N/A
2.a.(7)(d)	The anticipated type of structure for electric facilities	N/A
2.a.(7)(e)	The voltage for electric facilities	N/A
2.a.(7)(f)	The requirement for and general location of any new associated facilities	1.4
2.a.(7)(g)	The estimated distance between pipeline surface structures	1.3.1
2.a.(7)(h)	The pipe size	1.3.2
2.a.(7)(i)	The maximum design for pipeline operating pressure and temperature	1.3.3
2.a.(7)(j)	The maximum design pipeline flow rate	1.3.3
2.a.(7)(k)	The number and general location of compressor or pumping stations	1.4
2.b.	Time schedule	1.7
2.b.(1)	Obtaining the certificate of corridor compatibility	1.7.2
2.b.(2)	Obtaining the route permit	1.7.1
2.b.(3)	Completing right-of-way acquisition	7.1

2.b.(4)	Starting construction	1.7.3
2.b.(5)	Completing construction	1.7.3
2.b.(6)	Testing operations	1.7.3
2.b.(7)	Commencing operations	1.7.3
2.c.	A copy of each evaluative study or assessment of the environmental impact of the proposed facility submitted to the agencies listed in section 69-06-01-05 and each response received	Appendix C
2.d.	Need for the facility	3.0
2.e.	Description of alternatives	2.2
2.f.	Corridor width	N/A – Refer to Certificate of Corridor Compatibility
2.g.	Study area to enable the Commission to evaluate the factors in the Century Code section 49-22-09;	2.1, 4.1.1
2.h.	Discussion of factors in Century Code 49-22-09 to aid Commission's evaluation	4.1
2.i.	A discussion of the applicant's policies and commitments to limit the environmental impact of its facilities, including copies of the board resolutions and management directives	4.5
2.j.	Map of criteria that led to route location	Appendix B
2.k.	Discuss relative value of each criteria and how the location was selected; how operation will affect criteria	4.2, 4.3
2.l.	Mitigating measures	5.0
2.m.	Qualifications of each person involved in location study	8.0
2.n.	Map identifying criteria that led to the route location and new facilities	Appendix B

2.o.	8 ½ X 11 black and white map suitable for newspaper publication	Located in digital copy of Consolidated Application
2.p.	Discussion of present and future natural resource development in the area	4.2, 4.3
2.q.	Maps and GIS data for the project meeting the PSC requirements	Appendix B, electronic GIS data located in digital copy of Consolidated Application

Authority	List of Contents Required by 69-06-08-02: Transmission Facility Route Criteria	Section(s)
1	**Exclusion Areas**	4.2
1.a	Designated or registered nation: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	2.3.5, 2.3.6, 4.1.8, 4.2.1, 5.1
1.b.	Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves	2.3.5, 2.3.6, 4.1.8, 4.2.2, 5.1
1.c.	County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.	4.1.7, 4.1.10, 4.2.3
1.d.	Areas critical to the life stages of threatened or endangered animal or plant species.	2.3.4, 4.1.9, 4.2.4, 5.1
1.e.	Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	2.3.4, 4.1.9, 4.2.5, 5.1

1.f.	Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	4.2.6
1.g.	Areas within thirty feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference.	4.2.7
2	**Avoidance Areas**	4.3
2.a.	Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	2.3.5, 2.3.6, 4.1.8, 4.3.1
2.b.	Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.	4.1.8, 4.3.2
2.c.	Historical resources which are not specifically designated as exclusion or avoidance areas.	4.3.3
2.d.	Areas which are geologically unstable.	4.3.4
2.e.	Within five hundred feet [152.4 meters] of a residence, school, or place of business. This criterion shall not apply to a water pipeline transmission facility.	4.3.5
2.f.	Reservoirs and municipal water supplies.	4.3.6
2.g.	Water sources for organized rural water districts.	4.3.7
2.h.	Irrigated land. This criterion shall not apply to an underground transmission facility.	4.3.8
2.i.	Areas of recreational significance which are not designated as exclusion areas.	4.3.9
3	**Selection Criteria**	4.4
	The impact upon agriculture:	4.4.1
3.a.(1)	Agricultural production.	4.4.1, 6.1
3.a.(2)	Family farms and ranches.	4.4.1

3.a.(3)	Land which the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.	4.4.1
3.a.(4)	Surface drainage patterns and ground water flow patterns.	2.3.3, 4.4.1
	The impact upon:	4.4.2
3.b.(1)	Sound-sensitive land uses.	4.4.2
3.b.(2)	The visual effect on the adjacent area.	4.4.2
3.b.(3)	Extractive and storage resources.	4.4.2
3.b.(4)	Wetlands, woodlands, and wooded areas.	2.3.2, 2.3.3, 4.4.2, 5.1, 6.1
3.b.(5)	Radio and television reception, and other communication or electronic control facilities.	4.4.2
3.b.(6)	Human health and safety.	4.1.1, 4.4.2
3.b.(7)	Animal health and safety.	2.3.4, 4.1.9, 4.4.2, 5.1
3.b.(8)	Plant life.	2.3.1, 2.3.2, 4.1.9, 4.4.2, 5.1
4	**Policy Criteria**	4.5
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4.e.	A commitment of a portion of the transmitted product for use in this state.	4.5.6
4.f.	Labor relations.	4.5.7

4.g.	The coordination of facilities.	4.5.8
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4.j.	Other existing or proposed transmission facilities.	4.5.11

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APPENDICES

INTRODUCTION

Oasis Midstream Services, LLC (Oasis), owns and operates various pipeline assets throughout Montana and North Dakota. Oasis is proposing the Wild Basin to Johnsons Corner Crude Oil Pipeline Project (Project), which would be located in McKenzie County, North Dakota. The Project scope includes a new 10.75-inch outside diameter crude oil mainline and one lateral pipeline totaling approximately 19 miles in length. The mainline would originate at the Wild Basin Gas Processing and Crude Handling Facility and extend southeast to terminate at the Tesoro Johnsons Corner Station which is located approximately 2.8 miles east of Johnsons Corner North Dakota. Lateral 1 would transport crude from the mainline to the proposed Dakota Access Pipeline (DAPL) Johnsons Corner Terminal facility that will be located approximately 0.8 miles east of Johnsons Corner. Additionally, three aboveground storage tanks will be constructed at the Wild Basin Gas Processing and Crude Handling Facility providing 200,000 barrels of storage capacity. Refer to the maps in Appendix B for an overview of the Project.

Oasis 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 proposed Project would result in a new crude oil transmission pipeline. The steel pipeline would meet U.S. Department of Transportation (DOT) regulations, specifically the design criteria outlined in 49 CFR part 195 subpart C, constructed per 49 CFR part 195 subpart D, and operated and maintained per 49 CFR part 195 subpart F.

1.2 PURPOSE OF TRANSMISSION FACILITY

The purpose of the Project is to transport crude oil from the Wild Basin Gas Processing and Crude Handling Facility where the crude is housed in above ground storage tanks to third party pipeline interconnects near Johnsons Corner (Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility). From these facilities, the product would be transported via interconnecting pipelines for distribution to refineries across the United States. Oasis estimates the Project would cost approximately $13 million to develop.

1.3 LENGTH, SIZE AND DESIGN OF PIPELINE FACILITY

1.3.1 LENGTH OF FACILITY

The proposed Project is approximately 19 miles in length. The Mainline is approximately 18.3 miles and Lateral 1 is approximately 0.9 miles in length.

1.3.2 PIPE SIZE

The Project pipeline specifications are detailed below:

- 10.75-inch outside diameter steel pipe
- 0.250-inch wall thickness (minimum)

1.3.3 OPERATING PRESSURE AND THROUGHPUT

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

- Normal Operating Pressure: 500 pounds per square inch gauge (psig)
- Maximum Operating Pressure: 1,480 psig
- Normal Throughput: approximately 50,000 barrels per day (bpd)
- Maximum Throughput: approximately 75,000 bpd
- Maximum Operating Temperature: 120 degrees Fahrenheit

1.4 ABOVEGROUND FACILITIES

The Project would include the construction of three additional aboveground tanks at the Wild Basin Gas Processing and Crude Handling Facility. One tank would have 100,000 barrels of storage capacity and two tanks would have 50,000 barrels of storage capacity. The addition of these tanks will bring the total storage capacity at the Wild Basin Gas

Processing and Crude Handling Facility to approximately 200,000 barrels. The additional storage volume is required to support the transmission line. Two block valves would also be installed as part of the Project. These aboveground appurtenances would be designed to and installed at locations that will meet DOT regulations. Oasis would also improve and expand an existing two-track road to allow permanent access to the block valve location on Lateral 1. Refer to Appendix A for engineering schematics of these facilities and Appendix B for maps providing the location of the planned aboveground facilities.

1.5 WIDTH OF RIGHT-OF-WAY

The Project would be constructed utilizing a 75-foot construction right-of-way (ROW). Oasis would maintain 25-foot permanent ROW along the entire length of the pipeline.

1.6 LOCATION

The Project would be located in McKenzie County, North Dakota. Crude would be transported from the Wild Basin Gas Processing and Crude Handling Facility near Watford City, North Dakota to facilities located east of Johnsons Corner, North Dakota. Project maps are provided in Appendix B.

1.7 PROJECT SCHEDULE

1.7.1 ROUTE PERMIT

Oasis is seeking a Route Permit by or before April 2016.

1.7.2 CERTIFICATE OF CORRIDOR COMPATIBILITY

Oasis seeks a Certificate of Corridor Compatibility by or before April 2016.

1.7.3 CONSTRUCTION SCHEDULE

Oasis has scheduled construction activities to commence during the second quarter of 2016. The construction activities would take approximately four months to complete. Commissioning and restoration activities would commence immediately after construction is complete.

1.7.4 ADDITIONAL PROJECT PERMITS OR AUTHORIZATIONS

The Project will be constructed in compliance with applicable federal, state and local laws, regulations or plans. Oasis will obtain necessary permits or approvals for the construction and operation of the Project. Appendix H contains a comprehensive list of permits or authorizations Oasis is pursuing.

SECTION 2: ROUTE ANALYSIS AND ENVIRONMENTAL STUDIES

2.1 PIPELINE ROUTE

Oasis 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 one-mile corridor centered upon a proposed route). The purpose of this analysis was to confirm the proposed Project Corridor is suitable and would cause minimal environmental impacts, thus conforming to the PSC siting criteria.

In conjunction with these efforts, Oasis studied routing alternatives and developed the proposed Project alignment (Route). Oasis chose this Route to meet landowner requests and to minimize impacts to environmental features. The Route meets the Project's objectives while conforming to the PSC's transmission route siting requirements. In support of Oasis' route selection, the desktop studies from the Corridor were refined and augmented with field studies of the Route.

Trained natural and cultural resource specialists conducted field studies in April and September 2015. The purpose of the field studies was two-fold: (1) to definitively identify any potential resource issues (*e.g.*, 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 environmental Survey Corridor was 250 feet wide centered on the proposed Route. The results of these field surveys are summarized in the following sections; the Natural Resources Report is located in Appendix D, and the Cultural Resources Report Abstract is located in Appendix E. The full cultural resources report is privileged and not included in this Application per ND SHPO guidance, the guidance letter is also contained in Appendix E. The Survey Corridor is depicted on the maps in Appendix B.

2.2 ROUTE ALTERNATIVES

Construction of the proposed Project would provide firm, reliable service for 50,000 barrels of crude oil per day from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. From these facilities, the product would continue through interconnecting pipelines and become available for transport to refineries across the United States. Oasis identified and evaluated several project alternatives; however, none of these alternatives effectively satisfied the Project objective. These alternatives included:

- No Action Alternative;
- Trucking Alternative
- Rail Alternative

No Action Alternative:

This alternative would leave the region constrained by limited transport capacity for safe and reliable transmission of crude oil products to markets. A no action alternative could result in the curtailment of crude oil production. For these reasons, Oasis rejected a *No Action Alternative*.

Trucking Alternative:

This alternative was reviewed and eliminated due to the volume of crude oil to be transported. The normal daily throughput of the proposed Project would be approximately 50,000 barrels or 2,100,000 gallons of crude oil. The average load for a truck carrying crude oil is approximately 178 barrels (approximately 7,500 gallons) per truck. Thus, it would require 280 trucks per day, an average of 11.6 trucks every hour for 24 hours a day to transport this volume of product. This level of truck activity is not logistically feasible, as it would cause significant amounts of heavy vehicle traffic for area residents, as well as additional wear and tear on the infrastructure. Disruption in the trucking capacity due to seasonal load restrictions on roads, inclement weather or road repairs would cause a delay in delivering this valuable resource to market. This alternative is not desirable; therefore, Oasis rejected a *Trucking Alternative*.

Rail Alternative:

A Rail Alternative was also evaluated as a surface transportation alternative. However, this alternative was determined not feasible because of 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, Oasis rejected a *Rail Alternative*.

2.3 ENVIRONMENTAL SURVEY

Field surveys were conducted in April and September of 2015. The Survey Corridor was typically a 250-foot corridor centered upon the proposed Route. The Survey Corridor is depicted on the maps in Appendix B.

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. Field surveys identified a total of 183 noxious weed patches within the Project Survey Corridor. A summary of the features found within each segment of the Project follows.

Mainline: A total of 182 noxious weed patches were identified within the Mainline Survey Corridor during field surveys.

Lateral 1: One noxious weed patch was identified within the Lateral 1 Survey Corridor during field surveys.

Oasis would implement the appropriate mitigation measures in these areas to avoid spreading of the noxious weed. Refer to Appendix D for the Natural Resources Report and Section 5 for proposed mitigation procedures.

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 would form the baseline for restoration and mitigation reconciliation. Field survey identified 434 tree and shrub areas containing 1,206 trees within the 250-foot wide Survey Corridor. A summary of the features found within each segment of the Project follows.

Mainline: Field survey identified 430 tree and shrub areas were located within the Mainline Survey Corridor. In total, 1,204 trees were identified within the 250-foot wide Survey Corridor.

Lateral 1: Field survey identified four tree and shrub areas located within the Lateral 1 Survey Corridor. In total, two trees were identified within the 250-foot wide Survey Corridor.

See Appendix D for the complete Natural Resources Report and Section 5 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) features. Field crews identified features, characterized these features as a wetland or waterbody and recorded feature boundaries relative to the proposed Route to facilitate avoidance mitigation where practicable. Appendix D contains the Natural Resources Report, which outlines the results of these field studies.

2.3.3.1 WETLAND SURVEY

Field survey identified 12 wetland features within the Project Survey Corridor. A summary of the features found within each segment of the Project follows.

Mainline: Field surveys identified 10 wetland features within the Mainline Survey Corridor, one of which is likely U.S. Army Corps of Engineers (USACE) jurisdictional.

Lateral 1: Field surveys identified two wetland features within the Lateral 1 Survey Corridor, none of which are likely USACE jurisdictional.

Oasis would implement appropriate mitigation measures at these features, which may include avoidance (*e.g.,* workspace modification or horizontal directional drill) or use of construction mats and other best management practices (BMPs), to minimize impacts. Refer to Appendix D for the Natural Resources Report and Section 5 for proposed mitigation measures.

2.3.3.2 WATERBODIES SURVEY

Field survey identified 18 waterbody features within the Project Survey Corridor. A summary of the features found within each segment of the Project follows.

Mainline: Field surveys identified 18 waterbody features within the Mainline Survey Corridor, seven of which are likely USACE jurisdictional.

Lateral 1: Field surveys confirmed the absence of waterbody features within the Lateral 1 Survey Corridor.

Refer to Appendix B for the mapped location of each feature, Appendix D for the Natural Resources Report and Section 5 for 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 song birds (*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 Survey Corridor was inventoried for sensitive species and their critical habitat. No threatened or endangered species or their critical habitats were observed by field biologists. Appendix D contains the Natural Resources Report, which outlines the results of these field studies.

2.3.4.1 FEDERALLY PROTECTED SPECIES SURVEY

Under authority of the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) and the Fisheries Service division of the National Oceanic and Atmospheric Administration (NOAA) have identified and maintain a list of species and critical habitats that have been afforded protection under the ESA. The ESA also provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they live.

On July 28, 2015 and October 1, 2015, E3 Environmental, LLC (E3), on behalf of Oasis, requested a USFWS review of the Project, requesting information relating to the presence or absence of threatened and endangered species within the Project Area. A response from the USFWS is pending. Refer to Appendix C for agency correspondence.

Oasis commissioned field studies to confirm the presence or absence of these species and/or their critical habitats along the proposed pipeline Route. The results of this assessment are provided below. Refer to Appendix D for the Natural Resources Report, which outlines the results of these field studies, and Section 5 for proposed mitigation measures.

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 impact the whooping crane.

Least tern: Lake Sakakawea and the Missouri River, located approximately 12 miles to the east of the Project, provide suitable breeding and nesting habitat for least terns. However, the Survey Corridor does not contain the sandbars and riverbanks necessary for nesting. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the horizontal directional drilling (HDD) method for crossing waterbodies with the hydrologic capability of carrying sediment loads downstream. Due to the lack of nesting habitat within the Survey Corridor and the method of crossing these intermittent and ephemeral streams to avoid runoff, impacts to the interior least tern are not anticipated.

Pallid sturgeon: Lake Sakakawea and the Missouri River, located approximately 12 miles to the east of the Project, provide suitable habitat for the pallid sturgeon. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the HDD method for crossing waterbodies with the hydrologic capability of carrying contaminants downstream, likely resulting in minimal to no impacts to this listed species.

Gray wolf: Suitable habitat for the gray wolf does not occur in the Survey Corridor and the activities associated with construction and later operations would likely serve as a deterrent to this species. Therefore, impacts to the gray wolf are not anticipated.

Red knot: North Dakota is a possible migration stopover in spring and autumn for the rufa red knot, particularly within Lake Sakakawea and its major tributaries. Due to the lack of suitable foraging habitat within the Survey Corridor, impacts to this species and its associated habitat are not anticipated.

Piping plover: Lake Sakakawea and the Missouri River, which are located approximately 12 miles to the east of the Project, provide suitable breeding and nesting habitat for piping plovers. The Survey Corridor does not contain the sandbars or gravel beaches necessary for nesting. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the HDD method for crossing waterbodies with the hydrologic capability of carrying sediment loads downstream. Due to the lack of nesting habitat within the Survey Corridor and the method of crossing these intermittent and ephemeral streams to avoid runoff, impacts to the piping plover are not anticipated.

Dakota Skipper: To date, no Dakota skippers have been identified within the Survey Corridor and the nearest critical habitat identified by the USFWS is located 20 miles northeast of the Project in McKenzie County. However, the Survey Corridor intersects areas that desktop and field reviews suggest are potential marginal Dakota skipper habitat. Suitable habitat observed within the Survey Corridor was relatively disturbed,

with scars from other ROWs and agricultural fields dissecting patches that would otherwise be native prairie grassland. Therefore, disturbance to potential suitable habitat would be unavoidable. Project impacts on this species would remain minimal, as only small tracts of prairie will be cleared for construction.

Northern long-eared bat: Suitable winter habitat does not occur in the Survey Corridor and no mapped hibernacula are located in North Dakota. Because the northern long-eared bat can occur in similar habitats to other *Myotis* species, suitable habitat does exist within the Survey Corridor in the form of green ash, bur oak, and boxelder tree woodlands.

Bald and Golden Eagle: Field surveys conducted in September of 2015 confirmed suitable habitat is present within the Survey Corridor or within line-of-site of the Survey Corridor. No Bald or Golden eagle nests were observed during field surveys. Refer to Section 5 for mitigation measures should a bald or golden eagle be observed during construction.

Migratory Birds: Field studies confirmed suitable habitat for migratory birds exists within the Survey Corridor. No active nests were observed within the Mainline or Lateral 1 Survey Corridor, however the recommended half mile buffer for two red-tailed hawk nests and one northern harrier nest were identified within the view shed of the Mainline. Section 5 contains mitigation measures to be implemented should migratory birds be encountered during construction.

2.3.5 U.S. FISH AND WILDLIFE SERVICE MANAGED LANDS

On July 28 and October 1, 2015, on behalf of Oasis, E3 requested a USFWS review of the Project and 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 correspondence.

2.3.6 NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

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

In September of 2015, a Class I cultural resources inventory (literature review) was conducted of records from the State Historical Society of North Dakota to identify previously completed cultural resource investigations and recorded cultural resources within one mile of the Corridor. The Class I cultural resources inventory identified 14 recorded cultural resources within the Corridor. The cultural resources consist of five sites (32MZ772, 32MZ782, 32MZ793, 32MZ2672, 32MZ2697) and nine isolates (32MZx184, 32MZx187, 32MZx415, 32MZx1119, 32MZx1173, 32MZx1190, 32MZx1214, 32MZx1228, 32MZx1229). Three of the previously recorded sites are not eligible for the National Register of Historic Places (NRHP), two are unevaluated, and as isolates, the remaining resources are not eligible for the NRHP. One of the previously recorded cultural resources was identified within the Survey Corridor.

The ensuing Class III cultural resource inventory of the Survey Corridor was conducted in September 2015. During the inventory, archaeologists revisited one previously recorded cultural resource (32MZ793); and recorded 15 new resources (three archaeological sites and 12 isolated finds). The three newly recorded archaeological sites are recommended not eligible for the NRHP and require no further work. As isolates, the 12 remaining newly recorded sites are considered not eligible and require no further work. The previously recorded site (32MZ793) is left unevaluated for the NRHP even though several cairn features recorded within the site boundary are recommended eligible. It is recommended that these eligible features be provided 50-foot buffers from the outside edge their boundaries for avoidance by construction activities or ground-disturbing activities. If ground-disturbing activities occur between 50 feet and 25 feet of feature boundaries, on-site monitoring by a qualified archaeologist is recommended. Additionally no ground-disturbing activities should occur within 25 feet of eligible feature boundaries. If construction does occur within 25 feet of the site boundaries, on-site monitoring by a qualified archaeologist is recommended.

Based on the inventory results, E3 recommended that a determination of *No Significant Sites Affected* and *No Historic Properties Affected* be granted for the Project to proceed as planned.

Oasis submitted the Cultural Resources Report to the NDSHPO requesting concurrence with the recommendation of *No Significant Sites Affected* for the Project. A response from the NDSHPO is pending. Refer to Appendix C for documentation of agency consultations and Appendix E the Cultural Resource Report Abstract.

SECTION 3: ANALYSIS OF NEED BASED ON PRESENT AND PROJECTED DEMAND, INCLUDING SYSTEM STUDIES

The Project would transport product from formations in the Williston Basin. The development of hydrocarbon production in the Williston Basin has increased significantly in recent years due to advancements in deep horizontal directional drilling techniques and subsequent oil extraction in the Bakken and Three Forks Shale formations. Studies conducted by the North Dakota Department of Mineral Resources and the USGS in 2010 estimated mean undiscovered volumes of 3.65 billion barrels of recoverable crude oil reserves may be available in North Dakota's deep shale formations. From March of 2007 to July of 2015, oil production in North Dakota has surged. In March of 2007, North Dakota produced 118,000 barrels of oil per day. That figure has increased to 1,201,920 barrels per day in July of 2015. In 2007, North Dakota accounted for roughly 2.5 percent of all the oil produced in the United States. In 2013, North Dakota accounted for roughly 11 percent of all the oil produced in the country.

A major constraint in transporting hydrocarbons from North Dakota to 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 crude oil, natural gas and natural gas liquids. 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 would provide firm, reliable transport of 50,000 bpd of crude oil from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. From these facilities, the product would continue through interconnecting pipelines to refineries across the United States.

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 Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. From these facilities, the product would continue through interconnecting pipelines to refineries across the United States. Oasis owns and operates the Wild Basin Gas Processing and Crude Handling Facility. As such, all routing was anchored from this location to potential destinations. The two facilities (Tesoro Johnsons Corner Station and the DAPL Johnsons Corner Terminal facility) were chosen due to the capacity of product being transported and to provide greater access to more markets.

Route planning between the Wild Basin Gas Processing and Crude Handling Facility and the Johnsons Corner area 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 Wild Basin Gas Processing and Crude Handling Facility, identification of existing utility corridors for collocation, and acquisition of pipeline ROW from area landowners.

Field studies were conducted to identify environmental, biological and cultural resources along the Route; the results of this effort are discussed in Section 2 of this document. The full Natural Resources report is provided in Appendix D. Refer to Appendix E for the Cultural Resources Report Abstract. The sections below discuss possible effects on the public health and welfare.

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 specifically designed to minimize adverse environmental impacts.

The Project would 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.

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 would be temporary and minimized through compliance with environmental permits. The potential impacts to resources including vegetation, wildlife, agricultural operations, transportation, and noise levels are discussed in the following sections. Oasis would mitigate these temporary impacts to the maximum extent possible.

The Project would 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:

Oasis would fully participate in the hearing process and would 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:

Oasis 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:

Oasis would invest approximately $13 million in North Dakota to develop this Project. Once constructed and in-service, the continued costs of maintenance and operation of the proposed Project are minimal. While the pipeline itself would not generate any direct tariff revenues for the state of North Dakota, it is estimated the gross product value produced and transported through the Project would 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:

Oasis is aware of possible future developments near the Route; however, the Project will not conflict with any known developments planned in the area.

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

Oasis commissioned Class I and Class III cultural resource inventories. Oasis developed mitigation plans for registered or eligible sites that encroach on the proposed construction corridor. The proposed mitigation measures are detailed in Section 5 of this document. All related agency consultations can be found in Appendix C, and supporting documentation of field studies can be found in Appendix E. The full cultural resources report is privileged and not included in this Application.

Project-specific consultation 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 consultations.

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 impacts to the environment. See Section 2 for a comprehensive discussion of Oasis' effort to identify sensitive environmental resources within the proposed Route and Section 5 for a comprehensive discussion of proposed mitigation. Oasis 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 would not result in an impact to listed or sensitive species or their habitats. See Appendix C for complete federal and state agency consultations. Detailed survey results can be found in Appendix D.

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

Oasis provided Project specific consultations to various federal, state and local agencies; through this consultations process, these agencies had the opportunity to identify possible sensitive environmental resources within the Route and any related agency concerns. A summary of these concerns are 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 indicated there are no documented significant ecological community occurrences or plant and animal species of concern within the Corridor. The Department recommends the Project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed to help secure rare species conservation in North Dakota. The Department also recommends any impacted areas be revegetated with species native to the Project Area.

- 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. The Department recommended steps be taken to protect wetlands that cannot be avoided and that no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas.

Oasis incorporated this feedback into the Route selection process, and as appropriate, into field survey protocols. If field studies confirmed the presence of these items, Oasis refined the proposed alignment or developed mitigation strategies to avoid or minimize direct impacts. Further discussion on agency coordination can be found in Section 2 of the Certificate of Corridor Compatibility application and discussions of avoidance and mitigation measures are found in Section 5 of this document. See Appendix C for a summary of federal and state agency consultations within the Agency Consultations and Communications table and for copies of the correspondence. Detailed natural resource survey results can be found in Appendix D. Refer to Appendix E for the Cultural Resources Report Abstract.

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

A route cannot intersect the following areas and a buffer zone of a reasonable width to protect the integrity of the area must be implemented. A survey corridor may contain exclusion areas; however, exclusion areas may not encompass more than 50 percent of the survey corridor width at any point, unless there is no reasonable alternative. The following table and text identify and discuss exclusion areas identified within the Project Survey Corridor (Mainline and Lateral 1).

Exclusion Area	Within Project Survey Corridor	Crossed by Route	50 % or More of Survey Corridor	Section Providing Discussion of Resource
Federal				
National Parks or Memorial Parks	No	No	No	4.2.1
Historic Sites or Landmarks	No	No	No	2.3.5, 4.2.1
Natural Landmarks or Monuments	No	No	No	4.2.1
Wilderness Areas	No	No	No	4.2.1
State				
Historic Sites, Monuments, or Historical Markers;	No	No	No	4.2.2
Archaeological Sites	Yes	No	No	2.3.5, 4.2.2

Exclusion Area	Within Project Survey Corridor	Crossed by Route	50 % or More of Survey Corridor	Section Providing Discussion of Resource
Parks	No	No	No	4.2.2
Nature Preserves	No	No	No	4.2.2
County				
Parks	No	No	No	4.2.3
Recreation Areas	No	No	No	4.2.3
Municipal Parks	No	No	No	4.2.3
Other				
Areas Critical to the Life Stages of Threatened or Endangered Animal or Plant Species	No	No	No	Section 2.3, 4.2.4, Section 5
Areas where Animal or Plant Species that are Unique or Rare to this State would be Irreversibly Damaged	No	No	No	4.2.5
Areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	No	No	No	4.2.6
Areas within 30 feet on either side of a direct line between (ICBM) launch or launch control facilities to avoid microwave interference.	No	No	No	4.2.7

4.2.1 FEDERAL RESOURCE REVIEW

Oasis has initiated consultations with federal agencies and conducted a comprehensive review of published information. Oasis confirmed no national parks, memorial parks, landmarks, natural landmarks, historic sites listed on the NRHP, monuments, or wilderness areas within the Survey Corridor.

4.2.2 STATE RESOURCE REVIEW

Oasis has initiated consultations with state agencies and conducted a comprehensive review of published information. Oasis confirmed the absence of state parks, monuments, historical markers, or nature preserves within the Survey Corridor.

Oasis confirmed the presence of 16 archaeological sites within the Survey Corridor (cultural resources not listed on the NRHP). Refer to Section 2.3.5 for more information on this resource, Appendix C for a record of agency consultation, Appendix E for the Cultural Resources Report Abstract, and Section 5 for proposed mitigation. The full cultural resources report is privileged and not included in this Application.

4.2.3 COUNTY RESOURCE REVIEW

Oasis has confirmed through a combination of agency coordination, review of publicly available information, and field studies that no county parks, recreation areas, municipal parks, or parks owned by other subdivisions of government bodies are located within the Survey Corridor. Refer Appendix C for documentation of agency correspondence.

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

Oasis commissioned natural resource surveys of the proposed Route. The scope of the surveys included documentation for 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 identified through project consultations for the Corridor analysis that agencies indicated had 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. Refer to Appendix D for the complete Natural Resources 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 consultations and subsequent field surveys, the proposed Project would not result in irreversible impacts that would be detrimental to sensitive plant and animal species or their habitats. The implementation of the proposed mitigation plans and full compliance with environmental permits would fully 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

The University of Wyoming provided tabular data describing the location of historic missile sites; this data was supported by aerial imagery for each Minot Air Force Base Minuteman Intercontinental Ballistic Missile (ICBM) Site. Upon review of this data, it was confirmed that no ICBM launch or launch control facilities are located 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

The University of Wyoming provided tabular data describing the location of historic missile sites; this data was supported by aerial imagery for each Minot Air Force Base ICBM Site. Upon review of this data, it was confirmed that the Route does not contain areas within 30-feet of direct lines between ICBM launch or launch control facilities.

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

Avoidance areas are geographic areas that may not be considered in the routing of a transmission facility unless it is shown there is no reasonable alternative under the circumstances. A survey corridor may contain avoidance areas; however avoidance areas may not encompass more than 50 percent of the survey corridor width at any point, unless there is no reasonable alternative. The following table and text identify and discuss avoidance areas within the Project Survey Corridor (Mainline and Lateral 1).

Avoidance Area	Within Project Survey Corridor	Crossed By Route	50 % or More of Survey Corridor	Section Providing Discussion
Federal				
Historic Districts	No	No	No	4.3.1
Wildlife Areas	No	No	No	4.3.1
Wild, Scenic or Recreational Rivers	No	No	No	4.3.1
Wildlife Refuges	No	No	No	4.3.1
Grasslands	No	No	No	4.3.1
State				
Wild, Scenic or Recreational Rivers	No	No	No	4.3.2
Game Refuges or Game Management Areas	No	No	No	4.3.2
Forests or Forest Management Lands	No	No	No	4.3.2
Grasslands	No	No	No	4.3.2
Other				
Historic Resources not meeting Exclusion Areas criteria	No	No	No	4.3.3
Areas of Known Geologic Instability	Yes	No	No	4.3.4, 5.0
Areas within 500-Feet of a Residence, School, or Place of Business	Yes	No	No	4.3.5
Reservoirs and Municipal Water Supplies	No	No	No	4.3.6
Water Sources for Organized Rural Water Districts	No	No	No	4.3.7
Irrigated Land (not applicable to underground facilities)	N/A	N/A	N/A	4.3.8
Areas of Recreational Significance which are not Designated as Exclusion Areas	No	No	No	4.3.9

4.3.1 FEDERAL RESOURCE REVIEW

Oasis conducted agency consultations, 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

Oasis 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

Oasis conducted a review of publicly available information, initiated project specific agency consultations, and augmented agency review with field studies. Through these efforts, Oasis has concluded there are no historic resources not meeting exclusion areas criteria within the Survey Corridor. Refer to Appendix C for documentation of agency consultations and Appendix E for the Cultural Resources Report Abstract. The full cultural resources report is privileged and not included in this Application.

4.3.4 AREAS OF KNOWN GEOLOGIC INSTABILITY

Geologic instability generally refers to surface geology and areas where landslides have occurred. The North Dakota Geological Survey (NDGS) landslide mapping data was consulted for information regarding areas of landslides near the Project Area. Review of landslide deposit data from the NDGS indicated the presence of one landslide deposit within the Mainline Survey Corridor. This deposit consists of a variable mixture of strata and deposits that have slid to the base of steep slopes. Most of the landslides in this area are hundreds, if not thousands of years old. Refer to Section 5 for proposed mitigation.

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, no mining activities are located within the Survey Corridor.

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

Aerial photography was utilized to identify structures located within 500 feet of the proposed pipeline alignment. Three potentially occupied structures were identified within 500 feet of the Route and Oasis has obtained those required landowner waivers. Refer to the table in Appendix G for a summary of the structures requiring a waiver. Executed landowner waivers can also be found in Appendix G.

4.3.6 RESERVOIRS AND MUNICIPAL WATER SUPPLIES

Oasis has confirmed the absence of reservoirs and municipal water supplies within the Survey Corridor. Fourteen wells were identified within the Corridor; however, no wells

are located within the Survey Corridor. Refer to the maps in Appendix B for the location of the wells.

4.3.7 WATER SOURCES FOR ORGANIZED RURAL WATER DISTRICTS

Oasis has confirmed the absence of water sources for organized rural water districts within the Survey Corridor.

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

Oasis has confirmed the Route does not traverse areas of recreational significance.

4.4 SELECTION CRITERIA (NDAC 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, Oasis believes the Project would successfully avoid or minimize these effects to the maximum extent practicable.

4.4.1 AGRICULTURAL IMPACTS

Agricultural Production: The Project would temporarily affect approximately 179 acres of private land in North Dakota. Of the 179 acres, approximately 66 acres are located on privately owned cropland. Once construction is complete, the land would be restored to its pre-construction contours and land use. Oasis would provide settlements to landowners for crop loss resulting from Project construction.

Family Farms and Ranches: The Project would temporarily affect approximately 179 acres of private land in North Dakota. Of the 179 acres, approximately 66 acres are located on privately owned cropland. Once construction is complete, the land would be restored to its pre-construction contours and land use. Oasis would negotiate easements with all affected landowners. The Project would 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. Oasis works with local landowners and county officials to ensure 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 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 construction techniques would be employed; significant modifications to surface drainage patterns are not anticipated. Care would be taken

throughout the construction process to minimize environmental impacts, including modification of drainage patterns. During restoration, those areas that were disturbed during construction would be restored, the local topography shall be restored to its original contours, vegetation shall be reestablished, and impacts shall be minimal and temporary. Industry standard BMPs would be implemented and permanent impacts to surface drainage would be minimized to the maximum extent possible.

Ground Water: Well data, recorded by the State Water Commission, has been reviewed for the Project Area. Well data indicates groundwater in upland areas is located more than 20 feet below the surface. Typical subsurface excavations associated with the Project would not extend to more than ten feet below the ground surface. At that depth, the Project would not intersect the groundwater table, nor would the Project alter recharge rates or the infiltration, permeability, or percolation of water into the groundwater reservoir. Additionally, construction would 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 temporarily 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 of the proposed Project would be conducted during typical working hours and is expected to cause temporary increases in ambient sound within and adjacent to the Project. The use of heavy equipment or trucks would 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. Once constructed and in service, normal pipeline operations are not audible.

Visual Effect on Adjacent Areas: The Project would include three aboveground tanks and two block valves. Each valve assembly occupies approximately 0.04 acres with exposed piping and appurtenances that may be up to six feet in height. These facilities would be enclosed within chain-link fences with security wires to protect against vandalism. Each location would be clearly marked with a small placard that details ownership and contact information. These features are common throughout the landscape and are not obtrusive. No other permanent aboveground features are to be installed as a part of the Project.

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

Wetlands, Woodlands and Wooded Areas: Oasis commissioned field surveys to identify and record the locations of these resources along the proposed Route. Refer to Section 2 for a comprehensive discussion of the field studies results, Appendix C for copies of related correspondence, and Section 5 for proposed mitigation.

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

Human Health and Safety: Oasis' corporate Health and Safety Policy meets or exceeds federal and state laws, rules and regulations, and is enforced equally with respect to both Oasis and contractor employees. The implementation of this policy promotes a safe and healthy workplace during construction and operation of all Oasis' assets. In addition, the operation of the pipeline would be monitored in accordance with DOT regulations.

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

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

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

4.5.1 POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

Oasis 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. Oasis would 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 Oasis are required to conduct their work in compliance with environmental conditions, permit authorizations, and applicable regulations, and would be held accountable for their actions in that regard.

4.5.2 LOCATION AND DESIGN

The Project would be located in McKenzie County, North Dakota and result in a mainline transmission pipeline originating at the Wild Basin Gas Processing and Crude Handling Facility near Watford City, North Dakota and terminate at the Tesoro Johnsons Corner Station which is located approximately 2.8 miles east of Johnsons Corner North Dakota. Lateral 1 would transport crude from the mainline to the proposed DAPL Johnsons Corner Terminal facility that will be located approximately 0.8 miles east of Johnsons Corner. Refer to the Project maps provided in Appendix B.

The Project would be approximately 19 miles in length constructed of steel, and would be a nominal 10.75-inch outside diameter pipe. The pipe installed would have a nominal wall thickness of 0.250 inches (minimum) denoted as API Code 5L specification PSL2 Grade X52 pipeline pipe. The maximum operating pressure of the pipeline would be 1,480 psig.

The proposed pipeline would meet US Department of Transportation regulations, specifically the design criteria outlined in 49 CFR part 195 subpart C, constructed per 49 CFR part 195 subpart D, and operated and maintained per 49 CFR part 195 subpart F.

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. The primary contractor would be supplying specialized skilled labor. Oasis would draw upon the local labor force to supply as appropriate. The workforce is anticipated to reach a peak of approximately 100 personnel.

4.5.4 ECONOMIES OF CONSTRUCTION AND OPERATION

Oasis would invest approximately $13 million in North Dakota to develop this Project. Once constructed and in-service, the continued costs of maintenance and operation of the proposed pipeline are minimal. While the Project itself would not generate any direct tariff revenues, it is estimated the gross crude oil product value produced at the Plant and transported through the Project would 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

Oasis 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, Oasis has maintained several grass roots communication channels to inform local residents regarding the developments associated with the Project. Oasis would continue to maintain contact with local government officials. Through this contact, project related information would be exchanged and should concerns arise, Oasis would 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 would interconnect with one existing and one proposed facility. The products currently handled, transferred, and shipped at the existing facilities are currently delivered to markets located in and out of the state.

4.5.7 LABOR RELATIONS

Oasis 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

Oasis owns and operates the affected facilities, and operations would be coordinated by its management.

4.5.9 MONITORING OF IMPACTS

Oasis has established and maintained positive landowner and community relationships throughout the region. Oasis' operations reflect its commitment to corporate citizenship standards founded on integrity. Oasis would monitor landowner concerns, if any, through its Land Department and would respond to all reasonable concerns. Similarly, Oasis would monitor community concerns and would respond to all reasonable concerns brought to its attention by local community leaders.

4.5.10 UTILIZATION OF EXISTING AND PROPOSED ROW AND CORRIDORS

Oasis chose the preferred Project alignment in an effort to maximize the use of existing utility corridors. Approximately 67% (13 miles) of the Project is co-located with existing utility corridors. Refer to Appendix B for maps depicting portions of the Project which are collocated with other utilities.

4.5.11 OTHER EXISTING OR PROPOSED TRANSMISSION FACILITIES

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

SECTION 5: MITIGATIVE MEASURES

5.1 LOCATION

The Project would be located in McKenzie County, North Dakota and result in a transmission pipeline originating at the Wild Basin Gas Processing and Crude Handling Facility near Watford City, North Dakota and terminate at the Tesoro Johnsons Corner Station which is located approximately 2.8 miles east of Johnsons Corner North Dakota. Lateral 1 would transport crude from the mainline to the proposed Dakota Access Pipeline (DAPL) Johnsons Corner Terminal facility that will be located approximately 0.8 miles east of Johnsons Corner. Refer to the Project maps provided in Appendix B.

Trees and shrubs: Oasis would 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 would 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 would be based upon actual impacts due to construction, shall meet the 2:1 ratio specified, and shall be fully documented.

Wetlands and Waterbodies: Oasis would minimize impacts to wetland and waterbodies by minimizing workspace through these features and by utilizing low-impact crossing methods such as horizontal directional drilling where appropriate. Furthermore, Oasis would conduct all regulated crossings in compliance with the USACE Nationwide Permit #12. Features would be returned to their pre-construction condition and contours.

Whooping crane: In North Dakota, the cranes will typically pass through the state during the spring migration occurring March through early May. Construction activities for the Project is scheduled to begin as early as the second quarter of 2016, which should largely mitigate impacts to this species. Additionally, to mitigate potential impacts to migratory cranes, Oasis would suspend heavy equipment operations if whooping cranes sighted within 0.5 miles (line of sight) from active construction activities. Suspended activities would resume in the absence of whooping cranes. See Appendix C for Oasis' consultation with the USFWS.

Northern long-eared bat: Northern long-eared bats are not known to occur in the Project area and suitable winter habitat is not present within the Survey Corridor. Trees and rocky outcrops can act as suitable summer habitat and the field survey indicated suitable summer habitat is present within the Project area. To mitigate any adverse effects, it is recommended ROW width is reduced to 50 feet through suitable habitat to minimize loss.

Dakota skipper: Dakota skippers require untilled, high-quality prairie. Habitat preferred by the skipper is wet-mesic prairie with little topographic relief on near-shore glacial lake deposits and in rolling native-prairie terrain over gravelly glacial moraine deposits. Suitable habitat is present within the Survey Corridor and it is recommended

ROW width is reduced to 50 feet through suitable habitat to minimize loss. Additionally, pipeline construction impacts in areas of potential skipper habitat would be mitigated by restoration of the vegetation with a comparable native seed mix.

Bald and Golden Eagle: To mitigate potential adverse effects on nesting and breeding eagles, the USFWS generally recommends maintaining a nest buffer of at least 0.5 miles for any eagles nesting in the area. Oasis would work with the USFWS as necessary if an eagle nest is identified within 0.5 miles.

Migratory Bird Treaty Act: In North Dakota, species protected under the MBTA are present throughout the year. However, it is generally acknowledged that the majority of protected species seasonally present in North Dakota nest from February 1st through July 15th annually. During this nesting period, birds are more vulnerable to human activities. The proposed Project construction is scheduled to commence the second quarter of 2016 and take approximately four months to reach completion. Due to the Project schedule and phenology of resident birds, MBTA mitigation may be required. Should mitigation be required, Oasis would develop and implement a mitigation plan which may include conducting a survey for nesting birds prior to the commencement of ground disturbing activities and implementing avoidance and monitoring measures of any active nests.

Cultural Resources: Oasis submitted the Cultural Resources Report to the NDSHPO requesting concurrence with the recommendation of *No Significant Sites Affected* for the Project. A response from the NDSHPO is pending. Resources identified during field surveys requiring avoidance are summarized below. Refer to Appendix C for a complete record of this correspondence.

32MZ793: A 50-foot avoidance buffer would be established around cairn features. No ground disturbing activities would be allowed within this 50-foot buffer. If ground-disturbing activities occur within the 50-foot buffer, on-site monitoring by a qualified archaeologist would occur.

Noxious Weeds: Noxious weeds were identified within the Survey Corridor during field surveys. To mitigate the spread of noxious weeds, equipment leaving infested areas would be inspected visually prior to leaving the area, vegetation and soils would be cleaned from vehicles and equipment. The vehicles and equipment would be cleaned (*e.g.*; power washed) to remove remaining soils and vegetation prior to entering uninfected tracts.

Areas of Known Geologic Instability: Desktop analysis identified one area containing landslide deposits within the Survey Corridor on the Mainline (between milepost 17 and 18). Mitigation would be implemented through minimizing impacts with construction techniques and restoring the area to its original condition. This would be accomplished through preserving top soil and continued monitoring of the area through restoration until the site reaches final stabilization per applicable permit(s) requirements.

5.2 CONSTRUCTION

The proposed construction of the Project would 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 approximately four months. Construction techniques would be employed to 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 would immediately follow pipeline construction. Final grading would restore the original contours of the land. Disturbed areas would be prepared for re-seeding and restoration would be coordinated to meet landowner specifications.

5.3 OPERATION

Once put into service, the proposed Project would operate continuously, delivering crude oil from the Wild Basin Gas Processing and Crude Handling Facility to the Tesoro Johnsons Corner Station and the proposed DAPL Johnsons Corner Terminal facility. 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 would conform to applicable DOT requirements, which include regular pipeline monitoring and periodic inspection; additionally, routine maintenance of the ROW would likely be required to remain in compliance.

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

6.1 PIPELINE CONSTRUCTION

Construction would be an assembly-line process and would 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 would require approximately four months to complete from start to finish, except when weather-related delays affect the schedule. However, construction activity at any location would not continual but occurs in distinct phases with several days or weeks between each phase. For example, clearing and grading may require ten hours to progress for one mile along the pipeline ROW, but trenching may not follow in the 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, Oasis would stake the centerline and establish the boundaries of the approved work areas (*e.g.*, the construction ROW 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 also would be marked or fenced for protection at this time.

Clearing and Grading: Prior to clearing, landowner fences would be braced and cut, and temporary gates and fences would be installed to control livestock where necessary. A clearing crew would 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 ROW would be graded, where necessary, to provide a reasonably level work surface and to segregate topsoil. Topsoil would be carefully removed and stored along the edge(s) of the ROW 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 two and nine inches deep with the deepest topsoil in valleys and the thinnest topsoil on the hillsides and hilltops. The topsoil depth and the layer removed would be determined in the field; upon completion of pipeline construction, the trench would be backfilled and topsoil would to be returned to the upper soil horizon. All disturbed areas shall be graded to restore the original contours.

Where steep slopes or side slopes are encountered, the construction contractor may re-grade the slope, or in areas of side slopes, two-tone the area to create level working surface. At these locations, excess spoil would be pushed to the side of the construction

ROW, distributed over the working area and travel lane, or stored in alternative temporary workspace (ATWS.) This material would be returned to the original location and preconstruction contours reestablished during restoration.

Concurrent with grading, erosion and sediment control devices would be installed according to industry BMPs. Waterbodies may be bored using HDD methods to place pipe under the waterbody without disturbing it. The pipeline would be placed such that adequate cover from the bottom of the waterbody would be in place. This would be individual to the waterbody but would be no closer than five feet to the bottom of the waterbody. Construction mats would also be installed across saturated wetlands to prevent rutting as equipment traveled the ROW. Erosion and sediment control devices, which may include silt fences, straw wattles, straw bales and road access pads, would be installed where necessary to prevent soil and sediment from leaving the construction work area.

Following installation of the pipe and backfilling of subsoil in the trench, the ROW would be returned to the original grade and the topsoil would be redistributed over the work area.

Trenching: The trench would be excavated by using backhoes to a depth that provides sufficient cover over the pipeline after backfilling. The bottom width of the trench would be sufficient to accommodate the 10.75-inch diameter pipeline. Typically, the trench would 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 would be sufficient and safely below the maximum tillage depth. Additional cover requirements may be applicable at public road crossings.

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

Pipe Stringing, Bending, and Welding: Sections of externally coated pipe up to 60-feet long (*e.g.,* joints) would be transported over public roads to the ROW by truck and placed or "strung" along the ROW 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 the finished pipeline sections conform to the natural contours of the land. Typically, a track-mounted, hydraulic pipe-bending machine would be used. Where multiple or complex bends greater than what can be properly bent in the field are required, a factory made "fitting" would be used.

After the pipe sections are bent, the joints would be welded together into sections and placed on temporary supports. Welding would comply with requirements listed in Title 49 CFR Part 195 and API Standard 1104 *Welding of Pipelines and Related Facilities*. Each weld would be tested by using radiographic non-destructive examination to ensure

no defective welds were present and Oasis engineering standards were met. Welds that do not meet standards and specifications would be removed and/or repaired.

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

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

If the trench bottom were obscured by water, the trench would be dewatered. Where dewatering may be required, Oasis would 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 would be installed to prevent 'piping' from occurring along the pipe in the trench after the area was backfilled.

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

Hydrostatic Testing: Oasis would hydrostatically test the pipeline. Hydrostatic testing would conform to DOT standards and would establish the maximum operating pressure (MOP) for the pipeline when it was operational. Testing involves installation of test headers, which control the pressure applied. The test headers would be later removed upon the completion of a successful pressure test. 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 eight hour period, without a significant change in pressure. Once testing was completed, the test water would be evacuated; the line is dried, and prepared for commissioning. Oasis would either procure discharge permit(s) from the NDDOH and the ensuing discharge would conform to the conditions stipulated in the permit, or capture the water and transport it offsite for disposal.

Final Tie-in and Commissioning: Following successful pressure testing, test manifolds would be removed and the final pipeline tie-ins would be made. After final tie-ins were complete, the tie-in welds were inspected and the line was sufficiently dried, the pipeline would be commissioned. Commissioning involves activities to verify equipment is properly installed and working, the controls and communications systems are functional, and the pipeline is ready for service. The pipeline would be cleaned and dried using mechanical devices; the line would be purged of air and then loaded with product.

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

During restoration, segregated topsoil would be spread over the surface after final grading and permanent erosion controls would be installed. After permanent erosion control devices were installed, disturbed, non-cultivated areas would be seeded and slopes mulched where required. Seed mixes would be approved in advanced by the landowner, and seeding would occur within the recommended seeding dates for the Project Area.

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

Every reasonable effort would 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 would 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 would also be installed.

The HDD method involves setting a horizontal drill rig at one or both ends of the bore area. If the drill rig was located on or near the stream bank, erosion countermeasures would be installed to minimize bank disturbance and prevent further erosion during the drilling operation. The drill bores underneath the waterbody and the main pipe, known as the string pipe, would be pulled into place once the bore has been completed. The string pipe would then be connected to the main pipeline.

Following installation of the pipeline crossing, the stream bank would be restored as necessary. Oasis would 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 would be installed on the top of the banks to prevent sediment generated from the ROW from entering the waterbody. These barriers would remain in place until the ROW approaches were adequately vegetated.

The proposed Project would cross flowing waterbodies. Oasis would cross these features using methods, which would 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, Oasis would implement the following mitigative measures:

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

Wetland Restoration: Following pipeline installation, the trench would 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 would promote the rapid re-establishment of hydrophytic vegetation.

Oasis would 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 ROW 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 ROW and the ground surface slopes toward the wetland.

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

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

Agricultural Land Restoration: Extensive portions of the Project would involve heavy construction through agricultural areas. These areas consist of active croplands predominately used to grow durum, hard red spring wheat, red winter wheat, barley, sunflowers and canola. Additionally, agricultural lands are used as range or pasture land used for livestock production. Oasis would utilize the following general construction methods in agricultural areas, consistent with the requirements of landowners:

- Prior to construction, landowners would be contacted and irrigation facilities, wells, waterlines and other and livestock watering systems would be located.
- Water flow would be maintained in supply systems unless shutoff was coordinated with the affected parties.
- Existing fences would be cut and braced along the ROW, and temporary gates and fences, if necessary, would 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, Oasis would remove the topsoil removal and segregate the soil from subsoil.
- Oasis would decompact the travel lane on the ROW 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 four feet of soil cover between the top of the pipe and the final land surface after backfilling.
- Restoration and revegetation practices (*i.e.*, seeding) would comply with the requirements outlined in the landowner line list.
- Oasis would not plant an annual cover crop on actively cultivated land unless requested by the landowner.
- Weed-free mulch would be used on steep slopes to control erosion unless the landowner requests mulch not be applied. Mulch would be crimped into the soil.
- Earthen diversion berms would be constructed to reduce runoff on steep slopes only when the landowner approves.
- No erosion control fabric would be used in rangeland without having landowner approval.
- Fences and gates would be replaced in accordance with landowner agreements.

- Private roads would be restored to equal pre-construction condition.
- Oasis would respond promptly to landowner concerns following construction to mitigate areas of subsidence and erosion problems should they occur.
- Oasis would require the contractor to clean thoroughly the equipment and materials (*e.g.*, timber mates, bridges, etc.) at the contractor yard prior to mobilization to the ROW to prevent spread of nuisance weeds.

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 would be conducted of courthouse records for the purpose of identifying the current landowner. Oasis 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. Oasis, at all times, negotiates in good faith and necessary easement conditions and restrictions are presented and discussed. Oasis is in the process of acquiring the necessary easements for the Project.

7.2 COMPENSATION POLICY

Oasis' 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

David Copeland, Regulatory Specialist
Oasis Petroleum, N.A., 1001 Fannin, Suite 1500, Houston, TX 77002

M.A. Legal Studies, Environmental Law, Texas State University – San Marcos, Texas; and B.S. Business Management, Oklahoma State University – Stillwater, OK. Mr. Copeland has 5 years of regulatory compliance experience, which includes Texas damage prevention rules for underground oil and gas facilities, DOT pipeline safety regulations, as well as Texas' own pipeline safety rules. Mr. Copeland's expertise includes technical writing for state and federal drilling permits, and conditional use permits for county ordinances.

William McCarthy, C.W.B.
Senior Environmental Compliance Analyst
E3 Environmental, LLC, 871 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 20 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, and in this role conducts and coordinates field studies, agency consolations, 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 10 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.

Melissa Schmit
Consultant
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

B.A. in Environmental Studies and Geography, Gustavus Adolphus College; and J.D., Hamline University School of Law. Ms. Schmit has eight years of environmental consulting experience. Ms. Schmit has pursued a career focused on regulatory

compliance and supports energy clients by providing regulatory review and permitting services. Ms. Schmit's experience includes authoring technical reports in compliance with NEPA requirements for a variety of infrastructure projects across the Midwest and coordination with federal, state, and local agencies.

Jon Knudsen
Wildlife Biologist
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

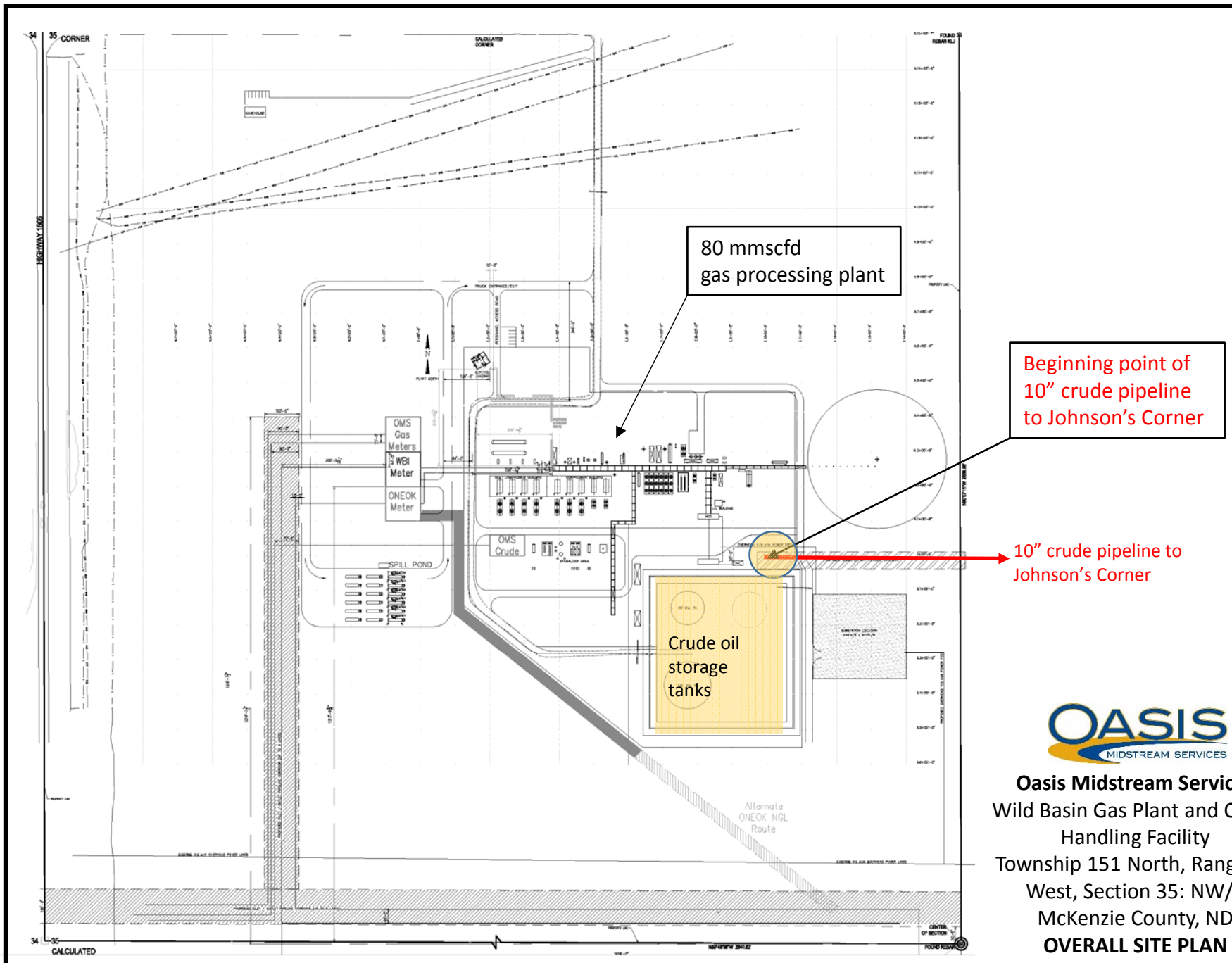
M.S. Biology, Idaho State University – Pocatello, ID; and B.S. Zoology, University of Wisconsin – Madison, WI. Mr. Knudsen has 10 years of environmental consulting and biological monitoring experience, which includes horizontal project management of oil, gas, wind, and mining projects in Colorado, Wyoming, Montana, and North Dakota. His expertise includes surveying sensitive species, writing technical reports, and consulting with regulatory agencies to ensure clients are in compliance with associated rules and regulations. In addition, Mr. Knudsen specializes in training energy development companies on wildlife-related issues, including the Endangered Species Act and Migratory Bird Treaty Act.

Garrett Knudsen, RPA
Senior Cultural Resource Specialist
E3 Environmental, LLC, 871 Jefferson Avenue, St. Paul, MN 55102

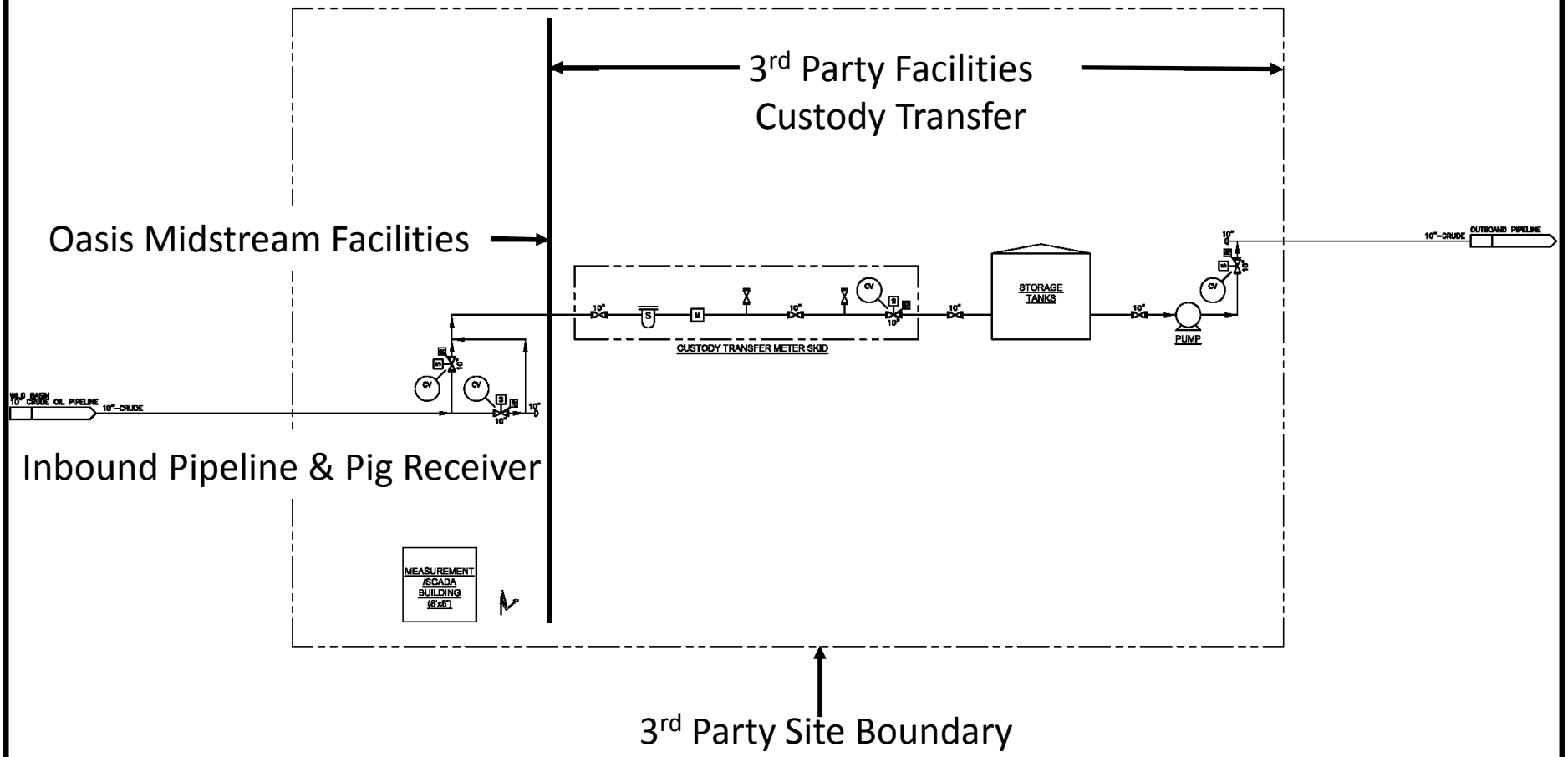
Ph. D. (candidate), Faculty of Archaeology and Anthropology, University of Cambridge, M.A. Anthropology, Idaho State University – Pocatello, ID; and B.S. Anthropology and Zoology, University of Wisconsin – Madison, WI. Mr. Knudsen is a Secretary of Interior qualified archaeologist with over 15 years of experience in cultural resource management, heritage preservation, and environmental compliance for private and public clients in the transportation, energy, and mining industries. Mr. Knudsen's regions of expertise include greater western North America; Midwest, Great Plains, Southwest, California, Texas, Great Basin, Plateau, Northwest Coast, and Alaska. He is also a specialist in archaeological landscapes, remote sensing, human skeletal remains, and predictive models.

Appendix A

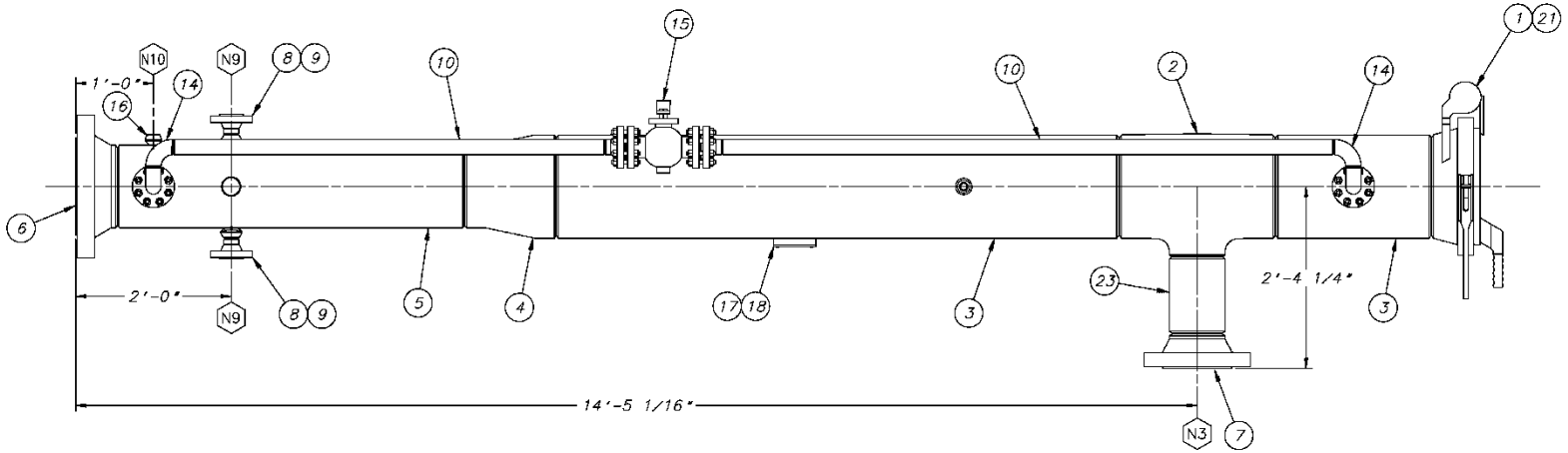
Engineering Documents



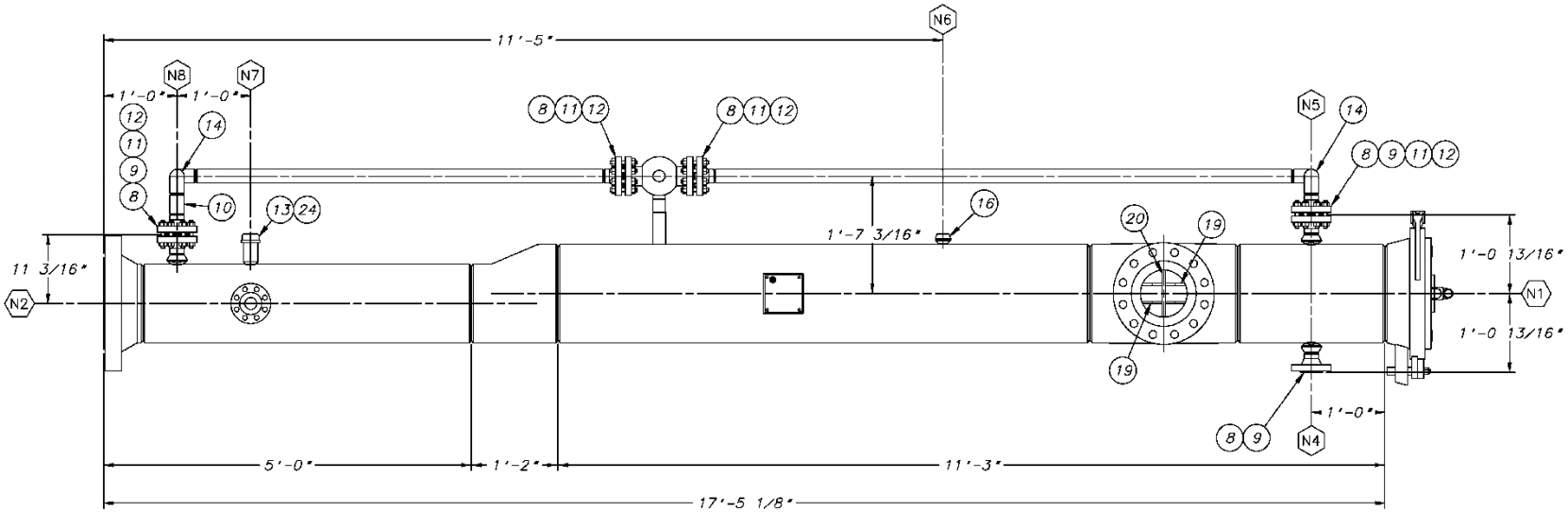
Oasis Midstream Services
Wild Basin Gas Plant and Crude Handling Facility
Township 151 North, Range 98 West, Section 35: NW/4
McKenzie County, ND
OVERALL SITE PLAN



Oasis Midstream Services
10" Crude Oil Johnson's Corner Pipeline
TYPICAL 3RD PARTY INTERCONNECT FACILITIES (AT JOHNSON'S CORNER)



PLAN VIEW

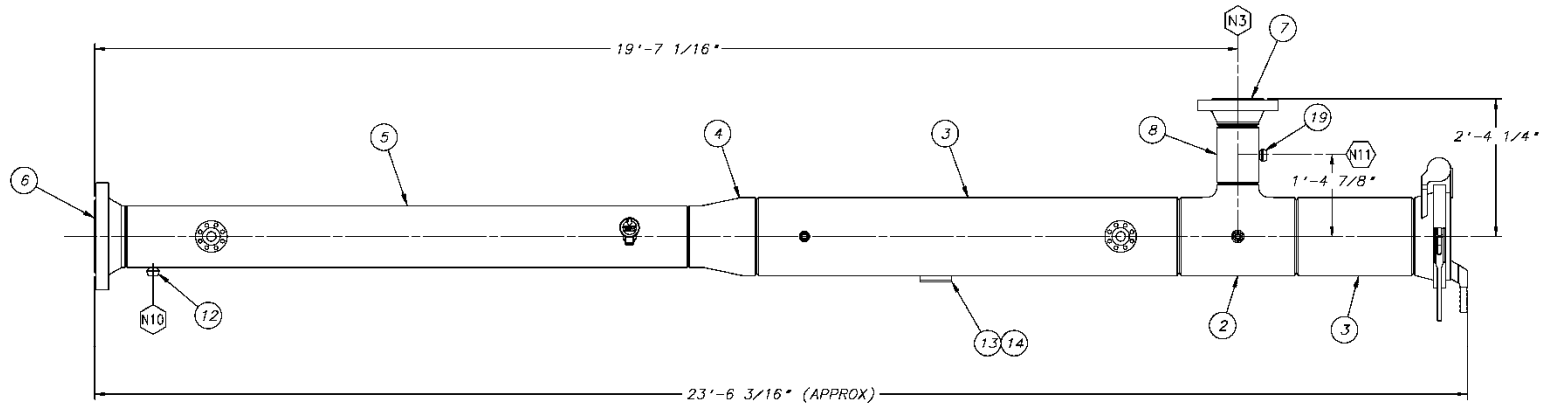


ELEVATION VIEW

Oasis Midstream Services

10" Crude Oil Johnson's Corner Pipeline

TYPICAL PIG LAUNCHER (PRELIMINARY)



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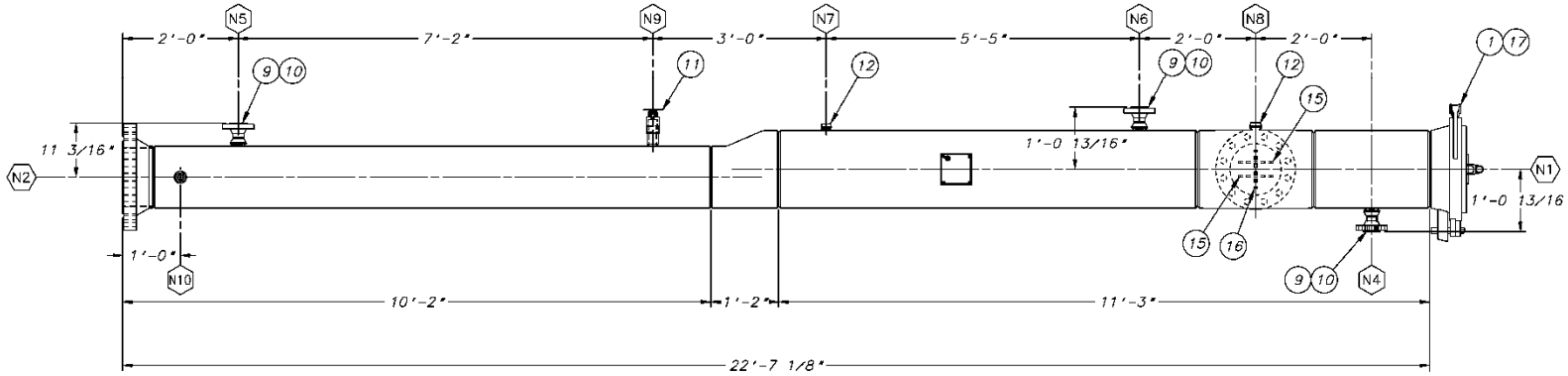


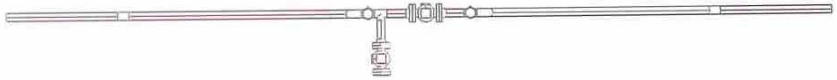
ELEVATION VIEW

Oasis Midstream Services

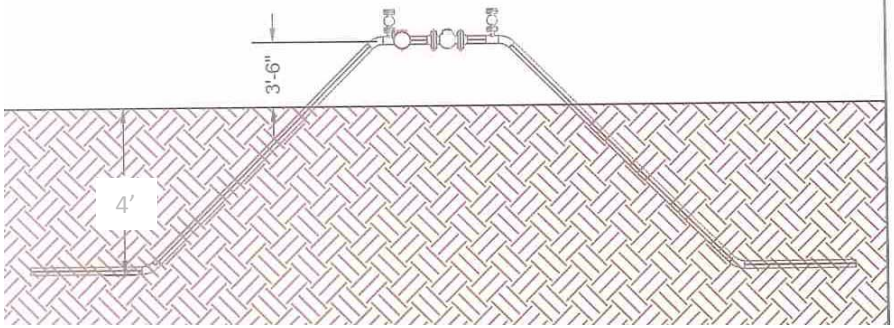
10” Crude Oil Johnson’s Corner Pipeline

TYPICAL PIG RECEIVER (PRELIMINARY)

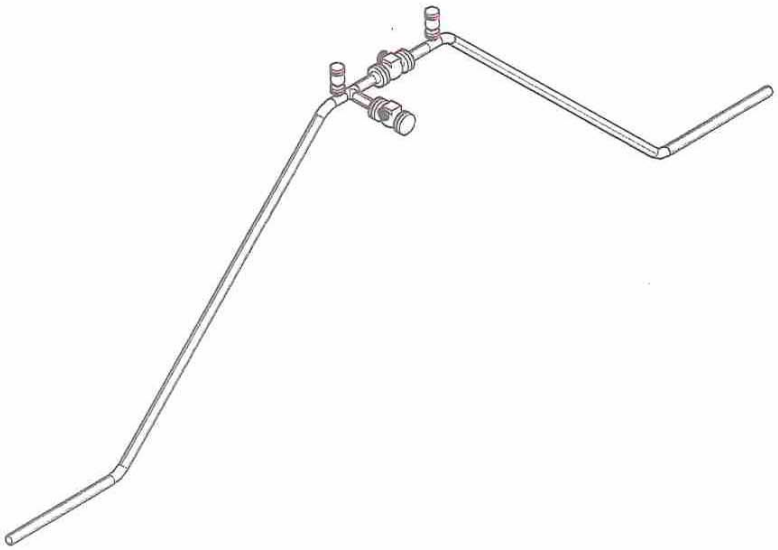
Top View



Side View



3D View



Oasis Midstream Services
10” Crude Oil Johnson’s Corner Pipeline
TYPICAL MAIN LINE VALVE SITE

Appendix B

Project Maps

Wild Basin Gas Processing and Crude Handling Facility

Tesoro Johnsons Corner Station

Lateral 1

Dakota Access Pipeline (DAPL) Johnsons Corner Terminal Facility

Milepost
Valves
Proposed Alignment
Corridor (1 mile)
NHD Flowline
NHD Waterbody

Map not to scale, for environmental review purposes only.

N

0 0.75 1.5 3 Miles

1:62,500

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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner Crude Oil Pipeline

Overview Map

McKenzie County, North Dakota

Author: TDanielson
Date: 11/3/2015
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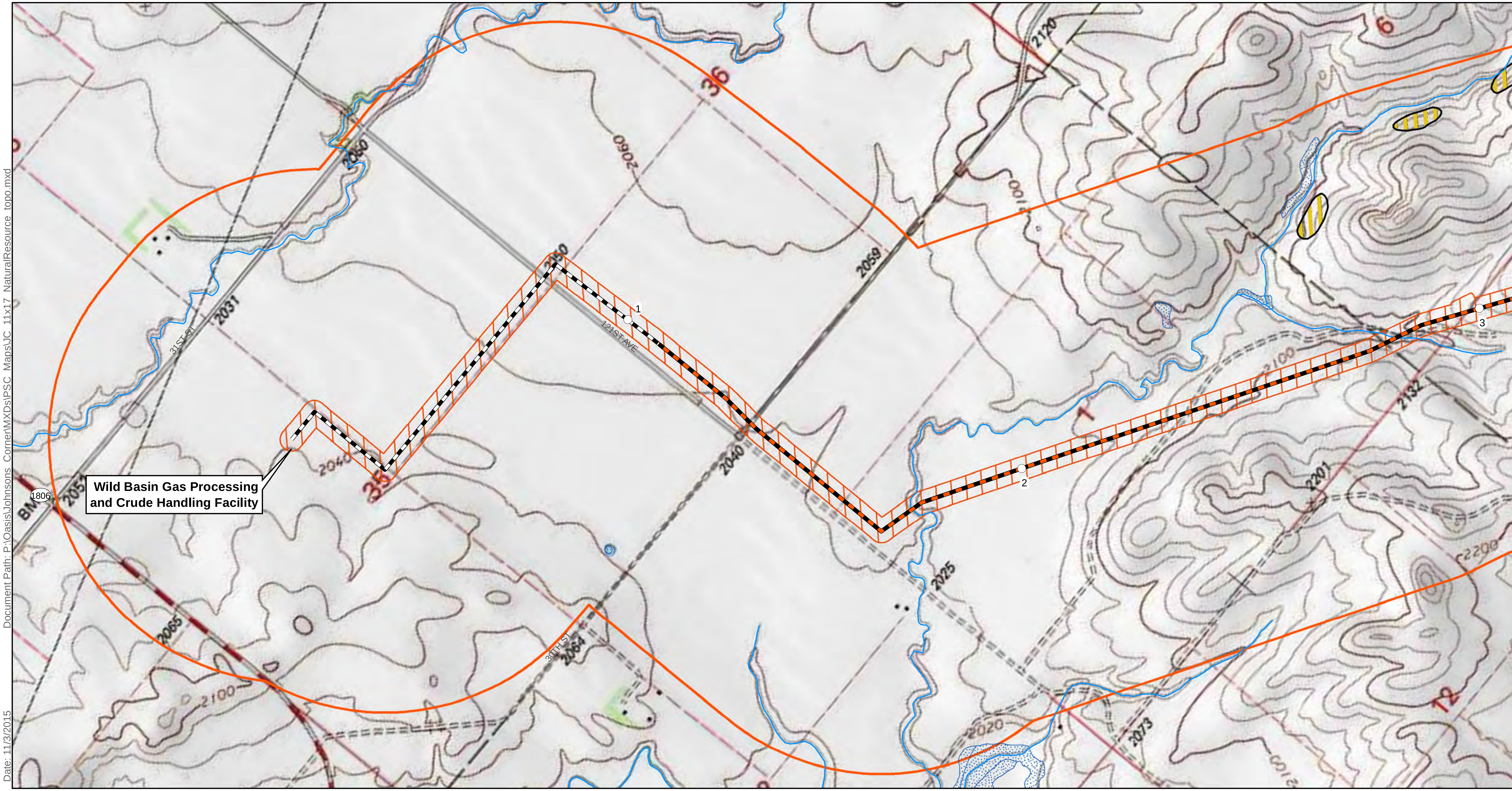

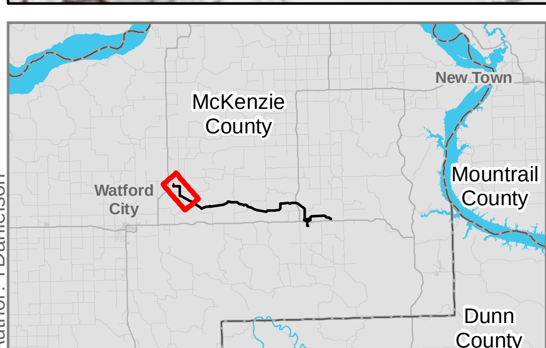

- Centerline
- Co-location
- Milepost
- Valve
- Corridor (1 mile)
- Environmental Survey Corridor
- NHD Waterway
- NHD Waterbody
- NWI Wetland

Criteria Data

- Federal Land
- State Land
- Native American Land
- ICBM Facility
- ICBM Direct Line to Control Facility
- Abandoned Mine
- NDGS Landslide Deposits
- North Dakota Mineral Trust Lands
- PLOTS Land

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0 500 1,000 2,000 Feet

1:12,000

Map not to scale, for environmental review purposes only.

Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner Crude Oil Pipeline

Siting Criteria

Natural Resource - Topo Map

Page 1 of 7

McKenzie County, North Dakota

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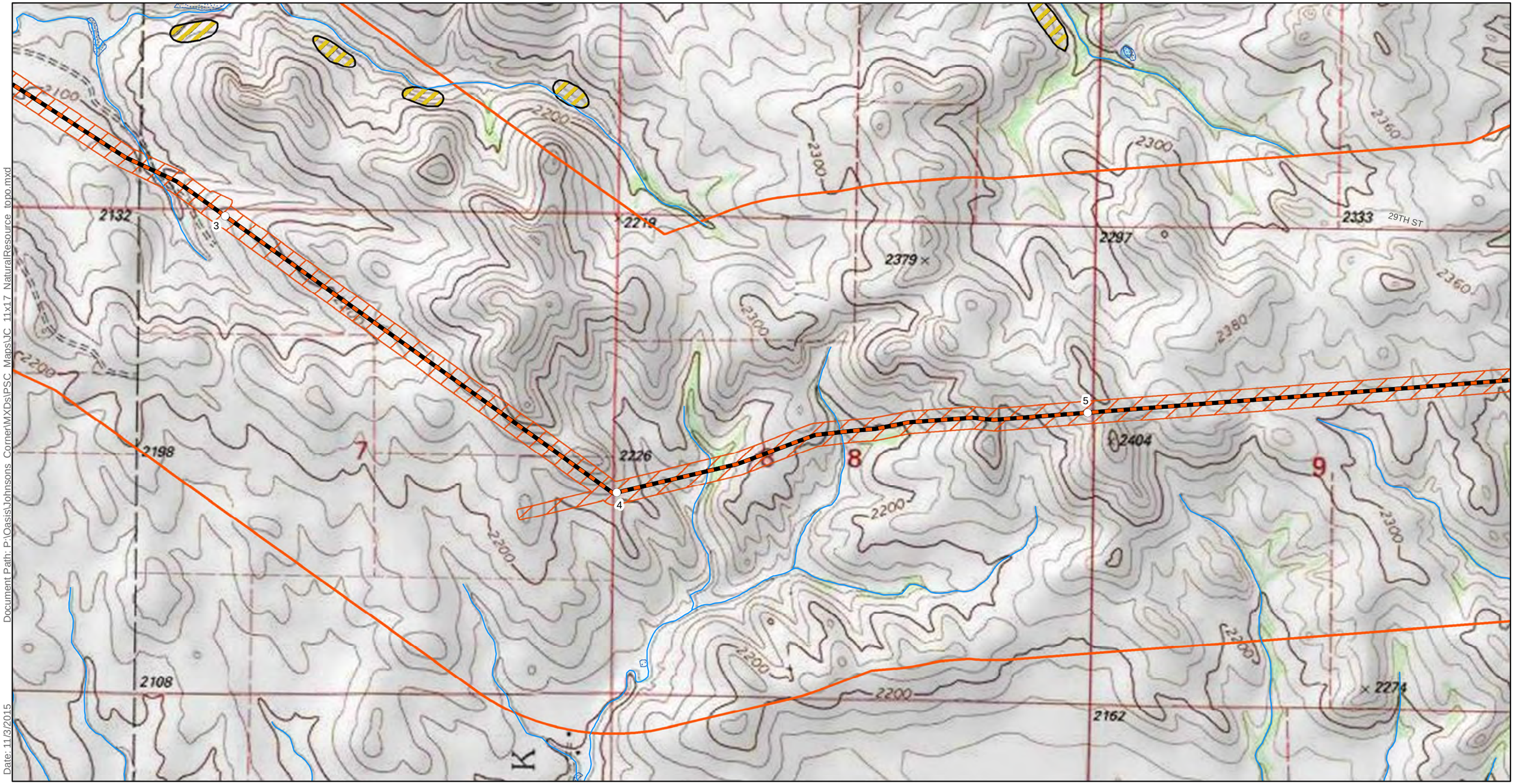
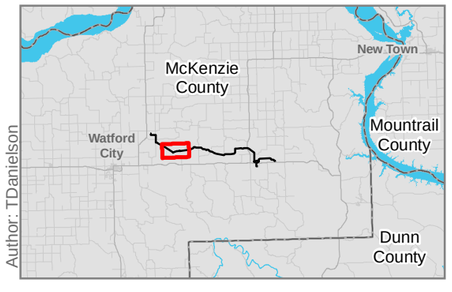
Date: 11/3/2015

Author: TDanielson





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E3 Environmental
Enhancing Execution with Experience

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1:12,000

Map not to scale, for environmental review purposes only.

Oasis Midstream Services, LLC

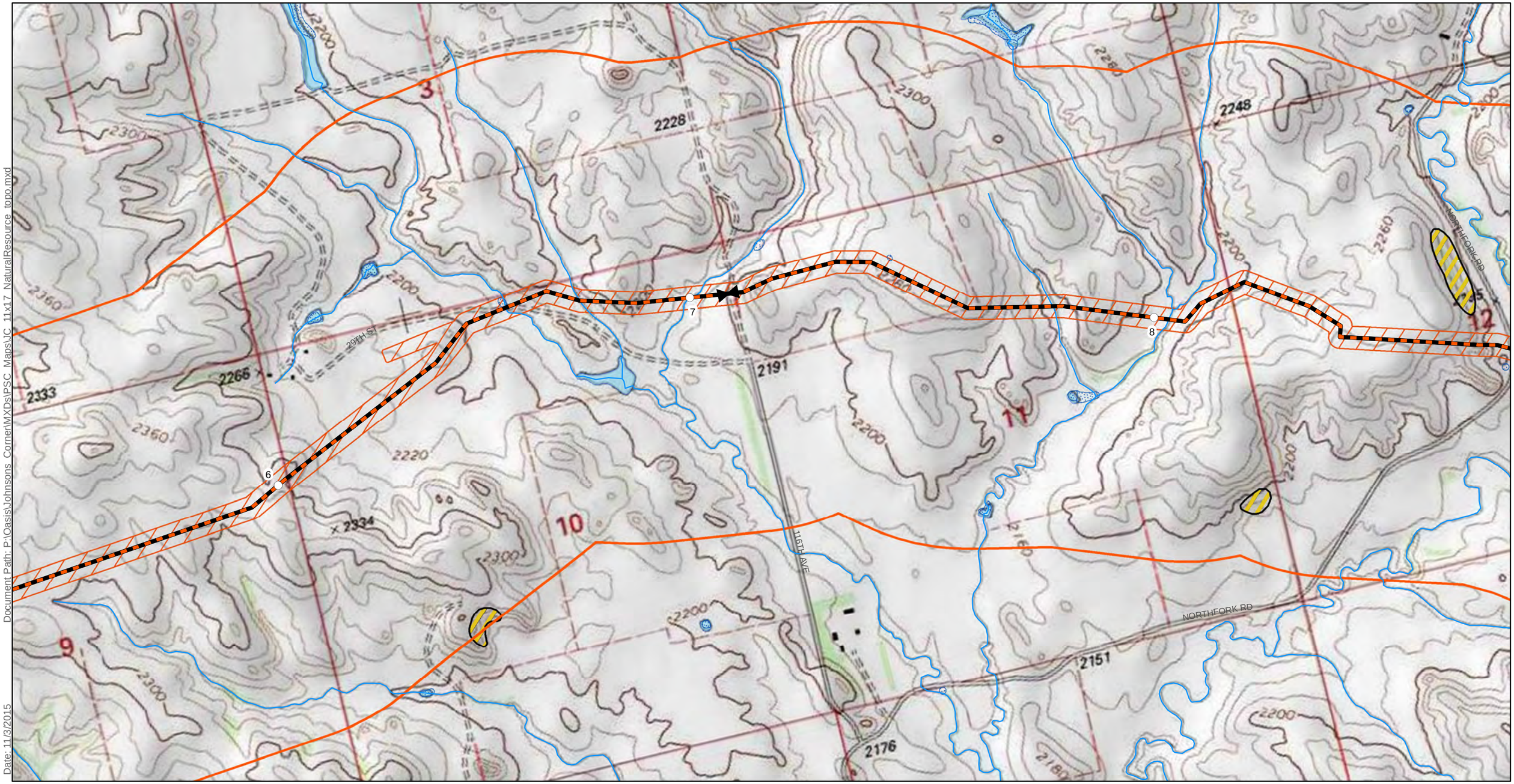
Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Topo Map

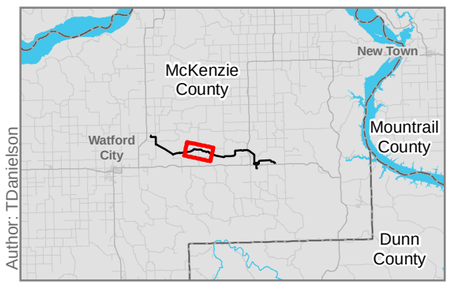
McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_CornerMXDs\PSC_Maps\JC_11x17_NaturalResource_topo.mxd

Date: 11/3/2015

Author: TDanielson





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E3 Environmental — Enhancing Execution with Experience

0 500 1,000 2,000 Feet

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Map not to scale, for environmental review purposes only.

Oasis Midstream Services, LLC

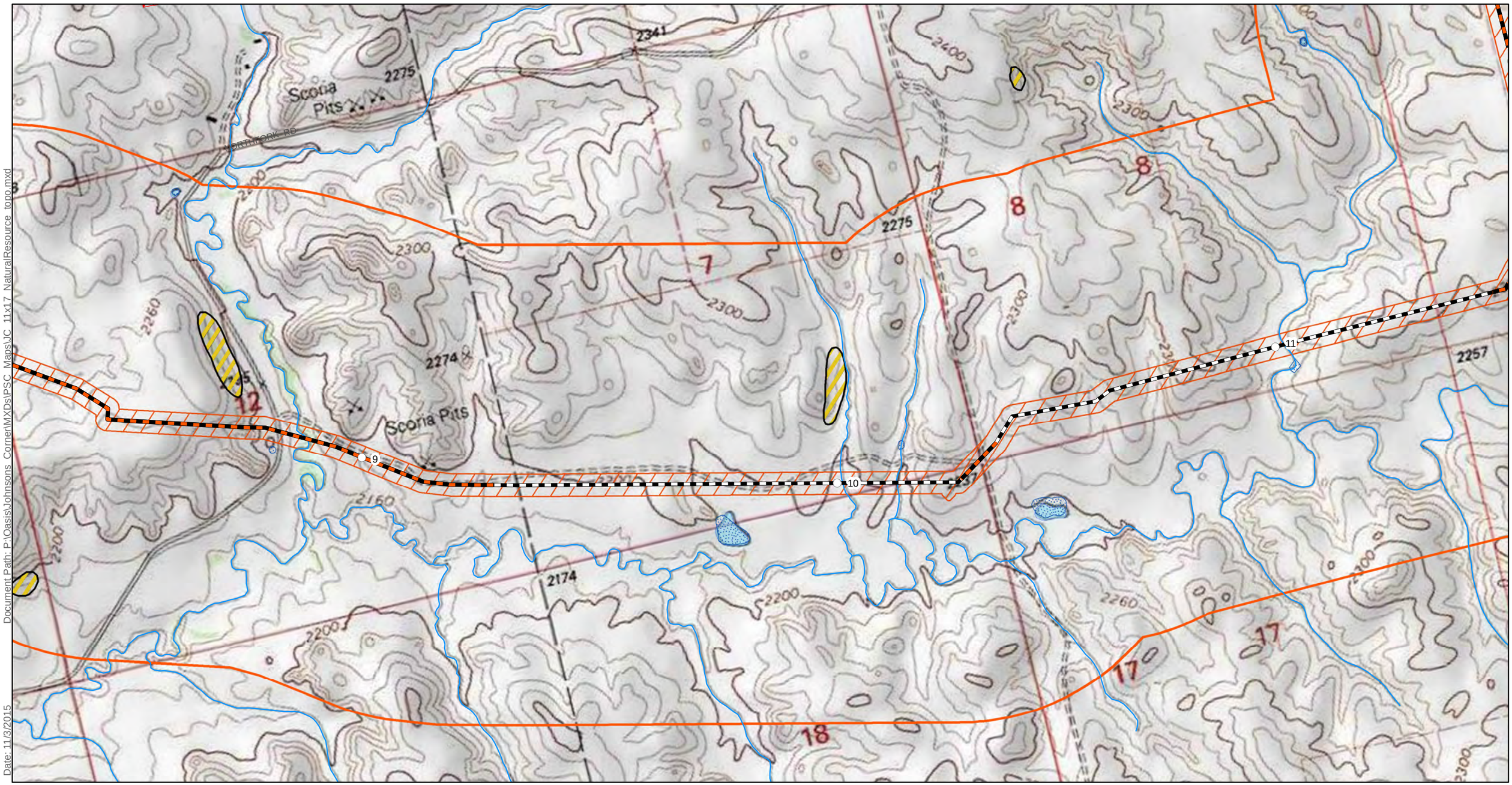
Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Topo Map

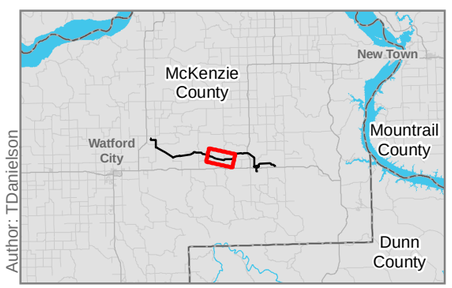
McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_Corner\MXDs\PSC_Maps\JC_11x17_NaturalResource_topo.mxd

Date: 11/3/2015

Author: TDanielson





- Centerline
- Co-location
- Milepost
- Valve
- Corridor (1 mile)
- Environmental Survey Corridor
- NHD Waterway
- NHD Waterbody
- NWI Wetland

Criteria Data

- Federal Land
- State Land
- Native American Land
- ICBM Facility
- ICBM Direct Line to Control Facility
- Abandoned Mine
- NDGS Landslide Deposits
- North Dakota Mineral Trust Lands
- PLOTS Land

N

E3 Environmental — Enhancing Execution with Experience

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Oasis Midstream Services, LLC

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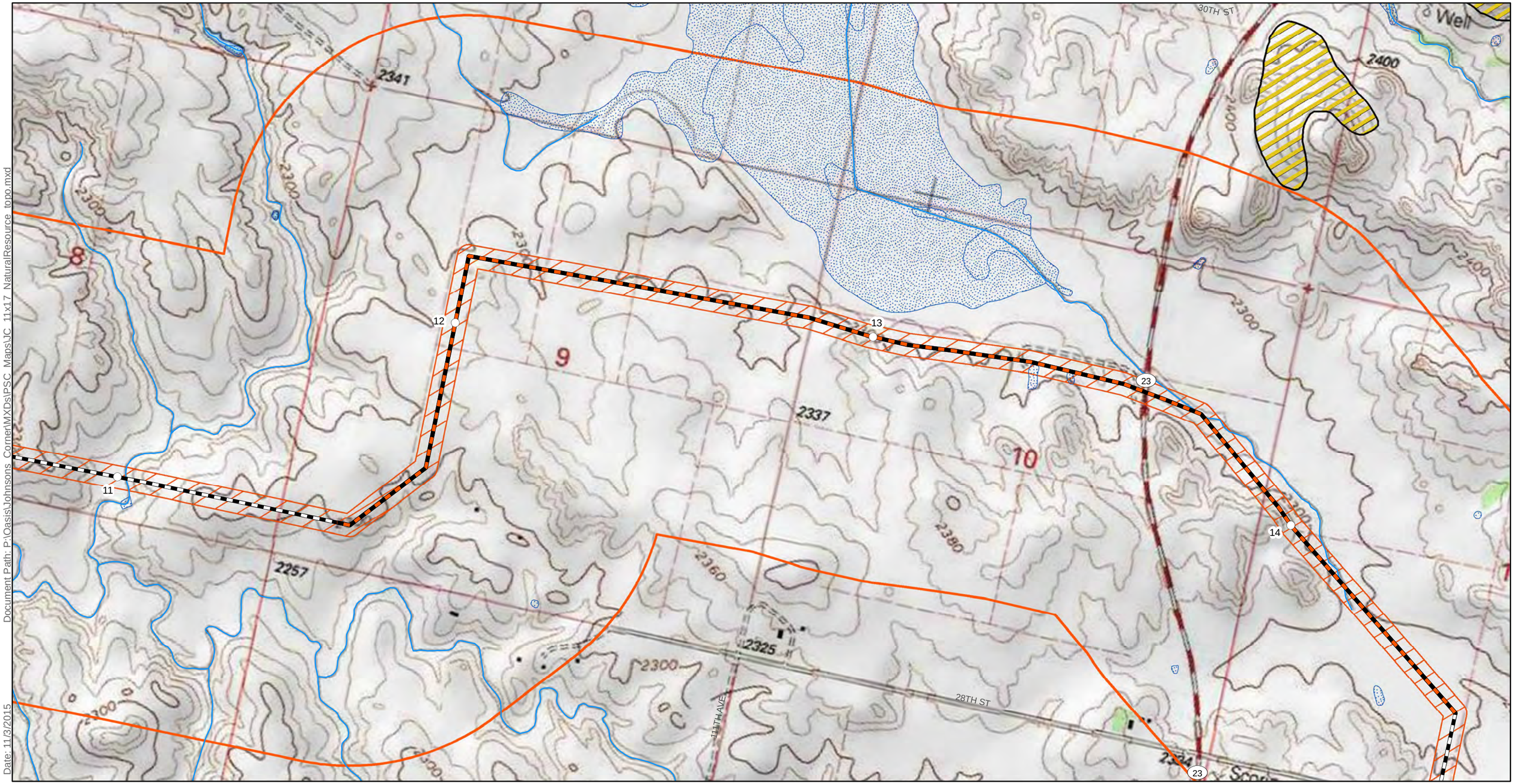
Crude Oil Pipeline
Siting Criteria
Natural Resource - Topo Map

McKenzie County, North Dakota



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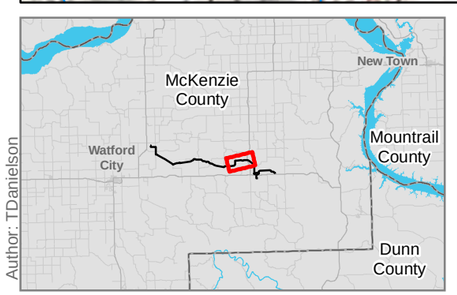

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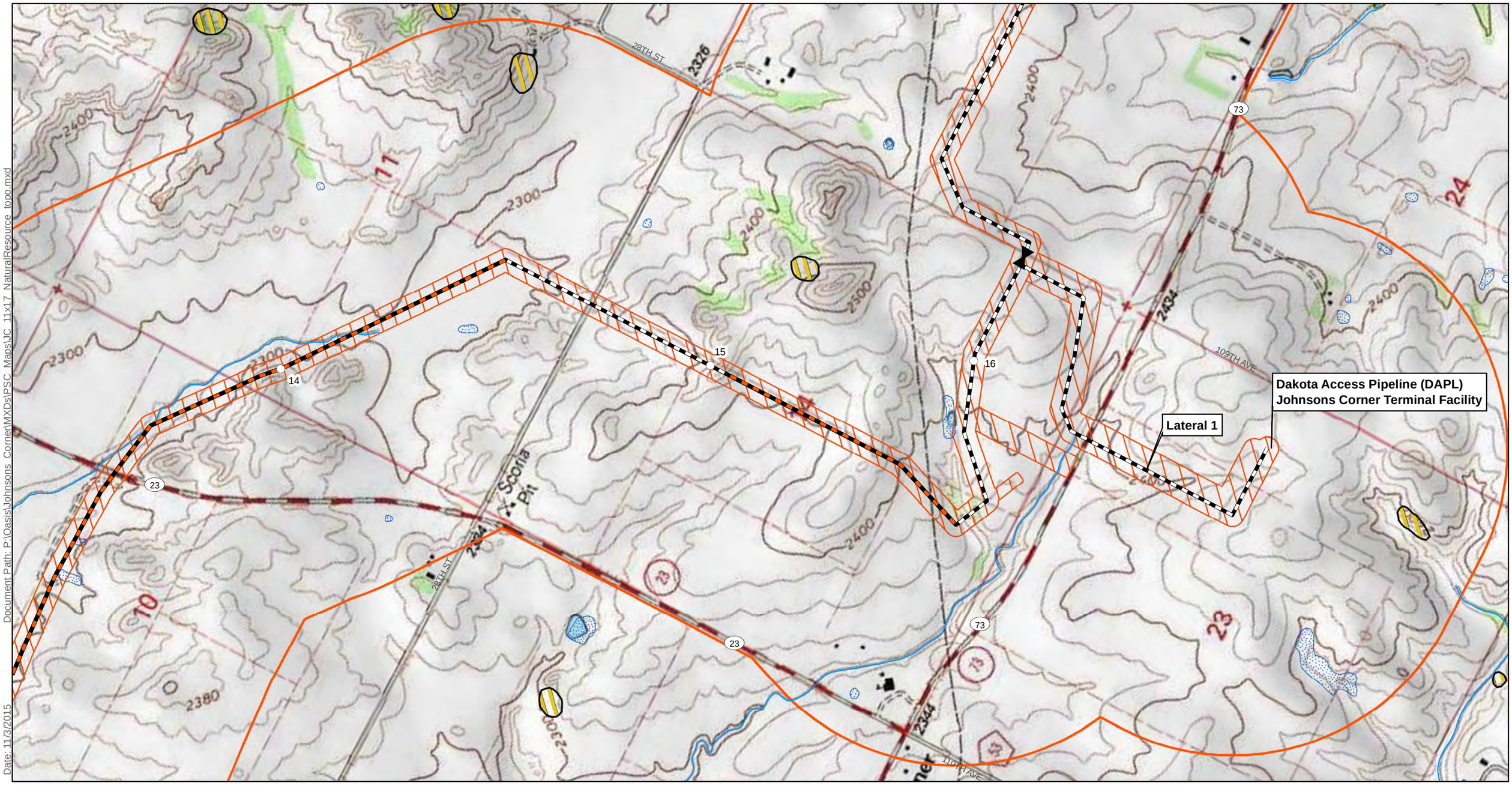

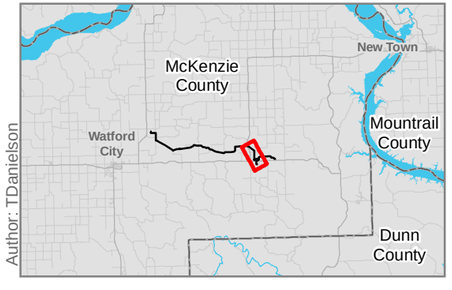

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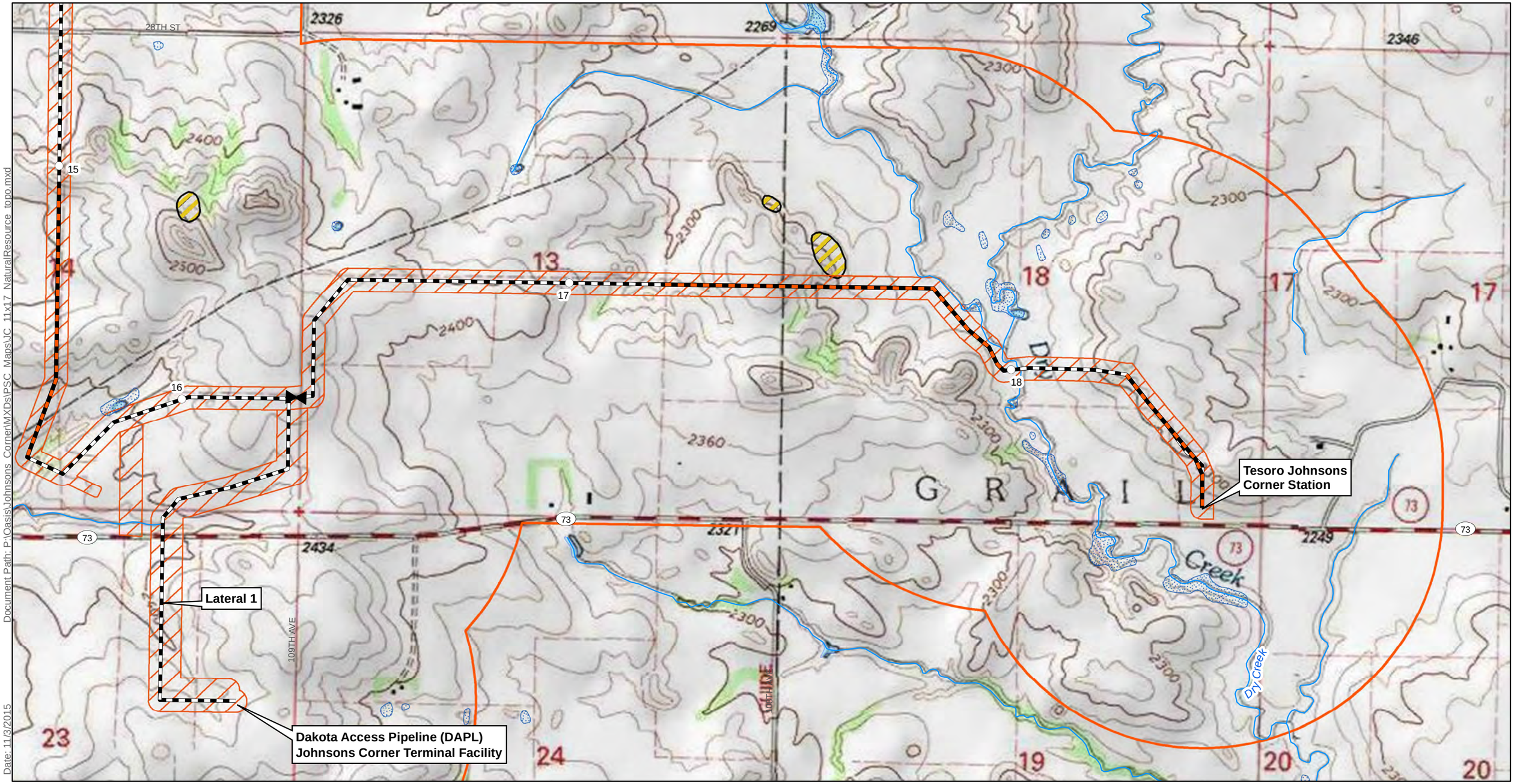

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Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Topo Map

McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons CornerMXDs\PSC Maps\JC 11x17 NaturalResource aerial2.mxd

Date: 11/3/2015

Author: TDanielson

121ST AVE

30TH ST

31ST ST

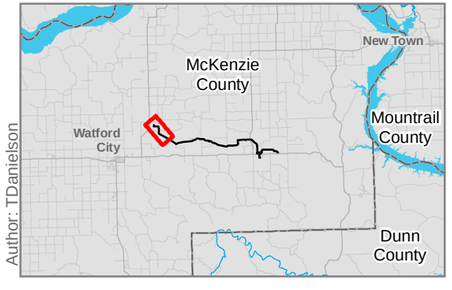
1806

Wild Basin Gas Processing and Crude Handling Facility

1

2

3



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- ND Well Data
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- Potentially Occupied Structure
- Potentially Occupied Structure (w/in 500ft)

Natural Resource Survey Data*

- Woody Vegetation - Trees
- Woody Vegetation - Shrubs
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- Noxious Weeds
- Nest

*Refer to Natural Resource Report for detailed maps and tables.

E3 Environmental
Enhancing Execution with Experience

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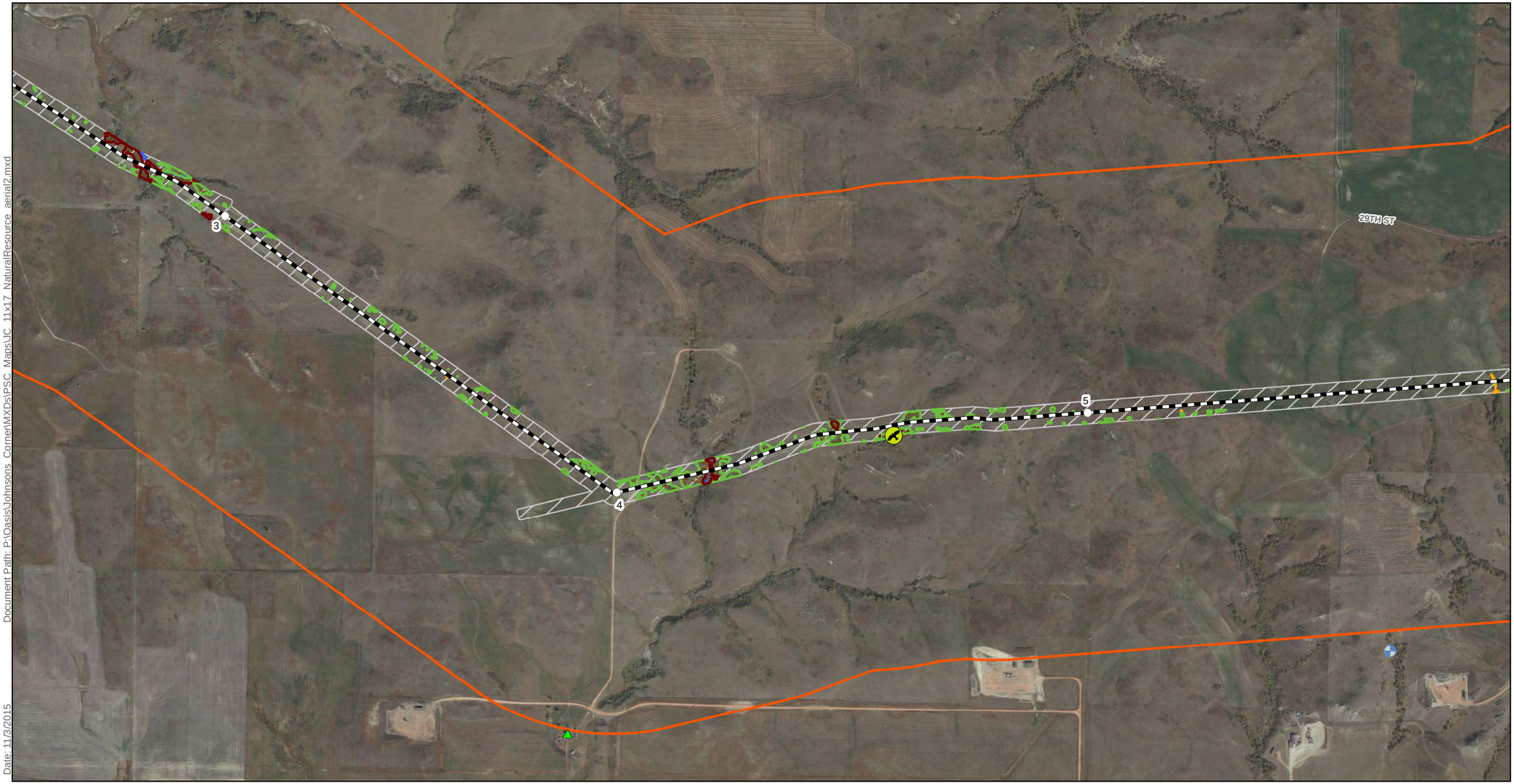
Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Aerial Map

Page 1 of 7

McKenzie County, North Dakota



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Wild Basin to Johnsons Corner
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Siting Criteria
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McKenzie County, North Dakota

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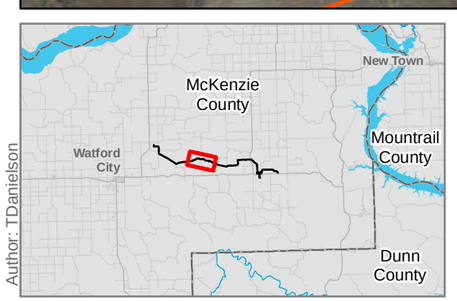

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McKenzie County, North Dakota

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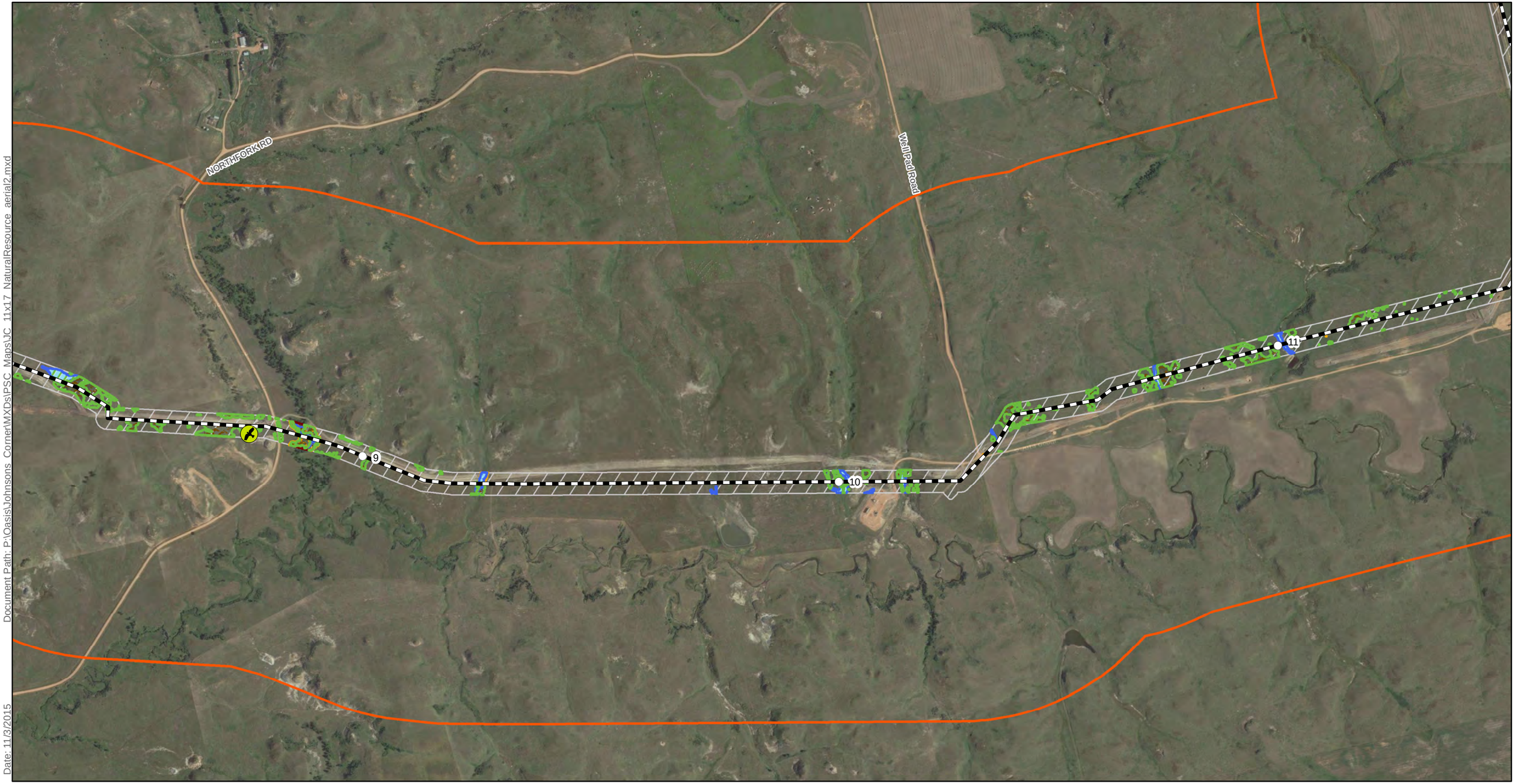

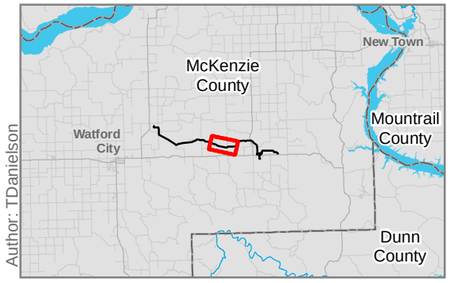

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E3 Environmental — Enhancing Execution with Experience

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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Aerial Map

McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_CornerMXDs\PSC_Maps\JC_11x17_NaturalResource_aerial2.mxd

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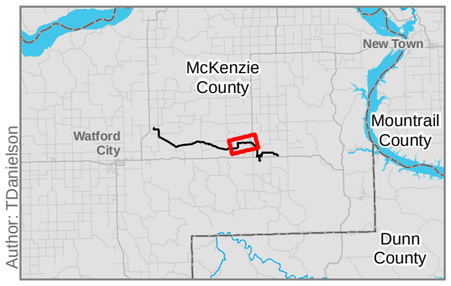
Author: TDanielson



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Enhancing Execution with Experience

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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Aerial Map

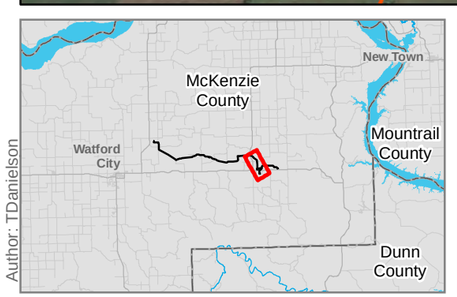
McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons CornerMXDs\PSC Maps\JC 11x17 NaturalResource aerial2.mxd

Date: 11/3/2015

Author: TDanielson

14
15
16
23
73
23RD ST
109TH AVE
110TH AVE
Lateral 1
Dakota Access Pipeline (DAPL)
Johnsons Corner Terminal Facility



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E3 Environmental
Enhancing Execution with Experience

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Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Aerial Map

McKenzie County, North Dakota

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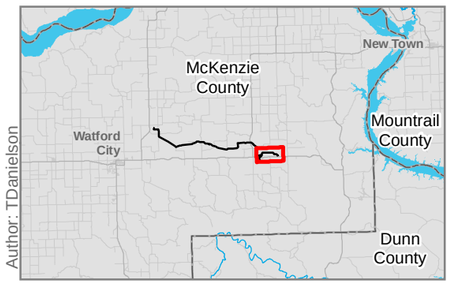

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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline
Siting Criteria
Natural Resource - Aerial Map

McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_Corner\MXDs\PSC_Maps\JC_11x17_LandCover.mxd

Date: 11/3/2015

Author: TDanielson

121ST AVE

1806

83ST ST

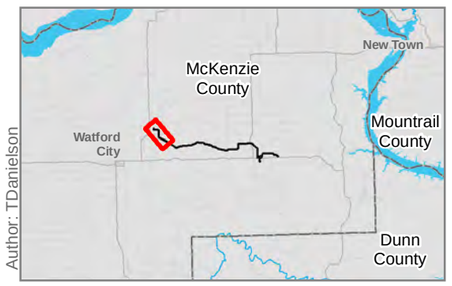
Wild Basin Gas Processing and Crude Handling Facility

1

2

3

SOUTH ST



Milepost

Centerline

Valve

Corridor (1 mile)

Environmental Survey Corridor

GAP Land Cover

Agricultural Vegetation

Developed & Other Human Use

Forest & Woodland

Introduced & Semi Natural Vegetation

Nonvascular & Sparse Vascular Rock Vegetation

Open Water

Recently Disturbed or Modified

Semi-Desert

Shrubland & Grassland

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E3 Environmental
Enhancing Execution with Experience

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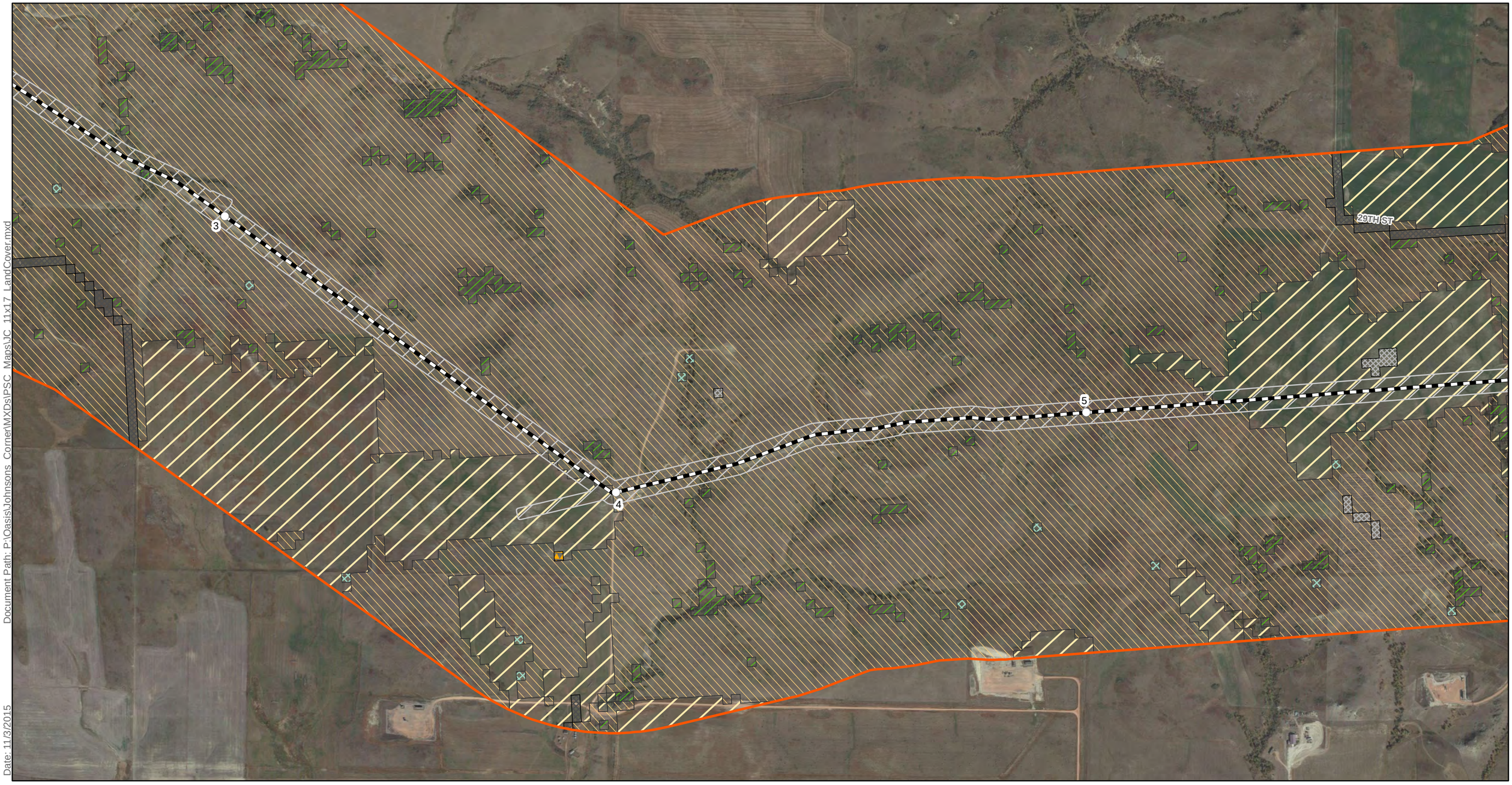
Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline

Land Cover Map

Page 1 of 7

McKenzie County, North Dakota



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GAP Land Cover

- Agricultural Vegetation
- Developed & Other Human Use
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E3 Environmental
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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline

Land Cover Map

Page 2 of 7

McKenzie County, North Dakota

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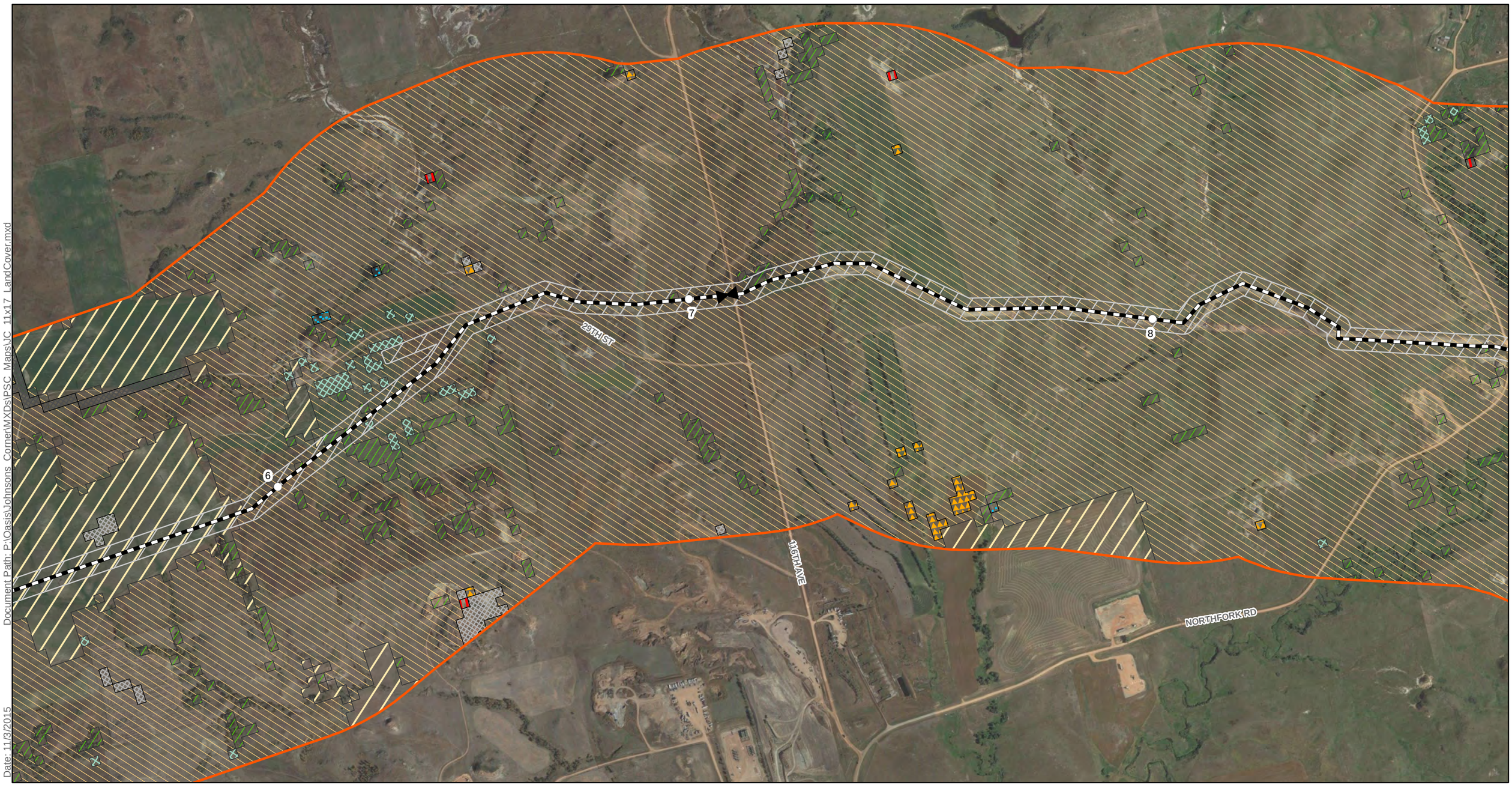

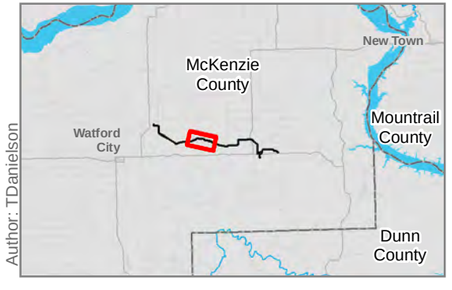

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E3 Environmental — Enhancing Execution with Experience

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Oasis Midstream Services, LLC

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Oasis Midstream Services, LLC

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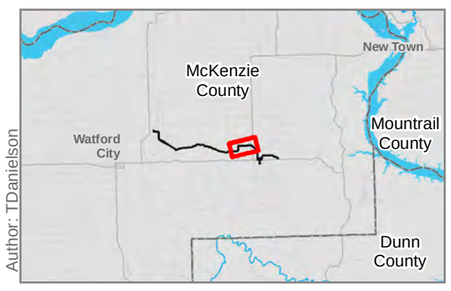

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E3 Environmental
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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
Crude Oil Pipeline

Land Cover Map

Page 5 of 7

McKenzie County, North Dakota

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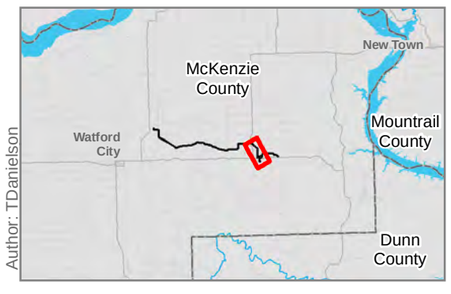

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E3 Environmental — Enhancing Execution with Experience

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Oasis Midstream Services, LLC

Wild Basin to Johnsons Corner
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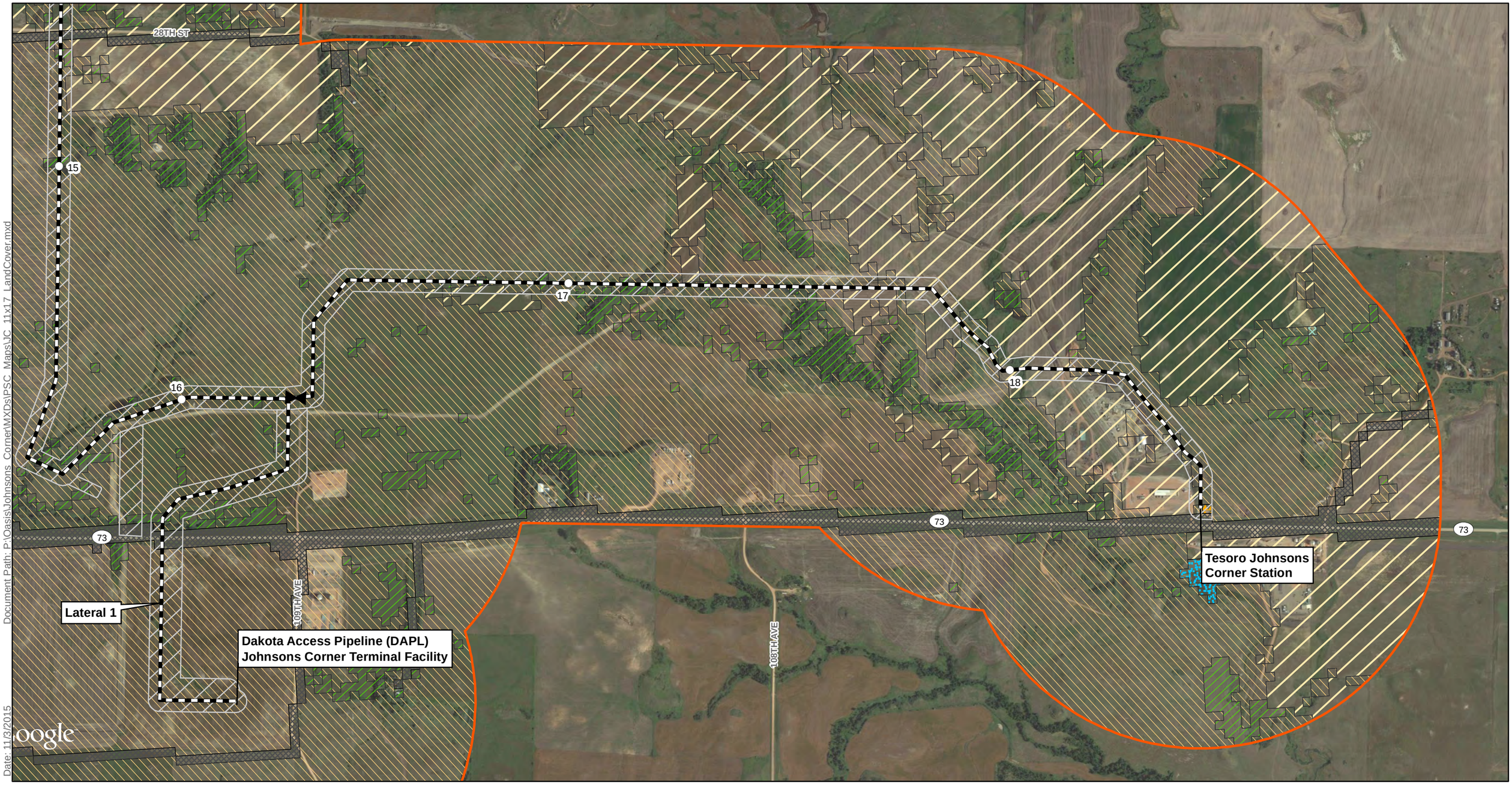
Land Cover Map

McKenzie County, North Dakota



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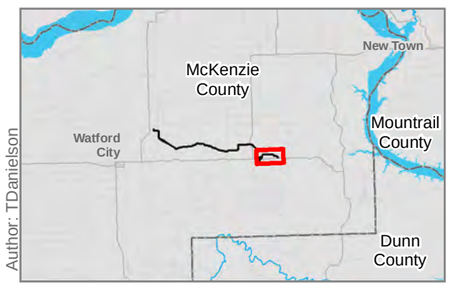

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Enhancing Execution with Experience

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Crude Oil Pipeline

Land Cover Map

Page 7 of 7

McKenzie County, North Dakota

Appendix C

Agency Consultations

Wild Basin to Johnsons Corner Pipeline Project Agency Consultations and Communications

		Project Notification Sent	Type of Communication	Response Received	Agency Response Discussion	
					Section Within the Certificate of Corridor Compatibility	Section Within the Route Permit
U.S. Fish and Wildlife Service (USFWS)		7/28/15 Revised Corridor Sent 10/1/15	Letter	Pending Pending	2.3.1	2.3.4.1 2.3.6 5.1
North Dakota Game and Fish Department (NDGFD)		7/28/15 Revised Corridor Sent 10/1/15	Letter	8/26/15 10/30/2015	2.3.2	4.1.10 6.1
North Dakota Parks and Recreation (NDPRD)		7/28/15 Revised Corridor Sent 10/1/15	Letter	8/14/15 10/20/15	2.3.3	4.1.10
North Dakota Department of Trust Lands (NDDTL)	**Surface Management Division**	7/28/15 Revised Corridor Sent 10/1/15	E-mail and Letter	7/29/15 10/3/15	2.3.4	N/A
	Minerals Management Division	7/28/15 Revised Corridor Sent 10/1/15	E-mail and Letter	7/28/15 10/1/15	2.3.4	N/A
North Dakota State Historic Preservation Office (NDSHPO)		Project Report Submittal Pending	Letter	Pending	2.3.5	2.3.5 5.1

U.S. Fish and Wildlife Service

Consultation

July 28, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
Threatened and Endangered Species, Migratory Bird, and Managed Lands Review

Oasis Petroleum (Oasis) has proposed the construction of the Wild Basin to Johnson's Corner Pipeline Project (Project). The Project will result in an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline.

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

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 18
- T150N R96W Sections 7, 8, 9, 10, 11, 13, 14, & 18
- T150N R97W Sections 6, 7, 8, 9, 10, 11, & 12
- T150N R98W Section 1
- T151 N R98W Sections 35 & 36

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 July 20, 2015 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
- Red knot (*Calidris canutus rufa*)-Threatened
- Piping plover (*Charadrius melodus*) – Threatened and final designated critical habitat

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

- Dakota Skipper (*Hesperia dacotae*) – Threatened, and proposed critical habitat
- Northern Long-eared Bat (*Myotis septenrionnalis*)-Threatened

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: The whooping crane is a large bodied marsh species that breeds primarily in Canada and winters in the Gulf of Mexico. This species has been closely studied and monitored in recent years due to its small population. North Dakota provides migratory habitat for the species, providing roosting and feeding opportunities during migration. This species prefers larger wetland complexes for roosting habitat, typically using adjacent uplands for foraging opportunities.

Precautionary measures will be implemented if whooping cranes are sighted in or near the Project area. Oasis will 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 will resume upon the departure of the individual(s). The Project under consideration will not result in a loss of crane habitat. The project schedule would avoid typical migration periods coupled with restoration of disturbed areas to their original land use will largely avoid and minimize impacts to this species.

Interior least tern: The interior populations of the Least Tern have historically been associated with large river systems for breeding and migratory habitats. The Project is approximately 11 miles from the Missouri River. Breeding birds are known to congregate in colonies, utilizing sandbar habitat common to larger rivers. The Least Tern is found in North Dakota during the late spring and summer breeding season (mid-May through late August, with the peak of the nesting season occurring from mid-June to mid-July). Desktop analysis has concluded that no suitable habitat is present within the Project area; therefore, impacts to the Least Tern are not anticipated.

Pallid sturgeon: The pallid sturgeon's 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. The species inhabits the Missouri and Mississippi Rivers from Montana to Louisiana. In North Dakota, reaches of the Missouri River have been cited as providing suitable habitat for the pallid sturgeon. However, there is no suitable sturgeon habitat in the Project area as the Missouri River does not intersect the project corridor; as such, impacts to the pallid sturgeon are not anticipated.

Gray wolf: The gray wolf is a large carnivore that through conservation measures has experienced strong population recovery, particularly in the Great Lakes states of the upper Midwest. As populations rebound, individuals may break from packs to explore opportunities to establish packs in unoccupied territory. Roaming individuals can cover great distances without establishing viable breeding populations in previously unoccupied habitat(s). This species is not tolerant of human disturbance and will tend to avoid interaction with humans. The activities associated with construction and later plant operations would likely serve as a deterrent to this species. Therefore, this Project will have no impact on the gray wolf.

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871 Jefferson Avenue
St. Paul, MN 55102

Rufa red knot: The Rufa red knot migrates between breeding grounds in Canada and wintering grounds in South America. A significant factor threatening the Rufa red knot is destruction and modification of its habitat due to beach erosion and shoreline protection and stabilization projects. Migratory behavior and habitat requirements of this species are poorly understood particularly for those populations occupying the midcontinent flyways. Inland stopovers include the Mississippi Valley, Great Lakes, and Great Plains. Desktop analysis has concluded that no suitable habitat is present within the Project area; therefore impacts to the Rufa red knot are not anticipated.

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% 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. The Missouri River, the nearest designated critical habitat for the piping plover, is located approximately 11 miles from the proposed Project. Breeding season in North Dakota occurs mid-April through August. Desktop analysis has concluded that no suitable habitat is present within the Project Area; therefore, impacts to the piping plover or its critical habitat are no anticipated.

Dakota skipper: Dakota skippers require untilled, high-quality prairie. Habitat preferred by the skipper is wet-mesic prairie with little topographic relief on near-shore glacial lake deposits and in rolling native-prairie terrain over gravelly glacial moraine deposits. Larvae feed on grasses, favoring little bluestem (*Schizachyrium scoparium*). Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower (*Echinacea angustifolia*). This species is not known to disperse widely and has low mobility, dispersing a maximum of 0.6 miles. The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding. Desktop analysis have concluded that some suitable foraging habitat is located within the Corridor. However, impacts to the Dakota skipper are not anticipated as the nearest proposed critical habitat is located approximately 11 miles from the Project.

Northern long-eared bat: The northern long-eared bat roost underneath bark, in cavities, or in crevices of both live and dead trees. Populations have also been found in cool environments such as caves and mines and prefer to spend winter hibernating in locations with high humidity and no air currents. Breeding occurs in late summer or early fall in maternity colonies where females give birth around the same time, which may occur anywhere from late May to late July. Desktop analysis has concluded that no suitable habitat is present within the Project area; therefore, impacts to the northern long-eared bat are not anticipated.

USFWS Managed Lands:
Conservation programs such as Waterfowl Production Areas 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. Oasis requests confirmation regarding the presence or absence of USFWS managed lands within the proposed study area.

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871 Jefferson Avenue
St. Paul, MN 55102

Migratory Bird Consultation:
USFWS administers various wildlife related mandates of national concern including the Migratory Bird Treaty Act (MBTA). Oasis 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. Oasis also understands that in North Dakota, the breeding season is typically defined as occurring annually from February 1 through July 15.

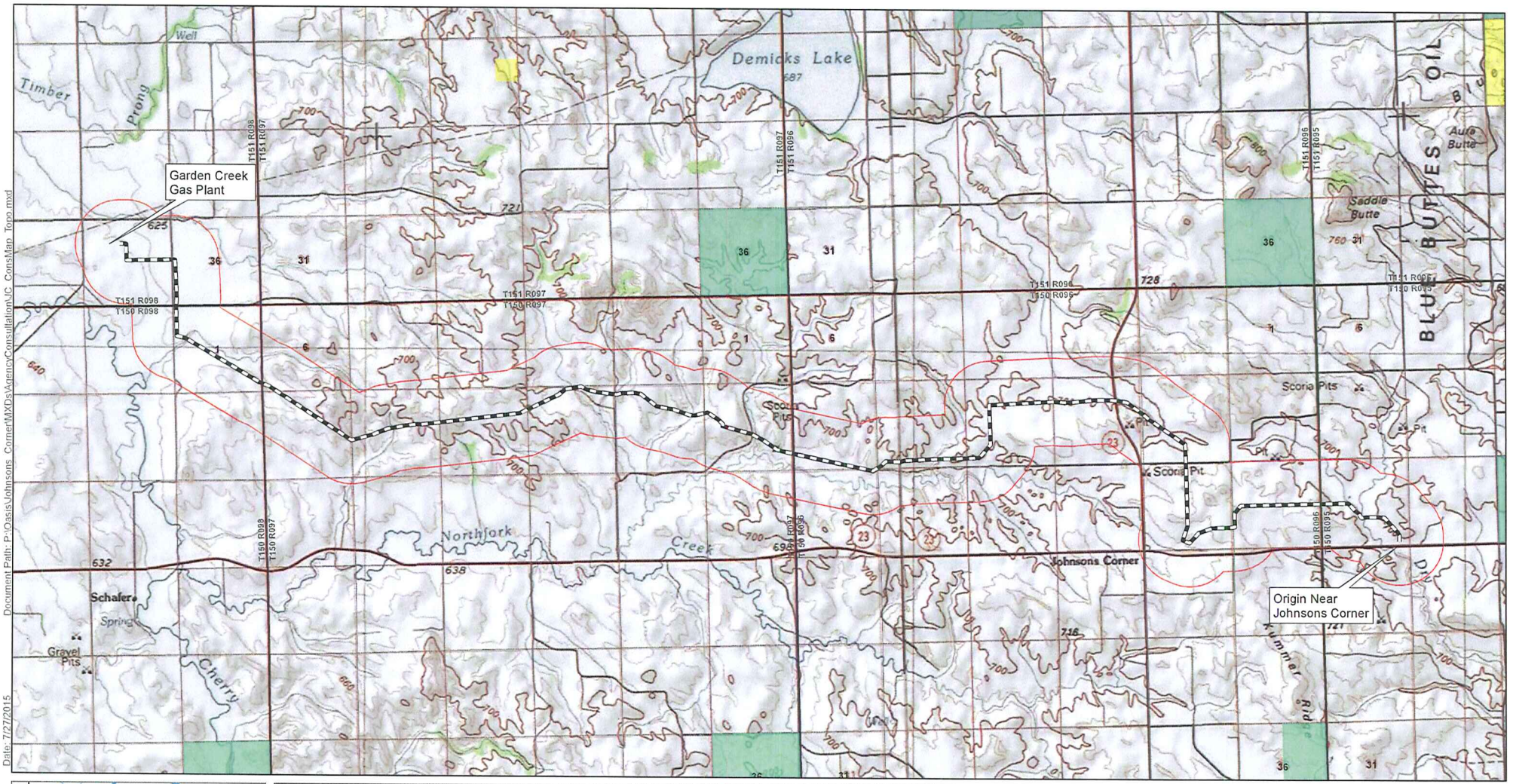
E3 Environmental, LLC (E3) has been retained by Oasis to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map - Aerial photography

cc: E3 Project Files



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Date: 7/27/2015
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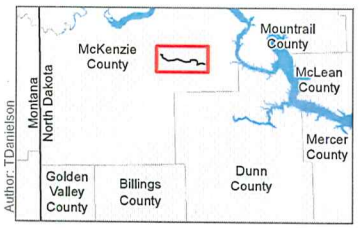


Proposed Route
Corridor (1 mile)
County Line
Township Boundary

Land Ownership
State of North Dakota
USFS Little Missouri National Grassland

N

E3 Environmental
Enhancing Execution with Experience

0 1 2 4 Miles

1:65,000

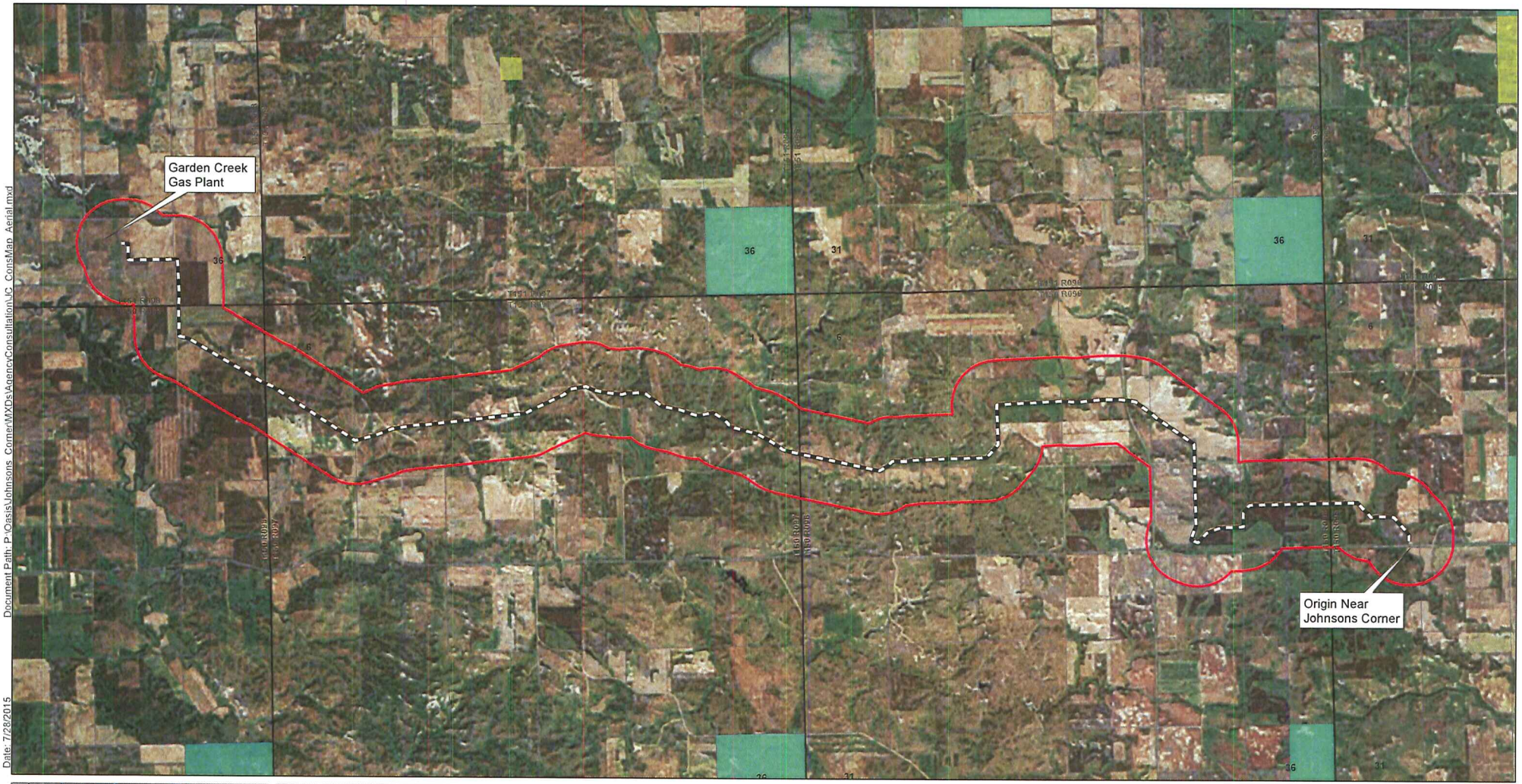
Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Topo

McKenzie County, ND



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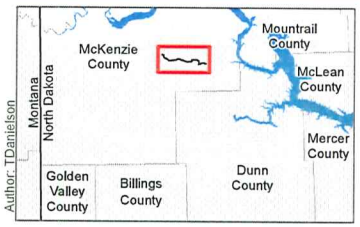
Date: 7/28/2015

Author: TDanielson



Proposed Route

Corridor (1 mile)

County Line

Township Boundary

Land Ownership

State of North Dakota

USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

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Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Aerial

McKenzie County, ND

October 1, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
Threatened and Endangered Species, Migratory Bird, and Managed Lands Review

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum (Oasis) to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (Project). Oasis has proposed the construction of the Project, which will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. The Project will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. A consultation letter was sent to you for this Project on July 28, 2015, and a response was not received. The design of the Project has since been modified and the enclosed maps depict the revised Proposed Route and associated 1-mile Corridor. Please note the previous Corridor is illustrated on the attached maps in green and the revised Corridor is shown in red.

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.

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

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 17, 18, 19 & 20
- T150N R96W Sections 2-5, 7-11, 17-18, 22-24
- T150N R97W Sections 1-13, 17 & 18
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E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

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St. Paul, MN 55102

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871 Jefferson Avenue
St. Paul, MN 55102

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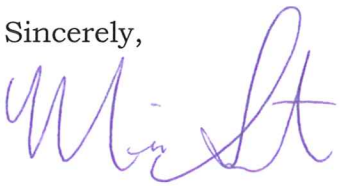
Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,



Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map - Aerial photography

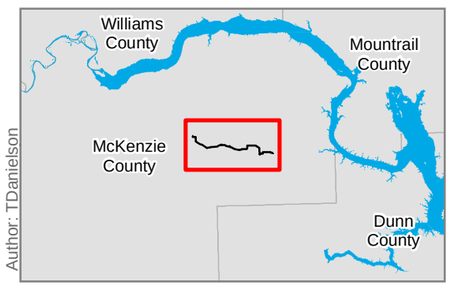
cc: E3 Project Files

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

36 31 1 6

T151 R098 T151 R097 T151 R096



Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

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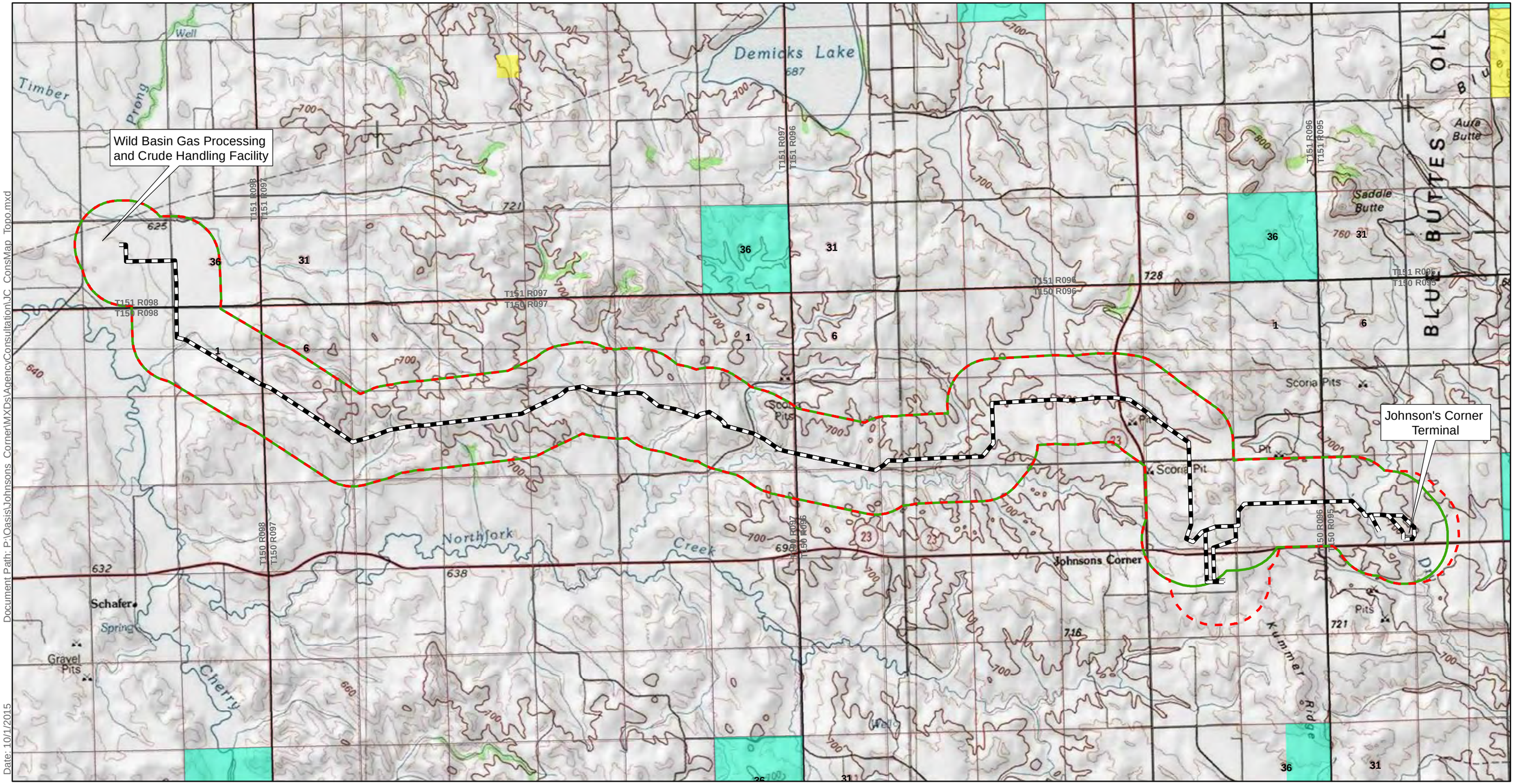
Oasis Petroleum

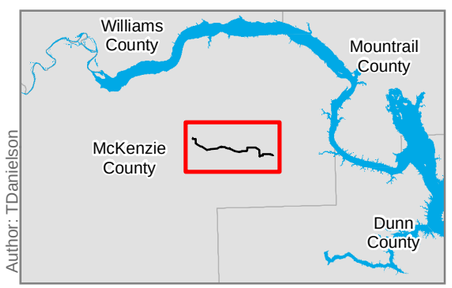
Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Aerial

McKenzie County, ND

Author: TDanielson
Date: 10/1/2015
Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd





Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

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Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Topo

McKenzie County, ND

Author: TDanielson

Date: 10/1/2015

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo.mxd

USFWS Response Pending

North Dakota Game and Fish Department

Consultation

July 28, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
State Conservation Priority Species Consultation

Oasis Petroleum (Oasis) has proposed the construction of the Wild Basin to Johnson's Corner Pipeline Project (Project). The Project will result in an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline.

The purpose of this correspondence is twofold: to afford the North Dakota Game and Fish Department (Department) the opportunity to assess the Project and associated Study Area for the presence or absence of State Conservation Priority Species.

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project.

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 18
- T150N R96W Sections 7, 8, 9, 10, 11, 13, 14, & 18
- T150N R97W Sections 6, 7, 8, 9, 10, 11, & 12
- T150N R98W Section 1
- T151 N R98W Sections 35 & 36

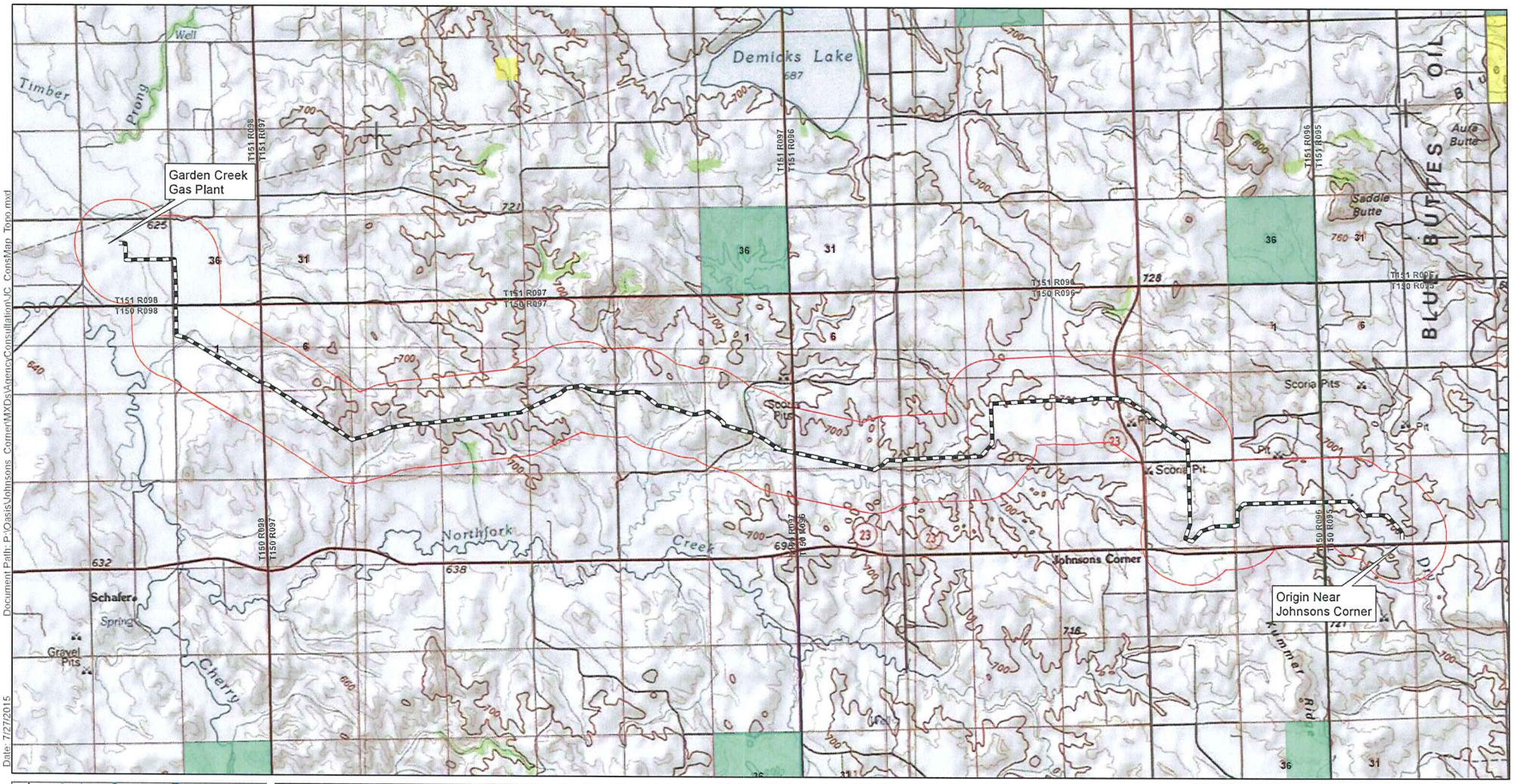
In closing, E3 Environmental, LLC (E3) has been retained by Oasis to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project map – USGS topographic
Project map – Aerial photograph

cc: E3 Project Files

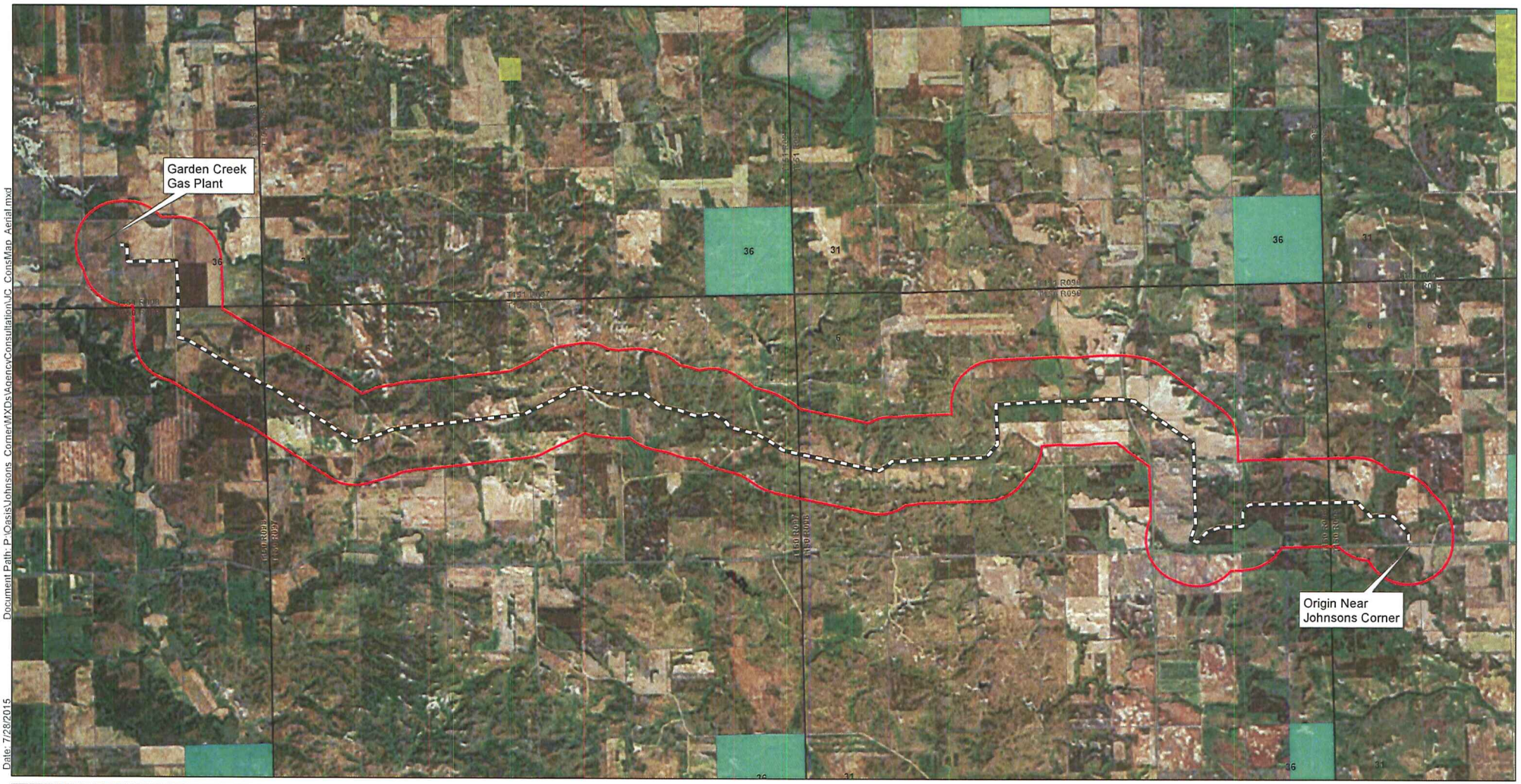


Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Topo

McKenzie County, ND



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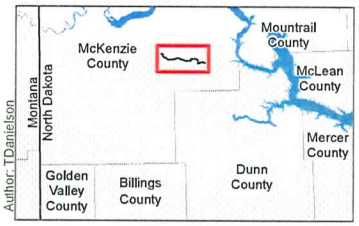
Date: 7/28/2015

Author: TDanielson



Proposed Route

Corridor (1 mile)

County Line

Township Boundary

Land Ownership

State of North Dakota

USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Aerial

McKenzie County, ND

"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

August 26, 2015

Melissa Schmit
Consultant
E3 Environmental, LLC
871 Jefferson Avenue
St. Paul, MN 55102

Dear Ms. Schmit:

RE: Wild Basin to Johnson's Corner Pipeline Project

Oasis Petroleum has proposed the construction of an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline in McKenzie County, North Dakota. The North Dakota Game and Fish Department (NDGF) has reviewed this project for wildlife concerns.

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 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. Unavoidable destruction or degradation of wetland acres should be mitigated in kind.

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

Private Lands Open to Sportsmen (PLOTS) is a public access program which cost-shares with private landowners to help conserve fish and wildlife habitat. PLOTS lands are not owned or managed by the NDGF. Information regarding PLOTS locations is available at: http://gf.nd.gov/hunting/private-land-open-sportsmen. This page is updated to reflect changes as tracts are added or removed.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js

October 1, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
State Conservation Priority Species Consultation

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum (Oasis) to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (Project). Oasis has proposed the construction of the Project, which will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. A consultation letter was sent to you for this Project on July 28, 2015, and a response was received via mail on August 26, 2015 indicating you do not believe the Project would have significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided the specific recommendations are implemented where appropriate. The design of the Project has since been modified and the enclosed maps depict the revised Proposed Route and associated 1-mile Corridor. Please note your comments have been received for the previous Corridor illustrated on the attached maps in green and we are requesting your comments on the revised Corridor shown in red.

The purpose of this correspondence is to afford the North Dakota Game and Fish Department (Department) the opportunity to assess the revised Project and associated Study Area for the presence or absence of State Conservation Priority Species.

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project.

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 17, 18, 19 & 20
- T150N R96W Sections 2-5, 7-11, 17-18, 22-24
- T150N R97W Sections 1-13, 17 & 18
- T150N R98W Section 1, 2 & 12
- T151 N R98W Sections 25, 26, & 34-36

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project map – USGS topographic
Project map – Aerial photograph

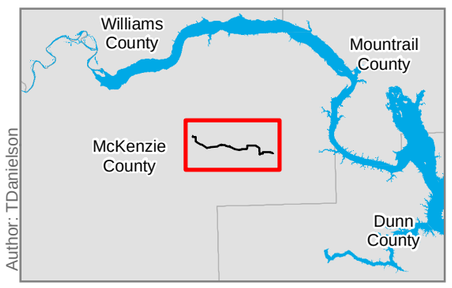
cc: E3 Project Files

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

36 31 1 6

T151 R098 T151 R097 T151 R096



Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

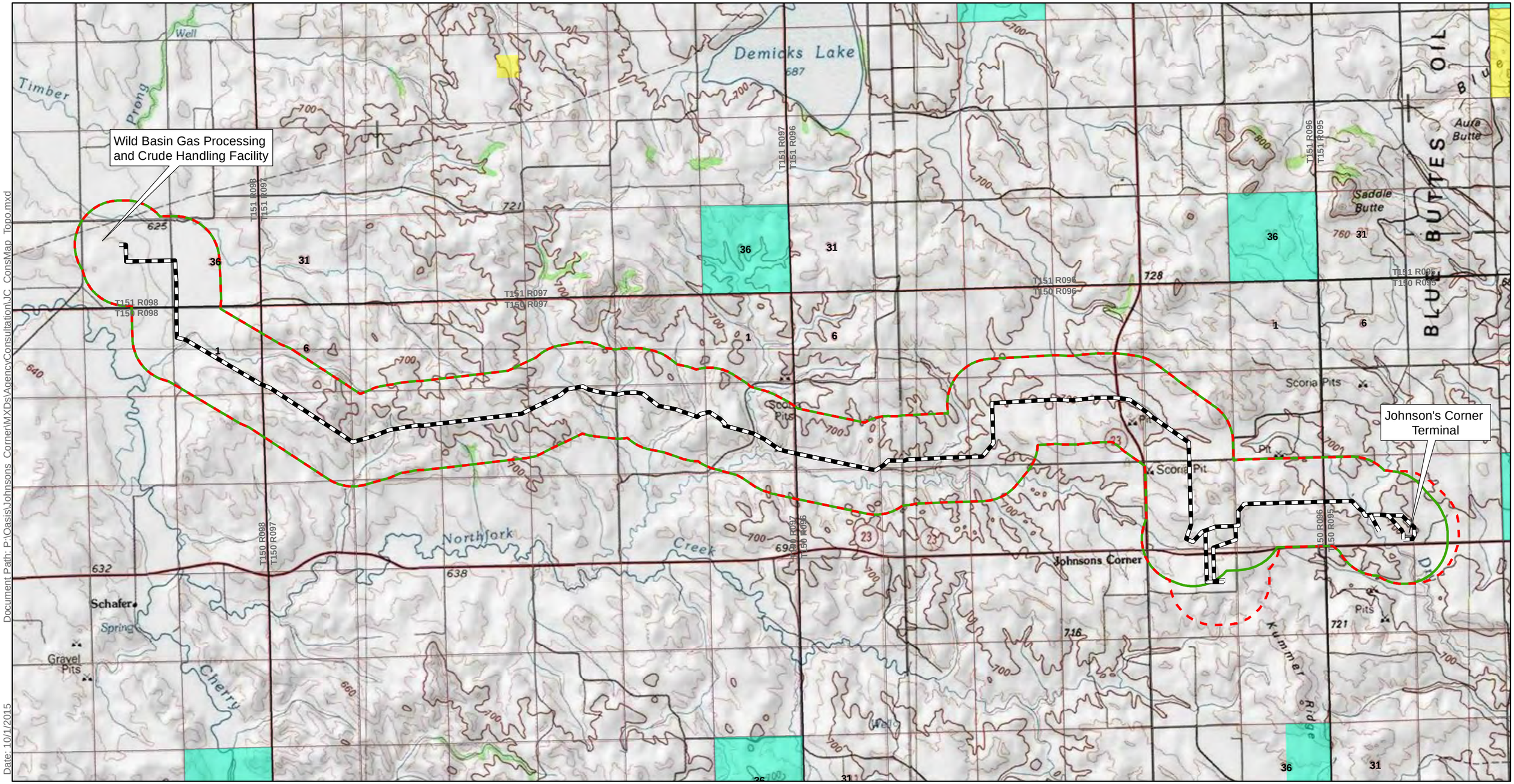
Oasis Petroleum

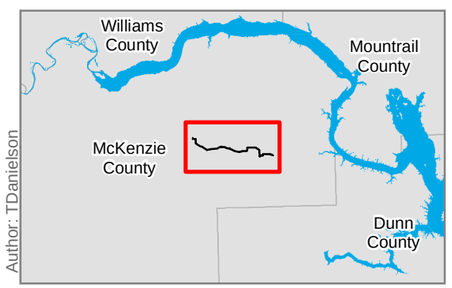
Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Aerial

McKenzie County, ND

Author: TDanielson
Date: 10/1/2015
Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd





Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Topo

McKenzie County, ND

Author: TDanielson

Date: 10/1/2015

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo.mxd

Melissa Schmit

From: Schumacher, John D. <jdschumacher@nd.gov>
Sent: Friday, October 30, 2015 11:40 AM
To: Melissa Schmit
Subject: Oasis Petroleum - Wild Basin to Johnson's Corner Pipeline Project

Ms. Schmit,

The North Dakota Game and Fish Department has reviewed this project as modified and has nothing additional to offer. Our original comments are still applicable.

If you have any questions I may be contacted by email or at the number below.

JOHN SCHUMACHER
RESOURCE BIOLOGIST
ND GAME AND FISH DEPT
701.328.6321

North Dakota Parks and Recreation Department

Consultation

July 28, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
Natural Heritage Inventory Review
State Park Lands; and Land and Water Conservation Fund Review

Oasis Petroleum (Oasis) has proposed the construction of the Wild Basin to Johnson's Corner Pipeline Project (Project). The Project will result in an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline.

The purpose of this request is to provide the North Dakota Parks and Recreation Department's (Department) notice of the Project such that the environmental topics that fall under the purview of the Department that are also relevant to the North Dakota Public Service Commission's siting requirements for Energy Conversion facilities are administrated properly. It is our understanding that the Department administers the following state programs:

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

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project for the presence or absence of any lands, projects, and sensitive species.

<u>In McKenzie County, North Dakota the pipeline crosses:</u>

- T150N R95W Section 18
- T150N R96W Sections 7, 8, 9, 10, 11, 13, 14, & 18
- T150N R97W Sections 6, 7, 8, 9, 10, 11, & 12
- T150N R98W Section 1
- T151 N R98W Sections 35 & 36

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

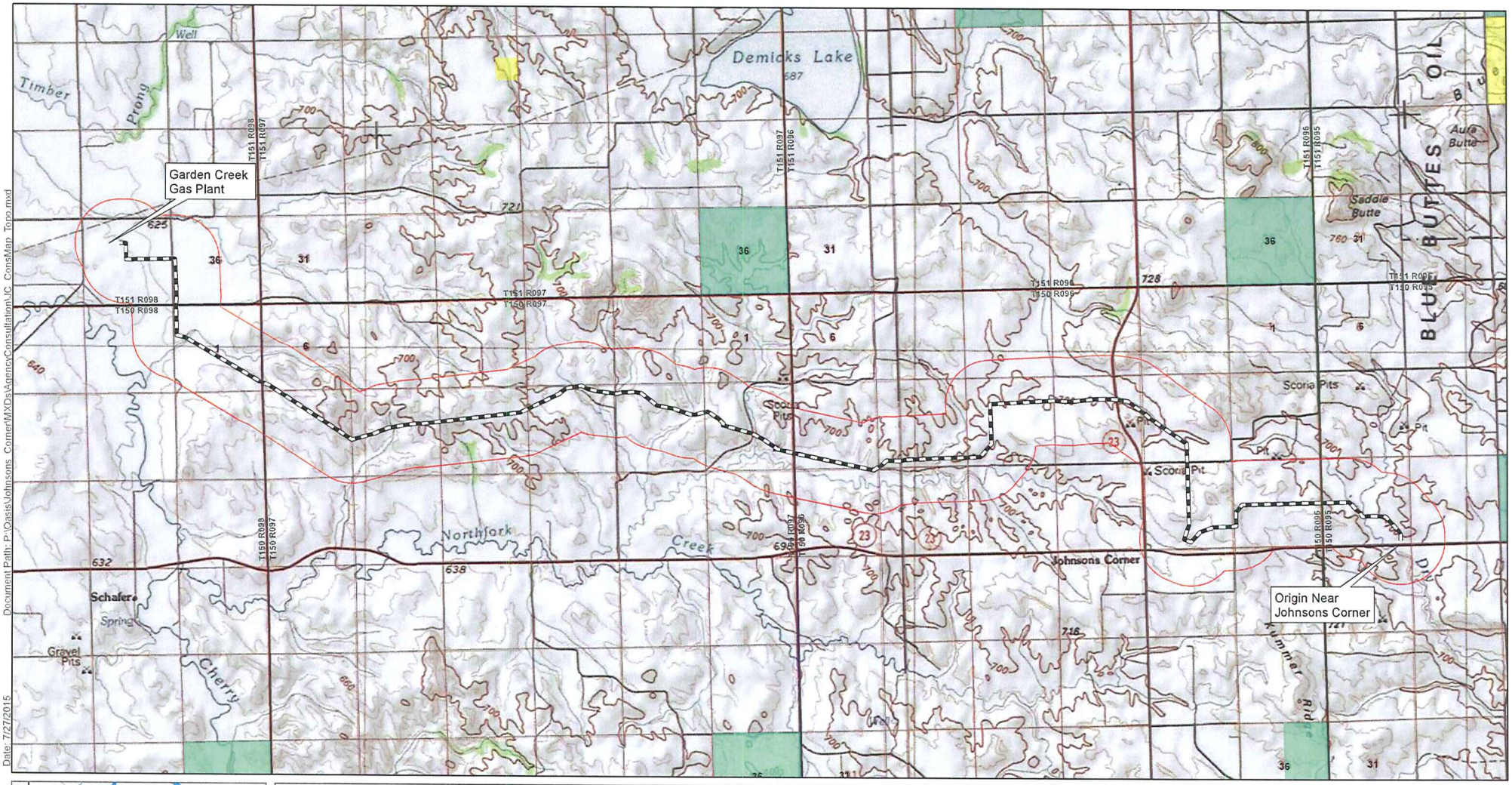
In closing, E3 Environmental, LLC has been retained by Oasis to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

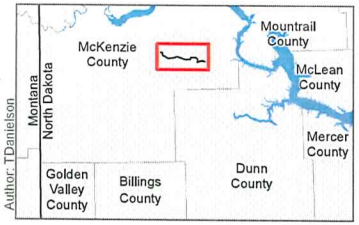
Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph

cc: E3 Project Files





Proposed Route
Corridor (1 mile)
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

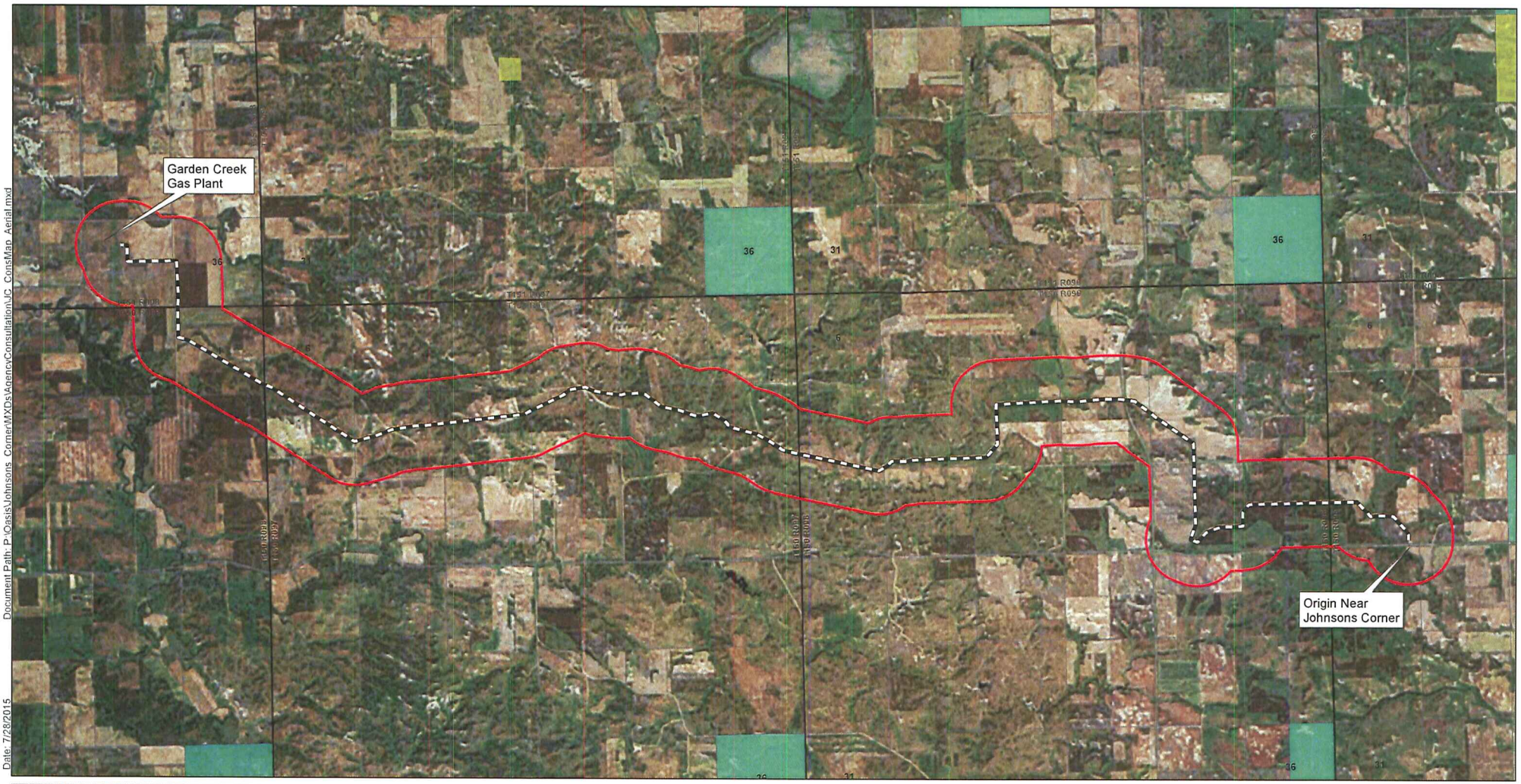
Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Topo

McKenzie County, ND

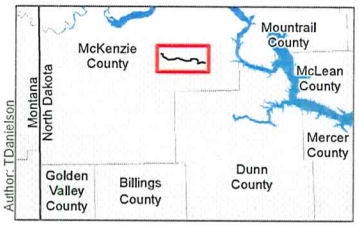
Author: TDanielson
Date: 7/27/2015
Document Path: P:\Oasis\Johnsons Corner\MXDs\AgencyConsultation\IC_ConsMap_Topo.mxd



Document Path: P:\Oasis\Johnsons Corner\MXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd

Date: 7/28/2015

Author: TDanielson



Proposed Route

Corridor (1 mile)

County Line

Township Boundary

Land Ownership

State of North Dakota

USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Aerial

McKenzie County, ND

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

August 14, 2015

Chris Schmitt
E3 Environmental, LLC
871 Jefferson Ave.
St. Paul, MN 55102

Re: Oasis Petroleum - Pipeline Project

Dear Mr. Schmitt:

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced project for the proposed construction of the Oasis Petroleum Pipeline project in McKenzie County, North Dakota.

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 significant ecological community occurrences or plant and animal species of concern in our database within 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

Kathy Duttenhefner, Coordinator
Natural Resources Division

R.USNDNHI*2015-076KD8.14.2015KD8/14/2015

October 1, 2015

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

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
Natural Heritage Inventory Review
State Park Lands; and Land and Water Conservation Fund Review

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum (Oasis) to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (Project). Oasis has proposed the construction of the Project, which will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. The Project will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. A consultation letter was sent to you for this Project on July 28, 2015, and a response was received via mail on August 14, 2015 confirming there are no documented occurrences of species or ecological communities of concern within the Corridor. The design of the Project has since been modified and the enclosed maps depict the revised Proposed Route and associated 1-mile Corridor. Please note your comments have been received for the previous Corridor illustrated on the attached maps in green and we are requesting your comments on the revised Corridor shown in red.

The purpose of this request is to provide the North Dakota Parks and Recreation Department's (Department) notice of the revised Project such that the environmental topics that fall under the purview of the Department that are also relevant to the North Dakota Public Service Commission's siting requirements for Energy Conversion facilities are administrated properly. It is our understanding that the Department administers the following state programs:

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

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project for the presence or absence of any lands, projects, and sensitive species.

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 17, 18, 19 & 20
- T150N R96W Sections 2-5, 7-11, 17-18, 22-24
- T150N R97W Sections 1-13, 17 & 18
- T150N R98W Section 1, 2 & 12
- T151 N R98W Sections 25, 26, & 34-36

Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph

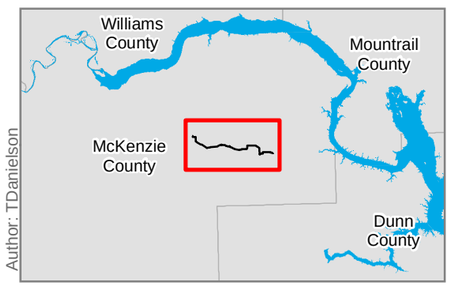
cc: E3 Project Files

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

36 31 1 6

T151 R098 T151 R097 T151 R096



Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

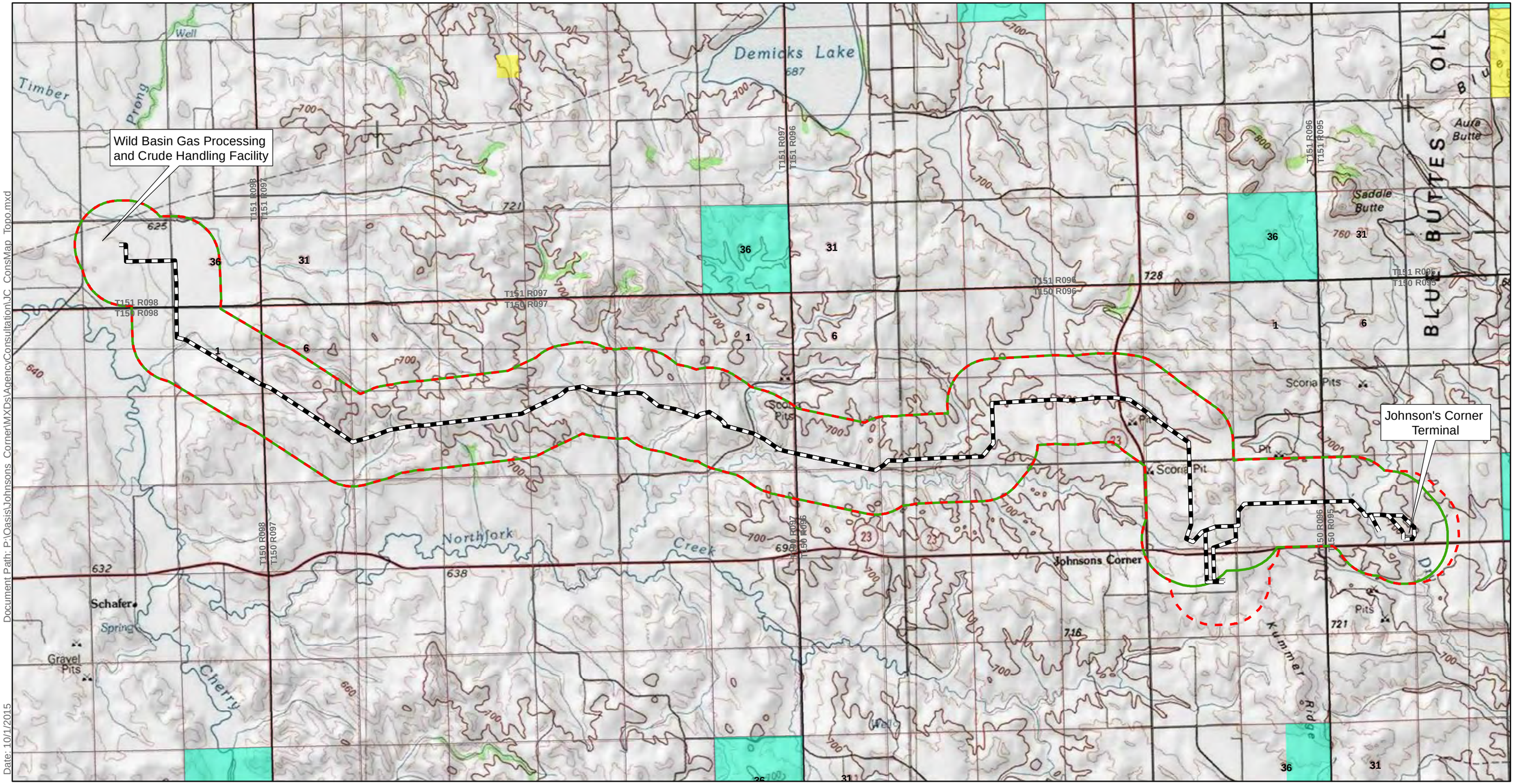
Oasis Petroleum

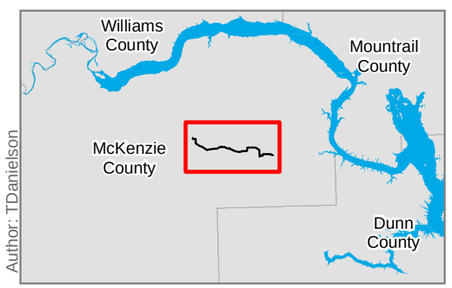
Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Aerial

McKenzie County, ND

Author: TDanielson
Date: 10/1/2015
Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd





Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Topo

McKenzie County, ND

Author: TDanielson

Date: 10/1/2015

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo.mxd

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

October 20, 2015

Melissa Schmitt
E3 Environmental, LLC
871 Jefferson Ave.
St. Paul, MN 55102

Re: Oasis Petroleum - Pipeline Project Revised Corridor

Dear Mr. Schmitt:

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced projects ***revised corridor*** for the proposed construction of the Oasis Petroleum Pipeline project in McKenzie County, North Dakota.

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 significant ecological community occurrences or plant and animal species of concern in our database within 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*2015-1100KD10/20/2015KD10.20.2015

Consultation

July 28, 2015

Mr. Michael Haupt, Land Management Professional
North Dakota Department of Trust Lands
Surface Management Division
1707 North 9th Street, P.O. Box 5523
Bismarck, ND 58506-5523

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
School Trust Lands Consultation

Oasis Petroleum (Oasis) has proposed the construction of the Wild Basin to Johnson's Corner Pipeline Project (Project). The Project will result in an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline.

The purpose of this correspondence is to request a review of the Project and associated Study Area (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.

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project.

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 18
- T150N R96W Sections 7, 8, 9, 10, 11, 13, 14, & 18
- T150N R97W Sections 6, 7, 8, 9, 10, 11, & 12
- T150N R98W Section 1
- T151 N R98W Sections 35 & 36

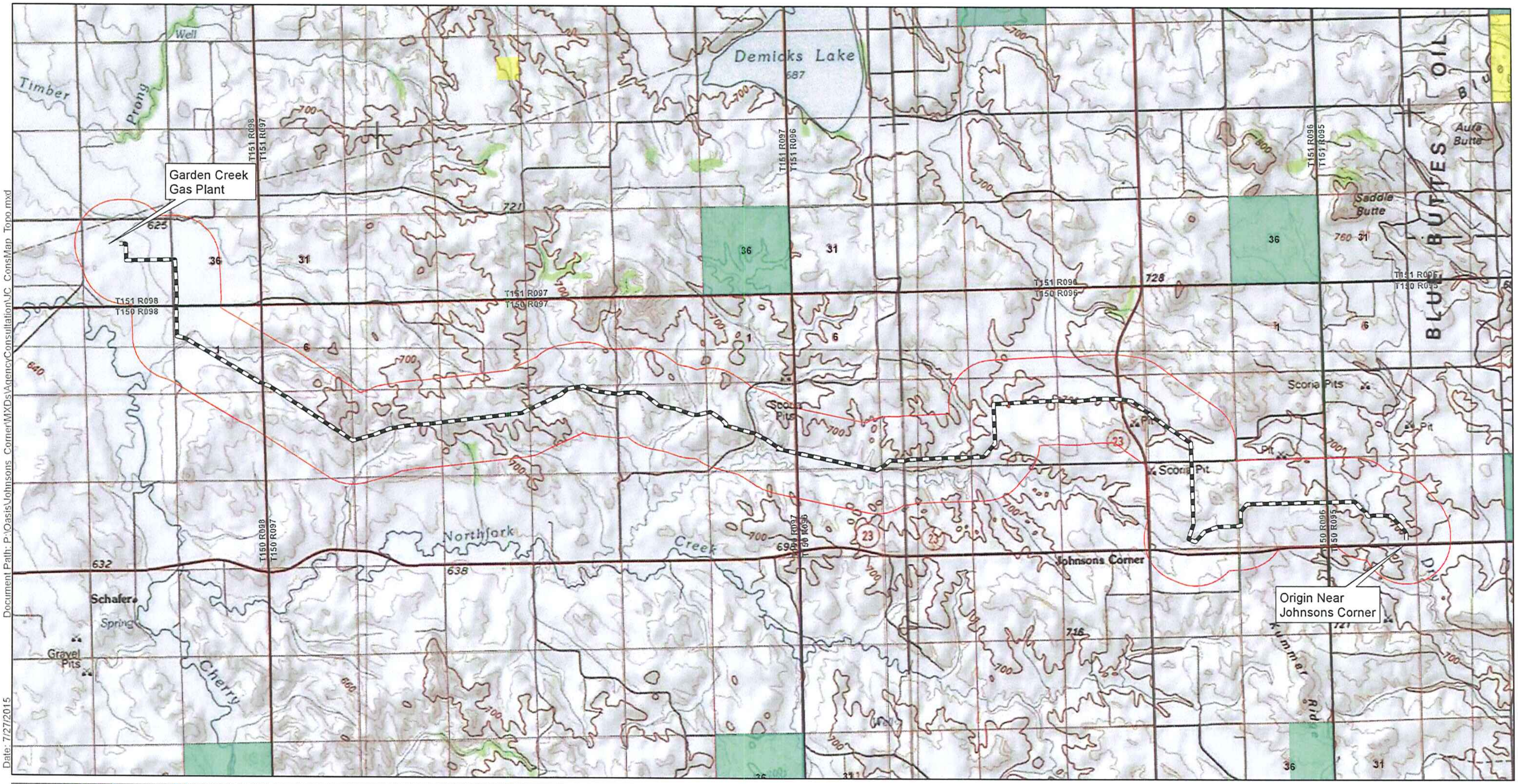
In closing, E3 Environmental, LLC has been retained by Oasis to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

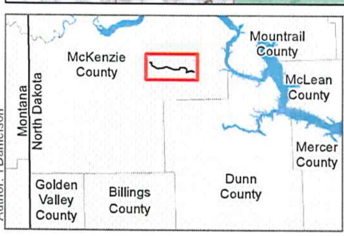
Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph

cc: E3 Project Files





Proposed Route
Corridor (1 mile)
County Line
Township Boundary

Land Ownership
State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles
1:65,000
Map not to scale, for environmental review purposes only.

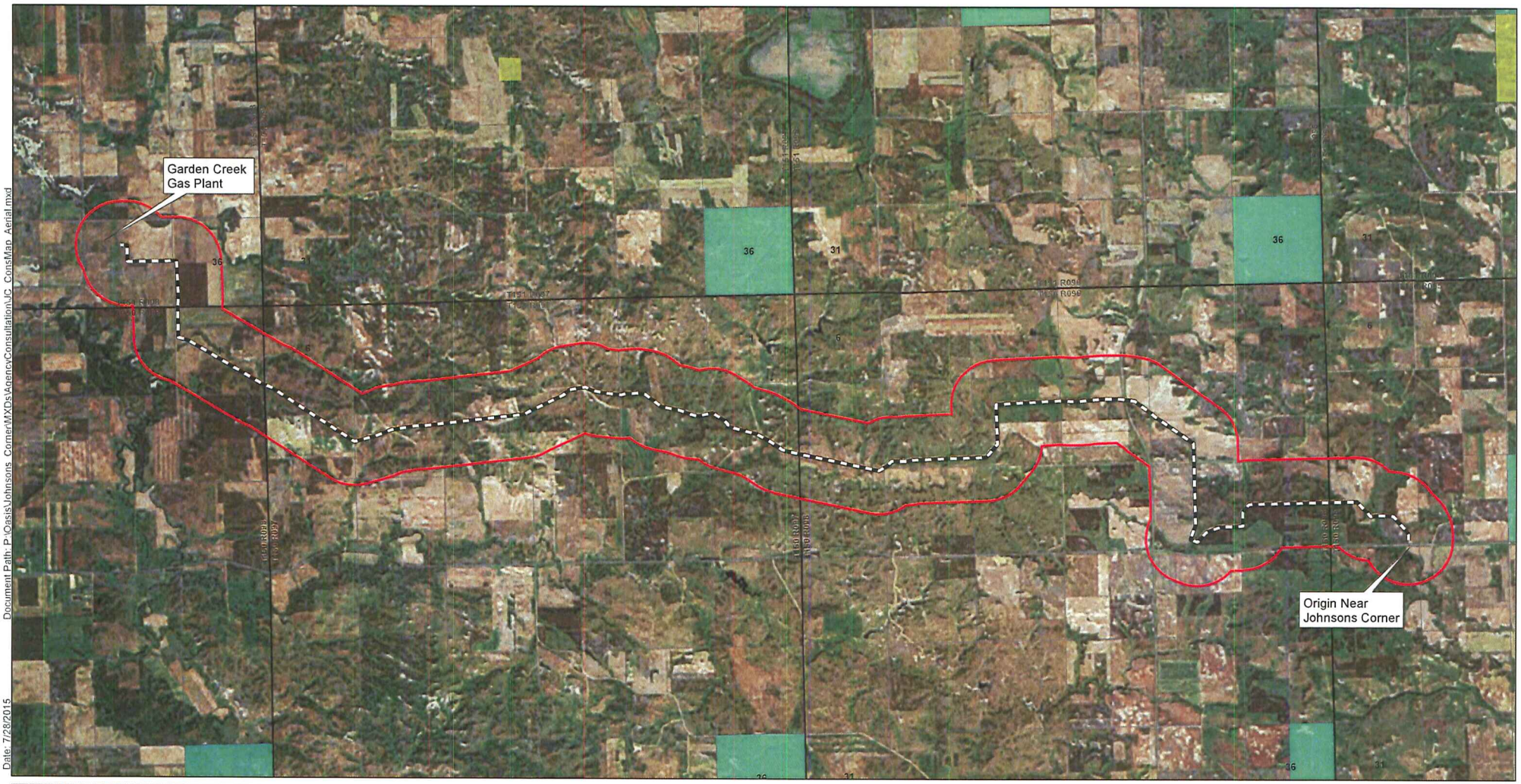
E3 ENVIRONMENTAL
Enhancing Execution with Experience

Oasis Petroleum
Wild Basin to Johnsons Corner

Consultation Map - Topo

McKenzie County, ND

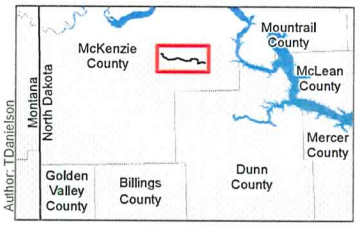
Document Path: P:\Oasis\Johnsons_Corner\MXDs\AgencyConsultation\JC_ConsMap_Topo.mxd
Date: 7/27/2015
Author: TDanielson



Document Path: P:\Oasis\Johnsons Corner\MXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd

Date: 7/28/2015

Author: TDanielson



Proposed Route

Corridor (1 mile)

County Line

Township Boundary

Land Ownership

State of North Dakota

USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Aerial

McKenzie County, ND

From: Haupt, Michael L.
To: Melissa Schmit
Subject: RE: Oasis Petroleum: Wild Basin to Johnson"s Corner Pipeline Project & Surface Trust Lands Consultation
Date: Wednesday, July 29, 2015 3:25:12 PM
Attachments: image001.png

Melissa,

Good afternoon! The ND School Trust has no surface in 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: Melissa Schmit [mailto:MSchmit@go2e3.com]
Sent: Tuesday, July 28, 2015 10:28 AM
To: Haupt, Michael L.
Subject: Oasis Petroleum: Wild Basin to Johnson's Corner Pipeline Project & Surface Trust Lands Consultation

Dear Mr. Haupt,

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (see attached). For your convenience, E3 is submitting an electronic copy of the project notification letter and maps to assist in your review of the Project.

Please let me know if I can be of further assistance, or if you have any questions or concerns regarding the attached files.

Thank you for your time and consideration.

Sincerely,

Melissa Schmit
Consultant
E3 Environmental, LLC
mschmit@go2e3.com
O: 651.282.0656
M: 651.263.7916
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

October 1, 2015

Mr. Michael Haupt, Land Management Professional
North Dakota Department of Trust Lands
Surface Management Division
1707 North 9th Street, P.O. Box 5523
Bismarck, ND 58506-5523

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
School Trust Lands Consultation

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum (Oasis) to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (Project). Oasis has proposed the construction of the Project, which will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. The Project will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. A consultation letter was sent to you for this Project on July 28, 2015, and a response was received via email on July 29, 2015 confirming the absence of state trust land tracts within the Corridor as depicted in the consultation map. The design of the Project has since been modified and the enclosed maps depict the revised Proposed Route, associated 1-mile Corridor, and State Trust Lands within the Corridor. Please note your comments have been received for the previous Corridor illustrated on the attached maps in green and we are requesting your comments on the revised Corridor shown in red.

The purpose of this correspondence is to request a review of the revised Project and associated Study Area (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.

The location of the proposed Project is described below and depicted on the attached maps. The enclosed topographic map and aerial photo depict the Project site and associated Study Area. These have been provided to assist the Department's review of the Project.

<u>In McKenzie County, North Dakota the pipeline crosses:</u>

- T150N R95W Section 17, 18, 19 & 20
- T150N R96W Sections 2-5, 7-11, 17-18, 22-24
- T150N R97W Sections 1-13, 17 & 18
- T150N R98W Section 1, 2 & 12
- T151 N R98W Sections 25, 26, & 34-36

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph

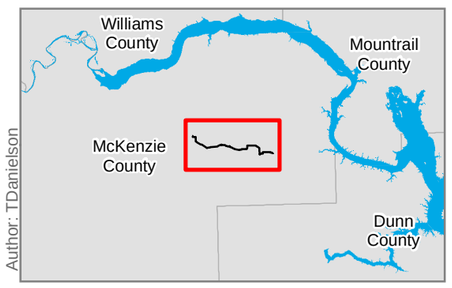
cc: E3 Project Files

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

36 31 1 6

T151 R098 T151 R097 T151 R096



Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

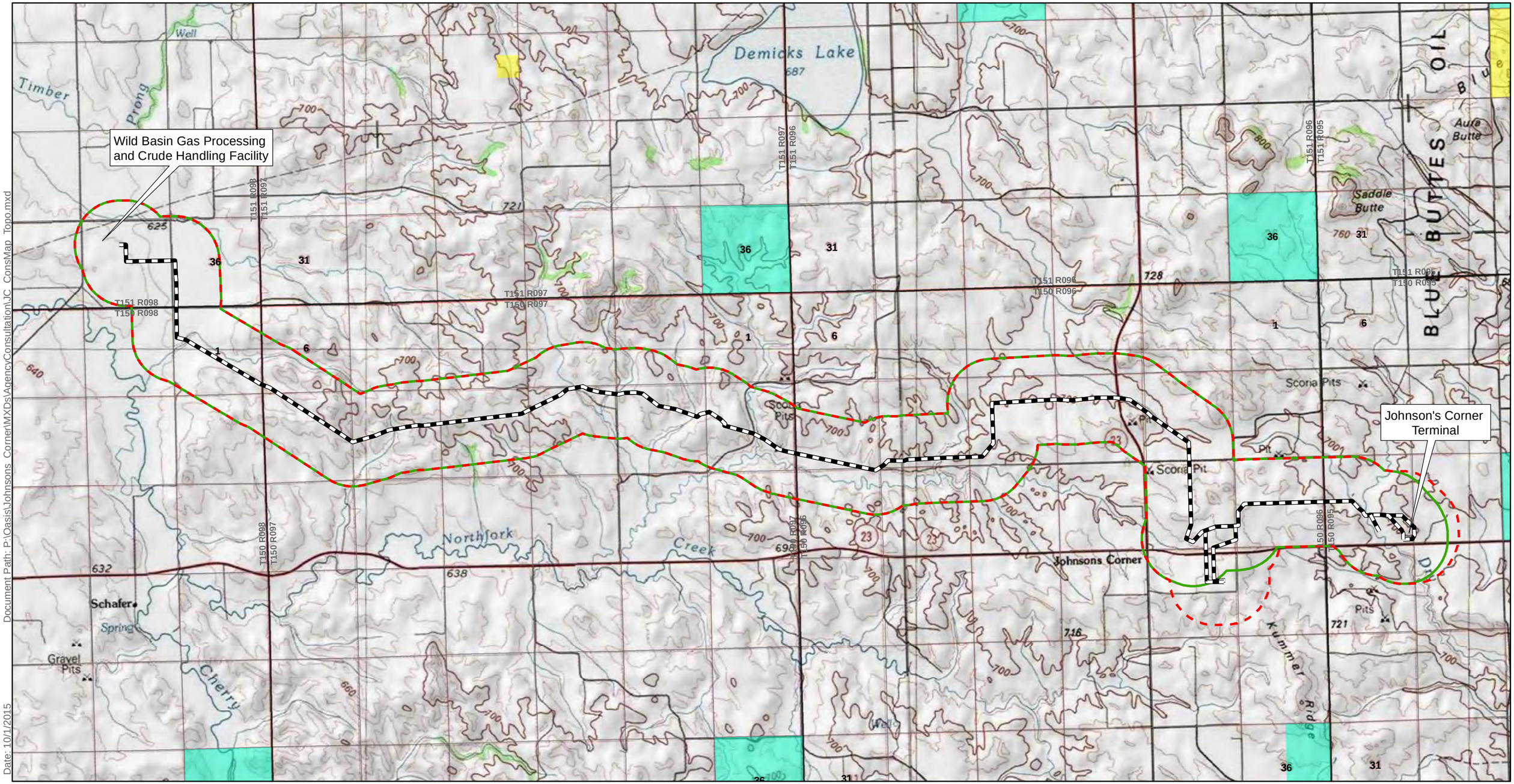
Oasis Petroleum

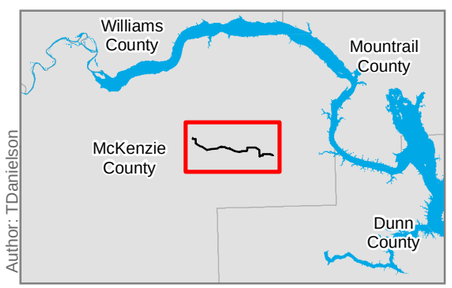
Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Aerial

McKenzie County, ND

Author: TDanielson
Date: 10/1/2015
Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd





Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Topo

McKenzie County, ND

Author: TDanielson

Date: 10/1/2015

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo.mxd

From:	Haupt, Michael L.
To:	Melissa Schmit
Subject:	RE: Oasis: Wild Basin to Johnson"s Corner Pipeline Project & Surface Trust Lands Revised Consultation
Date:	Saturday, October 03, 2015 8:12:22 AM
Attachments:	image001.png

Melissa,

Good morning! There appears to be no ND School Trust surface involved in 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: Melissa Schmit [mailto:MSchmit@go2e3.com]
Sent: Thursday, October 01, 2015 1:21 PM
To: Haupt, Michael L.
Subject: Oasis: Wild Basin to Johnson's Corner Pipeline Project & Surface Trust Lands Revised Consultation

Dear Mr. Haupt,

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum to provide environmental consulting support for the Wild Basin to Johnsons Corner Pipeline Project (Project). A project consultation was sent to you on the Project July 28, 2015. The Project has since been modified (see attached). For your convenience, E3 is submitting an electronic copy of the revised project notification letter and maps to assist in your review. I will send concurrently with this mailing the notification letter and project maps via mail.

Please let me know if I can be of further assistance, or if you have any questions or concerns regarding the attached files.

Thank you for your time and consideration.

Sincerely,

Melissa Schmit
Consultant
E3 Environmental, LLC
mschmit@go2e3.com
O: 651.282.0656

M: 651.263.7916
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

E3 ENVIRONMENTAL
Enhancing Execution with Experience

Consultation

July 28, 2015

Ms. Allisen Bement, Land Professional
North Dakota Department of Trust Lands
Mineral Management Division
1707 North 9th Street, P.O. Box 5523
Bismarck, ND 58506-5523

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
State Mineral Trust Lands Consultation

Oasis Petroleum (Oasis) has proposed the construction of the Wild Basin to Johnson's Corner Pipeline Project (Project). The Project will result in an approximately 19-mile, 10.75-inch outside diameter crude oil pipeline.

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

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 18
- T150N R96W Sections 7, 8, 9, 10, 11, 13, 14, & 18
- T150N R97W Sections 6, 7, 8, 9, 10, 11, & 12
- T150N R98W Section 1
- T151 N R98W Sections 35 & 36

A review of the Project and associated Study Area (see attached) for the presence of State Mineral Trust Lands was conducted using available information at www.land.nd.gov. The results of this search concluded that Township 151N Range 98W Section 36, Township 150N Range 97W Sections 10, 11, 12, Township 150N Range 96W Sections 8, 9, 10, 13, 14, 15, 16, 21, and Township 150N Range 95W Section 18 intersect State Lands in McKenzie County, which fall within the Study Area of the Project. The enclosed topographic map depicts the Project site and associated Study Area, and State Mineral Trust Lands within the Study Area. This has been provided to assist the Department's review of the Project.

The purpose of this correspondence 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, an electronic copy of this letter, attached map, and shapefiles have been submitted concurrently with this mailing.

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

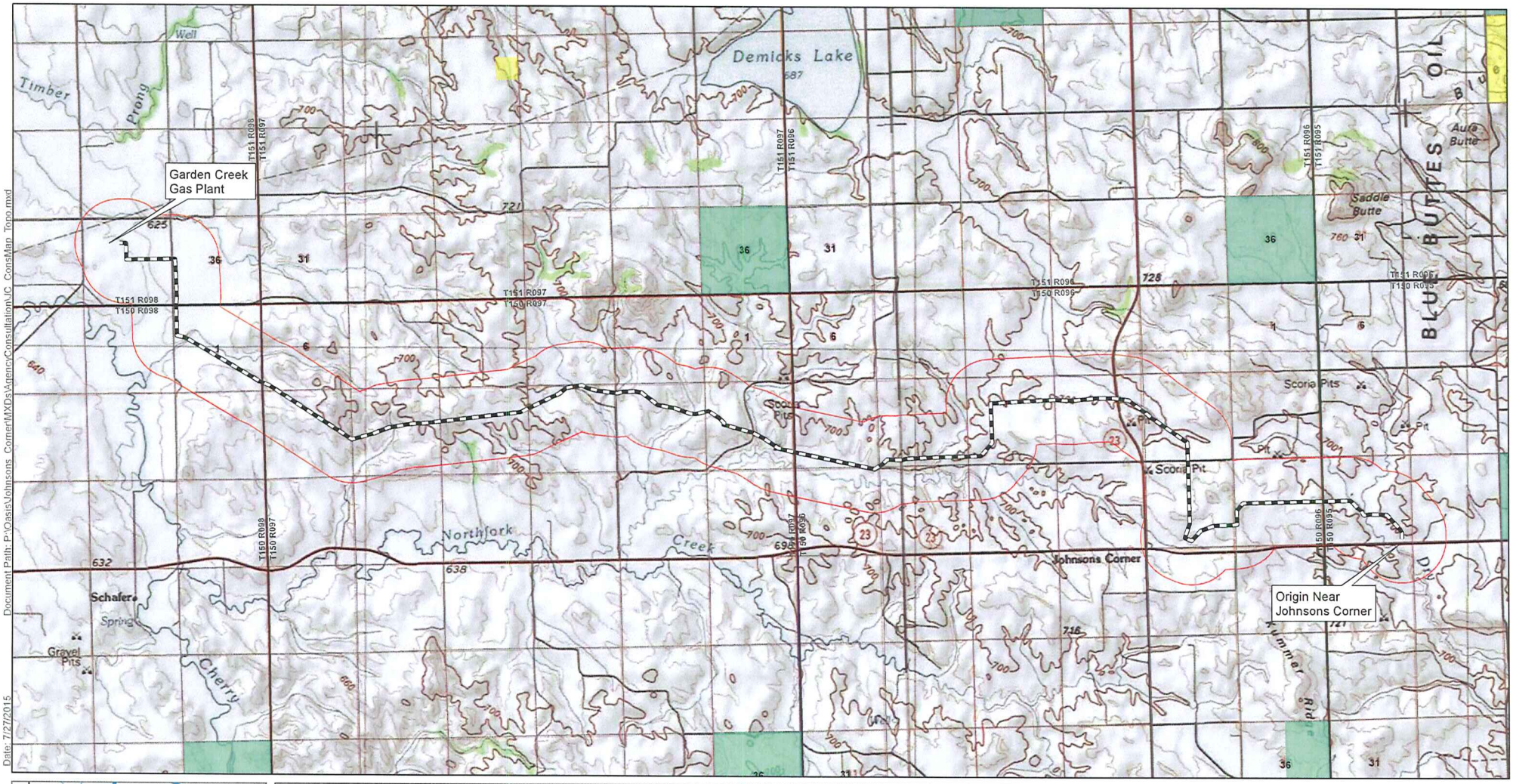
In closing, E3 Environmental, LLC has been retained by Oasis to provide environmental consulting support for this Project. Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

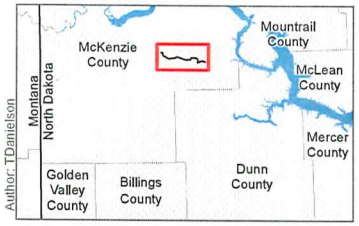
Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph
Project Map – Mineral Trust Land Overview

cc: E3 Project Files



Date: 7/27/2015 Document Path: P:\Oasis\Johnsons Corner\MXDs\Agency\Consultation\JC_ConsMap_Topo.mxd

Author: TDanielson



Proposed Route
Corridor (1 mile)
County Line
Township Boundary

Land Ownership
State of North Dakota
USFS Little Missouri National Grassland

N

E3 Environmental
Enhancing Execution with Experience

0 1 2 4 Miles

1:65,000

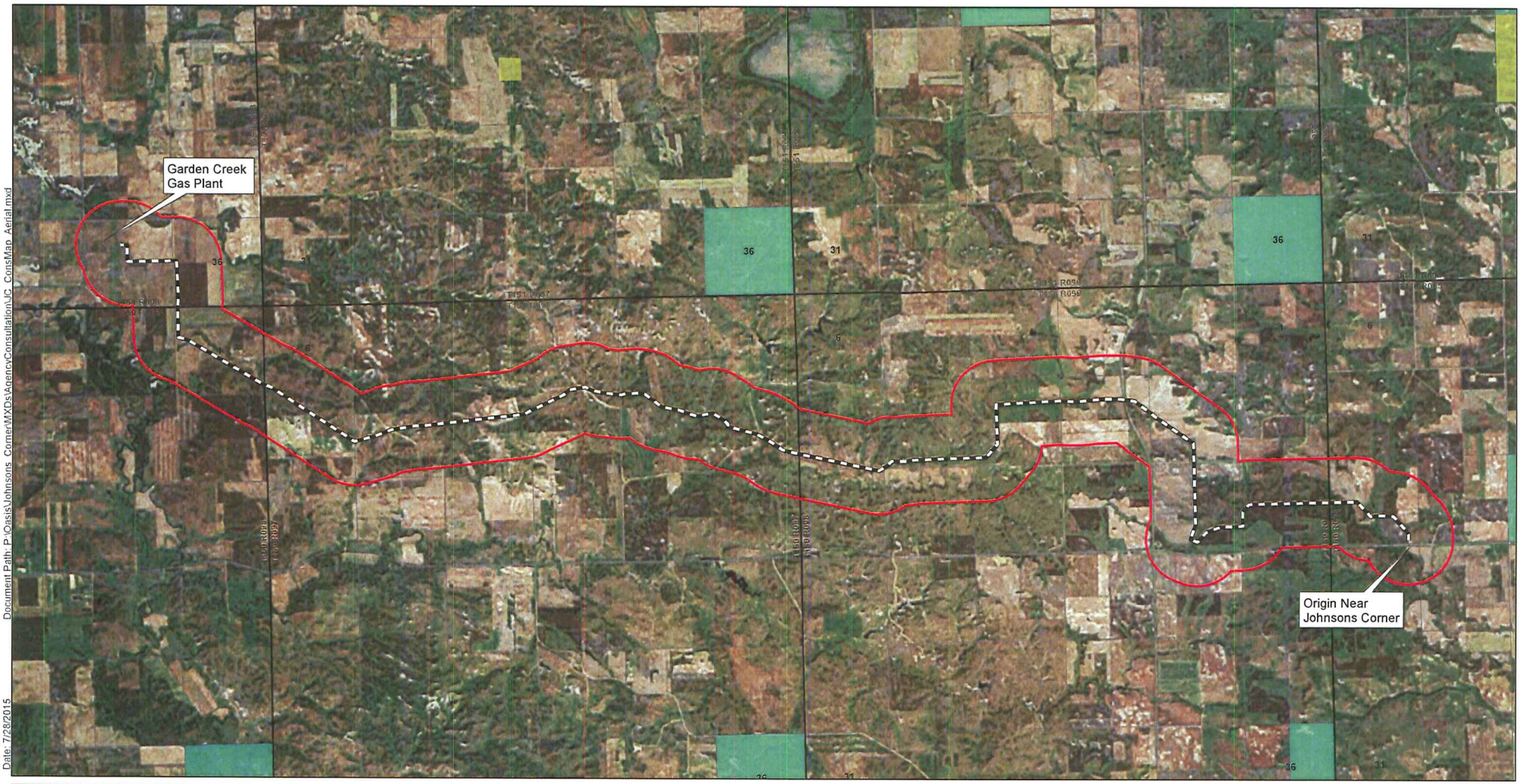
Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Topo

McKenzie County, ND



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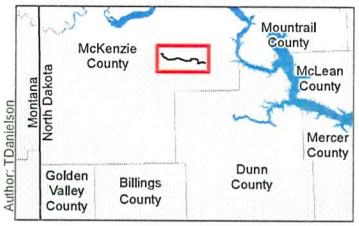
Date: 7/28/2015

Author: TDanielson



Proposed Route

Corridor (1 mile)

County Line

Township Boundary

Land Ownership

State of North Dakota

USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
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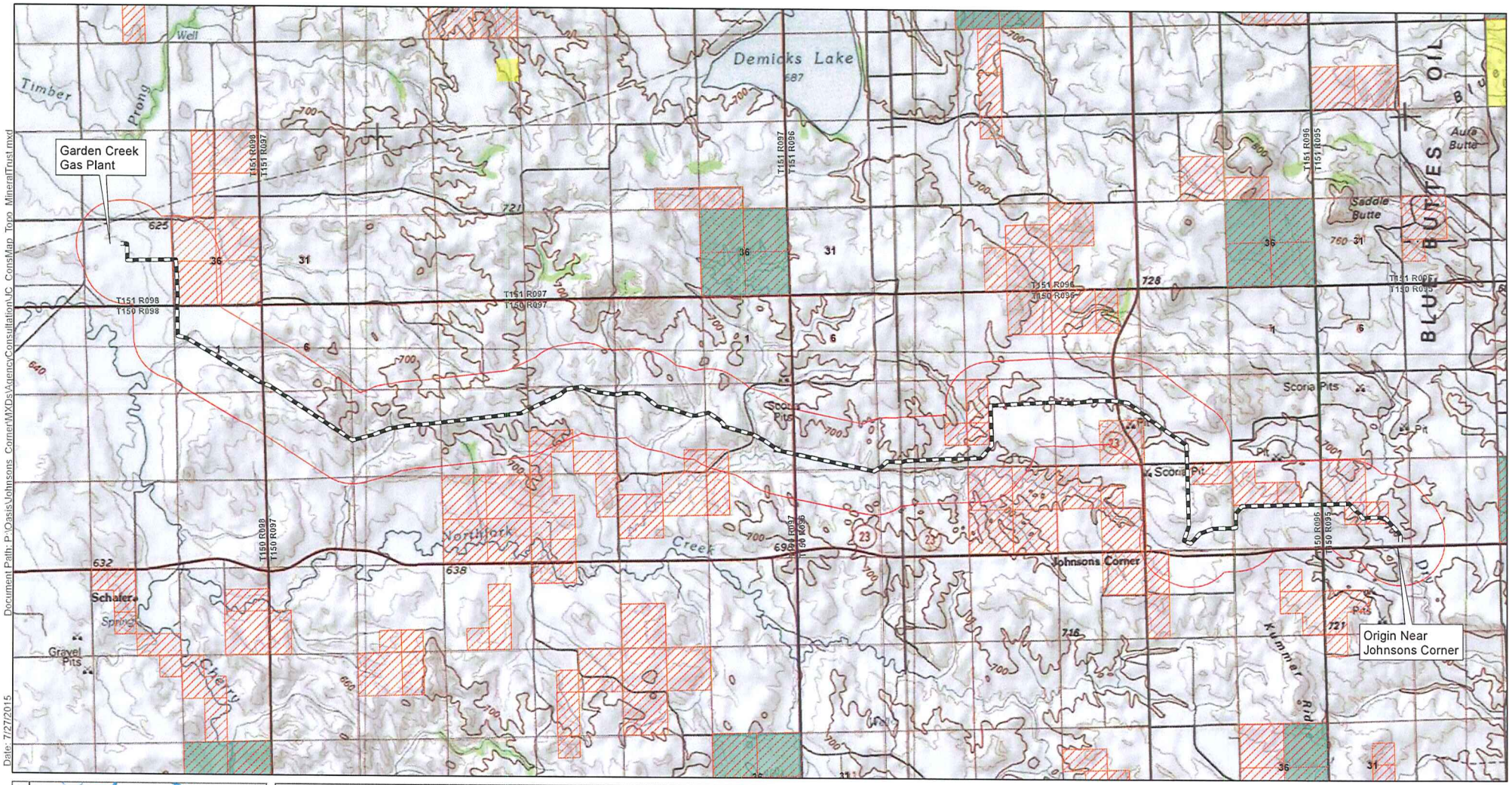
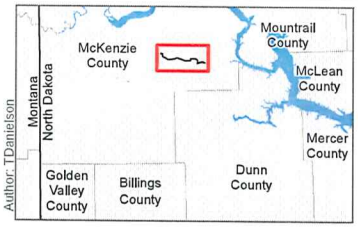
Oasis Petroleum

Wild Basin to Johnsons Corner

Consultation Map - Aerial

McKenzie County, ND





Proposed Route
Corridor (1 mile)
Mineral Trust Lands
County Line
Township Boundary

Land Ownership
State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum
Johnsons Corner

Consultation Map - Topo

McKenzie County, ND

From: Bement, Allisen C.
To: Melissa Schmit
Subject: RE: Oasis Petroleum: Wild Basin to Johnson"s Corner Pipeline Project & Mineral Management Consultation
Date: Tuesday, July 28, 2015 3:59:07 PM
Attachments: image001.png

Melissa,

We agree that the data provided fairly represents the approximate location of the Wild Basin to Johnson's Corner Pipeline Project and the proximity of mineral interests managed by this office, for use in a filing with the PSC in the state of North Dakota.

Allisen Bement
Land Professional
ND Department of Trust Lands
701.328.1952
abement@nd.gov

From: Melissa Schmit [mailto:MSchmit@go2e3.com]
Sent: Tuesday, July 28, 2015 11:09 AM
To: Bement, Allisen C.
Subject: Oasis Petroleum: Wild Basin to Johnson's Corner Pipeline Project & Mineral Management Consultation

Dear Ms. Bement,

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (see attached). For your convenience, E3 is submitting an electronic copy of the project notification letter, maps, and shapefiles to assist in your review of the Project. I will send concurrently with this mailing the original notification letter and project map via mail.

Please let me know if I can be of further assistance, or if you have any questions or concerns regarding the attached files.

Thank you for your time and consideration.

Sincerely,

Melissa Schmit
Consultant
E3 Environmental, LLC
mschmit@go2e3.com
O: 651.282.0656
M: 651.263.7916
871 Jefferson Avenue
St. Paul, MN 55102

www.go2e3.com

E3 ENVIRONMENTAL
Enhancing Execution with Experience

October 1, 2015

Ms. Allisen Bement, Land Professional
North Dakota Department of Trust Lands
Mineral Management Division
1707 North 9th Street, P.O. Box 5523
Bismarck, ND 58506-5523

Oasis Petroleum – Wild Basin to Johnson's Corner Pipeline Project
State Mineral Trust Lands Consultation

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum (Oasis) to provide environmental consulting support for the Wild Basin to Johnson's Corner Pipeline Project (Project). Oasis has proposed the construction of the Project, which will result in an approximately 20-mile, 10.75-inch outside diameter crude oil pipeline. A consultation letter and Project shapefiles were sent to you for this Project on July 28, 2015, and a response was received via email on July 28, 2015 indicating the data provided fairly represents the proximity of mineral interests for use in a filing with the North Dakota Public Service Commission. The design of the Project has since been modified and the enclosed maps depict the revised Proposed Route, associated 1-mile Corridor, and State Mineral Trust Lands within the Corridor. Please note your comments have been received for the previous Corridor illustrated on the attached maps in green and we are requesting your comments on the revised Corridor shown in red.

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

In McKenzie County, North Dakota the pipeline crosses:

- T150N R95W Section 17, 18, 19 & 20
- T150N R96W Sections 2-5, 7-11, 17-18, 22-24
- T150N R97W Sections 1-13, 17 & 18
- T150N R98W Section 1, 2 & 12
- T151 N R98W Sections 25, 26, & 34-36

A review of the Project and associated Study Area (see attached) for the presence of State Mineral Trust Lands was conducted using available information at www.land.nd.gov. The results of this search concluded that Township 151N Range 98W Section 36, Township 150N Range 97W Sections 10, 11, 12, Township 150N Range 96W Sections 8, 9, 10, 13, 14, 15, 16, 21, and Township 150N Range 95W Section 18 intersect State Lands in McKenzie County, which fall within the Corridor of the Project. The purpose of this correspondence 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, an electronic copy of this letter, attached map, and shapefiles have been submitted concurrently with this mailing.

E3 ENVIRONMENTAL
871 Jefferson Avenue
St. Paul, MN 55102

Should you have any questions or require additional information, please contact me at 651-282-0656 or mschmit@go2e3.com.

Sincerely,

Melissa Schmit, Consultant
E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

Enclosures: Project Map – USGS topographic
Project Map – Aerial photograph
Project Map – Mineral Trust Land Overview

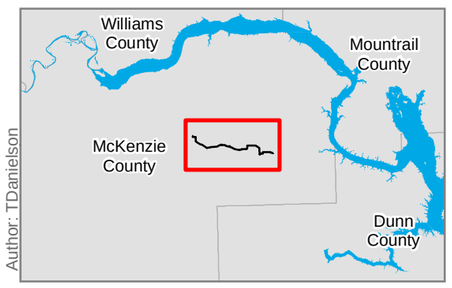
cc: E3 Project Files

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

36 31 1 6

T151 R098 T151 R097 T151 R096



Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

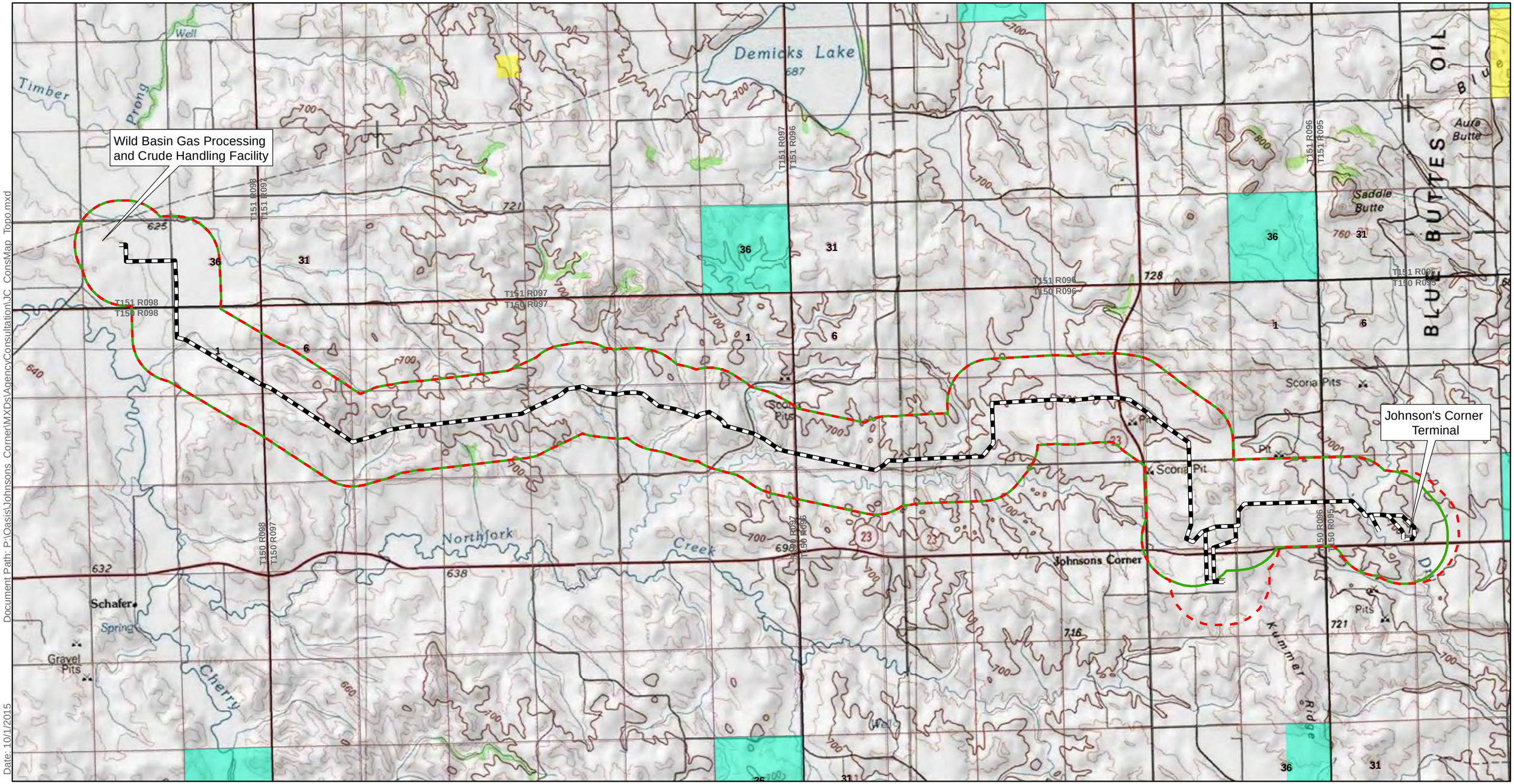
Oasis Petroleum

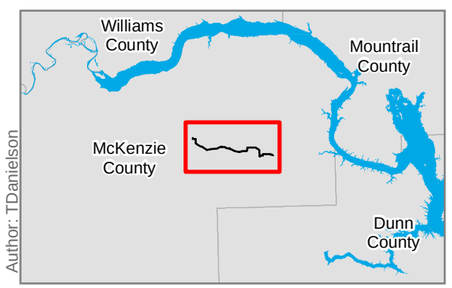
Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Aerial

McKenzie County, ND

Author: TDanielson
Date: 10/1/2015
Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Aerial.mxd





Proposed Route
Corridor (1 mile)
Previous Corridor
County Line
Township Boundary

Land Ownership

State of North Dakota
USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

Consultation Map - Topo

McKenzie County, ND

Author: TDanielson

Date: 10/1/2015

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo.mxd

Wild Basin Gas Processing and Crude Handling Facility

Johnson's Corner Terminal

Demicks Lake

Johnsons Corner

Schafer

Scoria Pits

Gravel Pits

Saddle Butte

Aufe Butte

BLUE BUTTES OIL

North Fork Cherry Creek

Kummer Ridge

T151 R098
T150 R098

T151 R097
T150 R097

T151 R096
T150 R096

T151 R095
T150 R095

Document Path: P:\Oasis\Johnsons_CornerMXDs\AgencyConsultation\JC_ConsMap_Topo_MineralTrust.mxd

Date: 10/1/2015

Author: TDanielson

- Proposed Route
- Corridor (1 mile)
- Previous Corridor
- Mineral Trust Lands
- County Line
- Township Boundary

Land Ownership

- State of North Dakota
- USFS Little Missouri National Grassland

N

0 1 2 4 Miles

1:65,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner Crude Oil Pipeline

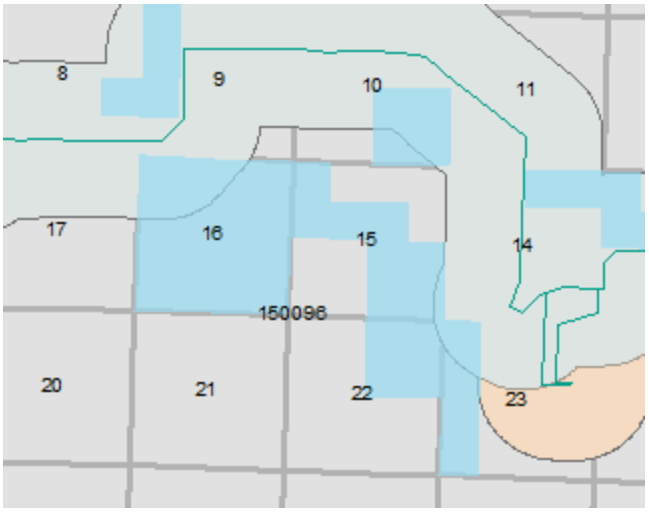
Consultation Map - Mineral Trust Topo

McKenzie County, ND

From: Bement, Allisen C.
To: Melissa Schmit
Subject: RE: Oasis: Wild Basin to Johnson"s Corner Pipeline Project & Mineral Management Revised Consultation
Date: Thursday, October 01, 2015 2:30:52 PM
Attachments: image001.png
image002.png

Melissa,

We agree that the data provided fairly represents the approximate location of the Wild Basin to Johnson's Corner Pipeline Project and the proximity of mineral interests managed by this office, for use in a filing with the PSC in the state of North Dakota. However, I do have one change as shown below, the Department does not own any interest in 150-96-21. I believe this should be corrected to 22 and 23.



Thank you,

Allisen Bement
Land Professional
ND Department of Trust Lands
701.328.1952
abement@nd.gov

From: Melissa Schmit [mailto:MSchmit@go2e3.com]
Sent: Thursday, October 01, 2015 1:21 PM
To: Bement, Allisen C.
Subject: Oasis: Wild Basin to Johnson's Corner Pipeline Project & Mineral Management Revised Consultation

Dear Ms. Bement,

E3 Environmental, LLC (E3) has been retained by Oasis Petroleum to provide environmental consulting support for the Wild Basin to Johnsons Corner Pipeline Project (Project). A project consultation was sent to you on the Project July 28, 2015. The Project has since been modified (see attached). For your convenience, E3 is submitting an electronic copy of the revised project notification letter, maps, and shapefiles to assist in your review. I will send concurrently with this mailing the notification letter and project maps via mail.

Please let me know if I can be of further assistance, or if you have any questions or concerns regarding the attached files.

Thank you for your time and consideration.

Sincerely,

Melissa Schmit
Consultant
E3 Environmental, LLC
mschmit@go2e3.com
O: 651.282.0656
M: 651.263.7916
871 Jefferson Avenue
St. Paul, MN 55102
www.go2e3.com

E3 ENVIRONMENTAL
Enhancing Execution with Experience

North Dakota State Historic Preservation Office

Consultation

SHPO Concurrence Pending

Appendix D

Natural Resources Report

Photos courtesy of: Jon Knudsen

Natural Resource Survey Report — Wild Basin to Johnson's Corner Crude Oil Pipeline McKenzie County, North Dakota.

Prepared for:

Oasis Midstream Services, LLC

Prepared by:

E3 Environmental, LLC

October 2015

E3 Environmental

Enhancing Execution with Experience

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

SECTION 1: INTRODUCTION

1.1 BACKGROUND

E3 Environmental, LLC (E3), at the request of Oasis Midstream Services, LLC (Oasis), performed natural resource surveys and reporting necessary to obtain permits to construct the Wild Basin to Johnson's Corner Crude Oil Pipeline (Project). The Project is composed of a crude oil mainline and one lateral pipeline, totaling approximately linear 20 miles. The proposed Project mainline would transport petroleum from the Wild Basin Gas Processing and Crude Handling Facility and trend southeast to terminate at the Tesoro Johnson's Corner Station (Mainline). The lateral pipeline would deliver crude oil from the Mainline to the proposed Dakota Access Pipeline (DAPL) Johnson's Corner Terminal facility Tesoro Johnson's Corner Terminal (Lateral 1) located approximately 0.8 miles east Johnson's Corner.

An additional lateral pipeline is proposed to deliver crude oil from the mainline to the Bakkenlink Dry Creek Facility (Lateral 2) located approximately 2.6 miles east of Johnson's Corner. This pipeline is not currently proposed for construction in 2016, but could be added to the project in the future. This lateral is therefore included discretely throughout this report.

E3 biologists conducted surveys to identify, delineate, and inventory natural resources that could potentially be impacted by pipeline construction and maintenance in order to comply with the North Dakota Public Service Commission's (PSC) siting authority requirements for the Mainline, Lateral 1, and Lateral 2. These surveys included:

- Raptor nest documentation and status determination
- Wetland and waterbody delineation and jurisdictional characterization
- Woody vegetation delineation and inventory
- Noxious weed inventory and delineation
- Protected species surveillance and habitat assessment
- Wildlife surveillance and inventory

This report details the methodologies used by E3 biologists to complete the above surveys and presents the results and recommendations of the surveys to ensure Oasis is in compliance with laws overseen by the regulatory agencies.

1.2 REGULATORY JUSTIFICATION

Several federal and state laws protect native wildlife and natural resources from being destroyed or degraded by anthropogenic disturbance. The following Acts and regulations protect certain species and natural resources within McKenzie County (Project Area),

and compliance with these Acts and regulations serves as justification for conducting the completed surveys.

1.2.1 CLEAN WATER ACT

The Clean Water Act of 1972 (CWA) (33 U.S.C. §1251 et seq.) prohibits the discharge of fill materials or pollutants into Waters of the United States or associated wetlands (jurisdictional waterbodies) without a permit from the USACE. Wetland and waterbody delineations and associated jurisdictional characterizations were therefore conducted for the Project. The U.S. Army Corps of Engineers (USACE) administers the Nationwide Permit Program (NWP) which is a series of general permits that regulates construction activities. This Project will seek coverage under the NWP No.12 utility line discharge, which regulates pipeline construction and maintenance in jurisdictional waterbodies.

1.2.2 MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. §§ 703–712) protects the majority of native birds species from being killed, sold, transported, harassed, or harmed. This also applies to bird parts, nests, feathers, and eggs. Most species found within the Project Area are protected under this Act, including raptors, which will frequently reuse nest sites.

1.2.3 BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 U.S.C. §§ 668-668c) offers comprehensive protection for bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) in the United States. The BGEPA prohibits the take of eagles, including parts, nests, or eggs; and any disturbance of protected species, including any activity that could cause injury to the species, nest abandonment, or a decrease in productivity. Suitable habitat and previously recorded nests for bald and golden eagles are present within the Project Area.

1.2.4 ENDANGERED SPECIES ACT

The Endangered Species Act of 1973 (ESA) (16 U.S.C. § 1531 et seq.) contains a suite of protective measures pertaining to critically imperiled species at risk of extinction. These include species classified as threatened and endangered (T & E), defined as a species which has the potential of becoming endangered and a species which is in danger of extinction, respectively. Species are listed as threatened or endangered due to natural and anthropogenic factors threatening their existence, including disease, predation, habitat degradation, or inadequate regulation. The ESA also identifies habitats critical to listed species and provides mitigation strategies relating to activities within these habitats. Projects that impact listed species may be required to acquire permits to allow for take or to conduct more intensive field studies. The Dakota skipper (*Hesperia dacotae*) and northern long-eared bat (*Myotis septentrionalis*) have been identified by the United States Fish and Wildlife Service (USFWS) as being particularly vulnerable to construction activities within the Project Area.

1.2.5 NORTH DAKOTA PUBLIC SERVICE COMMISSION MITIGATION REQUIREMENTS

The PSC requires utilities to conduct natural resource surveys to obtain a *Certificate of Corridor Compatibility and Route Permit* in order to construct an energy conversion facility or transmission facility (North Dakota Century Code, 2015)(N.D.C.C. Ch. 49-22). These surveys include T & E surveillance, noxious weed delineation, wetland and waterbody delineation and classification, and woody vegetation delineation and inventory for replacement.

SECTION 2: SURVEY CORRIDOR

The Project, which is approximately 20 miles in length, is located entirely within private lands in McKenzie County, North Dakota. The Project originates at the Wild Basin Gas Processing and Crude Handling Facility within Section 35 T151N:R98W and trends south southeast to terminate at the Tesoro Johnson's Corner Station within Section 18 T150N:R95W. E3 conducted natural resource surveys utilizing a typical 250-foot corridor centered upon the proposed Project alignment (Mainline, Lateral 1, and Lateral 2); additionally, several extra temporary extra workspaces (ETWS) of various dimensions were included, totaling approximately 610.1 acres (Survey Corridor). Natural resource features that occur within the Survey Corridor associated with the Mainline (569.7 acres), Lateral 1 (34.4 acres), and Lateral 2 (6.1 acres) are reported separately throughout this document. Refer to Appendix A for maps depicting the Project layout and Survey Corridor. Natural resource surveys were conducted in September of 2015, encompassing portions of 23 sections within 4 townships and ranges, including:

- T150N:R95W, Sections 17, 18
- T150N:R96W, Sections 7, 8, 9, 10, 11, 13, 14, 17, 18, 23
- T150N:R97W, Sections 3, 6, 7, 8, 9, 10, 11, 12
- T150N:R98W, Sections 1, 35, 36

2.1 GENERAL LANDSCAPE CHARACTERIZATION

The Survey Corridor is located entirely within the Northwestern Great Plains (43) Level III ecoregion, encompassing the Missouri Plateau of west-central North Dakota (Omernik, 1987; United States Environmental Protection Agency, 2013). The Northwestern Great Plains is characterized as a semiarid rolling plain of shale, siltstone, and sandstone punctuated by scattered sandstone buttes and badland formations with minimal wetland basins (Omernik & Griffith, 2008) (refer to photo in Appendix B). Native shortgrass prairie persists in areas devoid of steep or broken topography, but native prairie has been largely replaced by dryland farming of spring wheat, alfalfa, oats, and sunflowers and by pasture for cattle grazing throughout most of the ecoregion. Habitat

zones present in both uplands and wetlands consist of cultivated cropland, introduced perennial grassland and forbland, native grassland, shrubland, forest and woodland, riparian areas, and herbaceous wetlands (Bryce, et al., 1998).

Nested within the Northwestern Great Plains ecoregion, the Survey Corridor crosses the Missouri Plateau (43a) (52% of Survey Corridor) and River Breaks (43b) (48% of Survey Corridor) Level IV ecoregion (USEPA, 2013). The Missouri Plateau (43a) ecoregion was largely unaffected by glaciation and retains its original soils and complex stream drainage pattern (Bryce, et al., 1998). Physiography of the Missouri Plateau is described as moderately dissected, level to rolling plains with isolated sandstone buttes. This area is underlain by soft, calcareous shales, sandstones, and lignite coal. Dryland farming and cattle grazing are typical throughout this ecoregion.

The River Breaks (43c) are composed of erosional, broken terraces and uplands bordering the Missouri River and its tributaries (Bryce, et al., 1998). This ecoregion, unaffected by glaciation, is underlain by easily erodible shales easily carved into ravines and dissected hills. Cattle grazing is the predominant use for this ecoregion, as wooded draws and steep slopes restrict agrarian use.

2.2 VEGETATION COMMUNITIES

Vegetation communities are described by their location within United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Major Land Resource Areas (MLRA), which are broad geographic areas characterized by a particular pattern of soil, climate, vegetation, and land use. The Survey Corridor crosses one MLRA: Rolling Soft Shale Plains (MLRA 54)(USDA, NRCS, 2006).

The Rolling Soft Shale Plains are characterized by natural grasslands dominated by western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and little bluestem (*Schizachyrium scoparium*) (USDA, NRCS, 2006). Shrub and forb species including prairie rose (*Rosa arkansana*), western snowberry (*Symphoricarpos occidentalis*), and leadplant (*Amorpha canescens*) are interspersed throughout the uplands and mixed-prairie. Large patches of green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus virginiana*), and buffaloberry (*Shepherdia argentea*) typically occur in the draws and steep valleys common in this region.

Thirteen vegetation cover types, modeled by the Gap Analysis Program (GAP) as ecological systems, occur within the Mainline Survey Corridor. The most dominant ecological systems include, Northwestern Great Plains Mixedgrass Prairie, Cultivated Cropland, Western Great Plains Wooded Draw and Ravine, and Western Great Plains Depressional Wetland Systems (described below). All ecological systems within the Survey Corridor are included in Table 1 based on United States Geological Survey (USGS) GAP land cover data (US Geological Survey, 2011).

- Northwestern Great Plains Mixedgrass Prairie: This vegetation cover type dominates the upland portions of the Survey Corridor undisturbed by agricultural practices, woody draws, and broken lands (refer to photo in Appendix B). Dominant grasses for this ecological system include western wheatgrass, green needlegrass, and fescue (*Festuca spp.*), although blue grama and needle-and-thread (*Hesperostipa comate*) may also dominate. Shrub species including western snowberry, fringed sagewort (*Artemisia frigida*), and silver sagebrush (*Artemisia cana*) are also associated with this ecological system, and were observed within the Survey Corridor. Cool-season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth bromegrass (*Bromus inermis*), and Japanese brome (*Bromus japonicas*) can increase in dominance due to intensive grazing. This system is one of the most disturbed grassland systems in North Dakota (Comer, et al., 2003).

- Cultivated Cropland: This vegetation cover type is dominant along the flat areas of the Survey Corridor, interspersed throughout the Project Area. These areas would have likely been composed of Northwestern Great Plains Mixedgrass Prairie before being developed for agricultural purposes. Wheat and alfalfa are the most common crop species being cultivated within the Survey Corridor (refer to photo in Appendix B).

- Western Great Plains Depressional Wetland Systems: This ecological system is identified by low-lying depressions and emergent wetland vegetation, typically adjacent to permanent or semi-permanent streams. Sedge (*Carex spp.*), bulrush (*Typha spp.*), and rush (*Juncus spp.*) are the dominant mesic vegetation types found in proximity to wetland margins (Comer, et al., 2003). This ecological system is common along intermittent or ephemeral streams and at the bottoms of steep draws.

- Western Great Plains Wooded Draw and Ravine: This ecological system is dominant among the breaks and ravines along the tributaries to Cherry and North Fork creeks within the Survey Corridor (refer to photo in Appendix B). These areas are typically identified by woody vegetation associated with steep topography; shrublands composed of silver sagebrush and chokecherry and woodlands composed of green ash and American elm (*Ulmus Americana*) are dominant components of the landscape (Comer, et al., 2003).

Table 1. GAP vegetation types and acreages within the Survey Corridor.

Vegetation Type	Acres	% of Survey Corridor
Northwestern Great Plains Mixedgrass Prairie	368.5	64.7%
Cultivated Cropland	171.5	30.1%
Western Great Plains Depressional Wetland Systems	10.5	1.8%
Western Great Plains Wooded Draw and Ravine	7.4	1.3%
Northwestern Great Plains Shrubland	3.2	0.6%
Western Great Plains Sand Prairie	3.2	0.6%
Developed, Open Space	3.0	0.5%
Introduced Upland Vegetation - Perennial Grassland and Forbland	1.3	0.2%
Pasture/Hay	0.4	0.1%
Inter-Mountain Basins Big Sagebrush Shrubland	0.2	0.0%
Southwestern Great Plains Canyon	0.2	0.0%
Disturbed, Non-specific	0.2	0.0%
Developed, Low Intensity	0.0	0.0%
Total	**569.6**	**100.0%**

2.3 CLIMATE

The Project Area climate is semi-arid to sub-humid and continental, with warm summers and very cold winters (Aziz, Champa, & Vanderbusch, 2006). In winter, the average temperature is 13 degrees Fahrenheit, with an average daily minimum temperature of 1 degree Fahrenheit. In summer, the average temperature is 72 degrees Fahrenheit, with an average daily maximum temperature of 88 degrees Fahrenheit. Mean annual precipitation for the Project Area is 15 inches. Most of the precipitation falls during the warm period with about 80 percent falling April through September (Aziz, Champa, & Vanderbusch, 2006). The average seasonal snowfall is approximately 35 inches.

National Weather Service data for the Williston, North Dakota monitoring station (located approximately 28 miles northwest of Survey Corridor) recorded precipitation totals for the period from January 2015 to August 2015 to be 7.84 inches as described in Table 2 below (National Oceanic and Atmospheric Adminsistration (NOAA), 2015). The normal precipitation average for this time period is 11.12 inches. For this time period, rainfall was 3.28 inches below normal.

Table 2. Monthly recorded precipitation at National Weather Service Station in Williston, North Dakota.

Month	Recorded Precipitation	Normal Precipitation	Difference (inches)
January	0.48	0.59	-0.11
February	0.46	0.39	0.07
March	0.47	0.71	-0.24
April	0.27	1.00	-0.73
May	1.82	1.92	-0.10
June	1.90	2.52	-0.62
July	1.55	2.54	-0.99
August	0.89	1.45	-0.56
Total	**7.84**	**11.12**	**-3.28**

Source: NOAA preliminary climate Data Reports

2.4 SOILS

Soil types intersected by the Survey Corridor were analyzed through the NRCS Web Soil Survey in September of 2015 (NRCS, 2015). Described below are the components of dominant soil orders within the Survey Corridor, including higher coverages of Amor, Belfield, Brandenberg, Cabba, Chama Daglum, Dogtooth, Farnuf, Flasher, Janesberg, Rhoads, Savage, Sen, and Zahl soils. A list of all soil classifications and the acreage encompassed by the Survey Corridor are located in Table 3.

2.4.1 AMOR

The Amor soil series consist of well drained, moderately permeable soils that include moderately deep to soft sandstone bedrock. These soils are formed from weathered stratified soft sandstone, siltstone, and mudstone materials, and are located in upland areas with slopes of 0 to 25 percent. Amor soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 15 inches mean annual precipitation. Small grain agriculture, flax, corn, hay, and grassland are the predominant land uses associated with soils in the Amor series, while potential native vegetation populations include green needlegrass, needle-and-thread, western wheatgrass, and blue grama (NRCS, 2015b).

2.4.2 BELFIELD

The Belfield soil series is composed of deep and very deep, well to moderately well drained, slowly permeable soils. These soils are formed from alkaline, calcareous residuum or alluvium, and are located in uplands, flats, terraces, and swales with slopes of 0 to 9 percent. Belfield soils are present in areas with a mean annual temperature of 43 degrees Fahrenheit, receiving 15 inches mean annual precipitation. Small grain

agriculture, hay, and pasture are the primary land uses associated with soils in the Belfield series, while potential native vegetation populations include western wheatgrass, blue grama, and green needlegrass (NRCS, 2015b).

2.4.3 BRANDENBERG

The Brandenberg soil series is composed of very deep, excessively drained soils that form 10 to 20 inches above shattered porcelanite bedrock from porcelanite residuum. These soils have moderate to very rapid permeability with 2 to 70 percent slopes. Brandenberg soils are present in areas with a mean annual temperature of 43 degrees Fahrenheit, receiving 16 inches mean annual precipitation. Rangeland is the primary land use associated with soils in the Brandenberg series, while potential native vegetation populations include threadleaf sedge (*Carex filifolia*), short and mid-prairie grases, creeping juniper (*Juniperus horizontalis*), and other shrubs (NRCS, 2015b).

2.4.4 CABBA

The Cabba soil series is composed of shallow, well drained soils that are formed from residuum or colluvium or partial consolidations of loamy, sedimentary soil beds. These soils are located on sedimentary plains, escarpments, and hills with slopes of 2 to 70 perecnt. Cabba soils are present in areas with a mean annual temperature of 43 degrees Fahrenheit, receiving 16 inches mean annual precipitation. Rangeland is the primary land use associated with soils in the Cabba series, while potential native vegetation populations include little bluestem, western wheatgrass, needle-and-thread, prairie sandreed, bluebunch wheatgrass, green needlegrass, plains muhly (*Muhlenbergia cuspidate*), and many common forbs and shrubs (NRCS, 2015b).

2.4.5 CHAMA

The Chama soil series is composed of well drained, moderately to slowly moderately permeable soils that are formed from materials resulting from weathered soft siltstone, mudstone, and shale. These soils are located in upland areas with slopes of 0 to 46 percent. Chama soils are present in areas with a mean annual temperature of 42 degres Fahrenheit, receiving 15 inches mean annual precipitation. Small grain agriculture and rangeland are the primary land uses associated with soils in the Chama series, while potential native vegetation populations include western wheatgrass, needle-and-thread, and blue grama (NRCS, 2015b).

2.4.6 DAGLUM

The Daglum soils series is composed of deep and very deep, moderately well and well drained, slowly or very slowly permeable soils. These soils are formed in clayey alluvium or residuum on foot slopes and on upland or terrace swales, with slopes of 0 to 25 percent. Daglum soils are present in areas with a mean annual air temperature of about 42 degrees Fahrenheit, receiving 16 inches mean annual precipitation. Rangeland, pasture, and small grain agriculture are primary the land uses associated with soils in

the Daglum series, while potential native vegetation populations include western wheatgrass, blue grama, green needlegrass, threadleaf sedge, and forbs (NRCS, 2015b).

2.4.7 DOGTOOTH

The Dogtooth soil series is composed of moderately deep, well drained, high permeability soils formed from residual components of weathered saline-alkali, calcareous, soft shale, siltstone, or mudstone. These soils are located in upland areas with slopes of 0 to 25 percent. Dogtooth soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 15 inches mean annual rainfall. Rangeland and pasture are the primary land uses associated with soils in the Dogtooth series, while potential native vegetation populations include western wheatgrass, blue grama, inland saltgrass, sedges, prickly pear (*Opuntia polyacantha*), clubmoss, and some legumes (NRCS, 2015b).

2.4.8 FARNUF

The Farnuf soil series is composed of very deep, well drained soils formed in alluvial, glaciolacustrine, or glaciofluvial deposits. These soils are found on alluvial fans, stream terraces, hills, sedimentary plains, glacial lake plains, moraines, and outwash plains with slopes of 0 to 35 percent. Farnuf soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 16 inches mean annual precipitation. Irrigated and nonirrigated cropland agriculture are the primary land uses associated with soils in the Farnuf series, while potential native vegetation populations include western wheatgrass, prairie sandreer, green needlegrass, little bluestem, needle-and-thread, blue grama, shrubs, and forbs (NRCS, 2015b).

2.4.9 FLASHER

The Flasher soil series is composed of shallow, somewhat excessively drained soils with moderately rapid or rapid permeability. These soils are formed in soft sandstone on side slopes, shoulder slopes, summits of hills and ridges on uplands, and side slopes of valleys, with slopes of 3 to 70 percent. Flasher soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 14 inches mean annual precipitation. Rangeland and pasture are the primary land uses associated with soils in the Flasher series, while potential native vegetation populations include prairie sandreed, blue grama, little bluestem, upland sedges, creeping juniper, and other shrubs (NRCS, 2015b).

2.4.10 RHOADES

The Rhoades soil series is composed of deep and very deep, well or moderately well drained, very slowly permeable soils formed in stratified loamy and clayey materials derived from soft shale, siltstone, or mudstone. These soils are located in swales on uplands and terraces with slopes of 0 to 25 percent. Rhoades soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 16 inches mean

annual precipitation. Rangeland and pasture are the primary land uses associated with soils in the Rhoades series, while potential native vegetation populations include western wheatgrass, blue grama, sedges, legumes, prickly pear, and clubmoss (NRCS, 2015b).

2.4.11 SAVAGE

The Savage soil series is composed of very deep, well drained soils that are formed in silty alluvium, loess, or in glaciogluvial or glaciolacustrine material. These soils are located on alluvial fans, stream terraces, drainageways, sedimentary plains, and till plains with slopes of 0 to 25 percent. Savage soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 16 inches mean annual precipitation. Rangeland, dryland, and irrigated crop agriculture are the primary land uses associated with soils in the Savage series, while potential native vegetation populations include bluebunch wheatgrass, western wheatgrass, green needlegrass, and perennial forbs (NRCS, 2015b).

2.4.12 SEN

The Sen soil series is composed of well drained, moderately permeable soils that are formed in calcareous siltstone or shale. These soils are located in upland plains with slopes of 0 to 25 percent. Sen soils are present in areas with a mean annual temperature of 42 degrees Fahrenheit, receiving 15 inches mean annual precipitation. Small grain agriculture is the primary land use associated with soils in the Sen series, while potential native vegetation populations include green needlegrass, needle-and-thread, western wheatgrass, blue grama, and a variety of forbs (NRCS, 2015b).

2.4.13 ZAHL

The Zahl soil series is composed of very deep, well drained, moderately slow or slowly permeable soils that form are formed in calcareous glacial till. These soils are located on glacial till plains, moraines, and valley side slopes with slopes of 1 to 60 percent. Zahl soils are present in areas with a mean annual temperature of 40 degrees Fahrenheit, receiving 14 inches mean annual precipitation. Rangland, pasture, and small grain agriculture are the primary land uses associated with soils in the Zahl series, while potential native vegetation populations include little bluestem, western wheatgrass, and needle-and-thread (NRCS, 2015b).

Table 3. McKenzie County NRCS soil components and acreages within Survey Corridor.

Map Unit Symbol	Soil Types	Slopes (percent)	Acres within Survey Corridor	Percent within Map Unit
E0447B	Daglum-Belfield complex	0 to 6	41.9	6.7
E0515B	Rhoades-Daglum complex	0 to 6	55.0	8.8
E0559B	Dogtooth-Janesburg silt loams	0 to 6	16.1	2.6
E0605A	Belfield-Grail clay loams	0 to 2	20.8	3.3

Map Unit Symbol	Soil Types	Slopes (percent)	Acres within Survey Corridor	Percent within Map Unit
E0617B	Belfield-Savage-Daglum complex	2 to 6	29.9	4.9
E0651B	Regent-Janesburg complex	3 to 6	4.7	0.8
E0701F	Dogtooth-Janesburg-Cabba complex	6 to 35	35	5.6
E0821A	Lawther silty clay	0 to 2	12.5	2.0
E0835A	Savage-Grail silty clay loams	0 to 2	0.6	0.1
E0837B	Savage silty clay loam	2 to 6	1.5	0.2
E0837C	Savage silty clay loam	6 to 9	5.3	0.9
E0913C	Moreau-Wayden silty clays	6 to 9	1.7	0.3
E1009B	Moreau-Barkof silty clays	3 to 6	1.3	0.2
E1333C	Vebar-Cohagen fine sandy loams	6 to 9	3.7	0.6
E1403D	Beisigl-Flasher-Telfer loamy fine sands	6 to 15	0.5	0.1
E1423F	Flasher-Vebar-Parshall complex	9 to 35	23.2	3.7
E1475F	Flasher-Rock outcrop-Vebar complex	9 to 70	7.2	1.1
E1603D	Beisigl-Telfer loamy fine sands	6 to 15	9.8	1.6
E1805B	Lihen-Parshall complex	0 to 6	2.5	0.4
E1865C	Tally-Parshall fine sandy loams	6 to 9	2.4	0.4
E2120A	Farnuf loam	0 to 2	27.7	4.4
E2120B	Farnuf loam	2 to 6	20.2	3.2
E2120C	Farnuf loam	6 to 9	9.9	1.6
E2213A	Golva silt loam	0 to 2	2.1	0.3
E2213B	Golva silt loam	2 to 6	2.1	0.3
E2601C	Amor-Cabba loams	6 to 9	23.0	3.7
E2601D	Amor-Cabba loams	9 to 15	1.0	0.3
E2617F	Cabba-Chama-Shambo loams	9 to 50	22.5	3.6
E2737C	Chama-Cabba-Sen silt loams	6 to 9	24.8	4.0
E2741D	Cabba-Chama-Sen silt loams	9 to 15	49.1	7.9
E2803B	Amor-Shambo loams	3 to 6	3.5	0.6
E2913B	Chama-Sen-Cabba silt loams	3 to 6	4.8	0.8
E3009F	Brandenburg-Cabba-Badland complex	9 to 70	13.7	2.2
E3013D	Brandenburg-Searing-Dogtooth complex	6 to 15	16.0	2.6
E3013F	Brandenburg-Cabba-Dogtooth complex	15 to 70	52.7	8.4
E3161F	Cherry-Cabba silt loams	9 to 45	0.8	0.1
E3513B	Niobell-Williams loams	3 to 6	0.8	0.1
E3541B	Williams-Zahl loams	3 to 6	7.9	1.3
E3541C	Williams-Zahl loams	6 to 9	1.0	0.2
E3555D	Zahl-Williams loams	9 to 15	0.3	0.1
E3609F	Zahl-Cabba-Maschetah complex	6 to 70	7.4	2.2
E3639C	Zahl-Williams-Cabba complex	6 to 9	5.2	0.8
E3641D	Zahl-Cabba-Williams complex	9 to 15	12.0	1.9
E3701A	Dooley fine sandy loam	0 to 3	0.2	0.0
E4139A	Korchea-Fluvaquents complex, channeled, frequently flooded	0 to 2	3.3	0.5
E4190F	Cabba-Chama-Havrelon, occasionally flooded complex	2 to 70	28.7	4.6
E4729A	Heil silty clay loam	0 to 1	0.2	0.0
Survey Corridor Total			**616.5**	**100.0**

Source: (NRCS, 2015)

SECTION 3: SURVEY METHODOLOGY

E3 completed natural resource surveys within the Survey Corridor, including added re-routes and extra work spaces, on September 15-22 of 2015. Natural resource surveys were performed on foot by a team of E3 biologists following guidelines published by the

PSC, USACE, Bureau of Land Management (BLM), and United States Forest Service (USFS). Data were collected using Trimble® Juno T41/5, Trimble® GeoExplorer 6000 XT, or Trimble® GeoExplorer 6000 XH handheld GPS units facilitated with Terrasync® GIS software. Binoculars and spotting scopes assisted biologists with the observation and identification of wildlife within the Survey Corridor. All natural resource surveys were conducted concurrently, allowing entire tracts of the Survey Corridor to be completed during a single site visit.

3.1 RAPTOR NESTS

Pedestrian raptor nest surveys were conducted by E3 biologists within the Survey Corridor and within line-of-site from the Survey Corridor to determine activity status for known nests and record previously undocumented nests during September of 2015. These surveys were conducted to document raptor nests that could be potentially disturbed by construction activities and apply surface disturbance stipulations, if necessary, in accordance with recommendations by the USFWS to prevent violating the MBTA. Suitable nesting substrates, such as ash and elm stands, were searched for raptor nests within the Survey Corridor. Located nests were observed from a distance suitable to avoid disturbing the birds, using binoculars or spotting scopes to identify adult birds exhibiting nesting or brooding behavior (e.g. incubating or behaving agonistically). If nests were determined inactive, the areas under, around, and in the nests were searched for signs of recent activity (fresh mute, regurgitated pellets, eggs, eggshell fragments, prey remains, etc.) if within the Survey Corridor. Accurate GPS locations of raptor nests were recorded at each nest site and the nest status, condition, substrate, and species of raptor using the nests were documented (if possible). Annual activity status and productivity determinations for nests were unlikely due surveys being conducted outside of the nesting window. However, many species of raptors reuse nesting sites annually; active nests in future years would have surface disturbance stipulations applied.

3.2 WETLANDS

Remote sensing of the Survey Corridor indicates both lentic and lotic wetlands are prevalent across the landscape, especially near Cherry and North Fork creeks. The National Wetlands Inventory (NWI) contains six features that are intersected by the Survey Corridor, including pond, emergent, and impounded wetlands (USFWS, 2015a). E3 biologists identified, defined, and delineated all wetlands observed during field surveys using methodology in accordance with the USACE *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (Environmental Laboratory, 2010). For an area to be delineated as a regulated wetland, the hydrophytic vegetative, wetland hydrology, and hydric soils must all be present and consistent with

federal classification criteria. Wetlands inventoried within the Survey Corridor were classified using the Cowardin System, developed by the USFWS (Cowardin et al. 1979).

3.2.1 WETLAND VEGETATION

More than 50 percent of the vegetative cover must consist of obligate or facultative wetland species as determined by the dominance test using the 50/20 rule; the prevalence index; or by evidence of morphological adaptation (USACE 1987). Hydrophytic vegetation was determined to be present if any of these three indicators were satisfied. If none of the indicators are satisfied, then hydrophytic vegetation is absent unless (1) indicators of hydric soil and wetland hydrology are present and (2) the site meets the requirements for a problematic wetland situation.

3.2.2 WETLAND HYDROLOGY

To be considered a wetland, there must be evidence of periodic or permanent ground inundation. The presence of wetland hydrology was evaluated by recording the extent of observed surface flows, the depth of inundation, the depth to saturated soils, and the depth to free water in soil test pits. Other evidence such as water-stained leaves or general drainage patterns can indicate a site has the proper hydrology to be a wetland.

3.2.3 WETLAND SOILS

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that is formed under conditions of saturation, flooding, or ponding that occurs long enough during the growing season to develop anaerobic conditions (or conditions of limited oxygen) at or near the soil surface and that favor the establishment of hydrophytic vegetation. The USDA-NRCS *Field Indicators of Hydric Soils in the United States*—Guide for Identifying and Delineating Hydric Soils, Version. 7.0 was used to determine the presence of hydric soils (2010). The soil conditions within the Survey Corridor were sampled by taking cores along wetland/upland boundary to examine the water table depth and to identify hydric indicators.

3.3 WATERBODIES

A review of the National Hydrography Dataset (NHD) identified two creeks and one impounded lacustrine waterbody that intersect the Survey Corridor, some of which are likely jurisdiction tributaries within the Cherry Creek and North Fork Creek watersheds. E3 biologists confirmed the presence of these waterbodies and delineated their boundaries by identifying and mapping the ordinary high water mark (OHWM) of each feature. Common indicators of an OHWM include open water or evidence of a natural line visible on the bank, shelving or terracing, changes in soil characteristics, vegetation changes, 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's jurisdiction. However, the USACE has full discretion in

determining the jurisdictional status of referenced wetlands and waterbodies in this report.

Additional waterbodies were located and delineated in the field during field surveys to provide a comprehensive summary of wetland and waterbody features intersected by the Survey Corridor. A jurisdictional characterization was made for each waterbody, following the criteria outlined in the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (2007).

3.4 WOODY VEGETATION

The PSC requires utilities to adhere to their tree and shrub mitigation plan, which specifies replacement and monitoring requirements as well as a maximum construction corridor of 50 feet through areas of woody vegetation. E3 biologists mapped, characterized, and inventoried woody vegetation, defined as trees and shrubs, present within the Survey Corridor. The boundaries of each distinct woody vegetation habitat were mapped and are depicted on the Project maps in Appendix A. Woody vegetation within each habitat was inventoried using several PCS-approved techniques, depending on habitat type and size. Direct tallies (100%) were employed in forested upland lands, shrublands, and riparian zones for all trees greater than one-inch diameter at breast height (DBH) when possible; sub-sampling was employed in woodlands too dense to directly count. Large shrublands (typically dominated by snowberry) were inventoried by measuring percent cover, unless habitat patches were small enough to count each individual. Regardless of DBH, all trees and shrubs were mapped, characterized, and inventoried within shelterbelts and windbreaks. E3 biologists taxonomically identified and tallied all species within each habitat. Refer to Appendix C for a table detailing the woody vegetation identified within the Survey Corridor.

3.5 NOXIOUS WEEDS

Because North Dakota is home to many large-scale energy infrastructure construction projects, the proliferation of noxious weed and invasive plant species is a growing concern. Noxious weeds are defined by the Federal Noxious Weed Act of 1974 as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States, or public health" (Title 7 United States Code 2801-2814, 2011). The State of North Dakota defines noxious weeds as "weeds that are difficult to control, easily spread, and injurious to public health, crops, livestock, land, or other property" (North Dakota Century Code 4.1-47-01, 2015). North Dakota has County Weed Boards in all 53 counties, each of which has the opportunity to add noxious weeds to the state list for regulation only within their jurisdiction.

Noxious weeds are often nonnative and acclimated to survive in opportunistic conditions. Known to easily proliferate on disturbed lands, these plants actively invade landscapes and prevent native plant species from growing, often resulting in

monocultures. Noxious weeds could also adversely affect a wide range of ecosystems by increasing bare soil, which could have detrimental impacts to water quality and sedimentation (U.S. Forest Service, 2007); reducing the quality of habitat for many terrestrial species, while also decreasing the carrying capacity of the land; and losses in agricultural productivity.

The North Dakota Department of Agriculture identifies 11 plant species as noxious weeds (2015). McKenzie County recognizes 18 noxious weed species, which are identified as being problematic specifically within its boundaries (North Dakota Department of Agriculture, 2015) (Table 4).

Table 4. State and County designated noxious weeds with the potential to occur within the Survey Corridor.

Common Name	Scientific Name	Noxious Designation	
		North Dakota	McKenzie County
Absinth wormwood	*Artemisia absinthium*	X	X
Baby's breath	*Gypsophila paniculata*		X
Black henbane	*Hyoscyamus niger*		X
Canada thistle	*Cirsium arvense*	X	X
Common burdock	*Arctium minus*		X
Dalmatian toadflax	*Linaria dalmatica*	X	X
Diffuse knapweed	*Centaurea diffusa*	X	X
Field bindweed	*Convolvulus arvensis*		X
Halogeton	*Halogeton glomeratus*		X
Houndstongue	*Cynoglossum officinale*		X
Leafy spurge	*Euphorbia esula*	X	X
Musk thistle	*Carduus nutans*	X	X
Purple loosestrife	*Lythrum salicaria*	X	X
Russian knapweed	*Acroptilon repens*	X	X
Saltcedar	*Tamarix ramosissima*	X	X
Spotted knapweed	*Centaurea stoebe*	X	X
Yellow starthistle	*Centaurea solstitialis*		X
Yellow toadflax	*Linaria vulgaris*	X	X

Source: North Dakota Department of Agriculture, 2015

E3 conducted surveys for noxious weeds recognized by North Dakota and McKenzie County within the Survey Corridor during the growing season in 2015. Noxious weed infestations were identified and delineated in the field by mapping their boundaries using Trimble GPS units. Percent cover for all noxious weeds within each patch was estimated for each species. Refer to the Project maps in Appendix A for the location of these features and Appendix D for a table detailing the mapped boundaries and weed coverage.

3.6 THREATENED AND ENDANGERED SPECIES

The USFWS Information, Planning, and Conservation System (IPaC) was accessed on September 9, 2015 to obtain information regarding the presence of T & E species within the Survey Corridor (Table 5). This information does not represent a comprehensive survey, but rather acknowledges the potential presence of listed species within the Survey Corridor. The USFWS identifies 10 threatened, endangered, or candidate species that have the potential to occur within the Survey Corridor or could potentially be impacted by development within the Survey Corridor (USFWS, 2015b). However, no critical habitat for these species is currently identified within the Survey Corridor. These listed species were surveyed for opportunistically during field visits in 2015.

Table 5. Federally listed species with the potential to occur within the Project Area.

Common Name	Scientific Name	Federal Status
Interior least tern	*Sterna antillarum athalassos*	Endangered
Piping plover	*Charadrius melodus*	Threatened
Rufa red knot	*Calidris canutus rufa*	Threatened
Sprague's pipit	*Anthus spragueii*	Candidate
Whooping crane	*Grus americana*	Endangered
Pallid sturgeon	*Scaphirhynchus albus*	Endangered
Dakota skipper	*Hesperia dacotae*	Threatened
Black-footed ferret	*Mustela nigripes*	Experimental, non-essential
Gray wolf	*Canis lupus*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened

Source: (USFWS, 2015b).

3.6.1 INTERIOR LEAST TERN

Federal Status: Endangered

The interior least tern is the smallest member of the gull and is federally listed as endangered due to river channelization and impoundment, water pollution, and lower

water levels. The interior least tern is found throughout major interior rivers of the United States, including the Mississippi and Missouri rivers, where terns nest in bare, sandy areas along open water bodies. Nests are shallow holes and constructed between late April and August. Least terns prefer habitat near open or flowing water, where they hover in search of food, and dive for small fish in the water (USFWS, 2015c). The interior least tern is identifiable by its small size, measuring at approximately nine inches in length. Breeding adults have gray upper bodies and white lower bodies, with a black cap, black nape, and black eye stripe. Vocalization is short and high pitched (USFWS, 2015c).

3.6.2 PIPING PLOVER

Federal Status: Threatened

The piping plover is a small shorebird that is federally listed as threatened due to human disturbance and habitat destruction. The piping plover is identifiable by its small size and stocky stature, with a sandy brown colored upper body, and white lower body. During the breeding season, adults have a black forehead, a black breast band, and an orange bill (USFWS, 2015c). This species nest 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, 2015c).

3.6.3 RUFA RED KNOT

Federal Status: Threatened

The rufa subspecies of the red knot is a medium sized shorebird that is federally listed as threatened due to horseshoe crab overharvesting, coastal development, and climate change. The rufa red knot is identifiable by its proportionally large wingspan of 20 inches to its body length of 9 inches. This bird is a larger member of the sandpiper family, with a short, straight bill that tapers to the tip. During breeding, rufa red knots bear a reddish breeding plumage, which is gray the rest of the year (USFWS, 2015c). Migratory habits and habitat requirements of this species are poorly understood, especially for populations utilizing midcontinent and intercontinental flyways. Migration routes are typically between South America and Canada, with inland stopovers in the Great Plains, Great Lakes, and various areas within the Mississippi Valley (USFWS, 2015c).

3.6.4 SPRAGUE'S PIPIT

Federal Status: Candidate

The Sprague's pipit is a small songbird that is a candidate for federal listing due to human habitat disturbance and habitat loss. The Sprague's pipit is identified by its light gray plumage, with dark brown primaries that are edged in white. This small bird delivers a distinctive flight song, and is known to hover in the air for minutes at a time,

before steeply diving down to its nest (National Audubon Society, 2015). This species prefers prairie and grassland areas with little disturbance; it is deterred by the grazing and agricultural practices which have replaced much of its natural habitat. Sprague's pipit, unlike the American pipit, does not occur in flocks and eludes observation by covering in short grass within dry prairies. Nesting occurs on bare ground within prairie depressions or grass clumps.

3.6.5 WHOOPING CRANE

Federal Status: Endangered

The whooping crane is a large bird species that is federally listed as endangered due to habitat destruction and historic over-hunting. The whooping crane is identified by its height, standing erect at five feet, and by its snow white plumage, with black primaries. This large-bodied bird is known by its vocal tone, which is a loud, single note that is vocalized when alarmed. The whooping crane may live up to 30 years (USFWS, 2015c). This species prefers a variety of wetland habitats in both salt and fresh water. Nesting occurs in wetland potholes in Canada, predominantly consisting of bulrush, but also including populations of cattail, sedge, musk-grass, and other common aquatic plants. Nest sites are typically found in shallow diatom ponds. Migration paths include stops in a variety of landscapes, although wetlands are preferred throughout the route (USFWS, 2015c).

3.6.6 PALLID STURGEON

Federal Status: Endangered

The pallid sturgeon is an aquatic fish that is federally endangered, primarily due to the habitat destruction resulting from river channelization and damming. The pallid sturgeon is identified by its flat, shovel-shaped snout, with a long, slender, and fully plated caudal peduncle. Consistent with other sturgeon species, the mouth of the pallid sturgeon is ventrally positioned, protrusible, and toothless. This species has a cartilaginous skeletal structure (USFWS, 2015c). The pallid sturgeon is a large river obligate, primarily in Missouri and Mississippi River Systems, in areas with diverse habitat options. Pallid sturgeons prefer benthic environments with predominantly sandy and fine substrates, with successful populations of micro-invertebrates and deep water for spawning activity (USFWS, 2015c).

3.6.7 DAKOTA SKIPPER

Federal Status: Threatened

The Dakota skipper is a butterfly species listed as federally threatened due to habitat replacement for agricultural development. The Dakota skipper is identified by its one-inch wingspan and thick body, with an orange-brown color and brown characteristic wing markings. This butterfly has stronger wing motions compared to other species,

resulting in faster and more powerful flight (USFWS, 2015c). The Dakota skipper is a low mobility species, therefore has short dispersal ranges (USFWS, 2015d). Suitable Dakota skipper habitat is described as native prairie grasslands with minimal degradation due to anthropogenic disturbance or invasive species establishment (USFWS, 2015d).

3.6.8 BLACK-FOOTED FERRET

Federal Status: Experimental Population, Non-essential

The black-footed ferret is a small member of the weasel family listed as federally endangered due to habitat destruction. The black-footed ferret is identified by its slender, tan body with black limbs, and short paws developed for digging. This species has a large skull and strong jaws developed for carnivorous diets, consisting primarily of prairie dogs (USFWS, 2015c). This species is an obligate of prairie dog colonies where they predate upon prairie dogs and use their burrows to brood young. The black-footed ferret was extirpated from the wild by 1986, however numerous experimental populations have been introduced throughout the central United States and northern Mexico (USFWS, 2015c).

3.6.9 GRAY WOLF

Federal Status: Endangered

The gray wolf is a large canine species that is federally listed as endangered due to habitat destruction, human interference, and overhunting. The gray wolf is identifiable by its canine body shape, long bushy tail with a black tip, and a mix of gray and brown coat colors. The average size of a gray wolf is 3-5 feet in length, weighing approximately 60-145 pounds (USFWS, 2015c). This species prefers a wide range of habitat, including forests, plains, prairies, agricultural areas, swamps, and barren lands, but has been extirpated from most of its historic range. Dens are located near water and dug into well-drained soil on a south-facing slope, under boulders, among tree roots, or in cut banks, hollow logs, or other natural structures. This species is a roaming animal, therefore are wide-ranging and rare to encounter (USFWS, 2015c).

3.6.10 NORTHERN LONG-EARED BAT

The northern long-eared bat (NLEB) is a federally threatened species not only due to habitat destruction, but also due to onset white-nose syndrome (WNS), which affects many bat species in the United States. NLEBs are medium sized bats with a body length of 3-4 inches and a wingspan of 9-10 inches. Their fur color ranges medium to dark brown on the back and light brown on the underside. This bat is distinguished by its long ears (USFWS, 2015c). During the summer months, this small mammal roosts individually or in colonies underneath bark, or in any indentations on both live and dead trees. The NLEBs tend to select tree stand roosts based on a range of factors, including the ability of the tree to retain loose bark and provide crevices or cavities for

cover. Signs of roost presence include fallen loose bark and fecal matter in concentrated areas near tree bases in older stands. Breeding begins in late summer or early fall (USFWS, 2015c). Currently, the NLEB is managed as threatened under the 4(d) rule.

3.7 WILDLIFE INVENTORY

In addition to natural resource surveys required by the PSC, E3 biologists recorded all vertebrate species observed during field surveys. This inventory was completed to provide Oasis with a comprehensive list of resident species within the Survey Corridor.

SECTION 4: RESULTS

4.1 RAPTOR NESTS

Four total raptor nests were recorded by E3 biologists within the Survey Corridor or within line-of-site of the Survey Corridor during pedestrian surveys in September of 2015. Each nest is located along the Mainline Survey Corridor. Raptor nests included two red-tailed hawk (*Buteo jamaicensis*) nests, one northern harrier (*Circus cyanus*) nest, and one nest of an unknown raptor species (Table 6). Each nest was inactive, although the northern harrier nest contained hatched egg shell fragments, indicating it was a productive nest in 2015 (refer to photo in Appendix B). Although all nests were inactive during field survey, they could potentially be active in subsequent years. Therefore, all nests recorded in 2015 will be re-surveyed in 2016 to evaluate activity status. USFWS-recommended seasonal buffers are included in Table 6, which would only be applied to active nests in future years. Note, the recommended seasonal buffers of all nests are intersected by the Mainline Corridor and the seasonal buffer of red-tailed hawk nest 03 is intersected by the Mainline Survey Corridor and the Lateral 1 Survey Corridor. Several species of raptors were observed during field surveys, including American kestrels (*Falco sparverius*), Cooper's hawks (*Accipiter cooperii*), golden eagles, great horned owls (*Bubo virginianus*), northern harriers, red-tailed hawks, and Swainson's hawks (*Buteo swainsoni*).

Table 6. Raptor nests found during terrestrial surveys within line-of site-of the Survey Corridor in 2015.

Nest ID	Species	Status*	Recommended Buffer Distance if Active (miles)
01	Red-tailed hawk	Inactive	0.25
02	Northern harrier	Inactive - Productive	0.25
03	Red-tailed hawk	Inactive	0.25
04	Unknown Species	Inactive	0.25

*Status of nest September 15-22, 2015

4.2 WETLANDS

E3 identified and delineated 10 wetlands within the Mainline Survey Corridor, totaling approximately 3.1 acres (Table 7). These wetlands are typically Palustrine Emergent (PEM) features adjacent to intermittent streams or upland swales (refer to photo in Appendix B). One of these wetlands, totaling 1.5 acres, was classified as jurisdictional during surveys due to its proximity to perennial Dry Creek; however, the USACE has final authority on jurisdictional status. Refer to the Project maps in Appendix A for the location of these features.

Two additional wetlands totaling 0.5 acres were identified and delineated by E3 biologists within the Lateral 1 Survey Corridor. These are PEM wetlands that associate with a drainage ditch which likely flows during heavy rain and snowmelt. Neither wetland was characterized as jurisdictional.

One additional wetland totaling 0.2 acres was identified and delineated by E3 biologists within the Lateral 2 Survey Corridor. This is a PEM wetland that associates with a tributary of Dry Creek, which was flowing during surveys in September of 2015. Based on the flow regime of the adjacent tributary, this wetland was characterized as jurisdictional.

4.3 WATERBODIES

E3 identified and delineated 18 waterbodies within the Mainline Survey Corridor, totaling approximately 3.0 acres (Table 7). Waterbodies within Survey Corridor included tributaries to Cherry Creek, North Fork Creek, and Dry Creek, which exhibited an OHWM. Seven total waterbodies, totaling 1.3 acres, intersected by the Survey Corridor were characterized as jurisdictional during surveys; however, the USACE has final authority on jurisdictional status. The NHD also identifies several smaller drainage crossings within the Survey Corridor which did not exhibit an OHWM, and are likely upland swales which seasonally drain the uplands after snowmelt and rain storms. These features were not determined to be jurisdictional. Refer to the Project maps in Appendix A for the location of these features.

No Waterbodies are intersected by the Lateral 1 or Lateral 2 Survey Corridors.

Table 7. Wetlands, Waterbodies, and their Associated Acreages and Jurisdictional Determinations within the Survey Corridor.

Water Feature ID	Feature Type	Survey Corridor	Jurisdictional Determination*	PCN Required	Crossing Length (ft)	Surveyed Acres
WB-01	Waterbody	Mainline	Yes	No	26	0.11
WB-02	Wetland	Mainline	No	No	0	0.05
WB-03	Waterbody	Mainline	No	No	0	0.05
WB-04	Waterbody	Mainline	No	No	77	0.11

Water Feature ID	Feature Type	Survey Corridor	Jurisdictional Determination*	PCN Required	Crossing Length (ft)	Surveyed Acres
WB-05	Waterbody	Mainline	Yes	No	227	0.30
WB-05	Waterbody	Mainline	Yes	No	0	0.12
WB-06	Waterbody	Mainline	No	No	65	0.10
WB-07	Waterbody	Mainline	Yes	No	128	0.14
WB-08	Wetland	Mainline	No	No	0	0.03
WB-09	Waterbody	Mainline	No	No	43	0.14
WB-10	Waterbody	Mainline	Yes	No	46	0.26
WB-11	Wetland	Mainline	No	No	247	0.66
WB-12	Waterbody	Mainline	Yes	No	194	0.12
WB-13	Waterbody	Mainline	No	No	50	0.24
WB-14	Waterbody	Mainline	No	No	0	0.05
WB-15	Waterbody	Mainline	No	No	238	0.58
WB-16	Waterbody	Mainline	No	No	0	0.04
WB-17	Wetland	Mainline	No	No	71	0.22
WB-18	Waterbody	Mainline	No	No	22	0.04
WB-19	Wetland	Mainline	No	No	70	0.26
WB-20	Waterbody	Mainline	Yes	No	38	0.21
WB-21	Wetland	Mainline	No	No	61	0.12
WB-22	Wetland	Mainline	No	No	0	0.16
WB-23	Wetland	Mainline	No	No	0	0.15
WB-24	Waterbody	Mainline	No	No	47	0.23
WB-25	Wetland	Mainline	No	No	0	0.02
WB-26	Waterbody	Mainline	No	No	0	0.11
WB-27A	Wetland	Mainline	Yes	No	103	1.45
WB-27B	Wetland	Lateral 2	Yes	No	0	0.22
WB-28	Wetland	Lateral 1	No	No	158	0.26
WB-29	Wetland	Lateral 1	No	No	107	0.20

*USACE has final authority over jurisdictional status

4.4 WOODY VEGETATION

Woody vegetation was prevalent throughout the Survey Corridor, where shrub communities of western snowberry, silver buffaloberry, creeping juniper, and silver sage intermix within the grasslands, forming a mosaic across the landscape (refer to photos in Appendix B). The scattered draws and swales are typically dominated by narrow stands of green ash intermixed with chokecherry and elm (refer to photos in Appendix B). A total of 430 woody vegetation patches were mapped within the Mainline Survey Corridor during field surveys, totaling 57.4 acres. Of the 430 patches, 45 (3.3 acres) are woodlands or shelterbelts and 385 (54.1 acres) are shrub communities. The Lateral 1 Survey Corridor contains four woody vegetation communities including three shrub patches totaling 1.0 acres and one patch containing cottonwood and Russian olive. The

Lateral 2 Survey Corridor contains three woody vegetation patches totaling 0.1 acres (all shrub vegetation). Appendix C lists the species inventory within each patch, the estimated number of trees that will be destroyed with a 50-foot permanent ROW, and the estimated mitigation (2:1) for each woody vegetation patch. Because trees and shrubs will likely be restored using different methods, Appendix C lists the two patch-types separately. Table 8 lists all woody vegetation mapped within the Survey Corridor by species, with the total number disturbed and the estimated mitigation. Note that all 429 woody vegetation patches in Table 8 are divided between Mainline, Lateral 1, and Lateral 2 Survey Corridors.

Table 8. Total number of trees/shrubs by species disturbed by the 50-ft Survey Corridor and the estimated mitigation number per species.

	Mainline			Lateral 1			Lateral 2		
Tree Species	**Sum within Survey Corridor**	**Sum within 50-ft Const. ROW**	**Sum of Est. Mitigation**	**Sum within Survey Corridor**	**Sum within 50-ft Const. ROW**	**Sum of Est. Mitigation**	**Sum within Survey Corridor**	**Sum within 50-ft Const. ROW**	**Sum of Est. Mitigation**
American elm	23	4	8	0	0	0	0	0	0
American plum	19	3	6	0	0	0	0	0	0
Boxelder	7	3	6	0	0	0	0	0	0
Chokecherry	104	11	22	0	0	0	0	0	0
Common juniper	5	0	0	0	0	0	0	0	0
Creeping juniper	15	0	0	0	0	0	0	0	0
Green ash	151	32	64	0	0	0	0	0	0
Peachleaf willow	1	0	0	0	0	0	0	0	0
Plains cottonwood	0	0	0	1	0	0	0	0	0
Prairie rose	7	3	6	0	0	0	0	0	0
Prickly rose	2	1	2	0	0	0	0	0	0
Russian olive	12	4	8	1	0	0	0	0	0
Sandbar willow	2	0	0	0	0	0	0	0	0
Siberian elm	74	11	22	0	0	0	0	0	0
Silver buffaloberry	152	17	34	0	0	0	24	0	0
Silver sage brush	530	53	106	0	0	0	1	0	0
Skunkbush sumac	6	0	0	0	0	0	0	0	0
Western snowberry	92	2	4	0	0	0	0	0	0
Grand Total	**1204**	**144**	**288**	**2**	**0**	**0**	**25**	**0**	**0**

4.5 NOXIOUS WEEDS

A total of 182 noxious weed patches were mapped by E3 biologists within the Mainline Survey Corridor, totaling 19.5 acres (Appendix D). Four total species listed by McKenzie

County and one species (Canada thistle) listed by the State of North Dakota were mapped throughout the Survey Corridor, typically in areas disturbed by farming, grazing, or road construction. Most weed infestations contained dense patches of Canada thistle (94.5% of patches). Common burdock was scattered infrequently across the landscape, mostly found within woodlands or along pipeline scars. Black henbane and field bindweed were sparse throughout the Survey Corridor. One Canada thistle infestation totaling 0.01 acres was identified by E3 biologists within the Lateral 1 Survey Corridor. One Canada thistle infestation totaling 0.9 acres was delineated within the Lateral 2 Survey Corridor along a wetland margin.

4.6 THREATENED AND ENDANGERED SPECIES

No candidate, threatened, or endangered species were encountered by E3 biologists during field surveys within the Survey Corridor. The following sections detail the potential effects the Project could have on listed species.

4.6.1 INTERIOR LEAST TERN

Federal Status: Endangered

The Missouri River, located approximately 12 miles to the east of the Project, provides suitable breeding and nesting habitat for least terns. However, the Survey Corridor does not contain the sandbars, riverbanks, and broad beaches necessary for colonial nesting. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the HDD method for crossing waterbodies with the hydrologic capability of carrying sediment loads downstream. Due to the lack of nesting habitat within the Survey Corridor and the method of crossing these intermittent and ephemeral streams to avoid runoff, impacts to the interior least tern are not anticipated.

4.6.2 PIPING PLOVER

Federal Status: Threatened

Lake Sakakawea and the Missouri River, located approximately 12 miles to the east of the Project, provide suitable breeding and nesting habitat for piping plovers. However, the Survey Corridor does not contain the sandbars or gravel beaches necessary for nesting. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the HDD method for crossing waterbodies with the hydrologic capability of carrying sediment loads downstream. Due to the lack of nesting habitat within the Survey Corridor and the method of crossing these intermittent and ephemeral streams to avoid runoff, impacts to the piping plover are not anticipated.

4.6.3 RUFA RED KNOT

Federal Status: Threatened

North Dakota is a possible migration stopover in spring and autumn for the rufa red knot, particularly within Lake Sakakawea and its major tributaries. Due to the lack of suitable foraging habitat within the Survey Corridor, impacts to this species and its associated habitat are not anticipated.

4.6.4 SPRAGUE'S PIPIT

Federal Status: Candidate

Because the Survey Corridor includes relatively undisturbed grasslands, the Sprague's pipet is a likely summer resident. Construction is also planned to begin in April, which is encompassed by its breeding season, when it nests on the ground. Furthermore, impacts to this species could occur due to disturbance activities destroying nests. Therefore, E3 suggests conducting a nesting bird sweep along the Survey Corridor within two weeks of ground-disturbance activities. Following this guidance, impacts to this species are not likely to occur

4.6.5 WHOOPING CRANE

Federal Status: Endangered

North Dakota provides suitable migratory habitat for the whooping crane; desktop review has identified potentially suitable habitat within the Survey Corridor. Precautionary measures will be implemented if whooping cranes are cited near the Project, and Oasis will voluntary suspend all heavy equipment operation and notify the USFWS should a whooping crane be spotted within a half-mile of any Project activity. However, impacts to this species and its associated habitat are not anticipated, as stop-over or feeding wetlands will either be avoided or bored. Mitigation measures including scheduling Project activities around avoidance periods coinciding with typical migration patterns will be implemented if necessary.

4.6.6 PALLID STURGEON

Federal Status: Endangered

The Project crosses does not cross any waterbodies classifies as suitable habitat for the pallid sturgeon. However, Lake Sakakawea and the Missouri River, where this species is known to occur, are located approximately 12 miles to the east of the Project. In order to minimize disturbance downstream into the Missouri River, Oasis will utilize the HDD method for crossing waterbodies with the hydrologic capability of carrying contaminants downstream, likely resulting in minimal to no impacts to this listed species.

4.6.7 BLACK-FOOTED FERRET

Federal Status: Experimental Population, Non-essential

The Survey Corridor falls within the black-footed ferret's historical range, however no habitat or introduced populations are present. Therefore, the Project will not affect this species.

4.6.8 GRAY WOLF

Federal Status: Endangered

The Survey Corridor intersects potentially suitable habitat for the gray wolf, however potential habitat is not expansive, and is near regular human activity. Because the Project would likely act as a deterrent to this species, impacts to this species are unlikely.

4.6.9 DAKOTA SKIPPER

Federal Status: Threatened

To date, no Dakota skippers have been identified within the Survey Corridor and the nearest critical habitat identified by the USFWS is located 20 miles northeast of the Project in McKenzie County. However, the Survey Corridor intersects areas desktop and field reviews suggest are potential marginal Dakota skipper habitat. Suitable habitat observed within the Survey Corridor was relatively disturbed, with scars from other ROWs and agricultural fields dissecting patches that would otherwise be native prairie grassland. Therefore, disturbance to potential suitable habitat will be unavoidable. Project impacts on this species should remain minimal, as only small tracts of prairie will be cleared for construction.

4.6.10 NORTHERN LONG-EARED BAT

Federal Status: Threatened

Any records of the NLEB are limited to mapped hibernacula, none of which are located in North Dakota. However, because the NLEB occurs in similar habitats to other *Myotis* species, suitable habitat does exist within the Survey Corridor in the form of green ash and elm riparian woodlands. Therefore, E3 recommends Oasis reduces their ROW width to 50-feet through suitable habitat or HDD under large woodlands to minimize habitat loss. This strategy, in conjunction with the scope and timing of the Project, will minimize impacts to the NLEB and its associated habitat.

4.7 WILDLIFE INVENTORY

In order to assemble a complete inventory of species that occur within the Survey Corridor, opportunistic sightings of wildlife species were recorded over the course of field

surveys by E3 biologists. The complete list of species observed 2015 includes: 39 birds, 9 mammals, 2 amphibians, and 3 reptiles (Table 9).

Table 9. Complete inventory of vertebrate species observed within the Survey Corridor during field surveys.

Common Name	Scientific Name
Birds	
American Crow	*Corvus brachyrhynchos*
American Kestrel	*Falco sparverius*
American Robin	*Turdus migratorius*
American White Pelican	*Pelecanus erythrorhynchos*
Baird's Sparrow	*Ammodramus bairdii*
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica hudsonia*
Black-capped Chickadee	*Poecile atricapillus*
Brown Thrasher	*Toxostoma rufum*
California Gull	*Larus californicus*
Canada Goose	*Branta canadensis*
Cedar Waxwing	*Bombycilla cedrorum*
Cooper's Hawk	*Accipiter cooperii*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Eurasion Collared Dove	*Streptopelia decaocto*
European Starling	*Sturnus vulgaris*
Ferruginous Hawk	*Buteo regalis*
Gray Partridge	*Perdix perdix*
Great Horned Owl	*Bubo virginianus*
Horned Lark	*Eremophila alpestris*
House Wren	*Troglodytes aedon*
Indigo Bunting	*Passerina cyanea*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Flicker	*Colaptes auratus*
Northern Harrier	*Circus cyaneus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-necked Pheasant	*Phasianus colchicus*
Rock Pigeon	*Columba livia*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Spotted Towhee	*Pipilo maculatus*
Swainson's Hawk	*Buteo swainsoni*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Kingbird	*Tyrannus verticalis*

Common Name	**Scientific Name**
Western Meadowlark	*Sturnella neglecta*
Mammals	
Badger	*Taxidea taxus*
Black-tailed Prairie Dog	*Cynomys ludovicianus*
Coyote	*Canis latrans*
Eastern Gray Squirrel	*Sciurus carolinensis*
Mule Deer	*Odocoileus hemionus*
Northern Pocket Gopher	*Thomomys talpoides*
Porcupine	*Erethizon dorsatum*
Pronghorn	*Antilocapra americana*
Raccoon	*Procyon lotor*
White-tailed Deer	*Odocoileus virginianus*
Herpetofauna	
Common Garter Snake	*Thamnophis sirtalis*
Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*
Northern Leopard Frog	*Lithobates pipiens*
Plains Garter Snake	*Thamnophis radix*
Woodhouse's Toad	*Anaxyrus woodhousii*

SECTION 5: RECOMMENDATIONS

Based on the findings during field surveys, E3 recommends the following guidance to maintain compliance with regulatory agencies and minimize its impact on resident natural resources:

Raptors:

- Conduct a ground survey for active nests within Survey Corridor or within line-of-site of the Survey Corridor in April-May of 2016
- Adhere to USFWS-suggested timing buffers for active raptor nests during nesting season (April 15-July 15)
- If active nests are discovered during construction activity, notify the USFWS

Woody vegetation:

- Follow PSC guidelines for tree-clearing activity
- Decrease ROW to 50-feet through woodlands and shrublands to minimize loss
- Approximately 288 saplings may need to be replanted to fulfill the 2:1 mitigation requirement
- Replace native and non-native trees with native trees
- Seed mixes will likely be required to replace shrubs such as western snowberry and silver buffaloberry

Wetlands/waterbodies:

- Decrease ROW to minimum when constructing through wetlands
- HDD underneath potential jurisdictional wetlands
- HDD underneath wetlands that involve crossing lengths greater than 500 feet

Noxious weeds:

- Minimize top soil spread and traffic in areas with high concentrations of noxious weeds
- Visually inspect equipment prior to leaving infested areas – clean vegetation and soils from vehicles and equipment prior to entering uninfected tracts
- Contractors will thoroughly clean the equipment and materials (e.g., timber mates, bridges, etc.) at the contractor yard prior to mobilization to the Project and upon departure from locations of infestations to prevent spread of nuisance weeds

Threatened and Endangered Species:

- If any threatened or endangered species are encountered during construction activities, contact the USFWS.
- If construction activities occur between April 15-July15, conduct a breeding bird sweep of the impacted area within two weeks of construction to minimize impacts to protected bird species (including Sprague's pipit)

SECTION 6: REFERENCES

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Appendix A

Natural Resource Maps

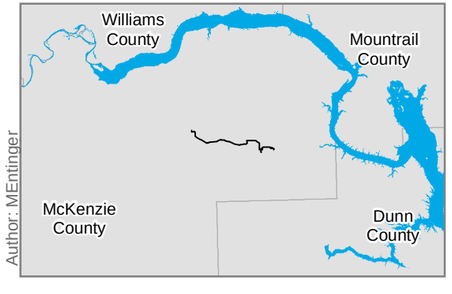
Document Path: P:\Oasis\Johnsons_CornerMXDs\Survey\NRReportMaps\JCNR_OverviewMap.mxd

Date: 10/27/2015

Author: MEntinger

Lateral 1

Lateral 2



Milepost
Mainline
Lateral 1
Lateral 2
Township Boundary
Section Boundary

Land Ownership

- Bureau of Land Management
- Fort Berthold Reservation
- State of North Dakota
- Theodore Roosevelt National Park
- US Army Corp of Engineers
- USFS Little Missouri National Grassland

N

0 0.75 1.5 3 Miles

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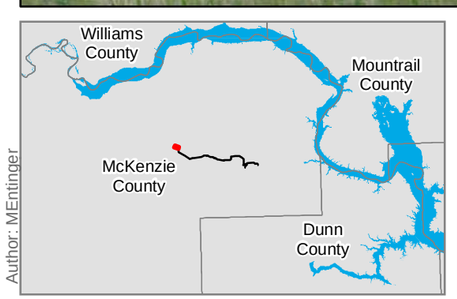
Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Overview Map

McKenzie County, North Dakota



- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes
- Nest
- Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

1:3,000

Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

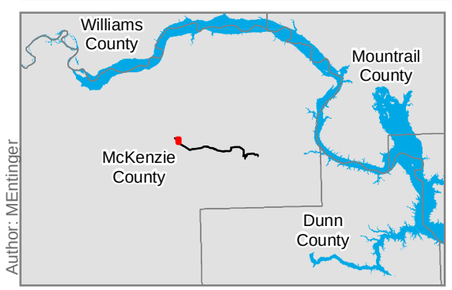
Page 1 of 26

McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_CornerMXDs\Survey\NRReportMaps\NR_Survey_ReportMaps_Draft.mxd

Date: 10/27/2015

Author: MEntinger



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- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
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- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

E3 Environmental
Enhancing Execution with Experience

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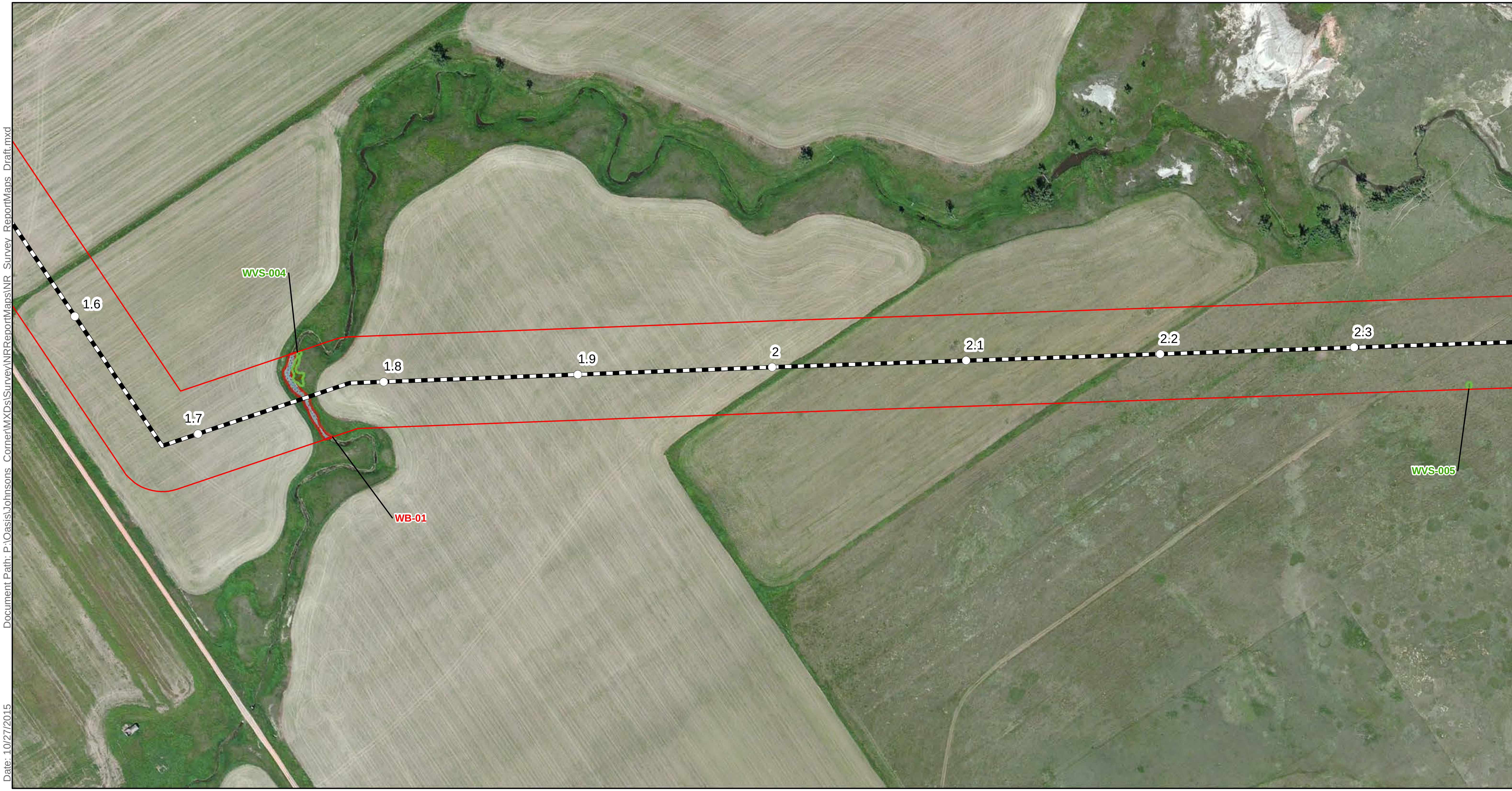
Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota



Milepost
Centerline
Natural Resouce Survey Corridor
Natural Resource Survey Data
Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features
Class, Jurisdictional Determination
Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

E3 ENVIRONMENTAL
Enhancing Execution with Experience

0 100 200 400 Feet
1:3,000

Map not to scale, for environmental review purposes only.

Oasis Petroleum
Wild Basin to Johnsons Corner
Natural Resource Survey

McKenzie County, North Dakota

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WVS-012
WVS-014
WVT-01
WVT-03
WVS-022
WVS-032
WVS-033
WVS-036
WVS-023
WVS-030
WVT-04
WVS-037
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WVS-007
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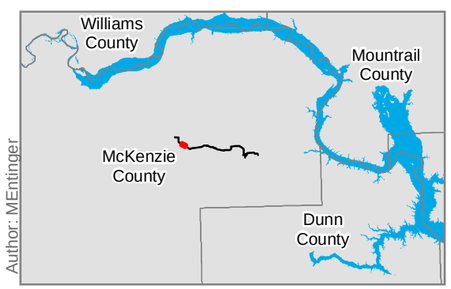

- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

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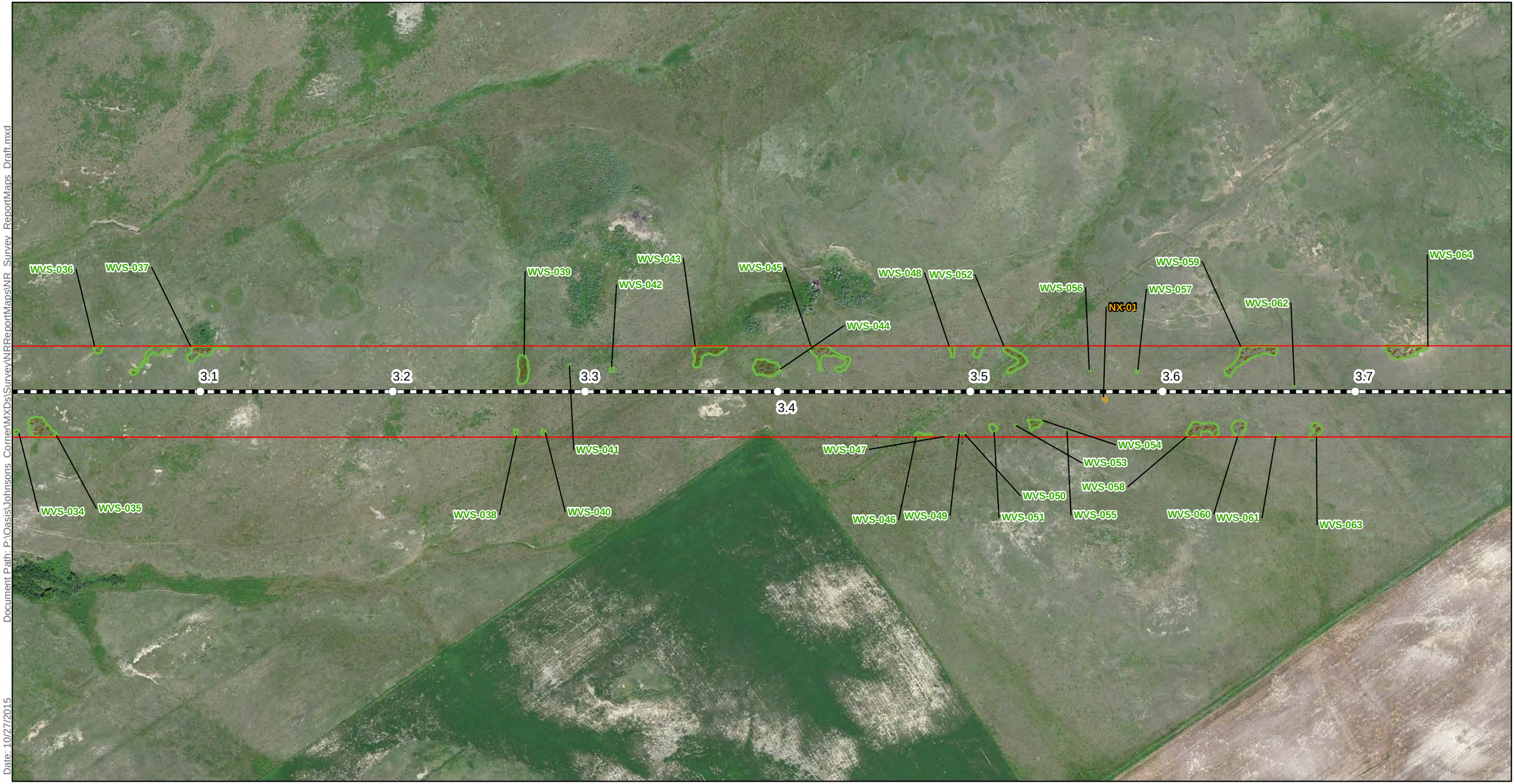
Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota



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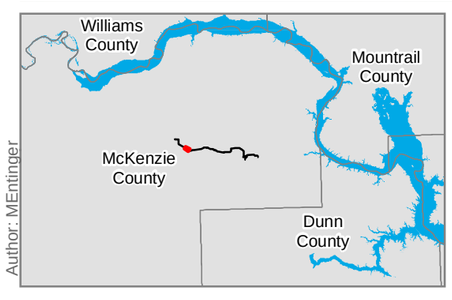
Date: 10/27/2015

Author: MEntinger



- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

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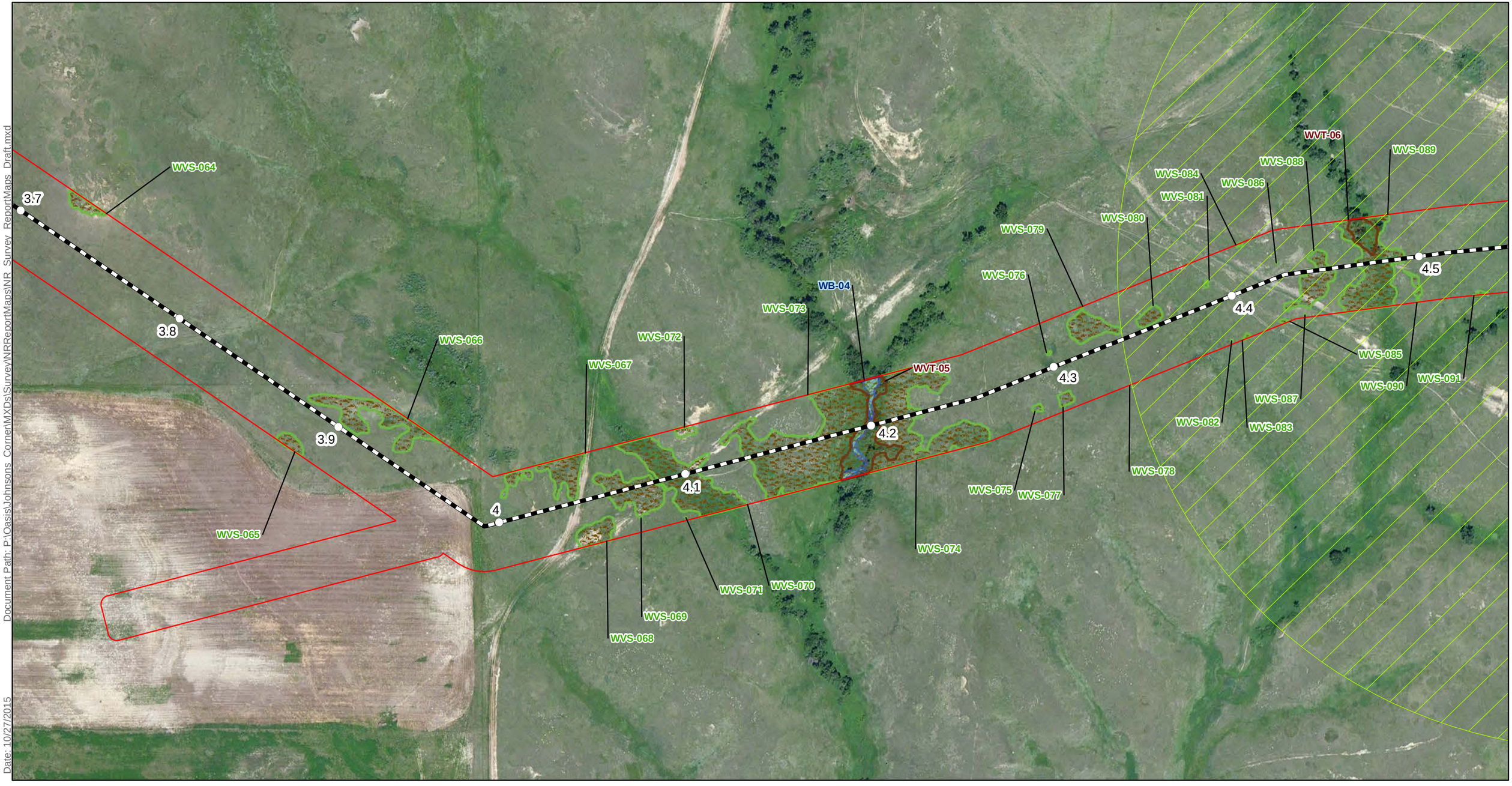
Map not to scale, for environmental review purposes only.

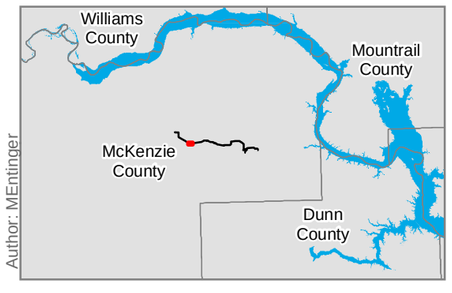
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota





- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

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Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

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Date: 10/27/2015

Author: MEntinger

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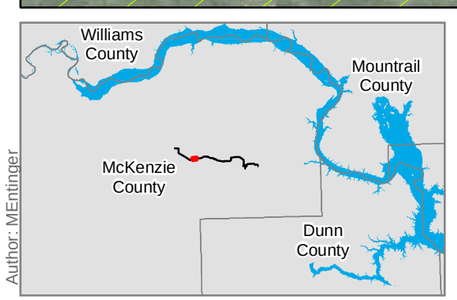

Milepost
Centerline
Natural Resouce Survey Corridor

Natural Resource Survey Data

Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

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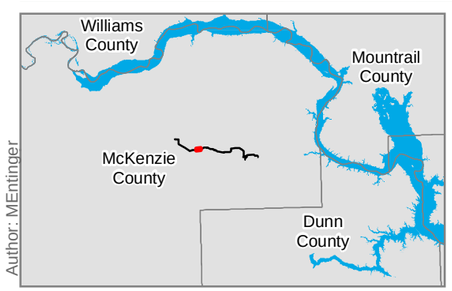
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota



- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

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Enhancing Execution with Experience

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Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

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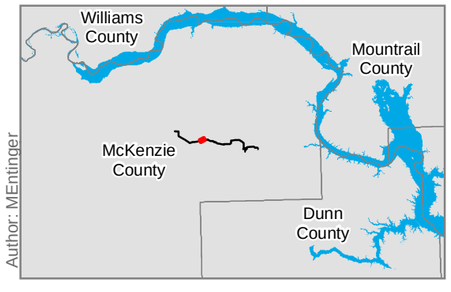

- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

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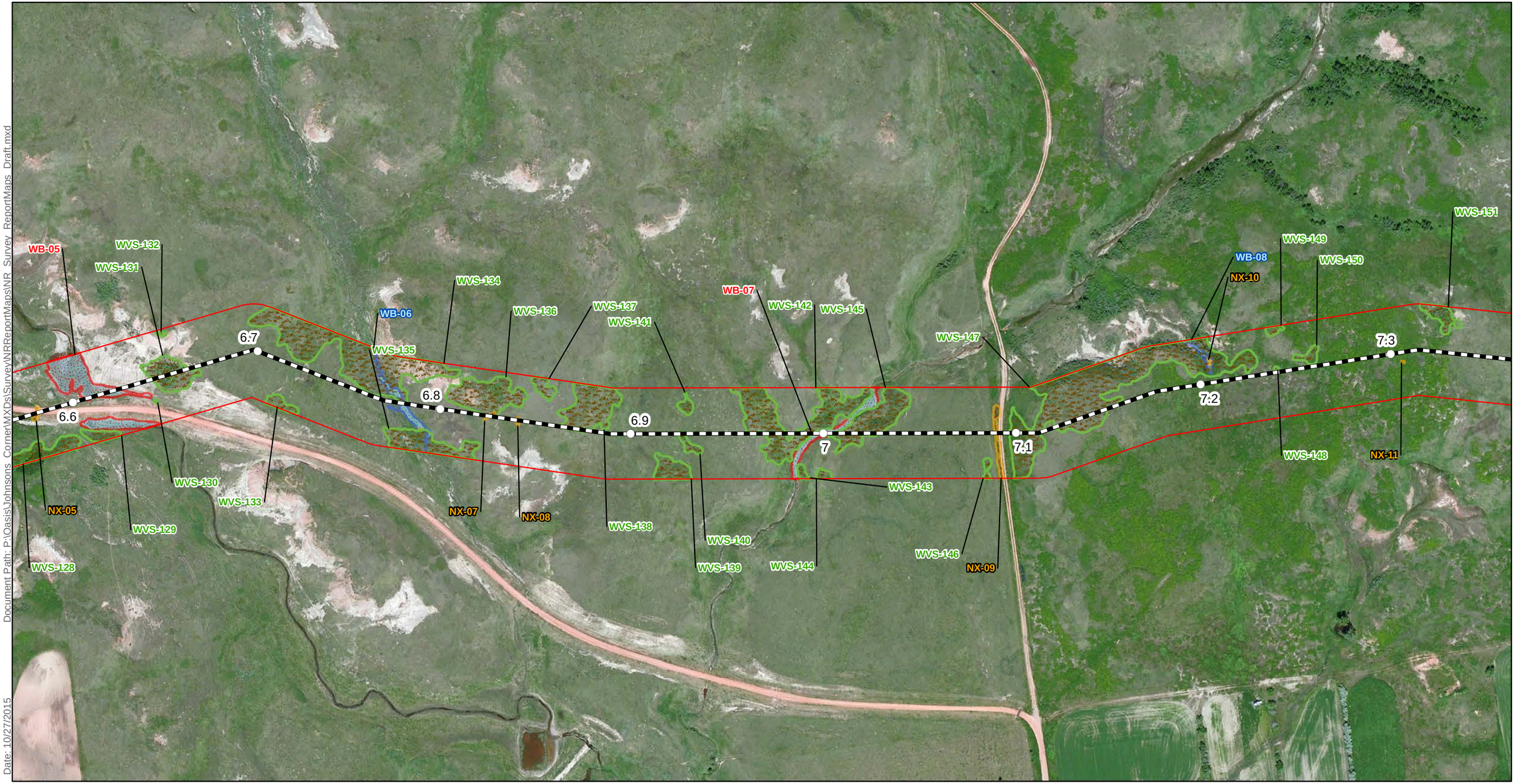
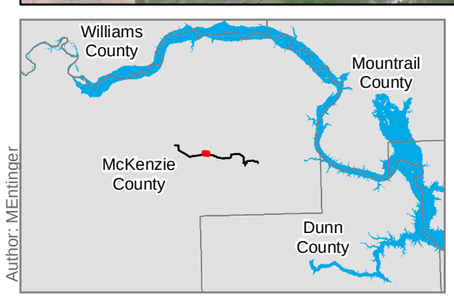
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota





Milepost
Centerline
Natural Resouce Survey Corridor

Natural Resource Survey Data

Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

1:3,000

Map not to scale, for environmental review purposes only.

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

WVS-151
WVS-153
WVS-158
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WVS-165
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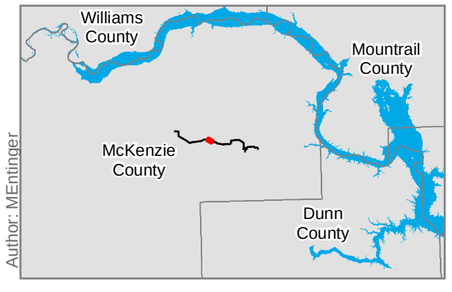


Milepost
Centerline
Natural Resouce Survey Corridor

Natural Resource Survey Data

Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet
1:3,000

Map not to scale, for environmental review purposes only.

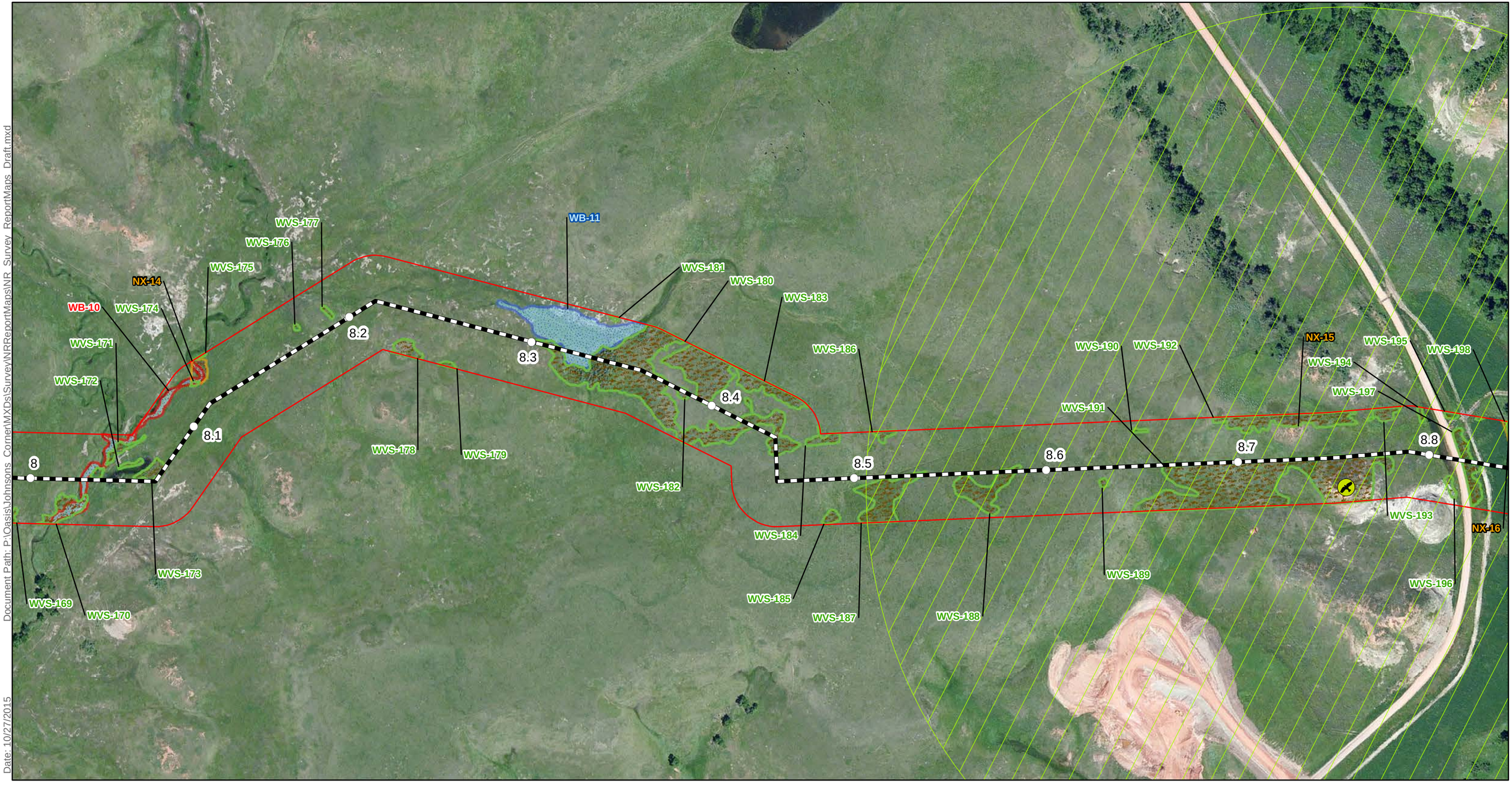
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

Page 11 of 26

McKenzie County, North Dakota



- Milepost
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- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
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Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

1:3,000

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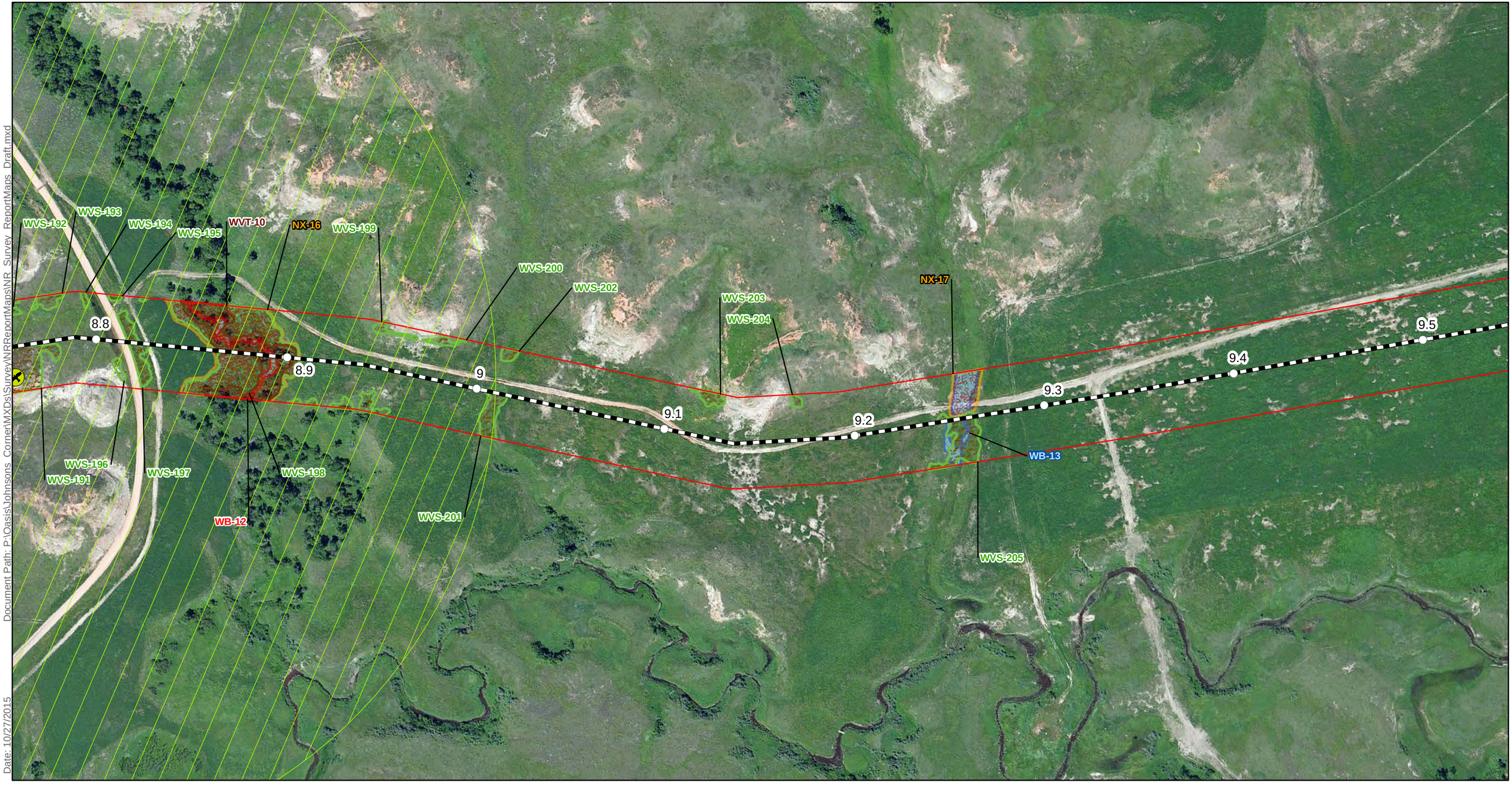
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota



- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
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- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
- Wetland, No
- Wetland, Yes

- Nest
- Nest Buffer

N

0 100 200 400 Feet

1:3,000

Map not to scale, for environmental review purposes only.

E3 Environmental
Enhancing Execution with Experience

Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

Page 13 of 26

McKenzie County, North Dakota

Document Path: P:\Oasis\Johnsons_Corner\MXDs\Survey\NRReportMaps\NR_Survey_ReportMaps_Draft.mxd

Date: 10/27/2015

Author: MEntinger

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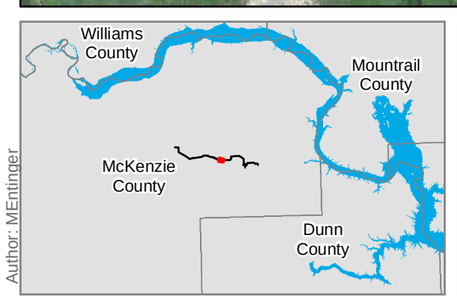

Milepost
Centerline
Natural Resouce Survey Corridor

Natural Resource Survey Data

Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

N

E3 Environmental
Enhancing Execution with Experience

0 100 200 400 Feet

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Map not to scale, for environmental review purposes only.

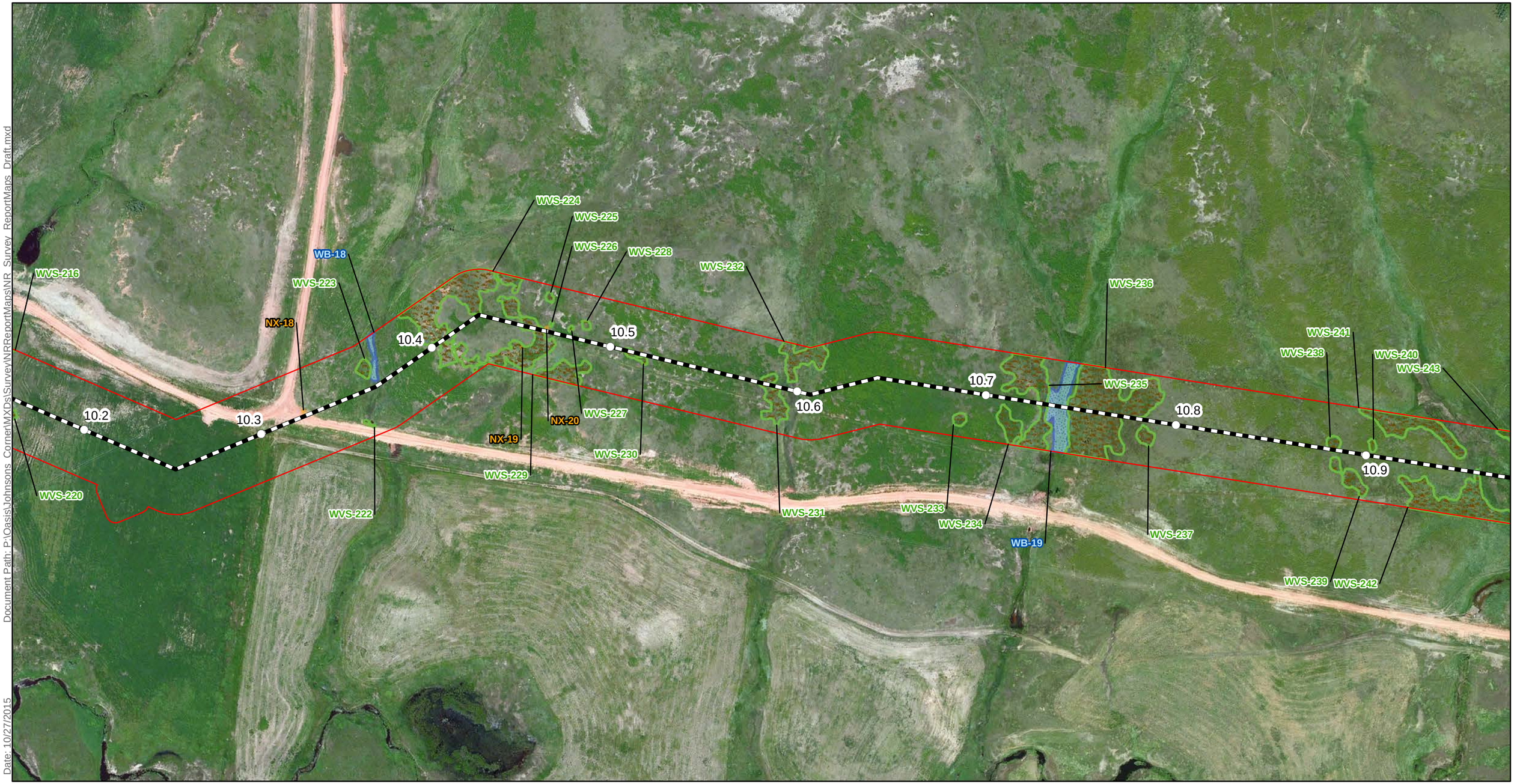
Oasis Petroleum

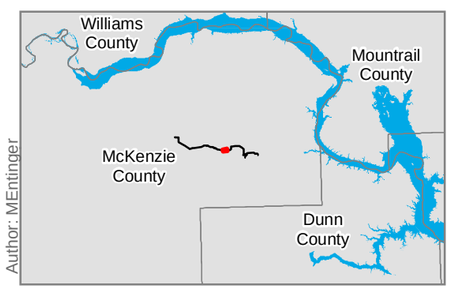
Wild Basin to Johnsons Corner

Natural Resource Survey

Page 14 of 26

McKenzie County, North Dakota





Milepost
Centerline
Natural Resouce Survey Corridor

Natural Resource Survey Data

Noxious Weed
Woody Vegetation - Shrubs
Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

Waterbody, No
Waterbody, Yes
Wetland, No
Wetland, Yes

Nest
Nest Buffer

N

E3 Environmental
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0 100 200 400 Feet

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Map not to scale, for environmental review purposes only.

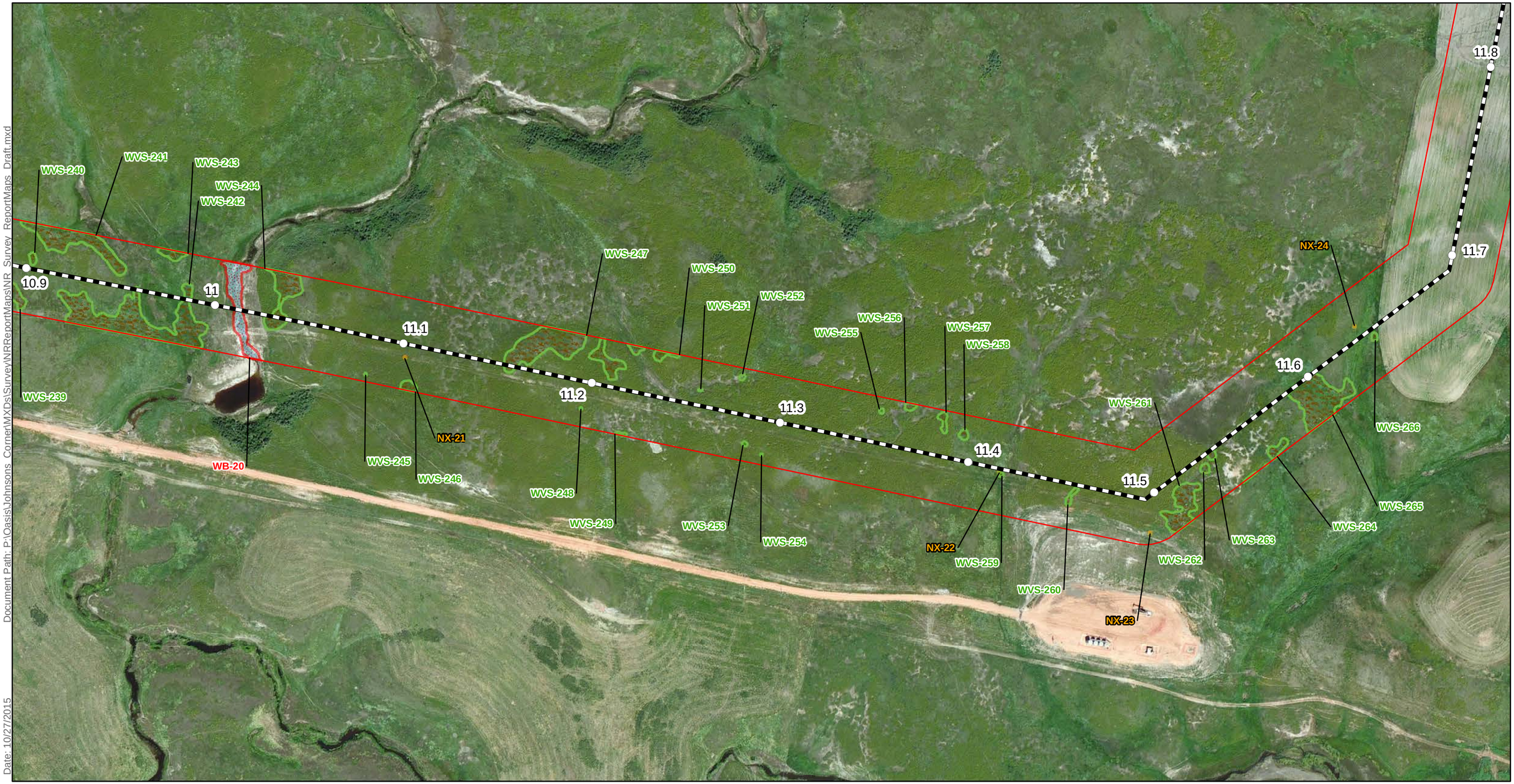
Oasis Petroleum

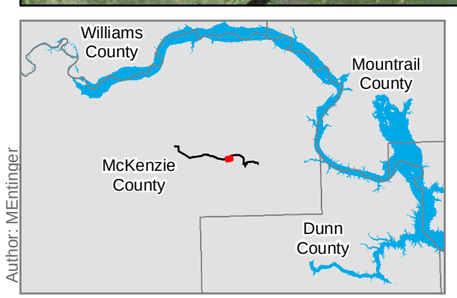
Wild Basin to Johnsons Corner

Natural Resource Survey

Page 15 of 26

McKenzie County, North Dakota





- Milepost
- Centerline
- Natural Resouce Survey Corridor

Natural Resource Survey Data

- Noxious Weed
- Woody Vegetation - Shrubs
- Woody Vegetation - Trees

Waterbody Features

Class, Jurisdictional Determination

- Waterbody, No
- Waterbody, Yes
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- Nest Buffer

N

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Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

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Date: 10/27/2015

Author: MEntinger

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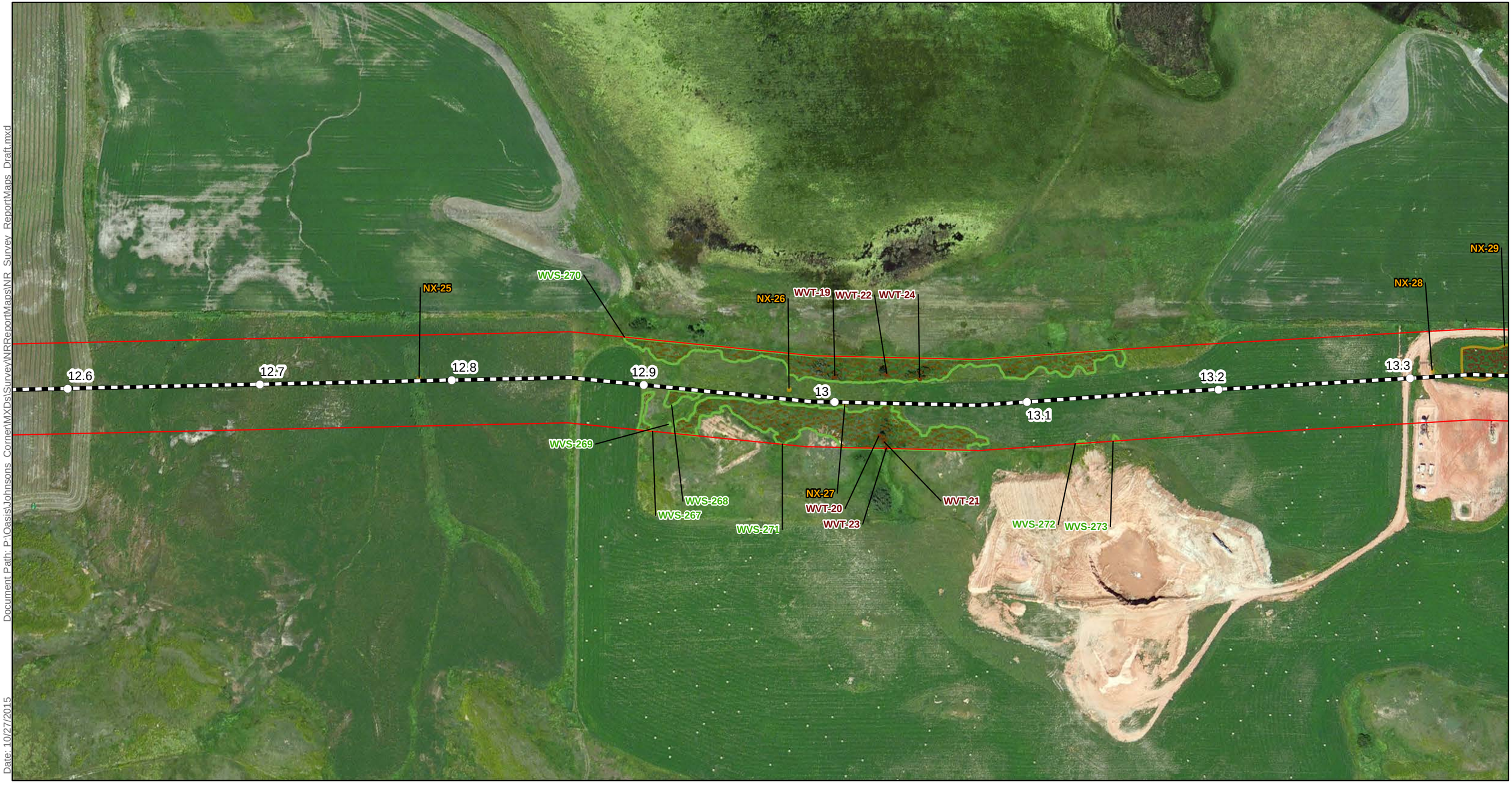
Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota



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Natural Resource Survey Data

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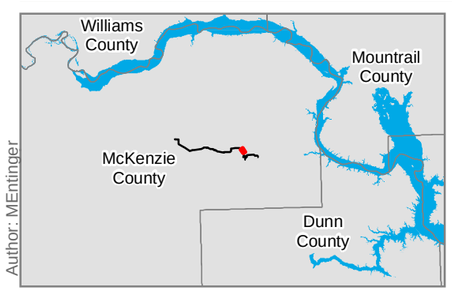

Milepost
Centerline
Natural Resouce Survey Corridor

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Woody Vegetation - Trees

Waterbody Features

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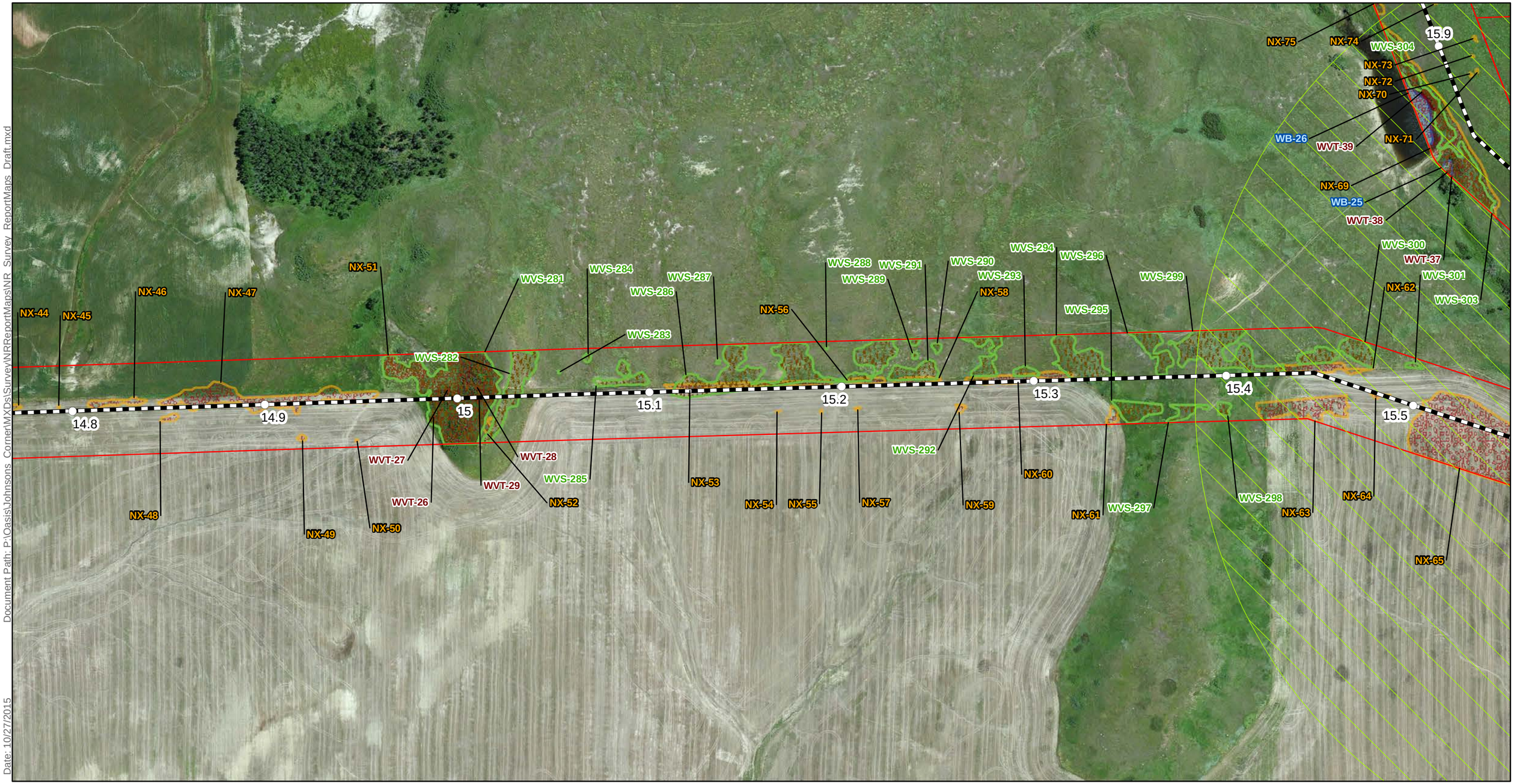

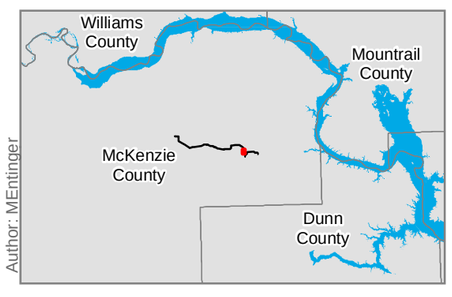

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- Nest Buffer

E3 Environmental — Enhancing Execution with Experience

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Oasis Petroleum

Wild Basin to Johnsons Corner

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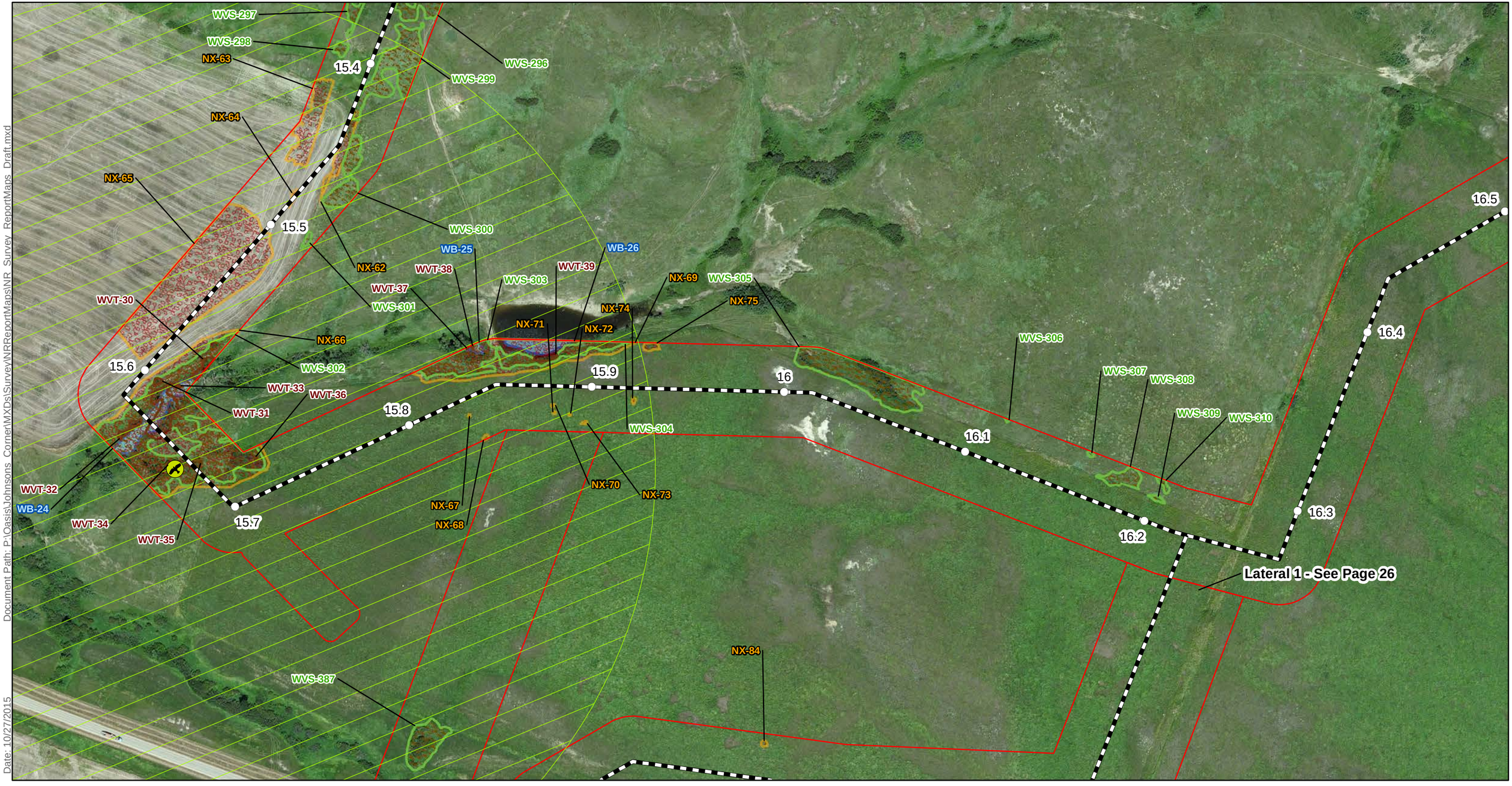
McKenzie County, North Dakota



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Wetland, Yes

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Nest Buffer

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Oasis Petroleum

Wild Basin to Johnsons Corner

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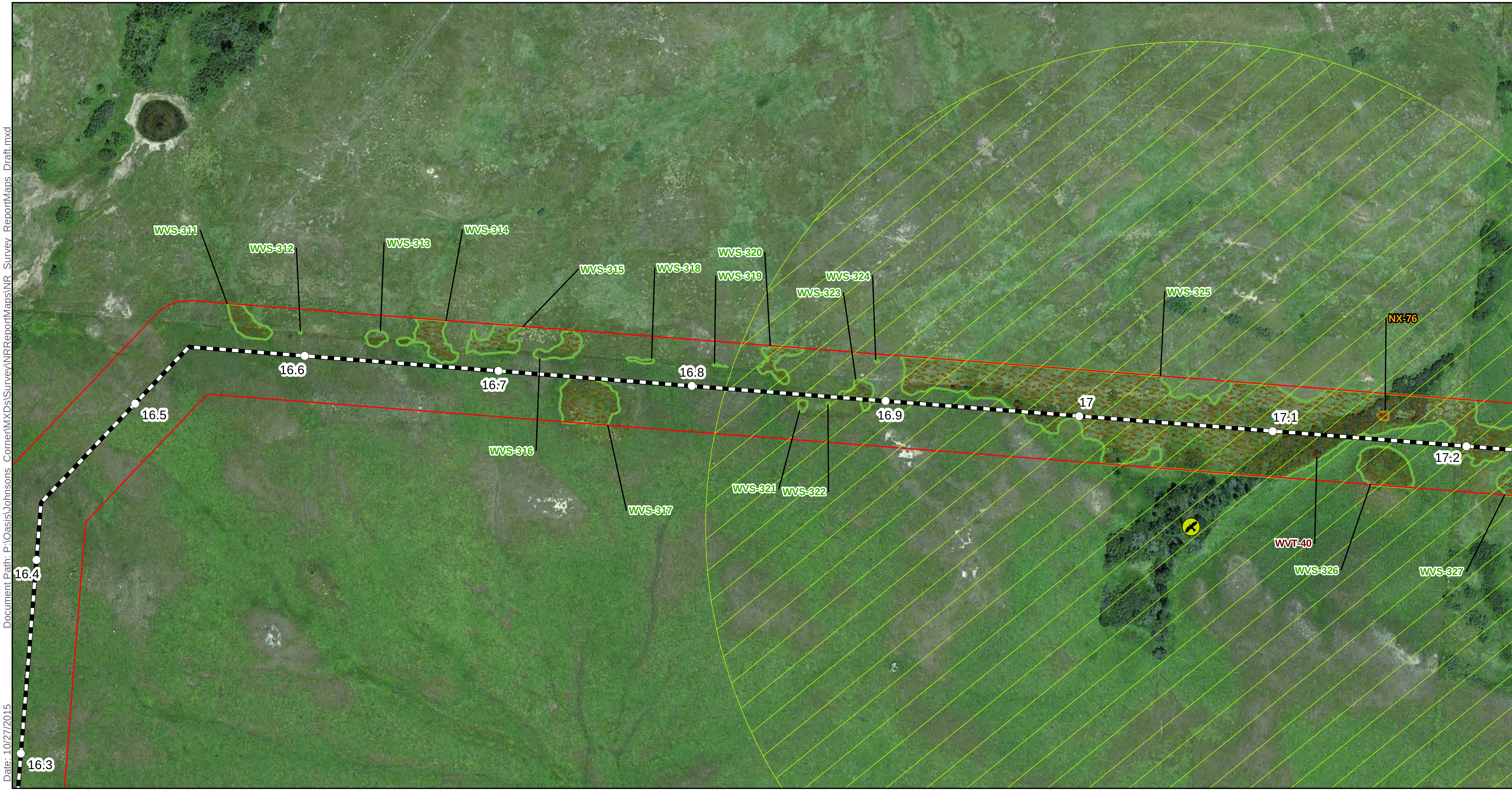

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Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

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Date: 10/27/2015

Author: MEntinger

NX-80
NX-77
NX-78
WVS-333
WVS-332
WVT-45
WVT-41
WVS-335
WVS-337
WB-27A
WVS-339
17.7
17.6
17.8
17.5
17.4
NX-76
WVS-325
WVS-329
WVS-334
17.9
17.3
17.2
WVT-43
WVT-44
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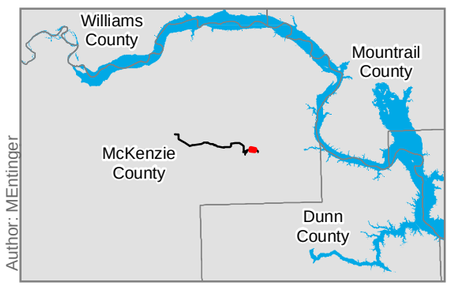

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Oasis Petroleum

Wild Basin to Johnsons Corner

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Document Path: P:\Oasis\Johnsons_Corner\MXDs\Survey\NRReportMaps\NR_Survey_ReportMaps_Draft.mxd

Date: 10/27/2015

Author: MEntinger

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WVS-361
WVS-358
WVS-359
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WVS-353
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WVS-350
WVS-362
WVS-349
WVS-365
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WVS-372
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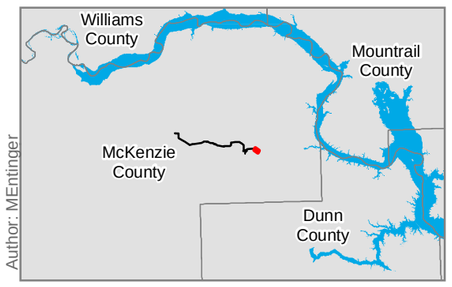

Milepost
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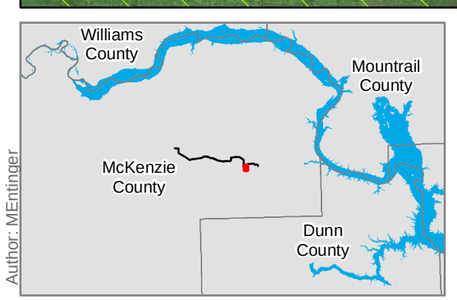

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Natural Resource Survey Data

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Oasis Petroleum

Wild Basin to Johnsons Corner

Natural Resource Survey

McKenzie County, North Dakota

Appendix B

Field Photographs

Photo 1. Missouri Plateau ecoregion within the Survey Corridor.

Photo 2. Northwestern Great Plains Mixedgrass Prairie located within the Survey Corridor.

Photo 3. Cultivated Cropland located within the Survey Corridor.

Photo 4. Western Great Plains Wooded Draw and Ravine located within the Survey Corridor.

Photo 5. Inactive, but likely productive, northern harrier nest identified during field surveys in 2015.

Photo 6. Palustrine emergent wetland (PEM) associated with a minor creek identified within the Survey Corridor.

Photo 7. Shrublands dominated by silver buffaloberry, western snowberry, and creeping juniper within the Survey Corridor.

Photo 7. Green ash and chokecherry gallery along a ravine within the Survey Corridor.

Appendix C

Woody Vegetation

Trees

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVT-01	Upland Deciduous	Chokecherry	25	5	**10**	0.798	0.148
		Green Ash	2	0	**0**		
		Snow Berry	5%	5%	**5%**		
		Black Currant	2%	2%	**2%**		
		Prairie Rose	1%	1%	**1%**		
WVT-02	Upland Deciduous	Chokecherry	6	0	**0**	0.214	0.008
		American Plum	5	0	**0**		
		American Elm	1	0	**0**		
		Silver Buffaloberry	40%	40%	**40%**		
		Black Currant	2%	2%	**2%**		
WVT-03	Upland Deciduous	American Plum	3	1	**2**	0.638	0.228
		Chokecherry	7%	7%	**7%**		
		Snow Berry	6%	6%	**6%**		
		Saskatoon Serviceberry	6%	6%	**6%**		
		Silver Buffaloberry	5%	5%	**5%**		
WVT-04	Upland Deciduous	Silver Sage Brush	10	0	**0**	0.075	0
		Siberian Elm	3	0	**0**		
		Silver Buffaloberry	60%	0	**0**		
		Snow Berry	20%	0	**0**		
		Prairie Rose	5%	0	**0**		
WVT-05	Riparian Deciduous	Silver Buffaloberry	28	4	**8**	0.402	0.059
		Green Ash	25	4	**8**		
		American Elm	5	1	**2**		
		Siberian Elm	2	0	**0**		
		Snow Berry	15%	15%	**15%**		
WVT-06	Upland Deciduous	Green Ash	8	0	**0**	0.119	0
		American Elm	3	0	**0**		
		Snow Berry	15%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVT-07	Upland Deciduous	Green Ash	1	0	**0**	0.0002	0
WVT-08	Upland Deciduous	Green Ash	1	0	**0**	0.0002	0
WVT-09	Upland Deciduous	Green Ash	3	0	**0**	0.015	0
		Silver Buffaloberry	2	0	**0**		
		Snow Berry	10%	0	**0**		
WVT-10	Upland Deciduous	Green Ash	73	19	**38**	0.628	0.165
		Siberian Elm	12	3	**6**		
		Chokecherry	15%	15%	**15%**		
		Silver Buffaloberry	3%	3%	**3%**		
		Snow Berry	3%	3%	**3%**		
WVT-11	Shelterbelt	Siberian Elm	39	6	**12**	0.068	0.010
WVT-12	Shelterbelt	Russian Olive	10	4	**8**	0.040	0.015
WVT-13	Shelterbelt	Russian Olive	1	0	**0**	0.0003	0

°°*Lateral 1*
^*Lateral 2*

% = Percent Cover

Trees

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVT-14	Shelterbelt	Siberian Elm	1	0	**0**	0.001	0
WVT-15	Shelterbelt	Siberian Elm	1	0	**0**	0.001	0
WVT-16	Shelterbelt	Siberian Elm	1	0	**0**	0.001	0
WVT-17	Shelterbelt	Siberian Elm	1	1	**2**	0.001	0.001
WVT-18	Shelterbelt	Siberian Elm	1	1	**2**	0.001	0.001
WVT-19	Upland Deciduous	Green Ash	1	0	**0**	0.001	0
WVT-20	Upland Deciduous	American Elm	1	0	**0**	0.001	0
WVT-21	Upland Deciduous	American Elm	2	0	**0**	0.001	0
WVT-22	Upland Deciduous	American Elm	1	0	**0**	0.001	0
WVT-23	Upland Deciduous	American Plum	1	0	**0**	0.001	0
WVT-24	Upland Deciduous	Green Ash	3	0	**0**	0.001	0
WVT-25	Upland Deciduous	Siberian Elm	1	0	**0**	0.001	0
WVT-26	Upland Deciduous	Green Ash	1	0	**0**	0.001	0
WVT-27	Upland Deciduous	Boxelder	1	1	**2**	0.001	0.001
WVT-28	Upland Deciduous	Green Ash	1	0	**0**	0.001	0
WVT-29	Upland Deciduous	Green Ash	2	2	**4**	0.001	0.001
WVT-30	Upland Deciduous	Siberian Elm	8	0	**0**	0.027	0
		Green Ash	4	0	**0**		
		American Plum	2%	0	**0**		
WVT-31	Upland Deciduous	Chokecherry	12	0	**0**	0.007	0
		Siberian Elm	2	0	**0**		
WVT-32	Upland Deciduous	American Elm	6	1	**2**	0.019	0.003
		Fireberry Hawthorn	65%	65%	**65%**		
		Snow Berry	2%	2%	**2%**		
WVT-33	Upland Deciduous	Green Ash	12	4	**8**	0.164	0.052
		Boxelder	6	2	**4**		
		American Elm	2	1	**2**		
		Siberian Elm	24%	24%	**24%**		
WVT-34	Upland Deciduous	Green Ash	3	0	**0**	0.001	0
WVT-35	Upland Deciduous	American Elm	1	1	**2**	0.001	0.001
WVT-36	Upland Deciduous	American Elm	1	0	**0**	0.001	0
WVT-37	Riparian Deciduous	Peachleaf Willow	1	0	**0**	0.0003	0
WVT-38	Riparian Deciduous	Siberian Elm	1	0	**0**	0.001	0
WVT-39	Upland Deciduous	Green Ash	4	0	**0**	0.018	0
WVT-40	Upland Deciduous	Siberian Elm	1	0	**0**	0.001	0
WVT-41	Upland Deciduous	Green Ash	1	1	**2**	0.001	0.001
WVT-42	Upland Deciduous	Green Ash	2	0	**0**	0.008	0
WVT-43	Upland Deciduous	Green Ash	2	0	**0**	0.001	0
WVT-44	Upland Deciduous	Green Ash	1	1	**2**	0.001	0.001
WVT-45	Upland Deciduous	Green Ash	1	1	**2**	0.001	0.0004
WVT-46°°	Riparian Deciduous	Plains Cottonwood	1	0	**0**	0.018	0
		Russian Olive	1	0	**0**		

°°*Lateral 1*
^*Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-001	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-002	Upland Shrub	Silver Sage Brush	1	1	**2**	0.0002	0.0002
WVS-003	Upland Shrub	Silver Sage Brush	1	1	**2**	0.0002	0.0002
WVS-004	Upland Shrub	Snow Berry	10%	0	**0**	0.030	0
WVS-005	Upland Shrub	Silver Sage Brush	10	0	**0**	0.005	0
WVS-006	Upland Shrub	Silver Sage Brush	6	0	**0**	0.0002	0
WVS-007	Upland Shrub	Snow Berry	20%	0	**0**	0.006	0
WVS-008	Upland Shrub	Silver Sage Brush	21	0	**0**	0.024	0
WVS-009	Upland Shrub	Silver Sage Brush	10%	0	**0**	0.005	0
WVS-010	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-011	Upland Shrub	Silver Sage Brush	5	0	**0**	0.0002	0
WVS-012	Upland Shrub	Silver Sage Brush	6	0	**0**	0.007	0
WVS-013	Upland Shrub	Silver Sage Brush	22	0	**0**	0.006	0
WVS-014	Upland Shrub	Snow Berry	15%	0	**0**	0.013	0
WVS-015	Upland Shrub	Silver Sage Brush	3	0	**0**	0.042	0
		Silver Buffaloberry	1	0	**0**		
		Snow Berry	7%	0	**0**		
WVS-016	Upland Shrub	Silver Sage Brush	1	0	**0**	0.00005	0
WVS-017	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-018	Upland Shrub	Silver Sage Brush	2%	0	**0**	0.005	0
WVS-019	Upland Shrub	Silver Sage Brush	12	0	**0**	0.003	0
WVS-020	Upland Shrub	Silver Sage Brush	36	0	**0**	0.114	0
		Snow Berry	5%	0	**0**		
		Skunkbush Sumac	2%	0	**0**		
WVS-021	Upland Shrub	Silver Sage Brush	5	0	**0**	0.188	0
		Snow Berry	30%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-022	Upland Shrub	Russian Olive	1	0	**0**	0.353	0
		Snow Berry	10%	0	**0**		
		Silver Sage Brush	5%	0	**0**		
		Prairie Rose	2%	0	**0**		
		Fireberry Hawthorn	1%	0	**0**		
WVS-023	Upland Shrub	Silver Buffaloberry	65%	0	**0**	0.049	0
		Snow Berry	5%	0	**0**		
		Saskatoon Serviceberry	4%	0	**0**		
WVS-024	Upland Shrub	Silver Buffaloberry	9%	0	**0**	0.003	0
WVS-025	Upland Shrub	Silver Sage Brush	13	0	**0**	0.012	0
WVS-026	Upland Shrub	Silver Sage Brush	5%	0	**0**	0.025	0
		Snow Berry	1%	0	**0**		
WVS-027	Upland Shrub	Silver Sage Brush	2	0	**0**	0.0002	0
WVS-028	Upland Shrub	Silver Sage Brush	5%	5%	**5%**	0.278	0.181
		Snow Berry	5%	5%	**5%**		
		Silver Buffaloberry	1%	1%	**1%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-029	Upland Shrub	Silver Sage Brush	6	0	**0**	0.021	0
		Snow Berry	10%	0	**0**		
WVS-030	Upland Shrub	Silver Buffaloberry	19	0	**0**	0.033	0
		Silver Sage Brush	4	0	**0**		
		Creeping Juniper	10%	0	**0**		
		Snow Berry	10%	0	**0**		
WVS-031	Upland Shrub	Silver Sage Brush	4	0	**0**	0.001	0
WVS-032	Upland Shrub	Creeping Juniper	90%	90%	**90%**	0.017	0.017
WVS-033	Upland Shrub	Silver Sage Brush	2	0	**0**	0.0002	0
WVS-034	Upland Shrub	Silver Buffaloberry	5	0	**0**	0.003	0
WVS-035	Upland Shrub	Snow Berry	20%	0	**0**	0.069	0
		Creeping Juniper	15%	0	**0**		
WVS-036	Upland Shrub	Silver Buffaloberry	3	0	**0**	0.009	0
		Snow Berry	5%	0	**0**		
WVS-037	Upland Shrub	Creeping Juniper	25%	0	**0**	0.086	0
		Silver Buffaloberry	10%	0	**0**		
		Silver Sage Brush	2%	0	**0**		
		Snow Berry	2%	0	**0**		
		Chokecherry	1%	0	**0**		
WVS-038	Upland Shrub	Silver Sage Brush	10	0	**0**	0.003	0
WVS-039	Upland Shrub	Snow Berry	3%	3%	**3%**	0.045	0.001
WVS-040	Upland Shrub	Silver Sage Brush	2	0	**0**	0.003	0
WVS-041	Upland Shrub	Snow Berry	2	0	**0**	0.0002	0
WVS-042	Upland Shrub	Silver Sage Brush	9	0	**0**	0.003	0
WVS-043	Upland Shrub	Snow Berry	30%	0	**0**	0.060	0
WVS-044	Upland Shrub	Silver Buffaloberry	65%	0	**0**	0.059	0
WVS-045	Upland Shrub	Snow Berry	15%	0	**0**	0.063	0
WVS-046	Upland Shrub	Silver Sage Brush	9	0	**0**	0.009	0
WVS-047	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-048	Upland Shrub	Snow Berry	10%	0	**0**	0.008	0
WVS-049	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-050	Upland Shrub	Silver Sage Brush	6	0	**0**	0.0002	0
WVS-051	Upland Shrub	Silver Sage Brush	40%	0	**0**	0.008	0
		Snow Berry	8%	0	**0**		
WVS-052	Upland Shrub	Snow Berry	10%	10%	**10%**	0.059	0.006
WVS-053	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-054	Upland Shrub	Silver Sage Brush	13%	0	**0**	0.018	0
WVS-055	Upland Shrub	Silver Sage Brush	4	0	**0**	0.0002	0
WVS-056	Upland Shrub	Snow Berry	58	0	**0**	0.0002	0
WVS-057	Upland Shrub	Silver Sage Brush	6	0	**0**	0.001	0
WVS-058	Upland Shrub	Snow Berry	6%	0	**0**	0.059	0
WVS-059	Upland Shrub	Snow Berry	5%	0	**0**	0.092	0
		Prairie Rose	2%	0	**0**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-060	Upland Shrub	Snow Berry	5%	0	**0**	0.031	0
		Prairie Rose	1%	0	**0**		
WVS-061	Upland Shrub	Snow Berry	5%	0	**0**	0.001	0
WVS-062	Upland Shrub	Snow Berry	2	2	**4**	0.0002	0.0002
WVS-063	Upland Shrub	Snow Berry	10%	0	**0**	0.020	0
WVS-064	Upland Shrub	Creeping Juniper	100%	0	**0**	0.066	0
WVS-065	Upland Shrub	Snow Berry	5%	0	**0**	0.055	0
WVS-066	Upland Shrub	Snow Berry	15%	15%	**15%**	0.386	0.025
		Silver Buffaloberry	10%	10%	**10%**		
		Chokecherry	3%	3%	**3%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-067	Upland Shrub	Creeping Juniper	70%	70%	**70%**	0.239	0.007
		Silver Sage Brush	5%	5%	**5%**		
		Snow Berry	5%	5%	**5%**		
WVS-068	Upland Shrub	Silver Buffaloberry	7	0	**0**	0.130	0
		Snow Berry	5%	0	**0**		
		Creeping Juniper	2%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-069	Upland Shrub	Snow Berry	12%	12%	**12%**	0.316	0.157
		Creeping Juniper	1%	1%	**1%**		
		Silver Sage Brush	1%	1%	**1%**		
WVS-070	Upland Shrub	Snow Berry	60%	60%	**60%**	0.643	0.134
		Silver Buffaloberry	5%	5%	**5%**		
		Creeping Juniper	2%	2%	**2%**		
		Silver Sage Brush	2%	2%	**2%**		
		Prickly Rose	1%	1%	**1%**		
WVS-071	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-072	Upland Shrub	Creeping Juniper	80%	0	**0**	0.027	0
WVS-073	Upland Shrub	Silver Buffaloberry	6	2	**4**	1.318	0.355
		Snow Berry	25%	25%	**25%**		
		Creeping Juniper	2%	2%	**2%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-074	Upland Shrub	Snow Berry	50%	50%	**50%**	0.898	0.131
		Silver Buffaloberry	17%	17%	**17%**		
		Creeping Juniper	10%	10%	**10%**		
		Silver Sage Brush	7%	7%	**7%**		
WVS-075	Upland Shrub	Creeping Juniper	90%	0	**0**	0.010	0
WVS-076	Upland Shrub	Snow Berry	3%	0	**0**	0.002	0
WVS-077	Upland Shrub	Creeping Juniper	90%	0	**0**	0.030	0
WVS-078	Upland Shrub	Silver Sage Brush	5	0	**0**	0.0001	0
WVS-079	Upland Shrub	Silver Sage Brush	3	0	**0**	0.163	0.001
		Snow Berry	30%	30%	**30%**		
		Creeping Juniper	1%	1%	**1%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-080	Upland Shrub	Snow Berry	40%	40%	**40%**	0.060	0.017
WVS-081	Upland Shrub	Silver Sage Brush	10%	0	**0**	0.004	0
WVS-082	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0002	0
WVS-083	Upland Shrub	Silver Sage Brush	18	0	**0**	0.005	0
WVS-084	Upland Shrub	Silver Sage Brush	8	0	**0**	0.003	0
WVS-085	Upland Shrub	Silver Sage Brush	15	0	**0**	0.005	0
WVS-086	Upland Shrub	Silver Sage Brush	1	1	**2**	0.0002	0.0002
WVS-087	Upland Shrub	Silver Sage Brush	2	0	**0**	0.0002	0
WVS-088	Upland Shrub	Creeping Juniper	20%	20%	**20%**	0.226	0.077
		Snow Berry	10%	10%	**10%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-089	Upland Shrub	Snow Berry	60%	60%	**60%**	0.536	0.129
		Silver Buffaloberry	2%	2%	**2%**		
		Silver Sage Brush	2%	2%	**2%**		
		Skunkbush Sumac	1%	1%	**1%**		
WVS-090	Upland Shrub	Silver Sage Brush	35	0	**0**	0.024	0
		Snow Berry	1%	0	**0**		
WVS-091	Upland Shrub	Snow Berry	50%	0	**0**	0.441	0
		Silver Sage Brush	5%	0	**0**		
		Silver Buffaloberry	2%	0	**0**		
WVS-092	Upland Shrub	Silver Sage Brush	15	2	**4**	0.436	0.051
		Snow Berry	85%	85%	**85%**		
		Prairie Rose	1%	1%	**1%**		
WVS-093	Upland Shrub	Snow Berry	25%	0	**0**	0.038	0
WVS-094	Upland Shrub	Snow Berry	30%	0	**0**	0.081	0
		Silver Sage Brush	5%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-095	Upland Shrub	Creeping Juniper	40%	0	**0**	0.071	0
		Snow Berry	2%	0	**0**		
WVS-096	Upland Shrub	Creeping Juniper	20%	20%	**20%**	0.167	0.050
		Snow Berry	15%	15%	**15%**		
		Prairie Rose	5%	5%	**5%**		
WVS-097	Upland Shrub	Snow Berry	35%	35%	**35%**	0.059	0.025
WVS-098	Upland Shrub	Silver Buffaloberry	45%	0	**0**	0.152	0
		Snow Berry	15%	0	**0**		
		Creeping Juniper	8%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-099	Upland Shrub	Creeping Juniper	45%	0	**0**	0.030	0
		Snow Berry	25%	0	**0**		
WVS-100	Upland Shrub	Prairie Rose	3	0	**0**	0.060	0
		Snow Berry	55%	0	**0**		
WVS-101	Upland Shrub	Snow Berry	15%	0	**0**	0.042	0
		Creeping Juniper	5%	0	**0**		

°° *Lateral 1*

^ *Lateral 2*

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Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-102	Upland Shrub	Snow Berry	55%	55%	**55%**	0.147	0.014
WVS-103	Upland Shrub	Creeping Juniper	50%	0	**0**	0.013	0
WVS-104	Upland Shrub	Snow Berry	60%	0	**0**	0.040	0
WVS-105	Upland Shrub	Snow Berry	50%	0	**0**	0.009	0
WVS-106	Upland Shrub	Creeping Juniper	70%	70%	**70%**	0.011	0.006
WVS-107	Upland Shrub	Creeping Juniper	60%	0	**0**	0.018	0
WVS-108	Upland Shrub	Creeping Juniper	45%	0	**0**	0.095	0
WVS-109	Upland Shrub	Creeping Juniper	80%	0	**0**	0.026	0
		Snow Berry	5%	0	**0**		
WVS-110	Upland Shrub	Snow Berry	50%	0	**0**	0.001	0
WVS-111	Upland Shrub	Creeping Juniper	50%	0	**0**	0.026	0
WVS-112	Upland Shrub	Creeping Juniper	90%	0	**0**	0.013	0
WVS-113	Upland Shrub	Creeping Juniper	50%	0	**0**	0.041	0
		Snow Berry	25%	0	**0**		
		Prairie Rose	7%	0	**0**		
WVS-114	Upland Shrub	Creeping Juniper	60%	0	**0**	0.037	0
		Prairie Rose	10%	0	**0**		
		Snow Berry	10%	0	**0**		
WVS-115	Upland Shrub	Creeping Juniper	100%	0	**0**	0.004	0
WVS-116	Upland Shrub	Silver Buffaloberry	30%	0	**0**	0.027	0
WVS-117	Upland Shrub	Creeping Juniper	35%	0	**0**	0.006	0
WVS-118	Upland Shrub	Creeping Juniper	20%	0	**0**	0.085	0
		Silver Buffaloberry	10%	0	**0**		
		Prairie Rose	5%	0	**0**		
WVS-119	Upland Shrub	Creeping Juniper	50%	0	**0**	0.156	0
WVS-120	Upland Shrub	Snow Berry	1%	0	**0**	0.008	0
WVS-121	Upland Shrub	Creeping Juniper	65%	0	**0**	0.098	0
		Prairie Rose	2%	0	**0**		
WVS-122	Upland Shrub	Creeping Juniper	50%	0	**0**	0.851	0
		Snow Berry	25%	0	**0**		
		Prairie Rose	5%	0	**0**		
WVS-123	Upland Shrub	Creeping Juniper	90%	0	**0**	0.037	0
		Prairie Rose	1%	0	**0**		
WVS-124	Upland Shrub	Creeping Juniper	45%	45%	**45%**	0.314	0.011
		Silver Buffaloberry	5%	5%	**5%**		
		Prairie Rose	1%	1%	**1%**		
		Snow Berry	1%	1%	**1%**		
WVS-125	Upland Shrub	Snow Berry	25%	0	**0**	0.070	0
WVS-126	Upland Shrub	Silver Sage Brush	2	2	**4**	0.011	0.011
		Snow Berry	40%	40%	**40%**		
WVS-127	Upland Shrub	Creeping Juniper	50%	50%	**50%**	0.051	0.051
		Skunkbush Sumac	10%	10%	**10%**		
		Snow Berry	3%	3%	**3%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-128	Upland Shrub	Snow Berry	30%	0	**0**	0.191	0
WVS-129	Upland Shrub	Snow Berry	15%	0	**0**	0.053	0
WVS-130	Upland Shrub	Silver Sage Brush	6	0	**0**	0.002	0
WVS-131	Upland Shrub	Silver Buffaloberry	50%	50%	**50%**	0.215	0.125
		Snow Berry	50%	50%	**50%**		
		Silver Sage Brush	7%	7%	**7%**		
WVS-132	Upland Shrub	Skunkbush Sumac	5	0	**0**	0.005	0
WVS-133	Upland Shrub	Snow Berry	10%	0	**0**	0.051	0
		Silver Sage Brush	3%	0	**0**		
WVS-134	Upland Shrub	Creeping Juniper	20%	20%	**20%**	0.992	0.081
		Snow Berry	15%	15%	**15%**		
		Silver Sage Brush	5%	5%	**5%**		
		Skunkbush Sumac	5%	5%	**5%**		
		Prairie Rose	2%	2%	**2%**		
WVS-135	Upland Shrub	Snow Berry	15%	0	**0**	0.254	0
		Creeping Juniper	10%	0	**0**		
		Silver Sage Brush	5%	0	**0**		
WVS-136	Upland Shrub	Silver Buffaloberry	35%	35%	**35%**	0.351	0.038
		Snow Berry	30%	30%	**30%**		
		Silver Sage Brush	7%	7%	**7%**		
WVS-137	Upland Shrub	Creeping Juniper	50%	0	**0**	0.055	0
WVS-138	Upland Shrub	Snow Berry	45%	45%	**45%**	0.342	0.144
		Creeping Juniper	10%	10%	**10%**		
		Prairie Rose	5%	5%	**5%**		
WVS-139	Upland Shrub	Snow Berry	25%	0	**0**	0.117	0
		Silver Sage Brush	5%	0	**0**		
WVS-140	Upland Shrub	Snow Berry	10%	10%	**10%**	0.036	0.012
		Silver Sage Brush	5%	5%	**5%**		
WVS-141	Upland Shrub	Snow Berry	10%	0	**0**	0.030	0
		Silver Sage Brush	3%	0	**0**		
WVS-142	Upland Shrub	Snow Berry	25%	25%	**25%**	0.680	0.149
		Silver Buffaloberry	10%	10%	**10%**		
		Creeping Juniper	4%	4%	**4%**		
		Silver Sage Brush	3%	3%	**3%**		
		Prairie Rose	1%	1%	**1%**		
WVS-143	Upland Shrub	Snow Berry	45%	0	**0**	0.019	0
		Silver Sage Brush	7%	0	**0**		
WVS-144	Upland Shrub	Snow Berry	40%	0	**0**	0.022	0
		Silver Sage Brush	5%	0	**0**		
WVS-145	Upland Shrub	Snow Berry	15%	15%	**15%**	0.342	0.115
		Silver Buffaloberry	10%	10%	**10%**		
		Creeping Juniper	2%	2%	**2%**		
		Prairie Rose	1%	1%	**1%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-146	Upland Shrub	Silver Sage Brush	2	0	**0**	0.020	0
		Snow Berry	50%	0	**0**		
WVS-147	Upland Shrub	Creeping Juniper	30%	30%	**30%**	1.544	0.369
		Silver Buffaloberry	15%	15%	**15%**		
		Snow Berry	15%	15%	**15%**		
		Chokecherry	10%	10%	**10%**		
		Prairie Rose	2%	2%	**2%**		
WVS-148	Upland Shrub	Snow Berry	20%	20%	**20%**	0.003	0.003
WVS-149	Upland Shrub	Snow Berry	50%	0	**0**	0.021	0
WVS-150	Upland Shrub	Snow Berry	30%	30%	**30%**	0.040	0.009
WVS-151	Upland Shrub	Creeping Juniper	15	0	**0**	0.090	0
		Silver Buffaloberry	50%	0	**0**		
		Snow Berry	5%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-152	Upland Shrub	Creeping Juniper	50%	0	**0**	0.027	0
WVS-153	Upland Shrub	Chokecherry	23	0	**0**	0.028	0
		Snow Berry	30%	0	**0**		
WVS-154	Upland Shrub	Snow Berry	35%	0	**0**	0.056	0
		Creeping Juniper	15%	0	**0**		
WVS-155	Upland Shrub	Creeping Juniper	25%	0	**0**	0.089	0
		Snow Berry	20%	0	**0**		
WVS-156	Upland Shrub	Snow Berry	35%	0	**0**	0.152	0
		Creeping Juniper	30%	0	**0**		
WVS-157	Upland Shrub	Creeping Juniper	50%	0	**0**	0.010	0
		Snow Berry	30%	0	**0**		
WVS-158	Upland Shrub	Silver Sage Brush	8	0	**0**	0.251	0
		Creeping Juniper	45%	0	**0**		
		Snow Berry	2%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-159	Upland Shrub	Creeping Juniper	80%	0	**0**	0.024	0
WVS-160	Upland Shrub	Silver Buffaloberry	65%	65%	**65%**	0.322	0.107
		Creeping Juniper	15%	15%	**15%**		
		Snow Berry	5%	5%	**5%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-161	Upland Shrub	Creeping Juniper	60%	0	**0**	0.252	0
		Snow Berry	5%	0	**0**		
		Silver Buffaloberry	2%	0	**0**		
WVS-162	Upland Shrub	Snow Berry	40%	0	**0**	0.016	0
WVS-163	Upland Shrub	Creeping Juniper	20%	0	**0**	0.016	0
WVS-164	Upland Shrub	Snow Berry	20%	0	**0**	0.035	0
		Common Juniper	15%	0	**0**		
		Silver Sage Brush	5%	0	**0**		
WVS-165	Upland Shrub	Silver Buffaloberry	3	1	**2**	0.185	0.038

°° *Lateral 1*

^ *Lateral 2*

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Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Creeping Juniper	45%	45%	**45%**		
		Snow Berry	35%	35%	**35%**		
WVS-166	Upland Shrub	Snow Berry	40%	0	**0**	0.009	0
WVS-167	Upland Shrub	Snow Berry	3%	0	**0**	0.014	0
WVS-168	Upland Shrub	Snow Berry	20%	0	**0**	0.011	0
WVS-169	Upland Shrub	Snow Berry	10%	0	**0**	0.061	0
		Silver Sage Brush	2%	0	**0**		
WVS-170	Upland Shrub	Snow Berry	15%	0	**0**	0.117	0
		Prairie Rose	10%	0	**0**		
		Silver Sage Brush	2%	0	**0**		
WVS-171	Riparian Shrub	Snow Berry	4%	4%	**4%**	0.056	0.011
		Creeping Juniper	2%	2%	**2%**		
		Prairie Rose	1%	1%	**1%**		
WVS-172	Upland Shrub	Snow Berry	60%	0	**0**	0.015	0
WVS-173	Upland Shrub	Silver Buffaloberry	2	1	**2**	0.055	0.032
		Snow Berry	45%	45%	**45%**		
WVS-174	Riparian Shrub	Silver Buffaloberry	3	0	**0**	0.005	0
		Common Juniper	1	0	**0**		
		Prickly Rose	1	0	**0**		
		Snow Berry	1%	0	**0**		
WVS-175	Riparian Shrub	Snow Berry	35%	0	**0**	0.004	0
WVS-176	Upland Shrub	Snow Berry	10%	0	**0**	0.005	0
WVS-177	Upland Shrub	Snow Berry	3%	0	**0**	0.012	0
WVS-178	Upland Shrub	Silver Buffaloberry	8	0	**0**	0.063	0
		Creeping Juniper	40%	0	**0**		
WVS-179	Upland Shrub	Creeping Juniper	70%	0	**0**	0.011	0
WVS-180	Upland Shrub	Silver Buffaloberry	20%	20%	**20%**	1.319	0.391
		Creeping Juniper	15%	15%	**15%**		
		Snow Berry	3%	3%	**3%**		
		Prairie Rose	1%	1%	**1%**		
WVS-181	Upland Shrub	Creeping Juniper	75%	0	**0**	0.004	0
WVS-182	Upland Shrub	Creeping Juniper	95%	95%	**95%**	0.017	0.017
WVS-183	Upland Shrub	Silver Buffaloberry	14	1	**2**	0.504	0.026
		Snow Berry	45%	45%	**45%**		
		Prairie Rose	10%	10%	**10%**		
		Creeping Juniper	5%	5%	**5%**		
WVS-184	Upland Shrub	Snow Berry	20%	0	**0**	0.049	0
		Prairie Rose	2%	0	**0**		
WVS-185	Upland Shrub	Snow Berry	20%	0	**0**	0.031	0
WVS-186	Upland Shrub	Snow Berry	30%	0	**0**	0.024	0
WVS-187	Upland Shrub	Snow Berry	6%	6%	**6%**	0.272	0.068
WVS-188	Upland Shrub	Snow Berry	45%	45%	**45%**	0.216	0.061
WVS-189	Upland Shrub	Snow Berry	35%	0	**0**	0.012	0

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-190	Upland Shrub	Snow Berry	25%	0	**0**	0.008	0
WVS-191	Upland Shrub	Silver Sage Brush	8	2	**4**	1.500	0.393
		Snow Berry	30%	30%	**30%**		
		Creeping Juniper	1%	1%	**1%**		
		Silver Sage Brush	1%	1%	**1%**		
		Skunkbush Sumac	1%	1%	**1%**		
WVS-192	Upland Shrub	Creeping Juniper	50%	0	**0**	0.298	0
		Snow Berry	5%	0	**0**		
		Silver Sage Brush	2%	0	**0**		
WVS-193	Upland Shrub	Snow Berry	10%	0	**0**	0.050	0
WVS-194	Upland Shrub	Snow Berry	35%	0	**0**	0.013	0
		Silver Sage Brush	10%	0	**0**		
WVS-195	Upland Shrub	Silver Sage Brush	1	0	**0**	0.012	0
		Snow Berry	40%	0	**0**		
WVS-196	Upland Shrub	Snow Berry	20%	0	**0**	0.023	0
		Silver Sage Brush	15%	0	**0**		
WVS-197	Upland Shrub	Silver Sage Brush	15	5	**10**	0.145	0.044
		Snow Berry	22%	22%	**22%**		
WVS-198	Upland Shrub	Snow Berry	30%	30%	**30%**	0.836	0.112
		Silver Buffaloberry	10%	10%	**10%**		
		Chokecherry	2%	2%	**2%**		
		Prairie Rose	2%	2%	**2%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-199	Upland Shrub	Silver Sage Brush	10%	0	**0**	0.034	0
		Snow Berry	10%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-200	Upland Shrub	Silver Sage Brush	15%	0	**0**	0.032	0
		Snow Berry	2%	0	**0**		
WVS-201	Upland Shrub	Silver Sage Brush	12	3	**6**	0.129	0.034
		Snow Berry	55%	55%	**55%**		
WVS-202	Upland Shrub	Silver Sage Brush	3	0	**0**	0.030	0
		Snow Berry	50%	0	**0**		
WVS-203	Upland Shrub	Snow Berry	15%	0	**0**	0.054	0
		Creeping Juniper	10%	0	**0**		
		Silver Sage Brush	10%	0	**0**		
WVS-204	Upland Shrub	Creeping Juniper	85%	0	**0**	0.019	0
		Snow Berry	10%	0	**0**		
WVS-205	Riparian Shrub	Skunkbush Sumac	1	0	**0**	0.253	0.069
		Snow Berry	50%	50%	**50%**		
		Silver Sage Brush	1%	1%	**1%**		
WVS-206	Upland Shrub	Snow Berry	25%	25%	**25%**	0.147	0.071
WVS-207	Upland Shrub	Silver Sage Brush	7	2	**4**	0.016	0.005
		Snow Berry	60%	60%	**60%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-208	Upland Shrub	Snow Berry	70%	0	**0**	0.083	0
		Silver Sage Brush	15%	0	**0**		
WVS-209	Upland Shrub	Snow Berry	50%	50%	**50%**	0.060	0.034
WVS-210	Upland Shrub	Snow Berry	45%	45%	**45%**	0.010	0.003
WVS-211	Upland Shrub	Snow Berry	50%	0	**0**	0.008	0
WVS-212	Upland Shrub	Snow Berry	60%	0	**0**	0.003	0
WVS-213	Upland Shrub	Prairie Rose	4	3	**6**	0.003	0.002
		Snow Berry	60%	60%	**60%**		
WVS-214	Upland Shrub	Snow Berry	30%	0	**0**	0.002	0
WVS-215	Upland Shrub	Creeping Juniper	10%	10%	**10%**	0.143	0.021
		Silver Buffaloberry	6%	6%	**6%**		
		Snow Berry	1%	1%	**1%**		
WVS-216	Upland Shrub	Silver Buffaloberry	5	0	**0**	0.249	0.015
		Snow Berry	45%	45%	**45%**		
		Prairie Rose	3%	3%	**3%**		
WVS-217	Upland Shrub	Snow Berry	25%	0	**0**	0.030	0
		Prairie Rose	2%	0	**0**		
WVS-218	Upland Shrub	Snow Berry	10%	10%	**10%**	0.012	0.001
WVS-219	Upland Shrub	Snow Berry	20%	0	**0**	0.010	0
WVS-220	Upland Shrub	Creeping Juniper	50%	50%	**50%**	0.018	0.0003
		Snow Berry	5%	5%	**5%**		
WVS-221	Upland Shrub	Creeping Juniper	60%	0	**0**	0.022	0
WVS-222	Upland Shrub	Sandbar Willow	2	0	**0**	0.006	0
		Snow Berry	4%	0	**0**		
WVS-223	Upland Shrub	Snow Berry	30%	0	**0**	0.034	0
WVS-224	Upland Shrub	Common Juniper	1	0	**0**	0.950	0.123
		Creeping Juniper	70%	70%	**70%**		
		Prairie Rose	30%	30%	**30%**		
		Skunkbush Sumac	5%	5%	**5%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-225	Upland Shrub	Snow Berry	40%	0	**0**	0.010	0
WVS-226	Upland Shrub	Snow Berry	40%	40%	**40%**	0.002	0.001
WVS-227	Upland Shrub	Snow Berry	15%	15%	**15%**	0.004	0.002
		Prairie Rose	2%	2%	**2%**		
WVS-228	Upland Shrub	Snow Berry	30%	0	**0**	0.011	0
WVS-229	Upland Shrub	Common Juniper	1	0	**0**	0.129	0
		Creeping Juniper	45%	0	**0**		
		Snow Berry	15%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-230	Upland Shrub	Snow Berry	45%	45%	**45%**	0.023	0.023
WVS-231	Upland Shrub	Snow Berry	35%	35%	**35%**	0.129	0.043
		Prairie Rose	25%	25%	**25%**		
WVS-232	Upland Shrub	Snow Berry	40%	40%	**40%**	0.163	0.0002

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-233	Upland Shrub	Snow Berry	25%	0	**0**	0.025	0
WVS-234	Upland Shrub	Snow Berry	3%	3%	**3%**	0.092	0.003
WVS-235	Upland Shrub	Snow Berry	20%	20%	**20%**	0.383	0.028
		Prairie Rose	2%	2%	**2%**		
WVS-236	Upland Shrub	Silver Buffaloberry	18	5	**10**	0.922	0.275
		Snow Berry	30%	30%	**30%**		
		Creeping Juniper	6%	6%	**6%**		
		Prairie Rose	1%	1%	**1%**		
WVS-237	Upland Shrub	Snow Berry	20%	20%	**20%**	0.041	0.007
		Prairie Rose	5%	5%	**5%**		
WVS-238	Upland Shrub	Creeping Juniper	90%	90%	**90%**	0.028	0.018
WVS-239	Upland Shrub	Creeping Juniper	50%	50%	**50%**	0.088	0.004
		Snow Berry	23%	23%	**23%**		
		Prairie Rose	2%	2%	**2%**		
WVS-240	Upland Shrub	Snow Berry	20%	20%	**20%**	0.013	0.003
WVS-241	Upland Shrub	Snow Berry	30%	0	**0**	0.267	0
		Prairie Rose	5%	0	**0**		
WVS-242	Upland Shrub	Snow Berry	6%	6%	**6%**	0.627	0.076
		Prairie Rose	1%	1%	**1%**		
WVS-243	Upland Shrub	Snow Berry	20%	0	**0**	0.034	0
		Prairie Rose	3%	0	**0**		
WVS-244	Upland Shrub	Silver Berry	10%	10%	**10%**	0.170	0.050
		Snow Berry	6%	6%	**6%**		
		Prairie Rose	1%	1%	**1%**		
WVS-245	Upland Shrub	Silver Sage Brush	2	0	**0**	0.001	0
WVS-246	Upland Shrub	Snow Berry	23%	0	**0**	0.024	0
WVS-247	Upland Shrub	Snow Berry	20%	20%	**20%**	0.416	0.037
		Prairie Rose	3%	3%	**3%**		
WVS-248	Upland Shrub	Snow Berry	18	0	**0**	0.001	0
WVS-249	Upland Shrub	Snow Berry	10%	0	**0**	0.005	0
		Prairie Rose	1%	0	**0**		
WVS-250	Upland Shrub	Snow Berry	20%	0	**0**	0.040	0
		Silver Buffaloberry	5%	0	**0**		
		Prairie Rose	2%	0	**0**		
WVS-251	Upland Shrub	Snow Berry	30%	0	**0**	0.001	0
WVS-252	Upland Shrub	Snow Berry	50%	0	**0**	0.005	0
WVS-253	Upland Shrub	Snow Berry	60%	0	**0**	0.004	0
WVS-254	Upland Shrub	Snow Berry	12	0	**0**	0.001	0
WVS-255	Upland Shrub	Snow Berry	30%	0	**0**	0.003	0
WVS-256	Upland Shrub	Snow Berry	50%	0	**0**	0.012	0
		Prairie Rose	5%	0	**0**		
WVS-257	Upland Shrub	Snow Berry	40%	0	**0**	0.020	0
		Prairie Rose	2%	0	**0**		

°° *Lateral 1*
^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-258	Upland Shrub	Snow Berry	30%	0	**0**	0.012	0
WVS-259	Upland Shrub	Snow Berry	35%	35%	**35%**	0.003	0.003
		Prairie Rose	3%	3%	**3%**		
WVS-260	Upland Shrub	Snow Berry	15%	15%	**15%**	0.013	0.005
WVS-261	Upland Shrub	Snow Berry	50%	50%	**50%**	0.173	0.002
WVS-262	Upland Shrub	Snow Berry	30%	30%	**30%**	0.011	0.004
WVS-263	Upland Shrub	Snow Berry	20%	20%	**20%**	0.013	0.013
WVS-264	Upland Shrub	Silver Sage Brush	5%	0	**0**	0.038	0
		Snow Berry	5%	0	**0**		
WVS-265	Upland Shrub	Snow Berry	35%	35%	**35%**	0.332	0.064
		White Sagebrush	20%	20%	**20%**		
		Prairie Rose	7%	7%	**7%**		
WVS-266	Upland Shrub	Snow Berry	50%	50%	**50%**	0.007	0.006
WVS-267	Upland Shrub	Snow Berry	15%	15%	**15%**	0.042	0.005
		White Sagebrush	15%	15%	**15%**		
		Prairie Rose	12%	12%	**12%**		
		Silver Sage Brush	10%	10%	**10%**		
WVS-268	Upland Shrub	Chokecherry	2	1	**2**	0.051	0.035
		Snow Berry	15%	15%	**15%**		
		Prairie Rose	5%	5%	**5%**		
		White Sagebrush	5%	5%	**5%**		
WVS-269	Upland Shrub	Silver Buffaloberry	1	0	**0**	0.001	0
WVS-270	Upland Shrub	Snow Berry	20%	0	**0**	1.366	0
		Chokecherry	10%	0	**0**		
		Silver Buffaloberry	6%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-271	Upland Shrub	Common Juniper	1	0	**0**	1.386	0.165
		Creeping Juniper	25%	25%	**25%**		
		Chokecherry	7%	7%	**7%**		
		Prairie Rose	5%	5%	**5%**		
		American Plum	3%	3%	**3%**		
WVS-272	Upland Shrub	Snow Berry	15%	0	**0**	0.004	0
WVS-273	Upland Shrub	Snow Berry	10%	0	**0**	0.004	0
WVS-274	Upland Shrub	Silver Sage Brush	7	2	**4**	0.136	0.031
		Chokecherry	2	0	**0**		
		Snow Berry	35%	35%	**35%**		
		Creeping Juniper	6%	6%	**6%**		
		Prairie Rose	1%	1%	**1%**		
WVS-275	Upland Shrub	Silver Buffaloberry	7	2	**4**	0.169	0.050
		Chokecherry	3	1	**2**		
		Snow Berry	35%	35%	**35%**		
		Silver Sage Brush	5%	5%	**5%**		
		Prairie Rose	2%	2%	**2%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
WVS-276	Upland Shrub	Snow Berry	15%	15%	**15%**	0.021	0.011
		Prairie Rose	1%	1%	**1%**		
WVS-277	Upland Shrub	American Plum	2	0	**0**	1.228	0.227
		Common Juniper	1	0	**0**		
		Chokecherry	15%	15%	**15%**		
		Prairie Rose	2%	2%	**2%**		
		Silver Berry	2%	2%	**2%**		
WVS-278	Upland Shrub	American Plum	1	0	**0**	0.215	0
		Snow Berry	25%	0	**0**		
		Prairie Rose	2%	0	**0**		
		White Sagebrush	2%	0	**0**		
WVS-279	Upland Shrub	Silver Sage Brush	11	0	**0**	0.001	0
WVS-280	Upland Shrub	Snow Berry	20%	0	**0**	0.015	0
WVS-281	Upland Shrub	Chokecherry	30%	30%	**30%**	1.043	0.223
		Silver Sage Brush	30%	30%	**30%**		
		Saskatoon Serviceberry	25%	25%	**25%**		
		Snow Berry	10%	10%	**10%**		
		Common Juniper	1%	1%	**1%**		
WVS-282	Upland Shrub	Snow Berry	15%	15%	**15%**	0.262	0.058
		Chokecherry	10%	10%	**10%**		
		Creeping Juniper	5%	5%	**5%**		
		Saskatoon Serviceberry	5%	5%	**5%**		
		Skunkbush Sumac	5%	5%	**5%**		
WVS-283	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-284	Upland Shrub	Snow Berry	15%	0	**0**	0.008	0
WVS-285	Upland Shrub	Snow Berry	45%	45%	**45%**	0.091	0.018
WVS-286	Upland Shrub	American Plum	6	2	**4**	0.826	0.270
		Snow Berry	18%	18%	**18%**		
		Prairie Rose	2%	2%	**2%**		
WVS-287	Upland Shrub	Snow Berry	10%	0	**0**	0.002	0
WVS-288	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-289	Upland Shrub	Snow Berry	15%	0	**0**	0.005	0
WVS-290	Upland Shrub	Snow Berry	30%	0	**0**	0.012	0
WVS-291	Upland Shrub	Snow Berry	15%	15%	**15%**	0.114	0.042
WVS-292	Upland Shrub	Snow Berry	25%	25%	**25%**	0.110	0.014
		Prairie Rose	3%	3%	**3%**		
WVS-293	Upland Shrub	Snow Berry	15%	15%	**15%**	0.031	0.018
WVS-294	Upland Shrub	Snow Berry	18%	18%	**18%**	0.277	0.071
		Chokecherry	10%	10%	**10%**		
		Prairie Rose	2%	2%	**2%**		
		Silver Buffaloberry	1%	1%	**1%**		
WVS-295	Upland Shrub	Chokecherry	10	0	**0**	0.120	0
		Silver Sage Brush	5	0	**0**		

°° *Lateral 1*
^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Snow Berry	1%	0	**0**		
WVS-296	Upland Shrub	Chokecherry	20%	20%	**20%**	0.128	0.013
		Silver Buffaloberry	10%	10%	**10%**		
		Snow Berry	10%	10%	**10%**		
		Prairie Rose	2%	2%	**2%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-297	Upland Shrub	Silver Buffaloberry	5	0	**0**	0.055	0
		Snow Berry	20%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-298	Upland Shrub	Chokecherry	4	0	**0**	0.025	0
		Snow Berry	25%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-299	Upland Shrub	Snow Berry	15%	15%	**15%**	0.415	0.065
		Silver Buffaloberry	10%	10%	**10%**		
		Prairie Rose	2%	2%	**2%**		
WVS-300	Upland Shrub	Snow Berry	15%	15%	**15%**	0.200	0.002
		White Sagebrush	7%	7%	**7%**		
WVS-301	Upland Shrub	Snow Berry	10%	0	**0**	0.013	0
WVS-302	Upland Shrub	Snow Berry	15%	15%	**15%**	1.495	0.183
		Fireberry Hawthorn	10%	10%	**10%**		
		Chokecherry	5%	5%	**5%**		
		Saskatoon Serviceberry	5%	5%	**5%**		
		American Plum	3%	3%	**3%**		
WVS-303	Upland Shrub	Snow Berry	30%	0	**0**	0.263	0
		Fireberry Hawthorn	10%	0	**0**		
		Chokecherry	8%	0	**0**		
		Red-Osier Dogwood	5%	0	**0**		
		Sandbar Willow	4%	0	**0**		
WVS-304	Upland Shrub	Snow Berry	7%	0	**0**	0.186	0
		Chokecherry	5%	0	**0**		
		Prairie Rose	5%	0	**0**		
		Black Currant	3%	0	**0**		
		Red-Osier Dogwood	3%	0	**0**		
WVS-305	Upland Shrub	Fireberry Hawthorn	15%	0	**0**	0.570	0
		Silver Buffaloberry	10%	0	**0**		
		Snow Berry	10%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-306	Upland Shrub	Snow Berry	20%	0	**0**	0.002	0
WVS-307	Upland Shrub	Snow Berry	10%	0	**0**	0.004	0
WVS-308	Upland Shrub	Snow Berry	25%	0	**0**	0.091	0
WVS-309	Upland Shrub	Snow Berry	6%	0	**0**	0.009	0
WVS-310	Upland Shrub	Snow Berry	15%	0	**0**	0.015	0
WVS-311	Upland Shrub	Chokecherry	3	0	**0**	0.143	0

°° *Lateral 1*
^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Snow Berry	40%	0	**0**		
WVS-312	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-313	Upland Shrub	Snow Berry	25%	0	**0**	0.044	0
WVS-314	Upland Shrub	Silver Buffaloberry	4	0	**0**	0.206	0.011
		Snow Berry	20%	20%	**20%**		
WVS-315	Upland Shrub	Chokecherry	2	0	**0**	0.171	0
		Snow Berry	15%	0	**0**		
		Prairie Rose	5%	0	**0**		
WVS-316	Upland Shrub	Snow Berry	17%	0	**0**	0.120	0
WVS-317	Upland Shrub	Silver Buffaloberry	30%	30%	**30%**	0.391	0.066
		Snow Berry	25%	25%	**25%**		
		Prairie Rose	2%	2%	**2%**		
WVS-318	Upland Shrub	Snow Berry	10%	0	**0**	0.016	0
WVS-319	Upland Shrub	American Plum	1	0	**0**	0.003	0
		Snow Berry	5%	0	**0**		
WVS-320	Upland Shrub	Silver Sage Brush	1	0	**0**	0.118	0
		Snow Berry	15%	0	**0**		
WVS-321	Upland Shrub	Chokecherry	9	4	**8**	0.014	0.007
WVS-322	Upland Shrub	Silver Buffaloberry	1	1	**2**	0.001	0.001
WVS-323	Upland Shrub	Silver Buffaloberry	50%	50%	**50%**	0.087	0.054
		Chokecherry	20%	20%	**20%**		
WVS-324	Upland Shrub	Silver Buffaloberry	10	0	**0**	0.002	0
WVS-325	Upland Shrub	Fireberry Hawthorn	35%	35%	**35%**	5.964	1.338
		Chokecherry	25%	25%	**25%**		
		Silver Buffaloberry	15%	15%	**15%**		
		American Plum	1%	1%	**1%**		
		White Sagebrush	1%	1%	**1%**		
WVS-326	Upland Shrub	Chokecherry	35%	35%	**35%**	0.304	0.013
		Silver Buffaloberry	25%	25%	**25%**		
		Snow Berry	15%	15%	**15%**		
		Fireberry Hawthorn	5%	5%	**5%**		
WVS-327	Upland Shrub	Snow Berry	35%	0	**0**	0.084	0
		Chokecherry	15%	0	**0**		
WVS-328	Upland Shrub	Snow Berry	25%	25%	**25%**	0.217	0.131
		Chokecherry	10%	10%	**10%**		
		Silver Buffaloberry	5%	5%	**5%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-329	Upland Shrub	Chokecherry	10%	10%	**10%**	0.023	0.002
		Snow Berry	10%	10%	**10%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-330	Upland Shrub	Snow Berry	30%	30%	**30%**	0.795	0.087
		Chokecherry	5%	5%	**5%**		
		Prairie Rose	2%	2%	**2%**		

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Silver Sage Brush	2%	2%	**2%**		
WVS-331	Upland Shrub	Chokecherry	40%	40%	**40%**	1.766	0.482
		Snow Berry	20%	20%	**20%**		
		Fireberry Hawthorn	15%	15%	**15%**		
		Saskatoon Serviceberry	3%	3%	**3%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-332	Upland Shrub	Chokecherry	15%	0	**0**	0.016	0
WVS-333	Upland Shrub	Silver Sage Brush	10%	10%	**10%**	0.479	0.104
		Chokecherry	5%	5%	**5%**		
		Fireberry Hawthorn	5%	5%	**5%**		
		Snow Berry	5%	5%	**5%**		
		Prairie Rose	2%	2%	**2%**		
WVS-334	Upland Shrub	Snow Berry	55%	0	**0**	0.005	0
WVS-335	Riparian Shrub	Chokecherry	30%	0	**0**	0.078	0
		Snow Berry	20%	0	**0**		
		Silver Berry	10%	0	**0**		
		Black Currant	2%	0	**0**		
		Silver Sage Brush	2%	0	**0**		
WVS-336	Upland Shrub	Snow Berry	40%	0	**0**	0.011	0
		Chokecherry	15%	0	**0**		
WVS-337	Upland Shrub	Snow Berry	23%	0	**0**	0.203	0
		Silver Sage Brush	10%	0	**0**		
		Chokecherry	5%	0	**0**		
WVS-338	Upland Shrub	Chokecherry	60%	60%	**60%**	0.354	0.121
		Snow Berry	25%	25%	**25%**		
		Silver Buffaloberry	5%	5%	**5%**		
WVS-339	Riparian Shrub	Fireberry Hawthorn	20%	20%	**20%**	0.197	0.022
		Saskatoon Serviceberry	15%	15%	**15%**		
		Snow Berry	10%	10%	**10%**		
		Chokecherry	5%	5%	**5%**		
		Prickly Rose	5%	5%	**5%**		
WVS-340	Riparian Shrub	Chokecherry	20%	20%	**20%**	0.034	0.009
		Fireberry Hawthorn	15%	15%	**15%**		
		Snow Berry	10%	10%	**10%**		
		Prickly Rose	2%	2%	**2%**		
WVS-341	Upland Shrub	Prickly Rose	1	1	**2**	0.001	0.001
WVS-342	Upland Shrub	Snow Berry	80%	0	**0**	0.001	0
WVS-343	Riparian Shrub	Black Currant	45%	0	**0**	0.014	0
		Peachleaf Willow	3%	0	**0**		
		Snow Berry	2%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-344	Riparian Shrub	Silver Sage Brush	4	0	**0**	0.0003	0
		Chokecherry	3	0	**0**		

°° *Lateral 1*
^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Prairie Rose	3%	0	**0**		
WVS-345	Riparian Shrub	Silver Sage Brush	6	0	**0**	0.058	0
		Black Currant	35%	0	**0**		
		Snow Berry	3%	0	**0**		
WVS-346	Upland Shrub	Snow Berry	5%	5%	**5%**	0.047	0.031
		Prairie Rose	2%	2%	**2%**		
WVS-347	Upland Shrub	Silver Sage Brush	21	13	**26**	0.006	0.004
		Prairie Rose	2%	2%	**2%**		
WVS-348	Upland Shrub	Silver Sage Brush	2	2	**4**	0.035	0.033
		Snow Berry	25%	25%	**25%**		
		Prairie Rose	3%	3%	**3%**		
WVS-349	Upland Shrub	Snow Berry	30%	0	**0**	0.028	0
		Prairie Rose	2%	0	**0**		
WVS-350	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-351	Upland Shrub	Silver Sage Brush	33	0	**0**	0.025	0
		Snow Berry	3%	0	**0**		
WVS-352	Upland Shrub	Silver Sage Brush	5	4	**8**	0.004	0.004
		Snow Berry	10%	10%	**10%**		
WVS-353	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-354	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-355	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-356	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-357	Upland Shrub	Silver Sage Brush	2	0	**0**	0.001	0
WVS-358	Upland Shrub	Snow Berry	15%	15%	**15%**	0.132	0.108
		Prairie Rose	5%	5%	**5%**		
		Silver Sage Brush	2%	2%	**2%**		
WVS-359	Upland Shrub	Snow Berry	25%	25%	**25%**	0.223	0.11
		Silver Sage Brush	10%	10%	**10%**		
		Prairie Rose	5%	5%	**5%**		
WVS-360	Upland Shrub	Snow Berry	25%	0	**0**	0.017	0
WVS-361	Upland Shrub	Snow Berry	35%	0	**0**	0.043	0
		Prairie Rose	1%	0	**0**		
WVS-362	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
WVS-363	Upland Shrub	Silver Sage Brush	1	1	**2**	0.006	0.006
		Snow Berry	20%	20%	**20%**		
WVS-364	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
WVS-365	Upland Shrub	Silver Sage Brush	8	4	**8**	0.004	0.002
WVS-366	Upland Shrub	Silver Sage Brush	3	0	**0**	0.001	0
WVS-367	Upland Shrub	Snow Berry	30%	0	**0**	0.008	0
WVS-368	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-369	Upland Shrub	Snow Berry	20%	20%	**20%**	0.003	0.003
WVS-370	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
WVS-371	Upland Shrub	Snow Berry	33%	33%	**33%**	0.097	0.070

°° *Lateral 1*

^ *Lateral 2*

% = Percent Cover

Shrubs

Woody Veg ID	Patch Type	Species	Number of Plants			Area Surveyed (Acres)	Anticipated Disturbance (Acres)
			Survey Area	Const. ROW	Estimated Mitigation		
		Silver Sage Brush	15%	15%	**15%**		
WVS-372	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
WVS-373	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
WVS-374	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-375	Upland Shrub	Silver Sage Brush	4	0	**0**	0.001	0
WVS-376	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-377	Upland Shrub	Silver Sage Brush	1	0	**0**	0.001	0
WVS-378	Upland Shrub	Snow Berry	15%	0	**0**	0.048	0
WVS-379	Upland Shrub	Snow Berry	15%	0	**0**	0.053	0
WVS-380	Upland Shrub	Silver Sage Brush	3	0	**0**	0.001	0
WVS-381	Upland Shrub	Silver Sage Brush	2	2	**4**	0.001	0.001
WVS-382	Upland Shrub	Snow Berry	10%	0	**0**	0.023	0
WVS-383	Upland Shrub	Silver Sage Brush	1	1	**2**	0.001	0.001
		Prairie Rose	25%	25%	**25%**		
		Snow Berry	20%	20%	**20%**		
		Silver Buffaloberry	10%	10%	**10%**		
WVS-384	Upland Shrub	Silver Sage Brush	2	0	**0**	0.001	0
WVS-386°°	Upland Shrub	Chokecherry	50%	0	**0**	0.036	0
		Snow Berry	15%	0	**0**		
WVS-387°°	Upland Shrub	Chokecherry	35%	0	**0**	0.219	0
		Fireberry Hawthorn	25%	0	**0**		
		Snow Berry	15%	0	**0**		
WVS-388°°	Upland Shrub	Chokecherry	55%	55%	**55%**	0.720	0.075
		Fireberry Hawthorn	35%	35%	**35%**		
		Snow Berry	25%	25%	**25%**		
WVS-389^	Riparian Shrub	Silver Buffaloberry	24	0	**0**	0.010	0
		Snow Berry	3%	0	**0**		
		Prairie Rose	1%	0	**0**		
WVS-390^	Upland Shrub	Silver Sage Brush	1	0	**0**	0.0004	0
WVS-391^	Upland Shrub	Silver Sage Brush	20%	0	**0**	0.067	0
		Snow Berry	5%	0	**0**		
		Prairie Rose	2%	0	**0**		

°° *Lateral 1*
^ *Lateral 2*

% = Percent Cover

Appendix D

Noxious Weeds

Noxious Weeds

Weed ID	Patch Type	Acres
NX-01	Canada Thistle 15%	0.002
NX-02	Canada Thistle 50%	0.001
NX-03	Canada Thistle 3% Common Burdock 1%	0.04
NX-04	Canada Thistle 10% Common Burdock 1%	0.002
NX-05	Canada Thistle 4% Common Burdock 1%	0.01
NX-06	Canada Thistle 2%	0.0003
NX-07	Canada Thistle 15%	0.004
NX-08	Canada Thistle 3%	0.005
NX-09	Field Bindweed 25%	0.05
NX-10	Canada Thistle 2% Common Burdock 5%	0.002
NX-11	Canada Thistle 1%	0.001
NX-12	Canada Thistle 2%	0.001
NX-13	Canada Thistle 2%	0.001
NX-14	Canada Thistle 35%	0.06
NX-15	Black Henbane 2 ind.	0.0003
NX-16	Canada Thistle 3% Common Burdock 1%	1.46
NX-17	Canada Thistle 5% Common Burdock 2%	0.20
NX-18	Common Burdock 1 ind.	0.001
NX-19	Canada Thistle 1 ind.	0.001
NX-20	Absinth Wormwood 1 ind.	0.001
NX-21	Common Burdock 1 ind.	0.001
NX-22	Common Burdock 1 ind.	0.001
NX-23	Common Burdock 1 ind.	0.001
NX-24	Common Burdock 1 ind.	0.001
NX-25	Common Burdock 1 ind.	0.001
NX-26	Canada Thistle 2 ind.	0.001
NX-27	Canada Thistle 2 ind.	0.001
NX-28	Canada Thistle 1 ind.	0.001
NX-29	Canada Thistle 6%	3.10
NX-30	Canada Thistle 25%	0.01
NX-31	Canada Thistle 25%	0.02
NX-32	Canada Thistle 30%	0.01
NX-33	Canada Thistle 5%	0.01

Weed ID	Patch Type	Acres
NX-34	Canada Thistle 1 ind. Common Burdock 1 ind.	0.001
NX-35	Canada Thistle 35%	0.003
NX-36	Canada Thistle 30%	0.05
NX-37	Canada Thistle 30%	0.002
NX-38	Common Burdock 1 ind.	0.001
NX-39	Canada Thistle 30%	0.05
NX-40	Canada Thistle 4%	0.03
NX-41	Canada Thistle 1 ind.	0.0001
NX-42	Canada Thistle 20% Common Burdock 3%	0.04
NX-43	Canada Thistle 50%	0.01
NX-44	Canada Thistle 50%	0.02
NX-45	Canada Thistle 5 ind.	0.001
NX-46	Canada Thistle 40%	0.06
NX-47	Canada Thistle 25%	0.46
NX-48	Canada Thistle 4%	0.02
NX-49	Canada Thistle 10%	0.01
NX-50	Canada Thistle 1 ind.	0.001
NX-51	Canada Thistle 4%	1.04
NX-52	Black Henbane 10%	0.01
NX-53	Canada Thistle 30%	0.13
NX-54	Canada Thistle 8%	0.001
NX-55	Canada Thistle 3%	0.001
NX-56	Canada Thistle 40%	0.03
NX-57	Canada Thistle 2%	0.002
NX-58	Canada Thistle 35%	0.04
NX-59	Canada Thistle 6%	0.01
NX-60	Canada Thistle 35%	0.11
NX-61	Canada Thistle 7%	0.03
NX-62	Canada Thistle 40%	0.10
NX-63	Canada Thistle 40%	0.27
NX-64	Canada Thistle 2%	0.01
NX-65	Canada Thistle 2%	1.72
NX-66	Canada Thistle 4%	2.27
NX-67	Canada Thistle 1%	0.001
NX-68	Canada Thistle 60%	0.003
NX-69	Canada Thistle 3%	0.88
NX-70	Canada Thistle 1%	0.001
NX-71	Canada Thistle 2%	0.001

Noxious Weeds

Weed ID	Patch Type	Acres
NX-72	Canada Thistle 2%	0.001
NX-73	Canada Thistle 5%	0.002
NX-74	Canada Thistle 3%	0.003
NX-75	Canada Thistle 2%	0.02
NX-76	Common Burdock 25%	0.01
NX-77	Canada Thistle 5%	1.63
NX-78	Canada Thistle 2%	0.002
NX-79	Canada Thistle 30%	1.19
NX-80	Canada Thistle 10%	2.40
NX-81	Canada Thistle 60%	0.10
NX-82	Canada Thistle 4%	0.003
NX-83^	Canada Thistle 10%	0.87
NX-84°°	Canada Thistle 45%	0.01

°°*Lateral 1*
^*Lateral 2*

Appendix E

Cultural Resources Report Abstract

July 11, 2012

Mr. Patrick Fahn
Public Service Commission
600 East Boulevard Avenue
Bismarck ND 58505-0480

RE: Cultural Resource Reports Submitted to the North Dakota Public Service Commission
Dear Mr. Fahn,

Here is the text to the letter we will be sending out to the permitted cultural resource contractors.
Locational information for archaeological and historic sites is protected under North Dakota Century Code § 55-02-07. Due to a problem of cultural resource reports and archeological site locational information appearing on the North Dakota Public Service Commission (PSC) website, we request that all reports (Class I, Class II or Class III, or documents outlining testing or data recovery methodologies) or any loose maps sent to the PSC offices by a permitee or their client not contain site locational information. Site locational information includes the location of a site on a topographic map or aerial photographs, the location of a site in tables, such as Township, Range and Section, or the photograph of a site. It is acceptable to mention the Smithsonian Trinomial designation (e.g., 32EM0123) as this does not contain locational information, other than state and county.

For reports or documents of any type omitting site locational information can most easily be accomplished by sending just the report cover and abstract pages. Please be sure that your abstracts do not contain tables of sites with Township, Range and Section columns, or other locational identification. Report covers sent to the PSC should not contain photographs of sites, which might be identifiable in reports that cover small areas. If for some reason you need to send a loose map, please delete all archaeological and historic site locations from the map before submittal to the PSC. We have been working with PSC staff, and the abstracts alone would be acceptable. Therefore full reports that are redacted are **not** necessary.

Thank you for your attention to this important matter. If you have questions, please contact either Susan Quinnell, Review and Compliance Coordinator at squinnell@nd.gov, (701) 328-3576, or Paul Picha, Chief Archaeologist at ppicha@nd.gov, (701) 328-3574.

Sincerely,

Susan Quinnell
Review and Compliance Coordinator
State Historical Society of North Dakota

Oasis Midstream Services LLC. Wild Basin to Johnsons Corner Crude Oil Pipeline Project

Class I and Class III Cultural Resource Inventory

Submitted to:

State Historical Society of North Dakota

Prepared for:

Oasis Midstream Services L.L.C.

Prepared By:

Garrett L. Knudsen, Daniel J. Woodward, and Joseph K. Pnewski

Principal Investigators:

Garrett L. Knudsen, Daniel J. Woodward

November, 2015

E3 Environmental, LLC
871 Jefferson Ave
St. Paul, MN 55102

EXECUTIVE SUMMARY

E3 Environmental, LLC (E3) conducted a Class I and a Class III cultural resources inventory for the proposed Oasis Midstream Services, L.L.C Wild Basin to Johnsons Corner Crude Oil Pipeline Project (Project). The Project falls entirely on private land in McKenzie County, North Dakota. The regulatory agencies involved are the North Dakota State Historic Preservation Office (ND SHPO) and the North Dakota Public Service Commission (NDPSC); ND SHPO guidelines are implemented in this cultural resources study.

A Class I inventory conducted November 2015 identified 18 completed cultural resources surveys (MS#5749, MS#6051, MS#7144, MS#11710, MS#11739, MS#12014, MS#12150, MS#12312, MS#13002, MS#13063, MS#13099, MS#13515, MS#13847, MS#14083, MS#14122, MS#14475, MS#14548, and MS#14839) within one-half mile of the proposed pipeline (Project Corridor). Fourteen previously-recorded cultural resources are located within the Project Corridor, including five *sites* (32MZ772, 32MZ782, 32MZ793, 32MZ2672, and 32MZ2697) and nine *isolates* (32MZX184, 32MZX187, 32MZX415, 32MZX1119, 32MZX1173, 32MZX1190, 32MZX1214, 32MZX1228, and 32MZX1229). Of these, one (32MZ793) is recorded within a 250-foot width, centered on the Project centerline and surrounding ancillary areas (Survey Corridor). The Survey Corridor spans 492.45 acres in area.

The Class III inventory, conducted in September, 2015, included pedestrian survey of the Survey Corridor and a re-investigation of previously recorded archaeological sites there. Although this area overlapped, for the majority of its length, a 75-foot wide corridor surveyed for cultural resources Summer, 2015, the entire Survey Corridor was re-surveyed in 15-meter (maximum) transects as part of this study. These survey efforts identified 15 newly-recorded cultural resources: three archaeological sites (32MZ2953, 32MZ2954, and 32MZ2955) and 12 isolates (32MZX1533, 32MZX1534, 32MZX1535, 32MZX1536, 32MZX1537, 32MZX1538, 32MZX1539, 32MZX1540, 32MZX1541, 32MZX1542, 32MZX1543, and 32MZX1544). E3 also re-located and investigated previously-recorded prehistoric site (32MZ793) within the Survey Corridor.

All three previously-unrecorded sites are recommended ***not eligible*** for inclusion to the NRHP and require no further consideration. The 12 isolates require no further consideration. Previously-recorded site 32MZ793, is left ***unevaluated***, although the several cairn features recorded within the site boundary are recommended ***potentially eligible***. It is recommended that these features be provided 50-foot buffers from the outside edge their boundaries for avoidance by construction activities or other ground-disturbing activities. If ground-disturbing activities occur between 50 feet and 25 feet of feature boundaries, on-site monitoring by a qualified archaeologist is recommended. It is recommended that no ground-disturbing activities occur within 25 feet of eligible feature boundaries.

Appendix F

10-Year Plan

TEN YEAR PLAN: 2015-2025
Oasis Midstream Services

October 2015

In accordance with Section 49-22-04 of the North Dakota Century Code and Chapter 69-06-02 of the North Dakota Administrative Code, Oasis Midstream Services ("Oasis"), submits the following Ten Year Plan for years 2015 through 2025.

1) *A description of the general location, size, and type of all facilities to be owned or operated by the utility during the ensuing ten years, as well as those facilities to be removed from service during the ten-year period.*

Oasis currently does not own or operate any transmission or energy conversion facilities in North Dakota. Oasis submitted a Certificate of Corridor Compatibility Application and Route Permit Application, requesting permission from the Commission to construct an approximately 19-mile crude oil pipeline originating at Oasis's Wild Basin Crude Handling Facility located approximately 5.5 miles northeast of Watford City, North Dakota in McKenzie County. The crude oil pipeline will connect to one or more 3rd party pipelines near Johnson's Corner in McKenzie County (the "Project"). As noted, the Project will be located within McKenzie County, North Dakota.

Oasis may construct other pipeline transmission facilities in McKenzie County for crude oil transport to the Wild Basin Crude Handling Facility. From the Crude Handling Facility, oil would be transported through the Oasis Pipeline to delivery points other than those at Johnson's Corner. The need and timing of any other transmission pipeline facility is subject to further commercial discussion and an expanded open season for Oasis.

Oasis does not own or operate any facilities that it plans to remove from service during the next ten years.

2) *An identification of the location of the tentative preferred site for all energy conversion facilities and the tentative location of all transmission facilities on which construction is intended to be commenced within the ensuing five years and such other information as may be required by the commission. The site and corridor identification shall be made in compliance with the criteria published by the commission pursuant to section 49-22-05.1.*

Oasis has no proposed energy conversion facilities on which construction is intended within the ensuing five years in North Dakota.

As discussed above, Oasis submitted a Certificate of Corridor Compatibility Application and Route Permit Application for the Project to be located in McKenzie County, North Dakota. The Project will begin at the Wild Basin Crude Handling Facility located in Section 35, Township 151 North, Range 98 West in McKenzie County and proceed East-Southeast to Section 18, Township 150 North, Range 95 West in McKenzie County where it will terminate at one or more 3rd party delivery points near Johnson's Corner.

Oasis conducted natural resource and cultural surveys to determine the best location for the placement of the corridor and route. The surveys were used to minimize any potential land use and environmental impacts, maximize public benefits, and take into consideration design and construction limitations and economics. The proposed location of the route within the corridor was made in compliance with Chapter 49-22-05.1, as discussed in the Applications for a Certificate of Corridor Compatibility and Route Permit Oasis filed with the Commission.

3) A description of the efforts by the utility to coordinate the plan with other utilities so as to provide a coordinated regional plan for meeting the utility needs of the region.

In developing the above-described pipeline project, Oasis coordinated with affected landowners and many local, state, and federal government agencies to eliminate conflicts in land use. Oasis does coordinate regionally with producers and shippers of crude oil, however, Oasis does not have contact with other pipelines due to confidentiality concerns and potential anti-trust issues.

4) A description of the efforts to involve environmental protection and land-use planning agencies in the planning process, as well as other efforts to identify and minimize environmental problems at the earliest possible stage in the planning process.

Oasis recognizes the various federal, state, and municipal regulatory agencies within the state of North Dakota that have environmental compliance authority over the construction, operations, and maintenance of its proposed Oasis Pipeline. Oasis is committed to developing and fostering an ongoing working relationship with each of these agencies.

Oasis will collaborate with local Emergency Management officials and planning commissions in the construction of the Oasis Pipeline. Oasis is committed to maintaining a strong safety record through emergency preparedness and readiness to mitigate the impact of a pipeline failure. Oasis is committed to environmental compliance during the execution of any future projects and will 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 any new facilities.

5) A statement of the projected demand for the service rendered by the utility for the ensuing ten years and the underlying assumptions for the projection, with that information being as geographically specific as possible, and a description of the manner and extent to which the utility will meet the projected demands.

The development of hydrocarbon production in the Williston Basin has increased significantly in recent years due to advancements in deep horizontal directional drilling techniques and subsequent oil extraction in the Bakken and Three Forks shale formations. The total recoverable amount of Bakken and Three Forks oil reserves is subject to interpretation and speculation. Studies conducted by the North Dakota

department of Mineral Resources (NDDMR)[1] and the U.S. Geological Survey[2] in 2008 and 2010 indicate that 4.0 to 6.3 billion barrels of recoverable reserves are available in North Dakota's Bakken and Three Forks formations. The most recent U.S. Geological Survey information estimated there may be 7.4 billion barrels of oil still undiscovered in the Bakken and Three Forks formations.[3] Information from the NDDMR indicates that oil production has increased dramatically over the past five years from approximately 263,000 bpd in 2010 to over 1,000,000 bpd in April 2014,[4] and production is expected to continue to increase dramatically.

The major constraint in transporting oil and gas from North Dakota to refining centers is the lack of pipeline capacity. Several major projects have been planned to address the growing volumes, but pipeline capacity is not expected to keep pace with the production, leaving incremental volumes to find alternative transportation methods, primarily by rail.

Oasis's proposed nineteen mile, ten-inch diameter crude oil pipeline will provide needed capacity to transport increased production of crude oil from the Bakken and Three Forks formations. In addition, to accommodate the ever-increasing Bakken development in northwestern North Dakota, the construction of even more processing and transmission infrastructure will be required, and Oasis may develop additional facilities to address this need within the next ten years.

[1] Bohrer, M., Fried, S., Helms, L., Hicks, B., Juenker, B., McCusker, D., Anderson, F., LeFever, J., Murphy, E., and Nordeng, S., North Dakota Department of Mineral Resources. State of North Dakota Bakken Resource Study Project 23 (2008).

[2] United States Geological Survey, Assessment of Undiscovered Oil Resources in the Devonian-Mississippian Bakken Shale Formation, Williston Basin Province, Montana and North Dakota (2008), *available at* http://pubs.usgs.gov/fs/2008/3021/ (Last visited Aug. 26, 2015).

[3] United States Geological Survey, Assessment of Undiscovered Oil Resources in the Bakken and Three Forks Formations, Williston Basin Province, Montana, North Dakota, and South Dakota (2013), *available at* http://pubs.usgs.gov/fs/2013/3013/

[4] North Dakota Department of Mineral Resources, North Dakota Monthly Oil Production Statistics, *available at* https://www/dmr.nd.gov/oilgas/stats/historicaloilprodstats.pdf (Last visited Aug. 15, 2015).

Appendix G

Landowner Waivers

Waiver Status for Occupied Structures within 500 feet of the Route – Wild Basin to Johnsons Corner Pipeline Project

Feature Type	Mile Post	Number of Structures within 500 feet	Distance from Route	Waiver Status	Comments
Commercial Building	19	1	261 feet	Obtained	Located along the Mainline. Commercial Buildings are owned by the same landowner and covered under one waiver dated October 6, 2015.
Commercial Building	18.5	1	323 feet	Obtained	
Commercial Building	1.5	1	469 feet	Obtained	Located along the Mainline

October 5, 2015

Hiland Partners Holdings, LLC f.k.a. Hiland Operating, LLC.
1001 Louisiana St, Suite 1000
Houston, TX 77002
Parcel ID#: 20-00-00750
Description: S2-T150N-98W IT #2094 Part Lot 1

Re: Oasis Midstream Services, LLC – Johnson's Corner Crude Pipeline

Gentlemen:

Please review the attached site map noting the proposed location of a pipeline (hereinafter referred to as "Facilities") associated with the Johnson's Corner Crude Pipeline Project Application Oasis Midstream Services, LLC intends to file with the North Dakota Public Service Commission. The map indicates that the Facilities will be located within 500 feet of your residence or business.

By signing below you are confirming that you have no objection to the installation of the Oasis Midstream Services, LLC proposed Facilities at this location, or the future operation and maintenance of the Facilities. Your cordial cooperation in this matter is greatly appreciated.

Respectfully,

Jeffrey Karcz
Agent
Oasis Midstream Services, LLC

Kinder Morgan,
dba Hiland Partners Holdings, LLC

Name: Kraig Huddleston
Title: Vice President

Date: October 9, 2015

October 6, 2015

Gary V. Levang and Patsy L. Levang
1061 Highway 73
Keene, ND 58847

Re: Oasis Midstream Services, LLC – Johnson's Corner Crude Pipeline
Parcel ID#: 09-00-07250,
Description: S18-T150N-95W S2SE Less a ROW

Mr. and Mrs. Levang:

Please review the attached site map noting the proposed location of a pipeline (hereinafter referred to as "Facilities") associated with the Johnson's Corner Crude Pipeline Project Application Oasis Midstream Services, LLC intends to file with the North Dakota Public Service Commission. The map indicates that the Facilities will be located within 500 feet of your residence or business.

By signing below you are confirming that you have no objection to the installation of the Oasis Midstream Services, LLC proposed Facilities at this location, or the future operation and maintenance of the Facilities. Your cordial cooperation in this matter is greatly appreciated.

Respectfully,

Jeffrey Karcz
Agent
Oasis Midstream Services, LLC

Kinder Morgan

Gary V. Levang, a/k/a Gary Levang

Date: 10/6/15

Patsy L. Levang a/k/a Patsy Levang

Date: 10/6/15

Appendix H

Additional Permits or Authorizations

Agency	Permit or Authorization	Status
Federal		
Pipeline Hazardous Materials Transportation Agency	Validation of assigned OPID Form PHMSA 1000.1	Pending
Pipeline Hazardous Materials Transportation Agency	PHMSA Notification to Construct 10 or miles of Hazardous Liquids Pipeline Form PHMSA 1000.2	Pending
State		
North Dakota Department of Health	NPDES-Construction Stormwater Permit	In Process
North Dakota Department of Health	NPDES-Hydrostatic Test Water Discharge Permit	In Process
North Dakota Department of Health	401 Water Quality Certification	In Process
North Dakota Department of Transportation	Road Crossing Permit State Hwy 23	In Process
	State Hwy 73	In Process
Local		
McKenzie County	Conditional Use Permit (CUP)	Received
McKenzie County	Road Crossing Permit 121 Ave NW	In Process
	30th St NW	In Process
	116 Ave NW	In Process
	N Fork Rd	In Process
	28th St NW	In Process