

Application to the
North Dakota Public Service Commission
for a
Certificate of Corridor Compatibility
for the Keystone Pipeline

April 2007



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Application for Certificate of Corridor Compatibility

TransCanada Keystone Pipeline, LP

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I. APPLICATION FOR CERTIFICATE OF CORRIDOR COMPATIBILITY

In accordance with Section 49-22-08 of the North Dakota Century Code, TransCanada Keystone Pipeline, LP (Keystone) provides the following information to the North Dakota Public Service Commission (Commission) in support of its application for a corridor certificate. This information is organized pursuant to the Commission's "Application Guidelines for a Certificate of Corridor Compatibility." All appendices are provided on the DVD that accompanies this document. Hard copies of route maps follow this application and also are provided on the DVD.

SECTION A: DESCRIPTION

1. Type

Keystone proposes to construct and operate a crude oil pipeline and related facilities from Hardisty, Alberta, Canada, to Patoka, Illinois (see **Figure 1**). The project, known as the Keystone Pipeline Project, or Keystone, initially will have the nominal capacity to deliver 435,000 barrels per day (bpd) of crude oil from an oil supply hub near Hardisty to existing terminals in Wood River and Patoka, Illinois. If market conditions warrant expansion in the future, additional pumping capacity will be added to increase the average throughput to 591,000 bpd. The length of the proposed facility in the United States (U.S.) is approximately 1,078 miles, from the North Dakota - Canada border to Patoka. Based on shipper interest, Keystone is also considering the construction of an extension in the U.S. to deliver crude oil to Cushing, Oklahoma. If the Cushing Extension is constructed, it will consist of an additional 294 miles.

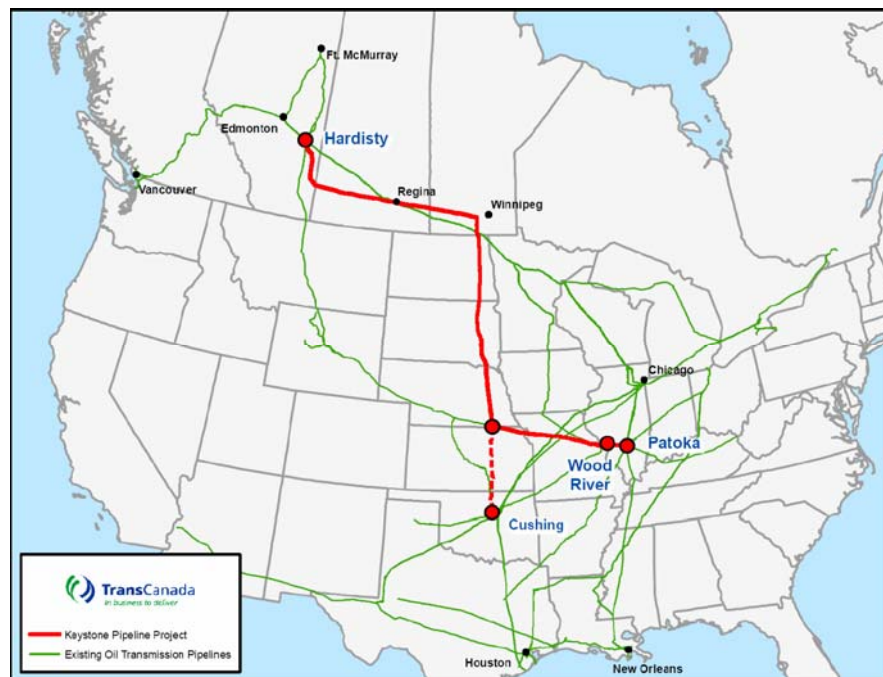


Figure 1 Pipeline Route

The pipeline will enter North Dakota at the Canada/North Dakota border in Cavalier County, and will extend in a southerly direction, exiting the State at the South Dakota border in Sargent County. The length of the pipeline in North Dakota will be approximately 218 miles.

2. Product

The pipeline will have batching capabilities and will be able to transport products ranging from light crude oil to heavy crude oil.

3. Size and Design

Design, construction, and operation of the pipeline and related facilities will be in accordance with U. S. Department of Transportation regulations governing the transportation of hazardous liquids. These regulations are set forth at Title 49, Part 195 of the Code of Federal Regulations.

a. Width of Right-of-Way (ROW)

In North Dakota, Keystone will construct the pipeline within a 110-foot-wide corridor, consisting of both a temporary 60-foot-wide construction right-of-way (ROW) and a 50-foot permanent ROW. To limit environmental impacts, Keystone will reduce the total ROW width to 85 feet during construction in certain wetlands, shelterbelts, other forested areas, residential areas, and commercial/industrial areas. **Figure 2** illustrates a typical ROW layout during pipeline construction.

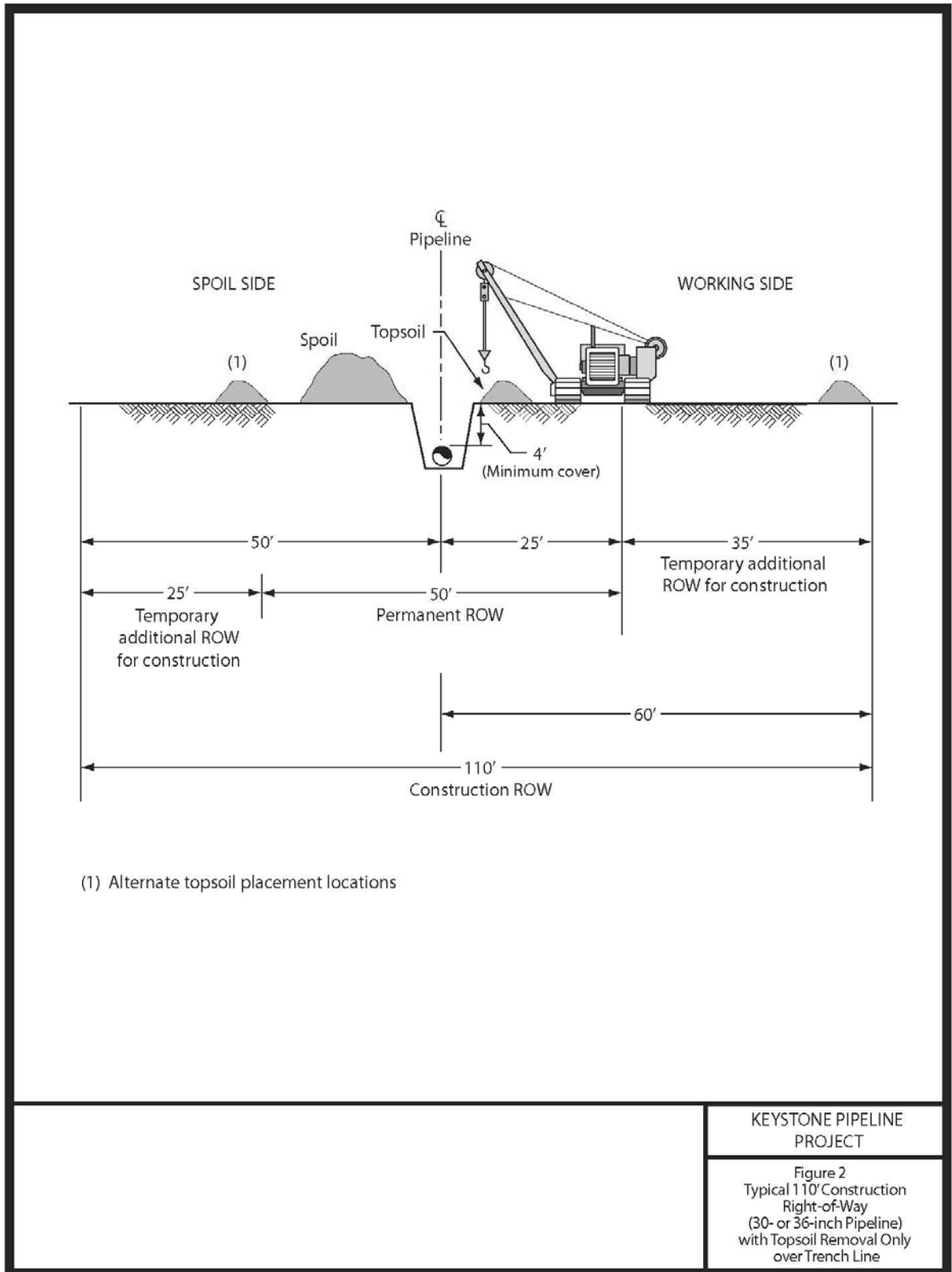
Table 1 lists the land areas affected during construction and operation for the various types of pipeline facilities.

Table 1 Summary of Land Requirements

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline ROW	2,903	1,319
Additional Temporary Workspace Areas	138	0
Pipe and Contractor Yards	310	0
Pump Stations/Delivery Facilities	20	15

b. Estimated distance between surface structures such as manholes or block valves

Keystone currently plans to construct 13 mainline valves along the Keystone Mainline in North Dakota. In addition, four emergency flow restricting valves will be located in North Dakota. Mainline valves will be installed at each pump station and along the ROW. Mainline valve intervals will have an average spacing interval of approximately 15 to 20 miles. When not located at a pump station, mainline valves will be sectionalizing block valves constructed within a fenced 50 foot-wide by 50-foot-long site located within the pipeline construction ROW and centered on the 50-foot-wide permanently maintained ROW. The spacing intervals between the mainline valves along the ROW are based upon the location of the pump stations, waterbodies greater than 100 feet in width, high consequence areas, and other topographic and environmental considerations. Remotely activated valves are located at pump stations, upstream of major river crossings and sensitive waterbodies. These valves can be closed remotely to isolate the pipeline segments to minimize environmental impacts in the unlikely event of a spill.



c. Pipe size

In North Dakota, the pipeline will have a 30-inch nominal pipe size diameter.

d. Approximate length of facility

The length of the pipeline in North Dakota will be approximately 218 miles.

e. Maximum design operating pressure and temperature

The maximum allowable operating pressure of the pipeline will be 1,440 psig. Keystone's current analysis for the initial flow rate suggests an estimated temperature range for product in the pipeline in North Dakota of approximately 55°F and 67°F in the winter and approximately 78°F and 89°F in the summer.

f. Maximum design flow rate

The initial design flow rate will be approximately 435,000 barrels per day (bpd). If market conditions warrant, the maximum design flow rate may be increased to approximately 591,000 bpd.

g. Number and general location of pumping stations

There will be five pumping stations in North Dakota (**Table 2**).

Table 2 Pump Stations in North Dakota

County	Pump Station	Milepost of Pump Station
Walsh	PS15	33.1
Nelson	PS16	76.2
Steele	PS17	123.7
Ransom	PS18	170.9
Sargent	PS19	217.7

4. Time Schedule**a. Certificate of Corridor Compatibility**

Keystone is requesting that a Certificate of Corridor Compatibility be issued on or before September 1, 2007.

b. Route application

Keystone is requesting a waiver of Commission procedures to allow joint and simultaneous filing of its applications for a Certificate of Corridor Compatibility and Route Permit herein.

c. Route Permit

Keystone is requesting that a Route Permit be issued at the same time as the requested Certificate of Corridor Compatibility.

d. Construction start date

Keystone is proposing to commence construction of the Keystone Project in North Dakota on or about May 1, 2008.

e. Construction complete date

Keystone is proposing to complete construction by November 2009.

f. In-service date

Keystone is proposing to place the pipeline in service by November 2009.

SECTION B: STUDIES

Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state, or local agency.

The following is a list of documents filed by Keystone with various agencies that evaluate environmental impacts. These documents are attached to this application in Appendix A - D. The contents of these documents are briefly described below.

Department of State

In order to construct pipeline facilities across the international border, Keystone is required to obtain a Presidential Permit from the U.S. Department of State (DOS). As required by the National Environmental Policy Act (NEPA), the proposed pipeline facilities will be the subject of an Environmental Impact Statement being prepared by the DOS, with the assistance of other cooperating agencies. It is anticipated that the Draft EIS for the Keystone Project will be issued by the DOS in mid-summer 2007. In support of its Presidential Permit application, Keystone has submitted studies and other environmental information to the DOS. The major environmental submittals are summarized below and are contained in Appendix A in chronological order.

- April 19, 2006. Keystone Pipeline Environmental Report.
In order to facilitate DOS review under NEPA, Keystone submitted to DOS a comprehensive Environmental Report in April 2006. This document contains a project description, route alternatives considered, environmental baseline information, an initial assessment of environmental impacts, and a Construction, Mitigation and Reclamation (CMR) Plan that includes construction methods and best management practices. This document was included as part of the November 2006 Environmental Report (see below).
- July 10, 2006. Supplemental Filing
Keystone filed supplemental information with the DOS that included an Emergency Response Plan (Oil Spill Response Plan), a preliminary pipeline risk and environmental consequence analysis, and a tract line list.
- September 15, 2006. Supplemental Filing
Keystone filed supplemental information with the DOS including an updated project description, refined route mapping, revised line list, and details of agency consultations.
- November 17, 2006. Keystone Environmental Report (April 2006 Environmental Report, Updated).
Keystone filed an updated Environmental Report that included project description updates and status updates for cultural, wetlands, and biological surveys (further described below).
- January 24, 2007. Supplemental Filing.
Keystone filed supplemental information with the DOS that included a 55.2-mile alternative route called the Hecla Sandhills Alternative located in both North and South Dakota. The purpose of the alternative was to address concerns about wetlands and shallow aquifers crossed by the previously filed proposed route. The alternative route will cross 24.5 miles in Sargent County. The supplemental filing includes a comparison between the resources affected by pipeline and pump station construction and operation on the proposed route segment and the alternative route. Cultural and biological survey status reports, as well as agency coordination documents also were filed.

- April 2, 2007. Supplemental Filing.

Keystone filed updated project facility location information, supplemental biological and cultural survey information, and a final pipeline spill risk assessment and environmental consequence analysis.

Cultural Resources

The DOS is responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA). Keystone has filed cultural resources reports with the DOS as well as the North Dakota State Historic Preservation Office. The DOS is conducting consultation with the Tribes.

The following cultural resource documentation is included in Appendix B to this application in chronological order:

- January 2006. Research Design for the Transcanada Keystone Pipeline Cultural Resource Inventory in North Dakota. Metcalf Archaeological Consultants, Bismarck, North Dakota.
- February 23, 2006. Letter from Merlan E. Paaverud, Jr. to Metcalf Engineering and ENSR providing concurrence with the cultural resources survey design.
- August 2, 2006. Letter from Amy Bleier and Ed Stine, Metcalf Archaeological Consultants to North Dakota State Historic Preservation Office. Status report on pedestrian cultural resource surveys through July 2006.
- October 13, 2006. Status of Cultural Resource Investigations Along the Keystone Pipeline Corridor in North Dakota (as of October 13, 2006). Prepared by Metcalf Archaeological Consultants. Bismarck, North Dakota.
- December 2006. Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota. Prepared by Metcalf Archaeological Consultants. Bismarck, North Dakota.
- February 2007. Keystone Pipeline Project: Testing 32RM160 and 32RMx89 in Ransom County, North Dakota. Prepared by Metcalf Archaeological Consultations. Bismarck, North Dakota.

Biological Resources

Keystone developed general wildlife habitat and occurrence information from published sources and interviews with state agency staff. This information is included in the Environmental Reports described above.

Keystone coordinated with the U.S. Fish and Wildlife Service (USFWS) and the North Dakota Game and Fish Department (NDGF) to identify listed, candidate, and species of special concern that could be affected by pipeline construction and operation. Keystone obtained a list of species from both the USFWS and the North Dakota Heritage Programs. Based on the information received, Keystone initiated biological surveys in the summer of 2006, and the winter of 2006-2007.

Keystone also initiated wetland surveys in 2006 along the pipeline as support for the U.S. Army Corps of Engineers (USACE) Section 404 permit applications. Estimates of acreages of wetlands affected by construction by type have been included in filings to the DOS.

A summary of Keystone's consultations with respect to biological resources and wetlands is provided in Appendix C.

The following biological reports are included in Appendix D in chronological order.

- October 2006. A Field Survey of the Keystone Pipeline Project Construction Corridor in North and South Dakota for Dakota Skipper (*Hesperia dacotae*), Western Prairie Fringed Orchid (*Platanthera praeclara*) Habitat, and for Native Grassland. Prepared by ENSR Corporation, Fort Collins, Colorado.
- October 2006. Keystone Pipeline Project Progress Report for Wetlands Surveys. Prepared by ENSR Corporation, Fort Collins, Colorado.
- March 2007. Bald Eagle and Raptor Nest Survey Report. Prepared by ENSR Corporation, Fort Collins, Colorado.

Future Assessments

In 2007, Keystone will conduct additional cultural, biological, and wetlands data on proposed North Dakota pump station sites, short pipeline reroute segments, proposed access roads, and on mainline pipeline segments for which access was not acquired in 2006.

SECTION C: NEED FOR FACILITY

1. An analysis of the need for the proposed facility based on present and projected demand for the product transmitted by the facility, including the most recent system studies supporting the analysis of the need.

As stated in Keystone's Ten-Year Plan, filed with the Commission on September 6, 2006, according to the Energy Information Administration (EIA), U.S. demand for petroleum products has increased by over 17 percent or 3 million bpd over the past 10 years and is expected to increase further. The EIA estimates that total U.S. petroleum consumption will increase by approximately 5.3 million bpd over the next 20 years, representing average demand growth of about 265,000 bpd per year (EIA Annual Energy Outlook 2006).

At the same time, domestic U.S. crude oil supplies continue to decline. For example, domestic crude production in the Petroleum Administration for Defense District II (PADD II), Keystone's initial target delivery area, continues to decline at an average rate of about 3 percent per year. Over the past 20 years, PADD II crude oil production has decreased by over 600,000 bpd or 60 percent (Canadian Association of Petroleum Producers [CAPP], April 2005).

The U.S. historically has compensated for decreases in domestic production through increased imports from Canada and foreign offshore sources. Canada is currently the largest supplier of imported crude oil and refined products to the U.S. (CAPP 2005), providing over 2.1 million bpd. Ten percent of oil consumed in the U.S. comes from Canada. U.S. imports of foreign crude and refined products continue to increase. Crude and refined petroleum product imports into the U.S. have increased by over 4.3 million bpd over the past 10 years. In 2004, the U.S. imported over 13 million bpd of crude oil and petroleum products (EIA 2006).

Keystone will provide a number of opportunities for refiners in the U.S. to utilize Canadian crude oil. Keystone's incremental pipeline capacity will provide the U.S. access to secure and growing Canadian crude supplies. Access to incremental Canadian crude supply also will provide an opportunity for the U.S. to offset declines in domestic crude oil production and decrease its dependence on offshore foreign crude supplies.

Reliable and safe transportation of oil will help ensure that U.S. energy needs are not subject to unstable political events. Established crude oil reserves in the Western Canada Sedimentary Basin (WCSB) are estimated at 179 billion barrels (CAPP 2005). Over 97 percent of WCSB crude oil supply is sourced from Canada's vast oil sands reserves located in northern Alberta. The Alberta Energy and Utilities Board (AEUB) estimates there are 175 billion barrels of established reserves recoverable from Canada's oil sands. Alberta has the second largest crude oil reserves in the world, second only to Saudi Arabia.

CAPP estimates that, as a result of increasing production from the oil sands, the current level of crude oil production from the WCSB of about 2.3 million bpd is expected to increase by about 1.3 million bpd by 2015. CAPP also has made a high case forecast, which estimates potential growth of over 2 million bpd over the same 10-year timeframe.

Existing crude oil export pipeline capacity out of the WCSB is insufficient to accommodate the forecasted crude oil supply growth. After accounting for Canadian domestic consumption, approximately 850,000 bpd of incremental export pipeline capacity will be required by 2015 to accommodate increased WCSB crude supply, based on CAPP's moderate forecast. Additional capacity above supply requirements is required to avoid potential pipeline apportionment situations where short-term supply exceeds export pipeline capacity.

The Keystone Pipeline Project initially will provide 435,000 bpd of incremental export capacity to address this deficiency. With expansion, Keystone could provide up to approximately 600,000 bpd of incremental export capacity. Thus, the addition of the Keystone pipeline will significantly increase the WCSB pipeline export capacity needed to address forecasted supply growth.

Keystone conducted a binding Open Season in December 2005 to provide shippers an opportunity to participate in the Keystone Pipeline Project by entering into contractual commitments for pipeline capacity. Binding contracts for 340,000 bpd were received, which Keystone has deemed sufficient to enable it to proceed with regulatory applications and, pending successful regulatory and environmental approvals, with construction of the pipeline. These binding commitments demonstrate the need for incremental pipeline capacity and access to Canadian crude supplies and represent a clear endorsement of the Keystone Pipeline Project. Keystone expects that the remainder of the excess capacity will be utilized by non-contract shippers at tariff rates approved by the Federal Energy Regulatory Commission (FERC).

2. A description of any feasible alternatives of serving the need.

Two alternatives to the Keystone project could potentially provide most of the proposed crude transportation services to Midwest U.S. markets.

a. Enbridge's Alberta Clipper, Southern Access Expansion, Southern Access Extension and Hypothetical Spearhead Expansion Projects

In 2006, Enbridge announced a proposal to develop the Alberta Clipper project. Alberta Clipper and the previously announced Southern Access Expansion (the "Enbridge Projects") are proposals to construct new pipelines that will parallel Enbridge's mainline oil pipeline between Alberta, Canada and northern Illinois. The Southern Access Extension proposal is new pipeline construction extending Enbridge's pipeline system from Flanagan, Illinois to Patoka, Illinois and the Spearhead expansion proposal is a hypothetical looping of the existing Spearhead pipeline from Chicago to Cushing.

Enbridge proposes that the Enbridge projects would provide additional capacity of approximately 400,000 bpd and could be in operation by the end of the decade. If constructed, the Enbridge Projects could represent a \$2.4 billion expansion (U.S. portion only) of Enbridge's mainline.

Enbridge's mainline oil pipeline follows a south-east route from Edmonton, Alberta, Canada across the Canada-U.S. border near Neche, North Dakota, and continues through Minnesota to Superior, Wisconsin and then south to Chicago, Illinois. Enbridge's Alberta Clipper project proposes construction of a new oil pipeline commencing in Alberta, Canada and terminating at their Superior, Wisconsin, terminal. Enbridge's Southern Access Expansion and Southern Access Extension projects propose construction of a new oil pipeline from Superior, Wisconsin to Patoka, Illinois. In total, the Enbridge Projects would require construction of approximately 955 miles of new pipeline, consisting of 501 miles of 36-inch pipe and 454 miles of 42-inch pipe.

Enbridge's Spearhead oil pipeline follows a route south-west from Chicago, Illinois, through Missouri to Cushing, Oklahoma, and currently has a capacity of approximately 125,000 bpd. Keystone evaluated the existing Spearhead system and determined that additional facilities, in the order of an estimated 655 miles of new 30-inch pipeline, would be needed in order for Spearhead to provide a volume of crude oil delivery to Cushing, Oklahoma, equivalent to that proposed by Keystone. If it were proposed and constructed, the hypothetical "Spearhead-Cushing Expansion" pipeline would likely be constructed adjacent to the existing Spearhead pipeline at an estimated capital cost of approximately \$900 million.

b. Hypothetical Kinder Morgan Express – Platte Pipeline System Expansion and Cushing Extension

The Express Pipeline (existing 24-inch pipe) interconnects with the Platte Pipeline (existing 20-inch pipe) at Casper, Wyoming. This 1,700-mile pipeline system transports oil sands crude oil from Alberta's oil sands in Hardisty, Alberta to refineries in the U.S. Rocky Mountain and Midwest regions. In the U.S., the pipeline crosses Montana, Wyoming, Nebraska, Kansas, Missouri, and terminates in Wood River, Illinois. Kinder Morgan has not announced any proposals to expand this system. Nevertheless, the construction of a parallel pipeline has been evaluated by Keystone as a system alternative.

The hypothetical construction of a new pipeline that would parallel the Express-Platte Pipeline system would consist of 1,282 miles pipeline in the U.S. To transport a volume of crude oil similar to Keystone, the pipeline likely would consist of a 30-inch-diameter pipeline and would require 27 pump stations. Keystone evaluated the Express-Platte Pipeline system to determine the additional facilities needed in order to provide an equivalent level of crude oil delivery to Cushing, Oklahoma, as that proposed by Keystone. It is estimated that an additional 292 miles of new 30-inch pipeline would be required. This pipeline mileage requirement would be same as that required for Keystone (an extension could be constructed from the existing Platte Pipeline to Cushing along the same route proposed by Keystone). Keystone estimated capital cost for 1,574 miles of new 30-inch pipeline and pumping facilities would be approximately \$2.1 billion.

c. Alternatives Evaluation

Keystone is the only identified system alternative in a position to meet the increased demand for crude oil within the timeframe required. At this time, no expansion of the Express-Platte System has been proposed. Also at this time, the proposed expansions and extension of the Enbridge mainline will not meet the market need for deliveries to Cushing proposed to be met by Keystone. Keystone is the only identified alternative that has secured contractual commitments from customers to ship crude oil. Keystone has secured long-term transportation contracts with customers totaling 340,000 bpd with an average term of 18 years.

Keystone proposes the least cost and most direct route to deliver to Cushing, Oklahoma, and proposes an in-service date for deliveries to the Midwestern U.S. that meets the forecasted increased demand for crude oil. All identified alternatives involve the construction of substantial lengths of new pipelines, all with sections of new pipeline construction located to some degree adjacent to existing pipelines and other previously disturbed linear ROWs, and all involving attendant environmental impacts and disturbance. In the end, Keystone is the only identified system alternative in a position to meet the increased demand for crude oil within the timeframe required.

A more extensive analysis and evaluation of alternatives is set forth at Section 2.3 of the Environmental Report submitted to the Department of State and attached to this application as Appendix A.

3. A statement justifying any deviation from the most recent Ten-Year Plan which the proposed facility may present.

This application is consistent with Keystone's most recent Ten Year Plan filed on September 6, 2006.

SECTION D: LOCATION

1. Study Area

North Dakota Code, Section 69-06-04-02 1 b, requires that the width of the corridor for the proposed pipeline be at least 10 percent of its length, but not less than 1 mile and not greater than 6 miles, unless approved by the Commission. Thus, the proposed project would require a 6-mile-wide corridor. Keystone, however, requests that the Commission reduce the width of the corridor to 1 mile, in view of the fact that Keystone has extensively studied a number of potential routes in North Dakota, as part of the DOS NEPA process, and has determined, taking into account extensive public and agency input, that the proposed route is superior to other alternatives from an environmental standpoint.

a. Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.

Keystone commissioned research and investigations and worked with federal and North Dakota governmental officials relating to the impact of the location, construction, and operation of the proposed pipeline on health and welfare, natural resources, and the environment. Keystone worked with the federal, state and local agencies and refined the pipeline route to avoid cultural resources, biological resources, wetlands, grasslands and other areas of interest to the agencies. Keystone's cultural, biological, and wetlands assessments are appended to this application in the Environmental Report and related documents, as identified above.

b. The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.

Pipeline design and construction technology and pipeline materials have advanced significantly over the past several decades. Keystone proposes to utilize proven technology in pipeline design, construction techniques, pipeline materials, and enhanced pipeline transmission monitoring methods, including leak-detection systems and remotely-controlled valves.

New federal regulations have increased the United States Department of Transportation (USDOT), Office of Pipeline Safety (OPS) oversight during pipeline construction and operations. Attachments to these applications include the Keystone Pipeline Construction Mitigation and Reclamation (CMR) Plan. The CMR Plan describes the best management construction practices that will be implemented including protective measures specific to areas such as wetlands, forested areas, waterbody crossings and residential structures. Reclamation procedures, which are also described in the CMR Plan, will return the construction corridor to its original contours and vegetative status, except for the permanent right-of-way (ROW) and five pump stations.

c. The potential for beneficial uses of waste energy from a proposed energy conversion facility.

Not Applicable

d. Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.

Keystone's CMR Plan is included at Appendix G of this application. The purpose of this CMR Plan is to identify detailed procedures for implementing protective measures during pipeline construction and appropriate reclamation measures during the post-construction phase. **Table 3** provides a summary of the environmental impacts that are expected to remain after Keystone's CMR Plan is applied. This impact summary addresses the North Dakota portion of the project. These impacts include short-term uses of renewable resources and long-term impacts.

Table 3 Impact Summary

Resource	Impact Summary
Air Quality	<ul style="list-style-type: none"> • Fugitive dust will be generated from ROW construction activities and traffic over the construction period regardless of the dust suppression measures applied. All regions crossed by the project are in attainment for particulate matter and no state-mandated dust control permits will be required. • Operational hydrocarbon emissions from pump stations spaced 30 to 50 miles apart will be minimal since pumps will be electric and no new crude oil tanks will be required.
Geology, Minerals, and Paleontology	<ul style="list-style-type: none"> • Construction and operation of the Keystone pipeline system will limit access to underlying minerals (sand and gravel) for the project life. This limitation will be confined to the width of the permanent pipeline ROW that overlies glacial deposits. • Any Pleistocene-era mammalian fossils excavated during construction will not be studied or retrieved.
Soils and Agricultural Production	<ul style="list-style-type: none"> • A small fraction of the excavated soils in areas with highly erodible soils will be lost to increased water and wind erosion acting on disturbed soil surfaces until grass and other herbaceous vegetation is restored (3 to 5 years). • Agricultural cropland and rangeland (including hayland) production will be lost from the construction ROW for the season during construction only. During the next growing season, production on all agricultural lands will be able to be resumed and long-term productivity will not be impaired.
Water Resources	<ul style="list-style-type: none"> • Construction across waterbodies will cause local short-term increases in total suspended solids and deposited sediment in perennial streams and rivers. • Water used for hydrostatic testing of the pipeline will be obtained from surface water resources. The volume for a 50-mile test section of 30-inch pipeline is approximately 9 million gallons. Withdrawal rates and volumes will be designed to avoid impacts to aquatic life and downstream water users. Hydrostatic test water will be discharged to the land surface at an approved location. Discharged water may evaporate or infiltrate into the soil or drainage where the water is released. • Pipeline construction will disturb a total of 205 acres of wetlands, river systems and open water in North Dakota. Of this total, approximately 197 acres are wetlands and 8 acres are located in river systems and open water. It is estimated that vegetation cover in palustrine emergent wetlands will recover in three to five years; forested wetlands will require 20 to 50 years. No permanent loss of wetlands will occur as a result of this project.
Vegetation	<ul style="list-style-type: none"> • Pipeline construction will disturb a total of 3,371 acres including 418 acres of native and modified grassland and 40 acres of forested land. It is estimated that vegetation cover in native and modified grasslands will recover in three to five years, while forests and woodlands will require 20 to 50 years. Trees will not be permitted to grow on approximately 17 acres of currently forested woodlands during pipeline operations to allow for aerial surveillance.
Wildlife	<ul style="list-style-type: none"> • Approximately 655 acres of upland and wetland wildlife habitats will be cleared during pipeline construction and then will recover over short- and long-term time frames (see Wetlands and Vegetation above). • Wildlife displacement from the construction ROW is expected to be short-term. No long-term displacement impacts from increased human activity are expected. • There may be a potential loss of bird eggs and young from pipeline clearing activities or increased human presence if these activities occur during the breeding season along the entire length of the pipeline. • Power lines will be constructed to serve the pump stations. The power lines represent a collision hazard for waterfowl and other birds similar to existing electrical distribution lines.

Table 3 Impact Summary

Resource	Impact Summary
Aquatic Resources	<ul style="list-style-type: none"> Based on the implementation of mitigative measures at watercourse crossings, the project will experience only short-term (1 to 10 days) effects on fish and fish habitat at the four perennial river and stream crossings designed for open cut water-course crossing. These effects will consist of potential increases in total suspended solids and sediment deposition downstream from channel excavation.
Sensitive Species	<ul style="list-style-type: none"> There will be a potential reduction in sensitive wildlife and aquatic species habitats as the result of pipeline construction. These habitat changes are described for wildlife and aquatic resources above. Keystone received the USFWS and state wildlife agency lists of species to be evaluated for project effects. In 2006, Keystone initiated habitat and occurrence surveys for several federally listed and state sensitive species, and will continue these surveys in 2007. Keystone will coordinate with the USFWS and state wildlife agencies to estimate direct and indirect impacts to federally listed and sensitive species and to identify pipeline route adjustments, and construction procedures that will avoid, or minimize effects to these species. Keystone has adjusted its proposed pipeline route at several locations in North Dakota to reduce the length of wetland and native prairie crossings.
Land Use (including noise, transportation)	<ul style="list-style-type: none"> Approximately 1,334 acres will not be permitted to be occupied by residential or other structures within the permanent pipeline ROW and pump station sites over the life of the project. Agricultural uses (cropland) will be allowed to continue as before except at the pump station and other aboveground facility sites. Small parcels of state land (generally less than 10 acres of surface disturbance) will be crossed in North Dakota. The majority of these state lands are used for wildlife management purposes. Keystone will consult with the state and federal managers of these lands to develop site-specific crossing plans to maintain public access and existing land uses. Construction noise will be generated and potentially heard at nearby (generally 0.5 mile or less) residences during daytime construction activities over a period of several weeks. Long-term operational noise from pump stations will be maintained below community noise level thresholds. Aboveground facilities (pump stations, power lines, valves, densitometers) will exist for the life of the project. The majority of these facilities will be located in rural areas. Power lines will be located along county roads and, therefore, will pass within the view of roadside residences. Short-term obstruction or temporary disruption to local roads may occur during construction across those roads. Major highways will be bored. There will be no long-term impacts to transportation.
Cultural Resources	<ul style="list-style-type: none"> Keystone developed study plans that were approved by the State Historic Preservation Office. Keystone then initiated field surveys in 2006 to determine the locations of prehistoric and historic cultural resources that could be affected by surface disturbance caused by pipeline and ancillary facility construction. Cultural resource impacts could include physical disturbance of archaeological sites or architecturally significant structures and features, and introduction of visual or audible elements (e.g., pump stations) that would alter the setting of a cultural resource feature. Impacts to sites that are eligible for the National Register of Historic Places (NRHP) will be mitigated by one or more of the following measures: avoidance through use of pipeline realignments and facility relocations; approved data recovery from sites that cannot be avoided; and use of landscaping or other techniques to minimize or eliminate effects on the historic setting or ambience of standing structures. Construction activities could adversely affect undiscovered archaeological sites. If previously undocumented sites are discovered within the construction corridor, work that could adversely affect the discovery will cease until consultation with appropriate cultural preservation agencies is completed. If the previously unidentified site is recommended as eligible to the NRHP, impacts

Table 3 Impact Summary

Resource	Impact Summary
	<p>will be mitigated through the procedures included in an Unanticipated Discovery Plan.</p> <ul style="list-style-type: none"> • Treatment of any discovered human remains will be handled in accordance with the guidelines contained in the Native American Grave Protection and Repatriation Act (NAGPRA) or state laws, depending on the age and cultural affiliation of the remains. Construction will not resume in an area where human remains are discovered until an authorized agency provides a notice to proceed.
Native American Consultation	<ul style="list-style-type: none"> • The DOS, as the lead federal agency, will consult with tribes that may have a past or current affiliation with the Keystone Pipeline project area and solicit input. These contacts will be maintained throughout the project permitting process.
Socioeconomic Conditions	<ul style="list-style-type: none"> • In exchange for monetary compensation, Keystone will acquire easements from landowners to place pipeline facilities on private lands. Keystone also will compensate landowners for property damage resulting from construction and make repairs as needed. • In the short term, construction of the pipeline will provide direct employment of up to 2,500 to 3,000 workers distributed across five to six states at once. An estimated 500 to 600 construction workers will be employed for the North Dakota section of the pipeline. Pipeline employees will increase retail sales in local areas along the pipeline route. Demands on local infrastructure will include temporary accommodations and, potentially, emergency services. It is anticipated that workers will commute from larger population centers to the pipeline work sites. • In the long term, operations will increase revenues to the state and counties crossed by the pipeline. It is estimated that the project will pay about \$5.3 million dollars in property taxes in North Dakota in the first year of operation.
Public Health and Safety	<ul style="list-style-type: none"> • The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone Pipeline Project, there will be a very low likelihood of a crude oil release from the pipeline that could injure people, drinking water supplies, and ecologically sensitive areas. Keystone submitted a preliminary risk assessment for the accidental release of crude oil from the pipeline. The assessment included the likelihood of crude oil releases and potential for environmental affects, depending upon release volumes and locations. Based on refinements of the route, hydraulic models, and additional engineering information, an updated risk assessment was submitted to the DOS in April 2007.

e. Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.

As a result of data collection, agency consultation, and ongoing refinement of the pipeline route, several modifications were made to the original pipeline route filed in April 2006 with the DOS. The route changes made in North Dakota are documented in Section 2.4.1.5, Additional Route Refinement, in the updated Environmental Report filed with the DOS in November 2006. These route changes are described briefly below:

- Pembina/Cavalier County Reroute (MP 0.4 to MP 6.9). This reroute was incorporated into the proposed route to address landowner and agency concerns as follows: avoid a drainage ditch; avoid woodlots and shelter belts; avoid grain bins; and minimize the length of wetlands crossed.
- Tongue River Reroute (MP 16.2 to MP 19.6). This reroute was incorporated into the proposed route to address landowner and agency concerns as follows: avoid pond; reduce the number of Tongue River tributaries crossed; and avoid shelter belts.
- USFWS Nelson and Steele County Reroutes (MP 69.3 to MP 121.5). In response to a letter from the USFWS, Keystone developed small reroutes in many locations to avoid the majority of wetland crossings within wetland easements held by the USFWS.

- USFWS Hecla Sandhills Reroute (MP 190.0 to MP 225.2). In response to USFWS input, the proposed route was shifted west to avoid crossing over environmentally sensitive areas consisting of USFWS grassland easements within a stabilized dune field called the Hecla Sandhills. Specific concerns were stabilization and revegetation of sand dunes over the long term, the presence of listed and sensitive plant and animal species, and the lack of existing access to a proposed pump station site within the sandhills.

Subsequent to the November 2006 filing, a review of shallow aquifers in the area was conducted. Additionally, the USFWS expressed concern about crossing grassland easements. Further field reconnaissance also indicated extensive wetlands along the revised route in South Dakota. As a consequence of this review and input, Keystone developed a new version of the Hecla Sandhills Reroute to the east of the sandhills in Sargent County. This reroute is located in existing farmland, crosses less wetland acreage, avoids all USFWS grassland easements, and traverses only one mile of USFWS wetland easements (approximately). This route change was filed as an alternative in Keystone's January 2007 filing with the DOS (see Appendix A).

f. Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.

Irreversible and irretrievable commitments of natural resources will be minimal for the proposed project. There will be a short-term use of surface water for hydrostatic testing of the pipeline but there will be no extended consumptive use of water resources. No unique geological features that have received state or federal protection will be disturbed by project facilities. The proposed pipeline route does not cross any active quarries or mines or the well-pads of any active oil and gas wells.

A total of 1,334 acres will be maintained as permanent ROW after construction is completed. After construction, the permanent ROW may return to farming, grazing and other pre-construction land uses or purposes, subject to limited restrictions. Loss of woodland vegetation will be permanent since trees will be restricted from reestablishing above the pipeline centerline. However the area above the pipeline centerline can be maintained in a herbaceous state thereby providing alternative habitat types. Habitat losses will be long term at the few permanent above ground valves and pump station sites. Through discussions with state agencies and through Keystone's environmental assessment, the project will not have any significant adverse effects on wildlife or wildlife habitat, including rare or priority species.

g. The direct and indirect economic impacts of the proposed facility.

Construction Phase:

Direct and indirect economic impacts that are anticipated during construction are summarized as follows:

Compensation for Damages to Land Use and Property

The proposed project will be constructed in predominantly rural, agricultural areas. Keystone will acquire pipeline ROW easements from landowners and will provide landowners with monetary compensation for the conveyance of those easements. Construction activities will create the potential for damage to land and property, including drainage tiles, irrigation systems, and fences. Keystone will restore damage or disturbance to lands. Keystone will repair or restore drain tiles, irrigation systems, fences, and other items and features that are damaged or temporarily disturbed during pipeline construction. Compensation for crop loss, diminished productivity, and other damages to farmland and property during construction will be provided.

Demands on Local Infrastructure

Construction of the project is proposed to be completed in two spreads in North Dakota which will require approximately 15 months to complete. Work is proposed to commence in early 2008 and to be completed by

the winter of 2009. Approximately 500 to 600 construction personnel (Keystone employees, contractor employees, construction inspection staff, and environmental inspection staff) are expected to be associated with each spread. Additionally, construction of pump stations will require an additional 20 workers per station. Construction of pump stations will commence in 2008 and will be completed in the third-quarter of 2009.

Keystone proposes to hire temporary construction personnel from the local communities where possible. It is estimated that approximately 10 to 15 percent of the total construction workforce could be hired locally, with the remaining portion (85 to 90 percent or more) consisting of non-local personnel. It is expected that most project workers will use temporary housing, such as hotels/motel, RV parks, and campgrounds. Most of the temporary workers will seek housing in the more populated, service-oriented towns located within a reasonable commuting distance to the work site. The demands on local infrastructure are expected to be temporary and minimal. The net economic effect on local communities should be positive for the duration of the construction period (approximately 18 months).

Short-term Fiscal Benefits

Taxes that may apply, other than property taxes levied by various state, county, or local taxing jurisdictions, include taxes on gross receipts from the sales of goods and services. These taxes and fees vary by region or locality and will be received only during the construction period.

Operations Phase:

Direct and indirect economic impacts that are anticipated during operation are summarized as follows:

Demands on Local Infrastructure

The limited number of permanent employees associated with the proposed project will result in negligible long term impacts on public services.

Long-Term Fiscal Benefits

In the operation phase, the pipeline will increase the tax base in the states, counties, and communities crossed. Based on 2005 property assessment and tax rate information for each state/county, it is estimated that Keystone's North Dakota property taxes will be approximately \$5.3 million in the first year after construction. Property taxes will continue to be paid over the life of the pipeline.

h. Existing Plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.

The State of North Dakota Department of Commerce, Division of Economic Development and Finance, was contacted to inquire if there is any existing information or plans for state, local or private entity development at or in the vicinity or the proposed corridor/route. The Department did not have any information available. The following counties also were contacted: Pembina, Walsh, Nelson, Steele, Ransom, and Sargent. No information was available from the staff contacted at the counties. Additional contacts will continue to be made throughout 2007 to make inquiries regarding any planned development(s) in the vicinity of the proposed corridor/route.

i. The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.

Construction Phase:

Appendix B provides documentation on potential cultural resource impacts and associated consultations.

There is the potential for discovery of Pleistocene-era mammal fossils during pipeline grading and trenching where the proposed route crosses continental glacial drift in North Dakota. Any mammalian fossils incidentally excavated during pipeline construction will not be recovered or studied for the scientific record.

Construction activities and associated operations could also adversely affect undiscovered archaeological sites. If previously undocumented sites are discovered within the construction corridor during construction activities, all work that might adversely affect the discovery will cease until Keystone, in consultation with the appropriate agencies such as SHPO, can evaluate the site's eligibility and the probable effects. If the previously unidentified site is recommended as eligible to the NRHP, impacts will be mitigated through an Unanticipated Discovery Plan, which will be included in the cultural resources survey reports prepared for each state.

If construction or other project personnel discover what they believe to be human remains, funerary objects, or items of cultural patrimony on federal land, construction will cease within the vicinity of the discovery and the appropriate agency will be notified of the find. Treatment of any discovered human remains, funerary objects, or items of cultural patrimony found on federal land will be handled in accordance with NAGPRA. Construction will not resume in the area of the discovery until the authorized agency has issued a notice to proceed.

If human remains and associated funerary objects are discovered on state or private land during construction activities, construction will cease within the vicinity of the discovery and the county coroner or sheriff will be notified of the find. Treatment of any discovered human remains and associated funerary objects found on state or private land will be handled in accordance with the provisions of applicable state laws.

The project will cross the Pembina River which is listed in the Nationwide Rivers Inventory and is identified as having Outstandingly Remarkable Values (ORVs) in the Scenery, Geology and Wildlife categories. During the construction phase, the scenic value in the vicinity of the pipeline crossing will be impacted for a short period; specific mitigation and reclamation measures for river crossings will be implemented during and after the pipeline is constructed. After reclamation of the crossing site occurs, the scenic value at that location should be generally restored.

Operation Phase:

The pipeline will be buried except for the relatively few aboveground facilities. The primary impact of the operation phase of the Keystone Pipeline Project is the potential introduction of visual or audible elements (e.g., pump stations), which could alter the setting associated with historic properties. Keystone will mitigate these operational impacts to NRHP-eligible sites by the use of landscaping or other techniques that will minimize or eliminate effects on the historic setting or ambience of standing structures.

j. The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species.

Consultation with the North Dakota Game and Fish Department included a letter received on May 4, 2006 (see Appendix E) that outlined the department's wildlife concerns with the project. The letter enumerated several streams classified as valuable fisheries:

- Pembina River
- Sheyenne River
- Middle Branch of the Forest River

- Tongue River and a specific tributary in Pembina County
- Goose River
- North and South Branches of the Park River
- Middle Branch of the Park River
- North Branch of the Forest River

The department requested either directional drilling of these streams or no construction activities between April 15 and June 1 with appropriate controls to minimize erosion and sedimentation. The department also requested specific mitigation measures for protection of wetlands. The letter indicated that the North Dakota Game and Fish Department did not believe that the project would have any significant adverse effects on wildlife or wildlife habitat, including rare or priority species. There have been changes to the pipeline route since this opinion was received; these route changes will be reviewed with the North Dakota Game and Fish Department to determine if there are any additional concerns.

k. Problems raised by federal agencies, other state agencies, and local entities.

The USFWS provided a letter regarding several segments of the proposed pipeline route that will cross USFWS grassland and wetland easements in North Dakota. Based on this input there have been several proposed reroute areas including the Hecla Sandhills, the effect of which has been to avoid all USFWS grassland easements.

The North Dakota Department of Health raised concerns about the Keystone pipeline's alignment relative to important surficial aquifers in North Dakota, specifically the Pembina River, Icelandic, Fordville, Inkster, Elk Valley, Galesburg/Page, Sheyenne Delta, Milnor Channel, and Hankinson aquifers. Keystone evaluated the relationship between the Keystone pipeline alignment and North Dakota surficial aquifers. Keystone compared surficial aquifer GIS shapefiles from the State of North Dakota with the proposed Keystone alignment. This comparison showed that the revised pipeline alignment will not cross the surficial aquifers listed in the North Dakota Department of Health letter.

2. Identify and Map Criteria

- a. Exclusion areas.** Exclusion areas are areas excluded in the consideration of a route for a transmission facility. The following section identifies and discusses exclusion areas within the proposed corridor and along the proposed route. Maps illustrating the location of exclusion areas within the proposed corridor and on the proposed route are included in Appendix F.

Exclusion Area	Within Proposed Corridor	Along Proposed Route
National Parks	No	No
National Memorial Parks	No	No
National Historic Sites	No	No
National Historic Landmarks	No	No
National Natural Landmarks	No	No
National Monuments	No	No
National wilderness Areas	No	No
North Dakota State Parks	Yes	No
North Dakota State Historic Sites	No	No
North Dakota State Monuments	No	No
North Dakota State Historical Markers	No	No
North Dakota State Archaeological Sites	No	No
North Dakota State Nature Preserves	No	No
North Dakota County Parks	No	No

Exclusion Area	Within Proposed Corridor	Along Proposed Route
North Dakota County Recreation Areas	No	No
North Dakota Municipal Parks	No	No
Parks Owned or Administered by Other Governmental Subdivisions	No	No
Areas Critical to Life stages: Threatened/Endangered Species	No	No
Areas Where Unique or Rare ND State Species Would be Irreversibly Damaged	No	No

- i. Designated or registered national: parks, memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.*

A review of the project corridor did not identify any designated or registered national parks; memorial parks; historic sites and landmarks; natural landmarks; monument; or wilderness areas within the proposed corridor.

- ii. Designated or registered state: parks, historic sites; monuments; historical markers, archaeological sites; and nature preserves.*

The 1-mile pipeline corridor passes through Fort Ransom State Park, however, the construction route does not impact the park. No other state designated or registered areas are located within the proposed one-mile corridor.

- iii. County parks and recreational areas: municipal parks; and parks owned or administered by other governmental subdivisions.*

There are no parks administered by other governmental subdivisions within the proposed one-mile corridor. There are several small areas owned by the North Dakota Game and Fish Department, the USFWS (for waterfowl production), and the Bureau of Reclamation within the pipeline corridor but they are not directly impacted by the construction corridor (see maps in Appendix F)

- iv. Areas critical to the life stages of threatened or endangered animal or plant species.*

A total of five special status wildlife species (gray wolf, bald eagle, greater prairie chicken, whooping crane, and Dakota skipper) and four wildlife species of special concern (Sprague's pipit, Baird's sparrow, swamp sparrow, and northern prairie skink) potentially could occur within suitable habitat along the proposed route in North Dakota. After consultation with the NHP and USFWS, surveys were conducted in 2006 for raptors and native prairie habitat (habitat for the Dakota skipper and Western prairie fringed orchid). In January 2007, aerial surveys for bald eagle nests were conducted in specific wintering areas in Pembina, Ransom, and Walsh counties. Also in 2007, surveys will be conducted for raptors along the entire pipeline route in North Dakota and for the Dakota skipper and Western fringed orchid in potential occurrence areas.

The majority of construction disturbance will occur within agricultural lands and these disturbances will be unlikely to affect populations of sensitive species. Surface disturbance activities along the pipeline ROW will, however, result in the incremental long-term disturbance of portions of native tall-grass prairie, wetland, and woodland habitats which may contain potentially suitable habitat for a number of sensitive species. Preconstruction surveys for federally listed and state listed threatened and endangered species, which will be completed prior to surface disturbance activities, are still to be determined through consultation with the USFWS and state wildlife agencies. Once these surveys are complete and if important habitat or populations are identified, appropriate protection measures will be implemented in order to minimize potential impacts to these species.

The letter received from the North Dakota Game and Fish Department in May 2006 indicated that the department did not believe that the project would have any significant adverse effects on wildlife or wildlife habitat, including rare or priority species. There have been changes to the pipeline route since this opinion was received; these route changes will be reviewed with the North Dakota Game and Fish Department to determine if there are any additional concerns.

- v. *Areas where animal or plant species that are unique or rare to North Dakota would be irreversibly damaged.*

A review of the project study area did not identify any areas in North Dakota where animal or plant species that are unique or rare to the state will be irreversibly damaged in the proposed corridor or along the proposed route. This was confirmed by the North Dakota Game and Fish Department (May 2006 letter). However, biological and habitat surveys will be continuing in 2007.

Impacts from construction activities are expected to be short-term – except for the permanent ROW and pump stations, all other potentially impacted areas will be returned to previous uses and vegetative growth.

b. Avoidance areas

Avoidance areas are areas that are not considered in the routing of a transmission facility unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area shall be included unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone.

Avoidance Area	Within Proposed Corridor	Along Proposed Route
National Historic Areas	No	No
National Wildlife Areas	No	No
National Wild, Scenic or Recreational Rivers	No	No
National Wildlife Refuges	No	No
National Grasslands	No	No
ND Wild, Scenic or Recreational Rivers	No	No
ND Game Refuges	No	No
ND Game Management Areas	Yes	No
ND Management Areas	No	No
ND State Forests	Yes	Yes
ND State Forest Management Lands	Yes	Yes
ND Grasslands	No	No
Historical Resources Which Are Not Specifically designated as Exclusion or Avoidance Areas	Potentially	No
Areas Which are Geologically Unstable	No	No
Within Five Hundred Feet of a Residence, School or Place of Business	Yes	Yes
Reservoirs and Municipal Water Supplies	No	No
Water Sources for Organized Rural Water Districts	No	No
Irrigated Land	Yes	Yes
Areas of Recreational Significance Which Are Not Designated as Exclusion Areas	No	No

Keystone also considered minimal crossing distances to include water sources, rural protection areas, well heads, wetlands, aquifers, and woodlands. The impacts on Avoidance Areas are discussed below:

- i. *Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.*

Registered National and Historic Districts

Registered National and Historic Districts resources are included in the previously discussed North Dakota Cultural Resource Investigations section discussion.

Wildlife Areas

No national or North Dakota designated wildlife areas will be crossed, with the exception of game and waterfowl management areas (see below). Keystone has refined the pipeline route to minimize potential wildlife disruptions at stream crossings, and in wetlands and native grasslands. Potential disruptions to wildlife during construction will be temporary. The buried pipeline will not impact wildlife activities.

Wild, Scenic, or Recreational Rivers

No designated wild, scenic or recreational rivers will be impacted by the proposed project.

- ii. *Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.*

The Keystone pipeline project will not impact any currently designated state wild, scenic, or recreational rivers. The project will cross the Pembina River which is listed in the Nationwide Rivers Inventory, maintained by the National Park Service. While not classified as a Wild, Scenic or Recreational river, the Pembina River is identified as having Outstandingly Remarkable Values (ORVs) in the Scenery, Geology and Wildlife categories.

Forests and Forest Management Lands

The pipeline route will impact 0.8 miles of the Tetrault Woods State Forest in Pembina County. Specific mitigation and reclamation measures for forested lands have been developed and are described in Keystone’s CMR Plan. The North Dakota State Forest Service has also been consulted on the routing and any special mitigation measures they request will be implemented on state forest lands.

Game Refuges and Game Management Areas

There are no designated USFWS wildlife refuges crossed by the Keystone ROW. The pipeline corridor crosses a number of game management areas – they are as follows:

Milepost	Within Construction Corridor	Ownership	Management
20	No	NDG&F	NDG&F
141.5	No	USFWS – Waterfowl Production	USFWS
180.5 – 181.5	No	NDG&F	NDG&F
181.6 – 182.7	No	USFWS – Waterfowl Production	USFWS
201.7 – 203.2	No	Bureau of Reclamation Wildlife/ Recreation	USFWS

The construction corridor crosses through approximately 22.4 miles of privately owned USFWS easements. In addition, the mile wide pipeline corridor crosses through approximately 23 miles of privately owned USFWS easements (see Maps in Appendix F). Keystone has worked with USFWS to minimize the acreages crossed; however, because of the prevalence of these easements, they cannot be avoided entirely.

Keystone continues to work closely with USFWS and North Dakota State Game and Fish and State Lands Departments to establish revegetation mixtures, any special construction methods, and any time restrictions.

Grasslands

An initial reconnaissance of North Dakota grasslands surveys was completed in 2006. Keystone worked with the USFWS to refine the current pipeline route to avoid all USFWS designated grassland easements. Keystone will develop revegetation mixtures to restore private native grasslands where these areas are crossed, based on consultation with National Resource Conservation Service and the landowner.

iii. Historical resources which are not specifically designated as exclusion or avoidance areas.

The attachments to this application include the cultural resource investigations conducted and the results of those investigations, including the evaluation of historical resources not specifically designated as exclusion or avoidance areas. On the basis of these investigations, Keystone has concluded that the pipeline route does not impact any other historical resources.

iv. Areas which are geologically unstable.

North Dakota lies within an area considered to be at the lowest possible risk for earthquakes in the U.S. There have been no earthquakes of the magnitude capable of damaging welded steel pipelines within North Dakota during historical times.

The pipeline route does not cross any areas that Keystone has determined to be geologically unstable.

v. Within 500 feet (152.4 meters) of a residence, school, or place of business.

Nineteen potential residences are within the proposed pipeline corridor. Keystone intends to contact these landowners to confirm that the structures are actually residences. If so, Keystone will request that the landowners grant waivers of the 500-foot Avoidance Area criterion. In the event that waivers are not obtained from all such landowners, Keystone will endeavor to reroute its pipeline outside of the 500-foot Avoidance Area, except in circumstances where there is no reasonable alternative to routing the pipeline within 500 feet of the structure. Once Keystone has had an opportunity to confirm these residences, request waivers and/or evaluate the feasibility of rerouting outside of the 500-foot area, it will supplement this application to further address this item.

The pipeline route avoids the Barnes County Memory Gardens Cemetery west of Valley City.

vi. Reservoirs and municipal water supplies.

See response related to water resources below.

vii. Water sources for organized rural water districts.

Based on a review of published wellhead maps, the pipeline route does not impact water sources for any organized rural water district.

In North Dakota, there are six locations (five in Pembina County and one in Walsh County) where the pipeline will be within 1 mile of a public water supply well. However, all of these well locations (see **Table 4**) are at least 2,100 feet from the pipeline centerline.

Table 4 Public Water Supplies within One Mile of Pipeline Centerline

County	Approximate Mile Post Marker (mi)	Distance From CL (mi)	Cardinal Direction from CL	PWS Name	Well ID
Pembina	20.24	0.99	east	Cavalier	ND5000201
Pembina	30.67	0.48	east	North Val	ND3401129
Pembina	30.71	0.46	east	North Val	ND3401129
Pembina	30.72	0.40	east	North Val	ND3401129
Pembina	30.72	0.56	east	North Val	ND3401129
Walsh	30.73	0.51	east	North Val	ND3401129

The pipeline corridor will pass through areas where shallow and surficial aquifers also exist. Aquifer data shown on the pipeline corridor maps were derived from a published map entitled: "Glacial Drift Aquifers in North Dakota and Estimated Potential Yields, 1986," published by the North Dakota State Water Commission. This document is a summary of the major glacial-drift aquifers described in the county ground-water reports produced by the US Geological Survey in cooperation with the North Dakota State Water Commission and the North Dakota Geological Survey.

"Shallow" and "surficial" aquifers are considered to have the greatest potential for yielding significant quantities of water for municipal, industrial, and agricultural purposes. In North Dakota, they underlie an area of about 8,900 square miles. It is estimated that about 66 million acre-feet of water is stored in these aquifers.

Shallow alluvial aquifers overlie older bedrock material, may range in thickness from 20 to several hundred feet, and generally have some other rock unit overlying them, with a lower hydraulic conductivity. Where there are two separate alluvial, surficial aquifers stacked on top of one another, the shallower aquifer is generally classified as a "surficial" aquifer. These two aquifers may or may not have some hydraulic interaction. The surficial aquifer also is likely to have some hydraulic interaction with surface waters, but this is not always the case.

Table 5 provides milepost locations for where the Keystone pipeline construction corridor overlies shallow or surficial aquifers.

Since the pipeline will be buried at a shallow depth, it is unlikely that the construction or operation of the pipeline will impact any aquifers that are used for drinking water purposes. Keystone will investigate shallow groundwater when it is encountered during construction to determine if there are any nearby livestock or domestic wells that might be affected by construction activities. Appropriate measures will be implemented to prevent groundwater contamination or interference with available irrigation flows. In the event that construction of the pipeline damages a landowner's well, Keystone will either re-establish the well or provide compensation. Pipeline construction in areas with known surficial aquifers or wetlands will be performed according to current best practices methods to minimize adverse impacts potentially associated with pipeline construction activities. The CMR Plan, which is an attachment to this application, addresses this topic in further detail.

Rural water delivery systems (buried pipelines, etc.) are expected to be encountered along the entire proposed construction route. In preparation for excavation activities, those lines will be duly located by working with local water and irrigation districts and private owners. Wherever possible, the proposed pipeline will be routed under the existing water pipeline and any associated structures. The water pipeline owner will be compensated for any temporary loss of water delivery or other associated losses.

Table 5 Milepost Locations of Shallow or Surficial Aquifers

County	Milepost	Type of Aquifer
Pembina	6.7 – 7.3	Shallow
Pembina	8.0 – 11.8	Shallow
Pembina	12.5 – 16.0	Shallow
Pembina	29.5 – 29.7	Shallow
Steele	119.2 – 121.3	Shallow
Steele	123.1 – 123.9	Shallow
Barnes	123.9 – 124.3	Shallow and surficial
Barnes	124.3 – 125.1	Surficial
Sargent	192.9 – 193.3	Shallow
Sargent	196.8 – 198.1	Shallow
Sargent	202.0 – 206.4	Surficial
Sargent	206.4 – 207.2	Shallow and surficial
Sargent	207.2 – 208.3	Shallow

viii. Irrigated land

North Dakota Administrative Code, Section 69-06-08-102.h, exempts underground transmission facilities such as the buried Keystone pipeline from analysis for impacts to irrigated land. However, the construction corridor in North Dakota crosses only one parcel of irrigated land at milepost 204 – 204.5. Keystone will coordinate during construction to minimize irrigation and drainage systems disruptions with landowners and compensate for damages and resulting lost production; repair, replace, or compensate landowners where irrigation and/or drainage systems are damaged by construction; and compensate landowners for a permanent easement on their property. The operational phase of the Keystone pipeline project will be underground and will avoid impacts to irrigated land.

ix. Areas of recreational significance which are not designated as exclusion areas.

None identified.

- c. Selection criteria. Selection criteria are those environmental resources upon which the project must have an acceptable minimum amount of impact, as determined by the Commission or that those effects will be managed and maintained at an acceptable minimum.**

i. The impact upon agriculture:

- (1) Agricultural production.

Agriculture is the predominant land use with the North Dakota proposed corridor – 2,364 acres out of a total of 3,371 acres or 70 percent. The effects of pipeline construction on agricultural production will be minor and short-term.

Keystone will implement mitigation measures to minimize short-term impacts on agriculture productivity. The mitigation measures will include:

- Burying the pipeline deeper than typical tillage depths;
- Cleaning heavy equipment to limit transport of weeds or soil pests prior to project use;

- Prohibiting construction during prolonged, heavy rainfall to minimize the potentials for soil compaction and reduced productivity;
- Deep tilling or chisel plowing soils or other landowner or land management agency approved method to alleviate compaction;
- Stripping and storing topsoil from over the trench line and returning topsoil to original horizon during backfilling;
- Implementing temporary erosion and sediment control best management practices during construction to minimize loss of soil due to wind or water erosion;
- Removing rocks exposed at the surface during clean-up to restore conditions present prior to construction as closely as practicable;
- Applying tackifier, if required due to excessively windy conditions, following the removal of the topsoil;
- Compensating landowners for crop loss and associated damages;
- Coordinating irrigation and drainage systems disruptions with landowners and compensating for damages and resulting lost production; and
- Repairing, replacing, or compensating landowners where irrigation and/or drainage systems are damaged by construction.

Reclamation and revegetation will be in accordance with applicable permits. Land will be re-contoured to approximate pre-existing conditions and disturbed structures, ditches, bridges, culverts, fences, and slopes will be restored. Rocks that are exposed during construction activities, warning signs, and other construction materials will be removed. Temporary gates will be replaced with permanent fences unless the landowner requests otherwise. Additional mitigation measures are detailed in the CMR Plan.

Permanent impacts on agricultural production are not expected since the pipeline will be buried deep enough to allow continued use of the land. Agricultural use will be allowed on the permanent ROW. Crop production should return to normal within a year or two of the end of the construction period.

(2) Family farms and ranches.

The effects of construction on family farms and ranches are expected to be minor and short-term. The proposed project will impact 418 acres of grassland and rangeland in North Dakota, which is approximately 12 percent of the total construction corridor. The primary impact on family farms will be the temporary loss of standing crops during construction and diminished production for a year or two after construction has been completed. These temporary effects will be mitigated as described in the previous section.

Family ranches will be mainly affected by the prohibition of grazing on those lands required for pipeline construction, which may result in obstacles to livestock movement across construction areas. Once construction is completed, grazing and livestock movement over the permanent ROW could resume. Landowners will be compensated for the temporary loss of land use. Grazing could return to normal after vegetation is re-established.

To minimize the impacts to grazing and movement, the proposed project will implement the following measures, where applicable:

- Arrange with landowners to move or keep livestock to fields not affected by the proposed project;
- Cut and brace fences crossed by the pipeline or other activities and install gates and temporary fencing where appropriate to prevent livestock movement across the ROW;

- Leave access lanes for movement of livestock across the ROW during the construction period, where necessary;
- Strip the existing topsoil, where there is a well-established sod layer, up to a maximum depth of 12 inches, from over the trench only;
- Store topsoil separately and return to its original horizon during backfill;
- Restore the work area to pre-construction contours and re-seed with native mixtures approved with landowner;
- Repair all fences to as good or better condition than existed prior to construction;
- Defer grazing in ROW area until vegetation becomes re-established; and
- Compensate landowners for incremental costs resulting from temporary loss of land use.

All work on pasture and farmlands including access and removal of bevel shavings, litter, and garbage will be in accordance with applicable permits. Temporary gates used for access will remain closed at all times. The temporary gates will be replaced with permanent fence.

Keystone prohibits feeding or harassment of livestock or wildlife, firearms, and pets on the construction ROW. Food and food wastes will be stored and secured.

- (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.

Almost all land suitable for agricultural production along the proposed corridor is or has been cultivated. The corridor crosses only one irrigated parcel in Sargent County.

- (4) Surface drainage patterns and ground water flow patterns

Surface Drainage:

Surface water resources in ND that occur along the proposed pipeline route are located in two water resource and major drainage regions, as identified by their major river systems:

- The Souris – Red – Rainy rivers region
- The Missouri River region

Primary drainages along the proposed route are indicated at a greater level of detail in the topographical maps found in Appendix F. The larger stream crossings proposed in North Dakota include the Pembina River, the Tongue River, the Park River branches, Forest River branches, the Goose River and tributaries, and the Sheyenne River and several of its tributaries. In addition, the proposed route is located alongside Lake Ashtabula on the Sheyenne River in southern Steele County and northern Barnes County. Along the route in Steele County, the surface drainage flows away from Lake Ashtabula. A railroad grade also lies between the proposed route and the lake. Near Sibley in northern Barnes County, numerous side drainages and aquifer outcrops drain toward Lake Ashtabula from the vicinity of the proposed pipeline route. Lone Tree Lake and Lake Taayer also occur near the route, downstream of proposed tributary stream crossings in western Barnes County. Prairie potholes and ponds are common in and along the project route through North Dakota. Numerous small and intermittent drainages will be crossed by the proposed route.

Waterbody Crossings

Depending upon the construction technique used, the installation of the pipeline across water bodies can cause the following impacts:

- Temporary degradation of water quality in the form of increased suspended solids concentrations
- Sedimentation (deposition of solids introduced into suspension by construction activities)
- Channel and bank modifications.

Keystone will consider the use of the following water crossing techniques in North Dakota:

- Open Cut Wet Crossings
- Open Cut Dry Flumed Crossing
- Open Cut Dry Dam and Pump Crossing
- Horizontal Directional Drilling

Keystone is currently proposing to use open cut wet crossings at the crossings located in North Dakota. Depending on agency consultation and further assessment, Keystone may use other crossing techniques for selected waterbodies in the state. Open cut wet crossings involve the direct excavation of the channel and banks in contact with any flow present. At open cut wet crossings, the extent of increased suspended solids concentrations and downstream sedimentation impacts will depend on the flow conditions at the time of construction and the channel substrate. Measures related to managing spoil, timing, access, and equipment are included in the CMR Plan and will be fully implemented during construction. These measures will limit impacts of increased suspended solids concentrations and downstream sedimentation. Most open cut crossings will be completed in 48 hours or less. Larger open cut crossings may take upwards of seven to 10 days.

Runoff and the resulting erosion of lands adjacent to water bodies can lead to the introduction of solids into suspension and the deposition of sediment in-stream. Keystone's CMR Plan includes extensive procedures to limit the extent of disturbed land adjacent to water bodies, to control erosion, and to apply methods to prevent sediments from entering water bodies or wetlands. These measures include Best Management Practices (BMPs), such as clearing limits, buffer strips, drainage diversion structures, and sediment barrier installations. In accordance with the Clean Water Act (CWA), Keystone will comply with the National Pollutant Discharge Elimination System (NPDES) permit process with respect to pipeline construction and operation. Keystone will develop and file a Storm Water Pollution Prevention Plan (SWPPP) as part of the NPDES permitting effort. This SWPPP will include BMPs to minimize soil erosion and sedimentation.

Open cut crossings will involve disturbance of stream banks and channel bottoms. The CMR Plan includes procedures for limiting the extent of this disturbance and for restoring disturbed areas. Restoration includes grading, stabilization, and revetment BMPs. These BMPs embrace bioengineering concepts, which encourage the restoration of natural stream banks.

The pipeline will be buried at an adequate depth under channels, adjacent floodplains, and flood protection levees to avoid pipe exposure caused by usual channel degradation and lateral scour. Determination of the pipeline burial depth will be based on site-specific channel and hydrologic investigations where deemed necessary.

The horizontal directional drilling (HDD) method involves drilling a pilot hole under the waterbody and banks, then enlarging the hole through successive reamings until the hole is large enough to accommodate a prefabricated segment of pipe. Throughout the process of drilling and enlarging the hole, a slurry consisting

mainly of water and bentonite clay will be circulated to power and lubricate the down-hole tools, remove drill cuttings, and hold the hole open. Pipe sections long enough to span the entire crossing will be staged and welded along the construction work area on the opposite side of the waterbody and then pulled through the drilled hole. Ideally, use of the HDD method results in no impact on the banks, bed, or water quality of the waterbody being crossed.

Hydrostatic Test Water Withdrawal and Discharge

Water used for hydrostatic testing of the pipeline will be obtained from surface water resources. Depending on locations, state requirements, and availability, water will be obtained and withdrawn from nearby streams or privately owned reservoirs. Recycling water between test sections will be maximized to reduce withdrawal volumes. Keystone has identified 5 surface water sources in North Dakota, which could provide hydrostatic test water, depending on the flows at the time of testing and the sensitivity of the individual water bodies for other uses.

If water is withdrawn from a sensitive surface water source during a low-flow period or at a time when particular flow ranges are needed for other uses, habitat reductions for water-dependent resources (e.g., fisheries, aquatic invertebrates) could occur. A similar effect on surface water resources could occur if large withdrawals are made from aquifer zones that provide late-season base flows to streams.

Hydrostatic test water withdrawals from surface waterbodies will be made at controlled rates and with equipment that will minimize impacts on stream beds and aquatic life. Keystone will coordinate with federal and state agencies to further identify such water sources and seasonal concerns. Similarly, discharges of hydrostatic testing waters will be made such that water quality requirements are met. Discharge controls will include restrictions on pipeline dewatering rates, velocity control devices (such as splash pups or diffusers) and/or temporary synthetic channel linings.

The maximum hydrostatic test section will be 50 miles in length. The volume for a 50-mile test section of 30-inch pipeline is approximately 9 million gallons. Withdrawal rates and volumes will be designed to avoid impacts to aquatic life and downstream water users. Hydrostatic test water typically will be discharged back into its source waterbody.

Water quality will not be reduced by pipe cleaning or hydrostatic test waters because discharged water will be required to meet water quality standards imposed by the discharge permits issued by the individual states for the permitted discharge locations. Water discharge rates will not exceed the daily discharge criteria referenced in the permits.

Spill Prevention

Refueling and lubricating of all construction equipment will be restricted to upland areas at least 100 feet away from the edge of any streams, wetlands, ditches, and other waterbodies and at least 150 feet away from groundwater wells. Wheeled and tracked construction equipment will be moved to an upland area more than 100 feet away from streams, wetlands, ditches, and other waterbodies for refueling when necessary. Fuels and lubricants will be stored in designated areas and in appropriate service vehicles. Whenever possible, storage sites for fuels, other petroleum products, chemicals, and hazardous materials, including wastes will be located in uplands or at least 100 feet from waterbodies and wetlands. SPCC procedures are described in the CMR Plan and will be implemented in the various states in compliance with 40 CFR 112 (for oil spills) and corresponding state regulations (including NPDES requirements for spills of other substances that may occur during construction activities).

In a few cases, such as for pumps or directional drill equipment located within or near a waterbody or wetland, refueling will be completed within or near a waterbody or wetland. In these situations, the specific measures identified in the SPCC portion of the CMR Plan will be followed.

Normal operations will not adversely affect water resources. Minor surface disturbance activities from pipeline inspection and maintenance may occur infrequently and at widely spaced locations.

Groundwater

Reductions in groundwater quality from spills, leaks, or disposal practices are not anticipated during construction. Most of the aquifers along the route will be at least temporarily isolated from any spills which occur on the land surface. In the unlikely event of an incident, attending personnel will be able to respond to an incident before contaminants migrate into groundwater. Ground disturbance below the surface during construction is usually limited to 6 feet or less. It is possible that activities such as trenching, blasting, drilling, dewatering and backfilling could impact shallow aquifers and create minor and short-term effects on groundwater levels and quality. Impacts to deep aquifers are not expected. In areas with near-surface groundwater or in areas adjacent to surface waterbodies, additional procedures and measures will be implemented as previously discussed in this application and in the CMR Plan.

ii. The impact upon:

(1) Noise-sensitive land uses.

The existing noise environment is characterized by determining ambient noise levels, identifying existing noise sources, identifying noise sensitive receptors in the vicinity of project noise sources, and evaluating local terrain features that may affect noise transmission.

The Keystone Pipeline Project will occur primarily in rural agricultural areas. Because of the primarily agricultural and rural land uses, existing ambient noise levels along the pipeline route are quite low. It is estimated that day-night average levels (L_{dn}) range between 40 dBA (rural residential) and 45 dBA (agricultural cropland). Ambient (background) noise levels occur from roadway traffic, farm machinery on a seasonal basis, pets, and various other household noises. Pipeline areas along major highways and interstate highways may experience higher ambient noise levels of approximately 68 to 80 dBA.

Residences within 500 feet of the ROW will experience short-term inconvenience from construction equipment noise for a period of one week to 30 days. During construction, Keystone will comply with all municipal noise guidelines. In addition, Keystone has agreed to limit construction activities primarily to daylight hours. Noise impacts from construction activities will be mitigated according to the CMR Plan.

During operation of the pipeline, the noise impact associated with the electrically driven pump stations will be limited to the vicinity of those facilities. Noise impacts from the electrically powered pump stations are anticipated to be minor. Keystone will install noise attenuation, if necessary, to ensure that noise levels from Keystone's pump station facilities comply with all applicable federal, state, and local regulations.

(2) The visual effect on the adjacent area.

An analysis of the proposed project corridor did not identify any designed scenic outlooks of viewing areas on or along the route. Visual resource impacts associated with construction of the Keystone Pipeline include removal of existing vegetation, exposure of bare soils, earthwork and grading scars, and landform changes that introduce contrasts. Keystone has aligned the pipeline route to avoid aesthetic features to the extent possible. Visual resource impacts from construction activities will be of short duration with no significant long-term impacts due to implementation of Keystone's mitigation measures outlined in the CMR Plan.

The long-term impacts of aboveground facilities on visual resources will depend on the location of each individual facility and its visibility from the surrounding area. Keystone has located the pump stations based on hydraulic and engineering design considerations but also has considered impacts on aesthetics and sensitive environmental resources in determining the facility locations. Pump stations are located on private land and

will require a small footprint of about 3 acres (130,680 ft²). There will be a series of two to three electrically driven pump units initially installed at each pump station; the number of pumps could be expanded to four or five, depending on whether Keystone elects to expand the throughput capacity of its system. The pump units generally will not be enclosed in buildings and will be connected via aboveground piping and valves. Other facilities will include an electrical transformer and a small control building to house electrical, measurement and control system components. The pumps station site will be enclosed by a chain link fence approximately 6 feet high. **Figure 3** presents an artist's rendering of a typical pump station.

(3) Extractive and storage resources.

The surficial unconsolidated geologic materials crossed by the proposed route are composed of alluvium, lake sediments, and glacial drift. The glacial drift resulted from the action of continental glaciers on the landscape over several glacial episodes. The alluvial deposits have resulted from the action of streams in recent time.

The bedrock geology that underlies the surficial materials along the proposed route are Upper Cretaceous units consisting of the Pierre Formation, Niobrara Formation, the Carlisle Formation, and the Greenhorn Formation. These formations are composed of marine shale, limestone, and sandstone and occur beneath the cover of the glacial and alluvial materials described above. The Cretaceous rocks outcrop along gullies, river valleys, and road cuts along the Pembina Escarpment. No unique geological features that have received state or federal protection will be disturbed by project facilities.

The major mineral resources along the proposed route in North Dakota are sand, gravel, crushed stone, and clay. There are no oil, natural gas, coal, or metallic ore resources. The proposed pipeline route does not cross any active quarries, mines or storage area associated with these kinds of operations. The proposed route does not cross the well pads of any active oil and gas wells. Future wells can be located to avoid the pipeline ROW so that extraction of these resources will not be precluded. Known oil reserves are not associated with the eastern part of the state.

The pipeline (or other utility) may preclude or interfere with the future extraction of underlying mineral resources. The proposed route crosses sand, gravel, clay, and stone deposits in North Dakota where the proposed route is not adjacent to an existing ROW corridor. Glacial sand and gravel deposits occur over a large area within these states and loss of access to underlying deposits will be very small relative to the available mineral materials supply.

(4) Wetlands, woodlands, and wooded areas.

Wetlands

Of the 3,371 acres that will be disturbed in North Dakota for pipeline construction, wetland/riparian areas comprise 197 acres or 5.8 percent. The dominant type of wetland community is palustrine emergent. In addition, farmed and wooded wetlands, although not common, occur occasionally within the proposed corridor and along the proposed route. Wetlands that are wooded will be mitigated as wetlands but mitigation measures for woodlands that are discussed in the following section also will be applied as appropriate.

Effects on wetland vegetation will be greatest during and immediately following construction. To mitigate the potential for these impacts, Keystone will implement specific procedures as outlined in the CMR Plan. The construction ROW width will typically be reduced to 85 feet through certain wetlands to minimize potential effects. Keystone will restore or mitigate impacts to wetlands affected by construction activities, to the extent practicable. Pipeline construction through wetlands must comply, at a minimum, with USACE Section 404 permit conditions. Section 404(b)(1) guidelines restrict the discharge of dredged or fill material into wetland areas where a less environmentally damaging practicable alternative exists.

Typical Pump Station

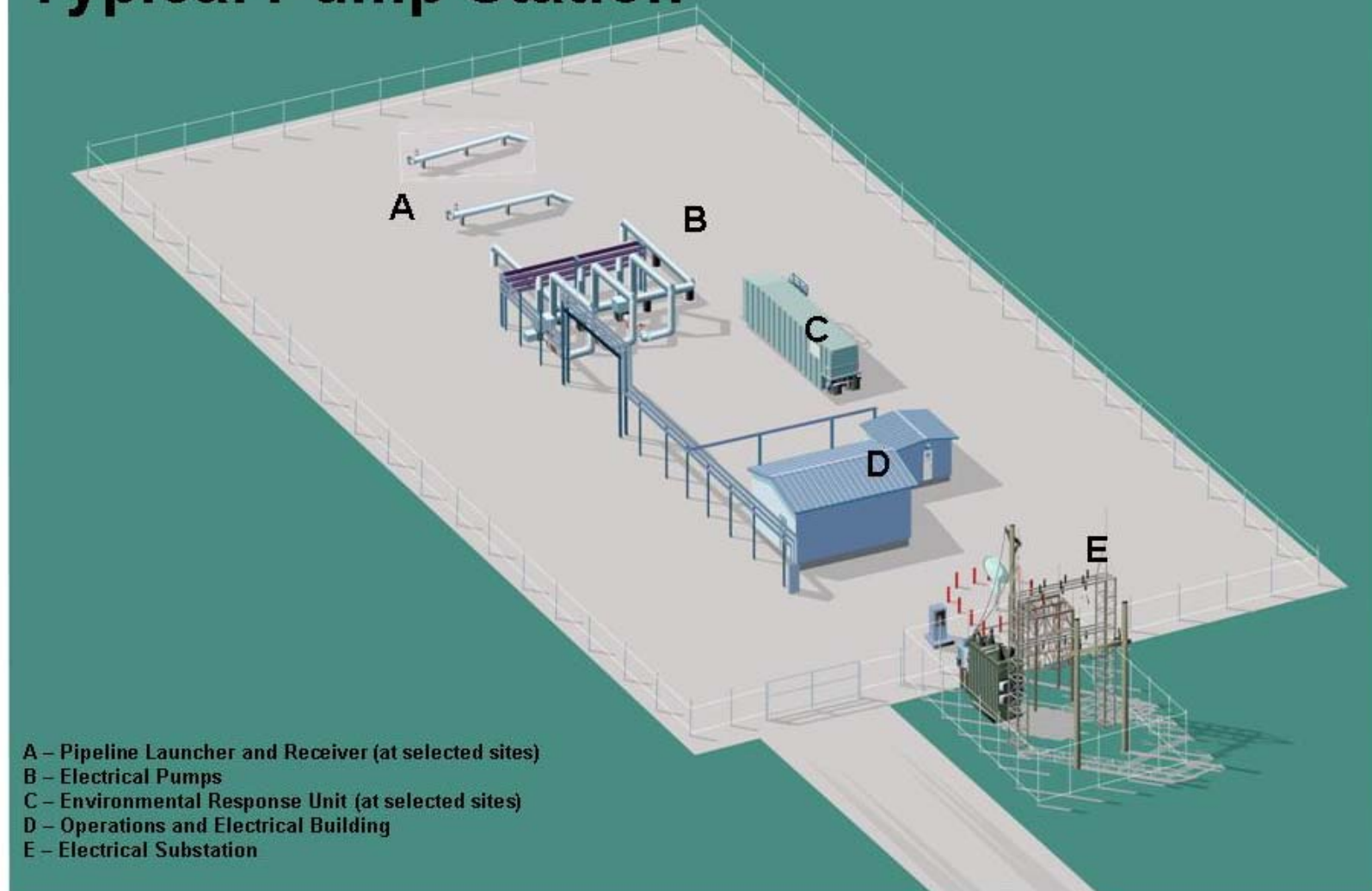


Figure 3 Typical Pump Station

Smaller streams and ephemeral or intermittent drainages will likely be open cut and wetlands located in these areas will be crossed by trenching. However, no installation of surface facilities will occur in wetlands and no permanent loss of wetlands will occur as a result of this project. Herbaceous vegetation in palustrine emergent wetlands is expected to reestablish to pre-construction levels within 3 to 5 years following the completion of reclamation, resulting in a short-term loss of vegetation and available habitat for some wildlife species. Trees in forested wetlands will recover in 20 to 50 years.

As described in the CMR Plan, specific construction techniques will be used to retain the hydrological and vegetation characteristics of wetlands that will be disturbed by construction. These techniques will include:

- Narrowing the ROW;
- Minimizing the duration of construction-related disturbance within wetlands to the extent practicable;
- Attempting to use no more than two layers of timber riprap to stabilize the construction ROW;
- Cutting vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal;
- Limiting pulling of tree stumps and grading activities to directly over the trench line. Not grading or removing stumps or root systems from the rest of the construction ROW in wetlands unless safety-related construction constraints require removal of tree stumps from under the working side of the construction ROW;
- Segregating the top 12 inches of topsoil from the area disturbed by trenching in standard wetlands, where practicable. After backfilling is complete, restoring topsoil to its approximate original stratum;
- Dewatering the trench in such a manner that does not cause erosion and heavily silt-laden water does not flow directly into any wetland or waterbody;
- Avoiding sand blasting in wetlands to the extent practicable. If sandblasting is performed within a wetland, a tarp or suitable material will be placed in such a way as to collect as much waste shot as possible and dispose of the collected waste. All visible deposits of wastes will be cleaned up and disposed at an approved disposal facility;
- Removing all timber riprap and prefabricated equipment mats upon completion of construction;
- Locating hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable;
- Not storing hazardous materials, chemicals, fuels, or lubricating oils, or performing concrete coating activities in a wetland, or within 100 feet of any wetland boundary; and
- Refueling all construction equipment in an upland area at least 100 feet from a wetland boundary.

Over the operational life of the pipeline, woody vegetation in forested wetlands will be removed periodically above the pipeline (approximately 15 feet on each side of the centerline) to maintain visibility of the area above the pipeline for aerial pipeline observation and to permit access to all areas along the pipeline in the event of an emergency.

Woodlands and Wooded Areas

Woodlands and wooded areas comprise only 40 acres or 1 percent of the 3,371 acres to be disturbed during construction. However, woodlands are important wildlife habitat since they are relatively scarce in North Dakota. They can also offer critical habitat for some of the species of special concern described in previous sections.

Construction of the pipeline will necessitate clearing of the ROW and permanent conversion of the affected wooded areas for the permanent ROW. The permanent ROW will be maintained free of trees for the life of the project. Within that permanent ROW, a 30-foot-wide corridor, centered on the pipeline, will be maintained solely in a herbaceous condition. Trees and shrubs will be removed during clearing activities and converted to early successional herbaceous and grassland communities. Trees and shrubs eventually will reinvade the temporary easement area after construction. However, shrubs will not become reestablished in the temporary easement area naturally for approximately 5 years or more and trees will require a minimum of 20 years or more, depending on species and age of woodlands cleared. Additional mitigation measures for wooded areas will include:

- Selective cutting of mature shrubs and trees in the construction ROW to preserve such vegetation where possible; and
- Cutting of vegetation flush to the surface of the ground, where practical, so that root stock is left in place to promote re-growth after construction.

Keystone will monitor revegetation success along the pipeline ROW in accordance with applicable permits and agency guidance.

(5) Radio and television reception, and other communication or electronic control facilities

Analysis of the proposed project corridor did not identify any radio, television or other communication or electronic control facilities. No effects on radio, television or communications reception are expected from construction or operational activities.

(6) Human health and safety

The U.S. has the world's largest petroleum pipelines network. Pipelines are the safest, most reliable, and efficient mode of transporting large volumes of crude oil. Pipeline transportation of crude oil involves some risk to the public despite its excellent safety record. The risks include the potential for fire and toxic exposure, ingestion, and inhalation from crude oil.

Pipeline safety is mandated under the authority of the U.S. Department of Transportation (USDOT). The USDOT pipeline standards (49 CFR Part 195) are intended to ensure public protection and to prevent accidents and failures. 49 CFR Part 195 specifically addresses petroleum pipeline safety issues and specifies material selection, qualification, minimum design requirements; and protection from internal, external, and atmospheric corrosion. The Office of Pipeline Safety (OPS) of the USDOT administers the national regulatory program to ensure safe transportation of crude oil and other hazardous materials by pipelines. OPS develops safety regulations and risk management approaches to encompass safety in pipeline design, construction, testing, operation, maintenance, and pipeline facilities emergency response.

The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone pipeline, there will be a very low likelihood of a crude oil release (leak or spill) from the pipeline that could enter surface water resources and drinking water supplies. On July 10, 2006, Keystone submitted two key documents to the DOS: a preliminary Emergency Response Plan (ERP) and a preliminary pipeline risk assessment and environmental consequence analysis. The ERP outlines the measures that Keystone will implement in the event of an accident. The preliminary risk assessment evaluates accidental release of crude oil from the pipeline. The assessment included the likelihood of crude oil releases and potential for environmental affects, depending upon release volumes and locations. Based on refinements of the route, hydraulic models, and additional engineering information, a final risk assessment and environmental consequence analysis was submitted to the DOS in April 2007.

To reduce the amount of product that could enter surface waters, federal regulation (49 CFR Section 195.260(3)) stipulates that new pipelines must have valves installed on both sides of any waterbody, which has at least a 100 foot width between ordinary high water marks. These additional valves will further aid in minimizing the amount of material, which could be released into other waterbodies in the unlikely event of a spill. The location of valves, spill containment measures, and Keystone's ERP will minimize adverse effects to perennial, intermittent, and ephemeral waterbodies, as well as to groundwater.

The OPS Rules on Pipeline Integrity Management in High Consequence Areas for Hazardous Liquid Operators specify conventions for assessing, evaluating, repairing, and validating the integrity of hazardous liquid pipeline segments that could have high consequences. High consequence areas (HCAs), as defined by 49 CFR Section 195.450, are high population areas (urbanized area that contains 50,000 or more people and that has a density of at least 1,000 people per square mile), other populated areas (a place that contains a concentrated population), unusually sensitive areas as defined by 49 CFR Section 195.6 (ecosensitive and drinking water), and commercially navigable waterways.

Pipeline operators are required to develop a written integrity management program (IMP) that must include methods to measure the program's effectiveness in assessing and evaluating integrity and protecting high consequence areas. Keystone will develop and implement an IMP for the entire pipeline including the HCAs. 49 CFR Part 195 also requires pipeline operators to develop and implement public awareness programs consistent with the American Petroleum Institute's Recommended Practice 1162, Public Awareness Programs for Pipeline Operators. The purpose of Recommended Practice 1162 is to enhance pipeline safety and security by increasing the public understanding of the role of pipelines in transporting energy, informing the public how to recognize and respond to a pipeline emergency, and notifying the public of whom to contact in an emergency. Recommended Practice 1162 contains provisions for enhancing liaison with emergency responders and public officials. Keystone's public awareness program applies to the relevant portions of the CMR Plan to construct and operate the proposed pipeline.

(7) Animal health and safety.

Impacts to white-tailed deer and other big game will include the incremental loss of potential forage (native vegetation and croplands) and will result in an incremental increase in habitat fragmentation within the proposed surface disturbance areas. However, these incremental losses of vegetation will represent a small percentage (far less than one percent) of the overall available habitat within the project region. Indirect impacts will result from increased noise levels and human presence during surface disturbance activities. Because white-tailed deer have adapted to human activities and land uses, displacement from construction areas are likely to be short-term.

Potential impacts to small game from the Keystone Pipeline Project will result in the incremental loss of habitat and increased habitat fragmentation until vegetation is reestablished. Indirect impacts could include the temporary displacement of small game from the disturbance areas as a result of increased noise and human presence. Displacement or loss of small game animals from disturbance areas will be short-term because of their generally high reproductive potentials and the fact that animals will return to the disturbance areas following completion of construction and reclamation activities. Overall, losses of small game species and their habitats will be relatively small since most habitat loss will occur within agricultural habitats.

Direct impacts to non-game species from surface disturbance activities will result from the incremental long-term loss of habitat and increased fragmentation until vegetation is reestablished. Potential impacts also will result in mortalities of less mobile or burrowing non-game species (e.g., small mammals, birds, reptiles, amphibians, invertebrates) due to exposure to vehicles and construction equipment traffic. Potential direct impacts also could include nest or burrow abandonment or loss of eggs or young where construction occurs during the breeding season. Other impacts will include the short-term displacement of some of the more mobile species (e.g., medium-sized mammals, adult birds) as a result of surface disturbance. Displacement or loss of non-game species from disturbance areas will be short-term because of their generally high

reproductive potentials and the fact that animals will return to the disturbance areas following completion of construction and reclamation activities.

After construction is completed, normal pipeline operations will have negligible effects on terrestrial wildlife resources. Direct impacts to wildlife species populations and habitats from extensive maintenance activities such as physical pipe inspections or ROW repair will be the same as those discussed above for construction. In order to reduce potential impacts to important wildlife resources as a result of maintenance activities, Keystone will consult with the appropriate state wildlife agencies prior to the initiation of maintenance activities beyond standard inspection measures. The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone Pipeline there will be a very low likelihood of a crude oil release from the pipeline, which could injure wildlife individuals and habitat.

Water withdrawal for hydrostatic testing could entrain small fish and drifting macroinvertebrates. The expected numbers of organisms removed during entrainment is considered to be relatively small in relation to the overall numbers in the stream or river. In summary, hydrostatic testing will result in minor impacts to aquatic biota. The discharge of hydrostatic test water will follow state permit requirements, which will reduce potential effects on water quality or aquatic organisms. Energy dissipaters also will be used to prevent erosion at discharge locations.

Routine maintenance of the pipeline ROW will consist of periodic vegetation clearance. Vegetation removal adjacent to waterbodies will be limited to the removal of trees encroaching on the 50-foot operational ROW. As a result, maintenance activities will not affect aquatic biota or their habitat.

The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone pipeline there will be a very low likelihood of a crude oil release from the pipeline that could injure aquatic biota and habitats.

(8) Plant Life

A review of the project area in North Dakota identified four types of vegetation communities – agricultural/cropland, grassland/rangeland, forest and wetland/riparian. The predominant vegetation community is agricultural/cropland followed by grassland/rangeland, wetland/riparian and forest.

Agricultural/Cropland

Construction of the pipeline will disturb approximately 2,364 acres (70 percent of the proposed corridor) of agricultural use lands. Section D.2.c discusses the impacts on agricultural lands and the mitigation measures that will be taken to minimize those impacts.

Grassland/Rangeland

Construction of the pipeline will disturb approximately 418 acres (12 percent of the proposed corridor) of grassland/rangeland. Grassland and rangeland areas are primarily a mix of tall to short grass prairie with occasional occurrence of non-native, cool season grasses. Grasslands, especially in southeastern North Dakota, primarily support native grass and forb species typically associated with the mixed grass prairie and are considered important habitat areas for special status plant and wildlife species. Dominant species include bluestem, blue grama, green needlegrass, needle and thread and Western wheatgrass.

The proposed project will impact grassland and rangeland areas by temporarily clearing vegetation in the corridor. These areas are expected to recover in one to three growing seasons after construction is completed. Long-term or permanent impacts are not expected. Keystone will promote recovery of these areas by

removing and then restoring topsoil and reseeding all disturbed areas with grass mixtures approved by the local Soil Conservation Service office or the landowner.

Wetland/Riparian

Construction of the pipeline will disturb approximately 197 acres (6 percent of the proposed corridor) of wetland/riparian areas. The CMR Plan delineates measures that will be implemented in these areas to minimize impacts.

Forest

Construction of the pipeline will disturb approximately 40 acres (1 percent of the proposed corridor) of forested areas. Impacts and mitigation measures are discussed in Section D.2.c.

Developed Land

Construction of the pipeline will disturb approximately 335 acres (10 percent of the proposed corridor) of developed land. Development consists primarily of existing ROWs and contractor yards – impacts to residential, farming and ranching operations are minimal.

d. Policy Criteria

Policy criteria are those factors which are positively affected by a project that may lead the Commission to give preference to an applicant.

i. Location and Design

The proposed Keystone route was developed through an iterative, multidisciplinary route selection process. This process involved the systematic identification of objectives, control points, collection of data, review of alternatives and continual reassessment of these factors. The route through North Dakota is largely defined by two distinct control points. The Keystone project involves the conversion of an underutilized natural gas pipeline in Canada to crude oil. The location of this existing pipeline suggests the new pipeline will enter the US in Cavalier County, North Dakota, a border-crossing location which serves as a primary control point. Optimal access to markets in Cushing, Oklahoma and Wood River, Illinois requires the pipeline to proceed generally south from this border crossing control point which then requires a crossing of the Missouri River. The optimum location to cross the Missouri River is near Yankton South Dakota which serves as a second control point.

Using these control points, the route has been further developed in North Dakota through the iterative review and assessment of input from agencies, other stakeholders, environmental studies and cultural surveys. This iterative process has allowed the consideration of numerous environmental, design and construction factors in order to derive an optimum route which balances these disciplines. TransCanada has designed the proposed pipeline route in coordination with federal, state, and local agencies to avoid, as much as possible, high value habitat, aquifers, and recreational use area. The proposed pipeline route is practical in that it minimizes potential adverse impacts to North Dakota's environment while transporting crude oil to assist in meeting the Nation's energy demands.

Keystone's studies considered three primary route alternatives and Keystone is in the process of finalizing a route that avoids to the maximum extent possible: wetlands, grasslands, shallow aquifers, communities, and other valuable resources designated by the USACE, USFWS, and state agencies and local concerns.

Buried pipelines are the safest method of transporting hydrocarbons, including oil and gas products. Transporting crude oil in a buried pipeline will reduce the potential risk of accidents and intentional tampering.

The pipeline will be designed, constructed, and operated to meet or exceed the requirements of the Code of Federal Regulations, Title 49, Part 195, "Transportation of Hazardous Liquids by Pipeline" and industry standards. A summary table of Keystone pipeline parameters is attached as Appendix H.

Operation of a buried pipeline and selection of a route was specifically designed to reduce the impact on North Dakota land owners, agricultural and wooded areas, grasslands, aquifers, and sensitive environmental resources and habitats.

The CMR Plan applies to work on all project lands including the following:

- Uplands including agricultural (cultivated or capable of being cultivated) lands, pasture lands; range lands; grass lands; forested lands; lands in residential, commercial, or industrial areas; lands in public ROWs; and lands in private ROWs
- Wetlands
- Waterbodies and Riparian lands

Keystone will implement CMR actions to the extent that they do not conflict with the requirements of any applicable federal, state and local rules and regulations and other permits and approvals that are obtained by Keystone for the project. Additionally, Keystone may deviate from specific requirements of this Plan on specific private lands as determined through negotiations with landowners or as required to suit actual site conditions as determined and directed by Keystone. All work will be in compliance with federal, state, and local permits.

ii. Training and Utilization of Available Labor in North Dakota for the General and Specialized Skills Required

The number of construction workers that will be employed during construction will vary depending on the chosen construction contractors, the construction approach taken, and the construction phase. The spreads constructed in North Dakota are expected to employ approximately 500 to 600 construction personnel during the peak construction seasons.

The Keystone pipeline project construction work will be temporary. The pipeline and facilities will be constructed utilizing organized labor from union locals whose geographic jurisdictions include North Dakota for the United Association, Teamsters, Operators, and Laborers. Each of these labor unions has requirements for joining their unions and also provides training and apprenticeship programs for new members. Utilization of available labor in North Dakota for pipeline construction will be limited to persons that are current members or join the referenced labor unions. Since pipeline construction is very specialized, it is likely most local hiring will be for general labor or truck drivers.

The number of construction workers that will be hired locally will also vary by contractor and by the availability of specifically trained residents available for pipeline construction employment. If this project is awarded to a non-local contractor, the likelihood of local employment is diminished because the skilled workers are retained and commonly travel to project work sites. Specialized pipeline construction skills are not readily available in the general workforce.

A small percentage of permanent jobs will likely be awarded to local workers for pipeline operations. For example, Keystone may hire three to four permanent employees to monitor the pump stations and to perform other minimal routine surveillance and corridor maintenance duties.

iii. Economics of Construction and Operations

Pipelines are integral to transporting crude oil from processing to use. Pipelines safely and reliably transport approximately two-thirds of the petroleum products shipped in the U.S. annually.

The U.S. network of petroleum pipelines is the largest of any country. Transporting large volumes of crude oil over long distances by pipeline is less expensive and safer than transport by truck, railcar, barge, or tanker. Pipelines are the safest, most reliable, and efficient mode of transporting crude oil. The Keystone pipeline will be operated as a common carrier pipeline and could boost North Dakota's ability to transport crude oil and receive economic benefits.

The local economies could benefit from temporary hiring of local employees and from the influx of non-local construction workers. Payroll taxes for the project will increase income tax revenue.

Economic benefits to local businesses will likely be increased through the sales of food, goods, services, and lodging that will be generated by the temporary non-local workforce. This increase in consumer demand could temporarily boost the local economies through hiring of additional temporary employees or longer work hours for the existing employed workforce.

Food and lodging expenditures are anticipated to be approximately \$3.25 million. Temporary workers' estimated retail purchases with added state and local government taxes will add approximately \$270,000 of additional revenue.

Keystone will purchase some construction materials and other supplies for the project from local businesses. Local purchases for construction will include consumables, fuel, equipment rental, space leasing, miscellaneous construction-related materials such as office supplies, and some medical/dental needs. Estimated local materials purchase cost estimates will be over \$750,000.

Sales taxes, land based taxes, and other taxation methods will be of greater economic significance to State and local revenues. Based on current tax rates, the Keystone pipeline is estimated to generate approximately \$5.2 million in property tax revenue for the North Dakota economy annually. Purchases, equipment rental leases, equipment maintenance and repairs, storage areas, fuel for construction vehicles and associated equipment, licensing and permitting fees will all provide additional economic benefits to the state during pipeline construction.

Keystone will pay ad valorem taxes to the local governments during the years of operation of the pipeline for the use of the corridor and associated pipeline facilities. The state centrally assesses the pipeline and facilities and the total valuation is allocated among the affected local counties. The allocation is based on their respective shares of the installed pipelines and facilities. The construction cost initially provides the basis for the pipeline system valuation assessment. With time, the assessment focuses on the pipeline facilities' contribution to the system-wide income and depreciated value. Generally, the assessment decreases over time. However, ongoing revenues to the counties should be significant.

iv. Use of Citizen Coordinating Committees

Citizen coordinating committees were not used for the Keystone pipeline project. However, Keystone scheduled and attended five open houses and received feedback that resulted in modifications to the pipeline routing and scheduling. Keystone has opened an office in Valley City, North Dakota to support coordination of construction activities and provide the public with a local resource for the project.

v. A Commitment of a Portion of the Transmitted Product for Use in This State

Keystone does not own the crude oil that will be transported through the pipeline system. Keystone will transport crude oil for shippers as a common carrier. Keystone will transport crude oil subject to a tariff prescribing rates, terms and conditions of service, subject to regulation by the Federal Energy Regulatory Commission (FERC) under the Interstate Commerce Act.

vi. Labor Relations

The Keystone pipeline will be constructed utilizing contractors that are signatory members to the Pipe Line Contractor's Association (PLCA) which has national labor agreements with the unions that cover pipeline construction work. During the over 50-year relationship between the PLCA and the pipeline construction unions, there have not been any significant labor disputes and, therefore, Keystone does not anticipate adverse labor relations on this project.

vii. The Coordination of Facilities

Keystone will notify all owners of existing utilities and infrastructure of the proposed pipeline route and request the requirements to cross these facilities. Company representatives of the owners of these facilities will be notified so they can be present at the time of crossing if they choose to do so.

The proposed project will coordinate with local electric power cooperatives to plan the required electrical transmission supply needed for each pump station operation. The utility providers will construct approximately 21 miles of new 69-kV, approximately 16 miles of 115-kV, and approximately 10 miles of 230-kV transmission lines and substations to supply power to the Keystone pump stations.

viii. Monitoring of Impacts

Keystone is committed to protecting the environment and complying with all applicable laws, regulations, and standards. Keystone will ensure environmental compliance during construction through environmental training, environmental inspections, and post-construction monitoring. In addition, operations and maintenance (O&M) programs per the Keystone IMP will be performed. During operations, Keystone will utilize a supervisory control and data acquisition system (SCADA) which provides for continuous, remote monitoring and control of pipeline operations. Additionally, visual surveillance will be conducted in accordance with 49 CFR Section 195.412.

Keystone is proposing to implement training and two types of monitoring on this project to help ensure compliance with environmental, safety, landowner, and company requirements as follows:

Environmental Training

Experienced, well-trained personnel are essential for the successful construction and operation of the proposed pipeline project. To communicate the project requirements to personnel, Keystone will require environmental training of all project personnel prior to construction. In addition, Keystone and its contractors will undergo prevention, response, and general safety training. The training program will be designed to improve awareness of environmental and safety requirements, pollution control laws and procedures for proper operation and maintenance of equipment.

Keystone will require that the contractors ensure that all persons (contractors' and subcontractors' personnel) engaged in work associated with the pipeline's construction are informed of the construction issues and concerns, and that they attend and receive training regarding these requirements as well as all laws, rules and regulations applicable to the work. Required environmental training and certification will be required for all personnel including Keystone personnel visiting or working on the job site.

Different levels of training will be required for different groups of contractor personnel. Contractor supervisors, managers, field foremen, and other contractor personnel designated by Keystone will attend a full-day, comprehensive environmental training session. All contractor personnel will attend a one-to-two-hour group training session before the beginning of construction and during construction as new personnel are assigned or as environmental issues and incidents warrant. All visitors and any other personnel without specific work assignments will be required to attend a brief safety and environmental awareness orientation.

Training will be acknowledged on a training form and the records of proof-of-training will be maintained for the duration of the project. Each successfully trained individual will receive a copy of the training material and a hardhat certification sticker. Only personnel displaying the hardhat training sticker will be allowed on a job site. A copy of environmental training certification will be maintained in each individual's personnel file.

To provide on-site documentation of compliance, Keystone will utilize a team of inspectors overseeing environmental, safety and, quality. Keystone will require training of all inspectors to the company's construction specifications. A review of the landowner and permit requirements with the applicable inspectors will also be required.

Environmental Inspection

Keystone is committed to environmental compliance. Keystone's environmental inspectors will be responsible for overseeing the contractor's compliance with environmental requirements, project specifications, permits and landowner requirements during construction activities. The environmental inspector's primary responsibility will be to observe construction-related activities and monitor compliance with, and provide interpretation of, the environmental requirements specific to the Keystone project. The environmental inspector will be qualified to perform the environmental compliance evaluations and interpretations required to preserve the environment. The environmental inspector's duties include documenting and preparing written project compliance and non-compliance reports and recommending corrective measures where non-compliance is observed. The inspectors will follow up to see and document that all non-compliances are corrected. If environmental damage or the safety of the workers or the public is imminent, the environmental inspector will have the authority to stop a non-compliance activity until the concern can be resolved.

On-site environmental compliance by Keystone's contractors will be documented. Keystone will use at least one full-time environmental inspector during active construction activities. The site supervisor will be responsible for the inspector's duties if the environmental inspector is not available on site.

Post-Construction Monitoring and Maintenance Programs

Keystone will conduct post-construction monitoring of the project area to minimize the potential for long-term adverse impacts of the environment. Operations and maintenance programs such as vegetation management, pipeline maintenance, integrity surveys, hydrostatic testing or other programs may have an impact on the final reclamation of the ROW. To ensure that the integrity of the facility and land surface reclamation of the ROW is maintained after completion of construction and that regulatory requirements are adhered to during operations, the following measures will be implemented unless otherwise directed by Keystone in response to site specific conditions or circumstances:

- Post construction monitoring inspections will be conducted of disturbed areas after the first growing season to determine the success of revegetation. Areas which have not been successfully re-established will be revegetated by Keystone or by compensation of the Landowner to reseed the area. If, after the first growing season, revegetation is successful, no additional monitoring will be conducted.
- In non-agricultural areas, revegetation will be considered successful if, upon visual survey, the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation will be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.
- Keystone will maintain communication with the landowners and or tenants throughout the operating life of the pipeline to allow expedient communication of issues and problems as they occur. Keystone will provide the landowners with corporate contact information for these purposes. Keystone will work with landowners to prevent excessive erosion on lands disturbed by construction. Reasonable methods will be implemented to control erosion. This may not be implemented if the property across

which the pipeline is constructed is bare cropland which the landowner intends to leave bare until the next crop is planted.

- In wetland areas, all timber riprap, timber mats, and prefabricated equipment mats will be removed upon completion of construction. The contractor will replace topsoil, as applicable, and spread to its original contours in the wetland as possible with no crown over the trench. Any excess spoil will be removed from the wetland. The contractor will stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and re-vegetation, as applicable, during final clean up. For each standard wetland crossed, the contractor will install a permanent slope breaker and trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. The contractor will locate the trench breaker immediately upslope of the slope breaker.
- Vegetation maintenance will not be conducted over the full width of the permanent ROW in wetlands. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 30 feet wide may be maintained in an herbaceous state. In addition, trees within 30 feet of the pipeline greater than 15 feet in height may be selectively cut and removed from the permanent ROW.
- Herbicides and pesticides will not be used in or within 100 feet of a wetland except as allowed by the appropriate land management agency or state agency.

The success of wetland re-vegetation will be monitored after construction until wetland re-vegetation is successful except in circumstances where property is purchased and developed. Wetland re-vegetation will be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If re-vegetation is not successful at the end of 3 years, a remedial re-vegetation plan will be developed in consultation with a professional wetland ecologist to actively re-vegetate the wetland. Re-vegetation efforts will continue until wetland re-vegetation is successful.

ix. Utilization of Existing and Proposed ROWs and Corridors

Keystone has evaluated the utilization of existing ROWs and corridors through North Dakota during routing studies, but use of such existing ROWs was not determined to be feasible. Therefore, the Keystone pipeline route does not utilize existing and proposed ROWs and corridors. However, the pipeline route is parallel and adjacent to public roads and certain utilities in some areas.

Keystone will acquire easements and work with the landowners and managers to minimize impacts to sensitive environmental and agricultural resources. Section D addresses impacts to environmental and agricultural resources. Maps depicting the proximity of the proposed pipelines to sensitive environmental and agricultural resources are included in Appendix F.

x. Other Existing or Proposed Transmission Facilities

Keystone's proposed project is a new initiative that is focused on providing pipeline transportation capacity for crude oil from Alberta to consumers in the U.S. The only other major oil transmission line traversing through the state of North Dakota is the Enbridge Lakehead Pipeline System. This is a 3,100 mile pipeline initiating in Edmonton, Alberta Canada which delivers approximately 1.4 million barrels of crude oil each day to the major oil refineries in the American Midwest and the province of Ontario, Canada. The pipeline crosses the northeast corner of Pembina County and consists of approximately 22 miles of pipeline ROW in the State of North Dakota. There are no existing or proposed transmission facilities in North Dakota that feasibly can be utilized or consolidated by TransCanada to meet shipper demands for delivery to specific markets.

e. Design and Construction Limitations

Refer to Section A for design and construction limitations.

f. Economic Considerations

Section D and the Route Permit Application discuss economic considerations.

3. Mitigative Measures

Keystone-specific mitigation measures are set forth in the CMR Plan, a copy of which is attached as Appendix G.

4. List of Preparers

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Kaye Laughlin

Todd White

Donald Wodek

5. Maps

- a. Maps identifying the criteria within the proposed pipeline corridor and route are included in Appendix F.
- b. Mylar maps are no longer in use.

6. Permits, Licenses, Approvals, and Consultation Requirements

The following table (**Table 6**) is a summary of the federal and state permits, licenses, and approvals required for construction of the Keystone pipeline project in North Dakota.

Table 6 Permits, Licenses, Approval, and Consultation Requirements

Agency	Permit or Consultation/Authority	Agency Action
FEDERAL		
Department of State (DOS)	Presidential Permit, Executive Order 11423 of August 16, 1968 (33 Fed. Reg. 11741)	Approve cross-border facilities. DOS is lead Federal agency for NEPA purposes.
U.S. Corps of Engineers (USACE) – Omaha District	Section 404, Clean Water Act (CWA)	Section 404 permits for the placement of dredge or fill material in waters of the U.S., including wetlands.
	Section 10 Permit (Rivers and Harbors Act of 1899)	Section 10 permits for pipeline crossings of navigable waters.
Federal Highway Administration	Encroachment Permit	Permits for the crossing of federally funded highways.
Office of Pipeline Safety	49 CFR Part 195	Review and approval of Integrity Management Plan for High Consequence Areas.
	49 CFR Part 194	Review and approval of Emergency Preparedness Plan.
U.S. Environmental Protection Agency (EPA), Region VIII	Section 401, CWA, Water Quality Certification	Water use and crossing permits for non-jurisdictional waters. Implemented through each state's Water Quality Certification Program.
	Section 402, CWA, National Pollutant Discharge Elimination System (NPDES)	Review and issue NPDES permit for the discharge of hydrostatic test water. Implemented through each state's Water Quality Certification Program.
NORTH DAKOTA		
Public Service Commission	Energy Conversion and Transmission Facility Siting Act Corridor certificate; Route Permit	Permits for construction of a pipeline within an approved corridor, and along an approved route.

Table 6 Permits, Licenses, Approval, and Consultation Requirements

Agency	Permit or Consultation/Authority	Agency Action
Department of Health, Division of Water Quality	Section 401, CWA, Water Quality Certification	Permit for stream and wetland crossings/consultation for USACE 404 process.
	NPDES Temporary Dewatering / Hydrostatic Testing Permit (NDG07000)	Permit regulating hydrostatic test water discharge, and construction dewatering to waters of the state.
	NPDES Storm Water Discharge Permit	Permit regulating discharge of storm waters from the construction work area. Reviewed in conjunction with Section 401 application.
		Permit for construction of pipeline in a floodway. Reviewed in conjunction with 401 permit application.
Department of Transportation	Encroachment Permits	Permits for encroachment on state highways.
County Road Departments	Encroachment Permits	Permits for encroachment on county roads.

Appendix A

Documents Filed by Keystone with Various Agencies that Evaluate Environmental Impacts

(see DVD)

Appendix B

Cultural Resource Documentation

(see DVD)

Appendix C

Biological Resources and Wetlands

(see DVD)

Appendix D

Biological Reports

(see DVD)

Appendix E

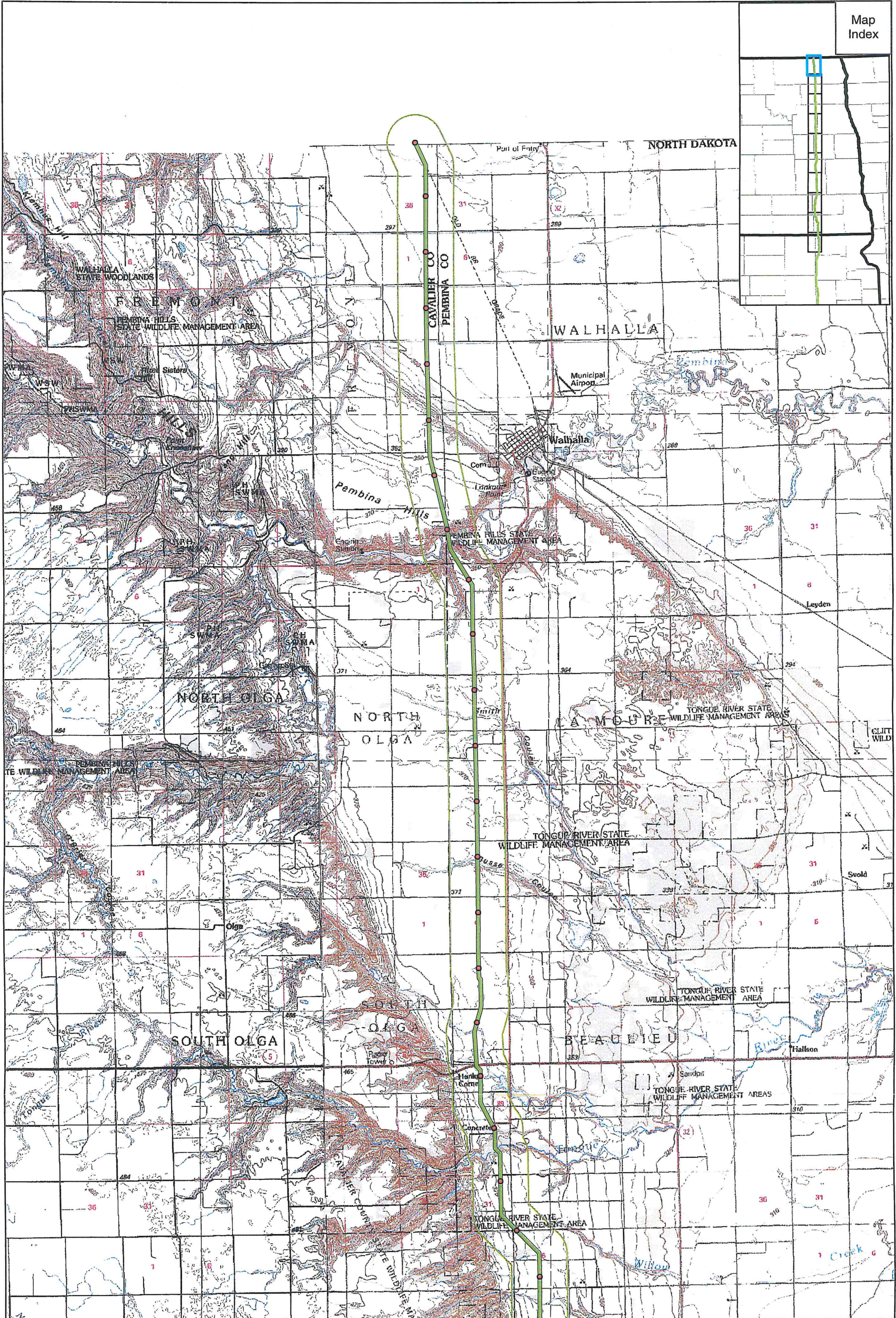
May 2006 Letter from North Dakota Game and Fish

(see DVD)

Appendix F

Maps

(see DVD)



- Mileposts
- Proposed Pipeline
- Half-mile Buffer



Keystone Pipeline Project

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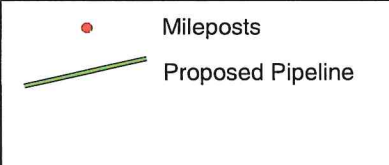
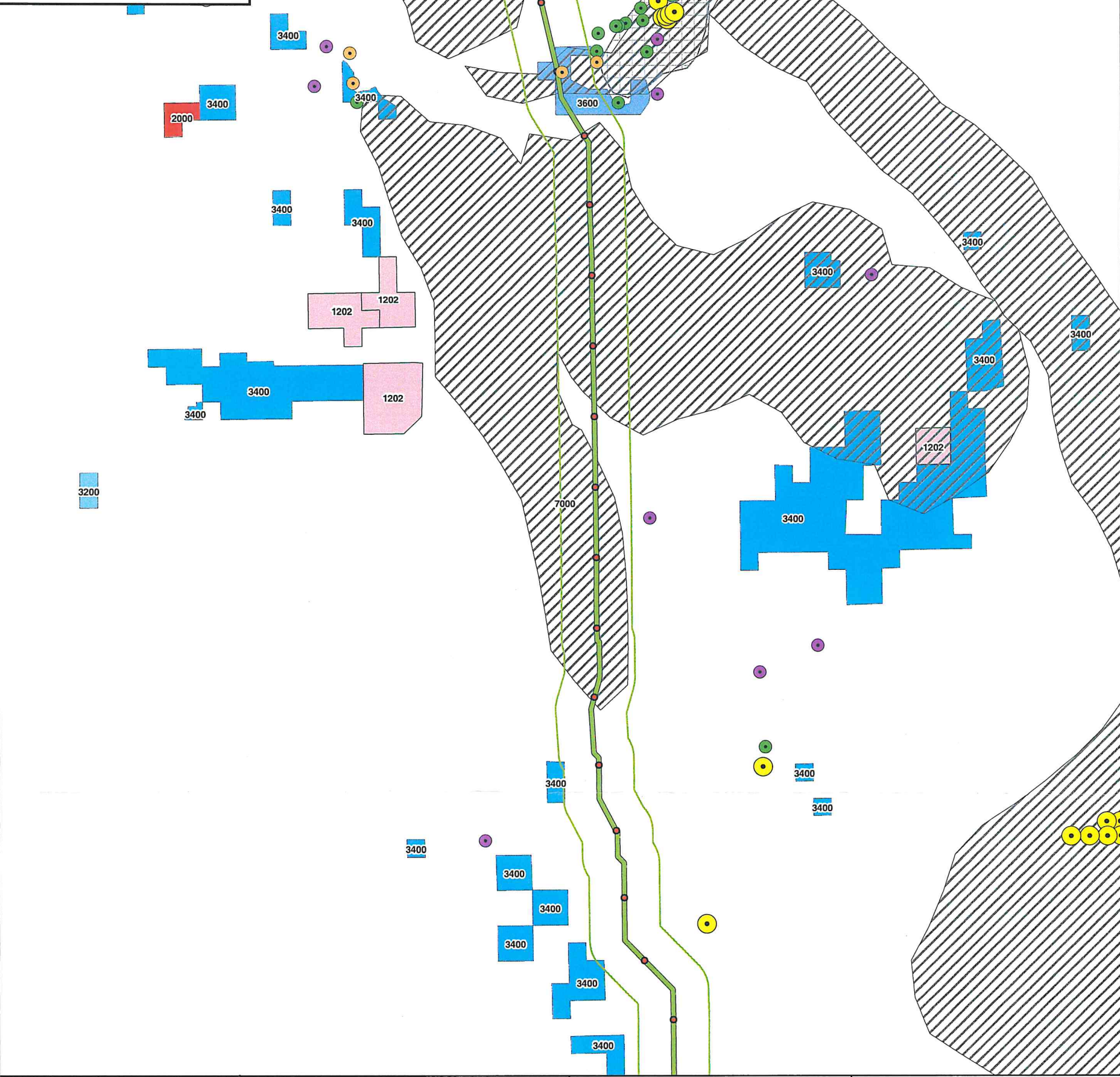
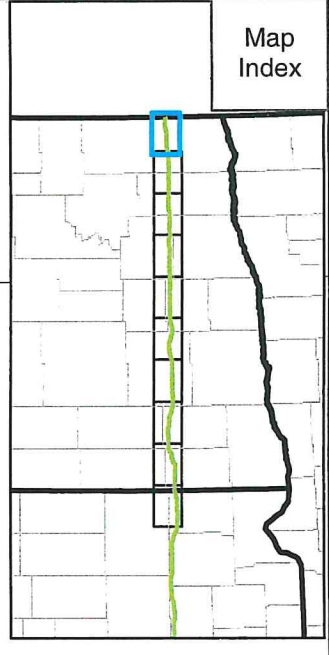
Map 1 of 10
General Project Location
Topographic Map (1:100,000 scale)
(North Dakota)

Legend

- ★ Raptor Nests (Helicopter GPS Survey)
- NHD Animals
- NHD Communities
- NHD Plants
- Public Water System GPS Points
- ▭ Half-mile Buffer
- ▨ Shallow Aquifers
- ▧ Surficial Aquifers
- ▭ USFWS Easements

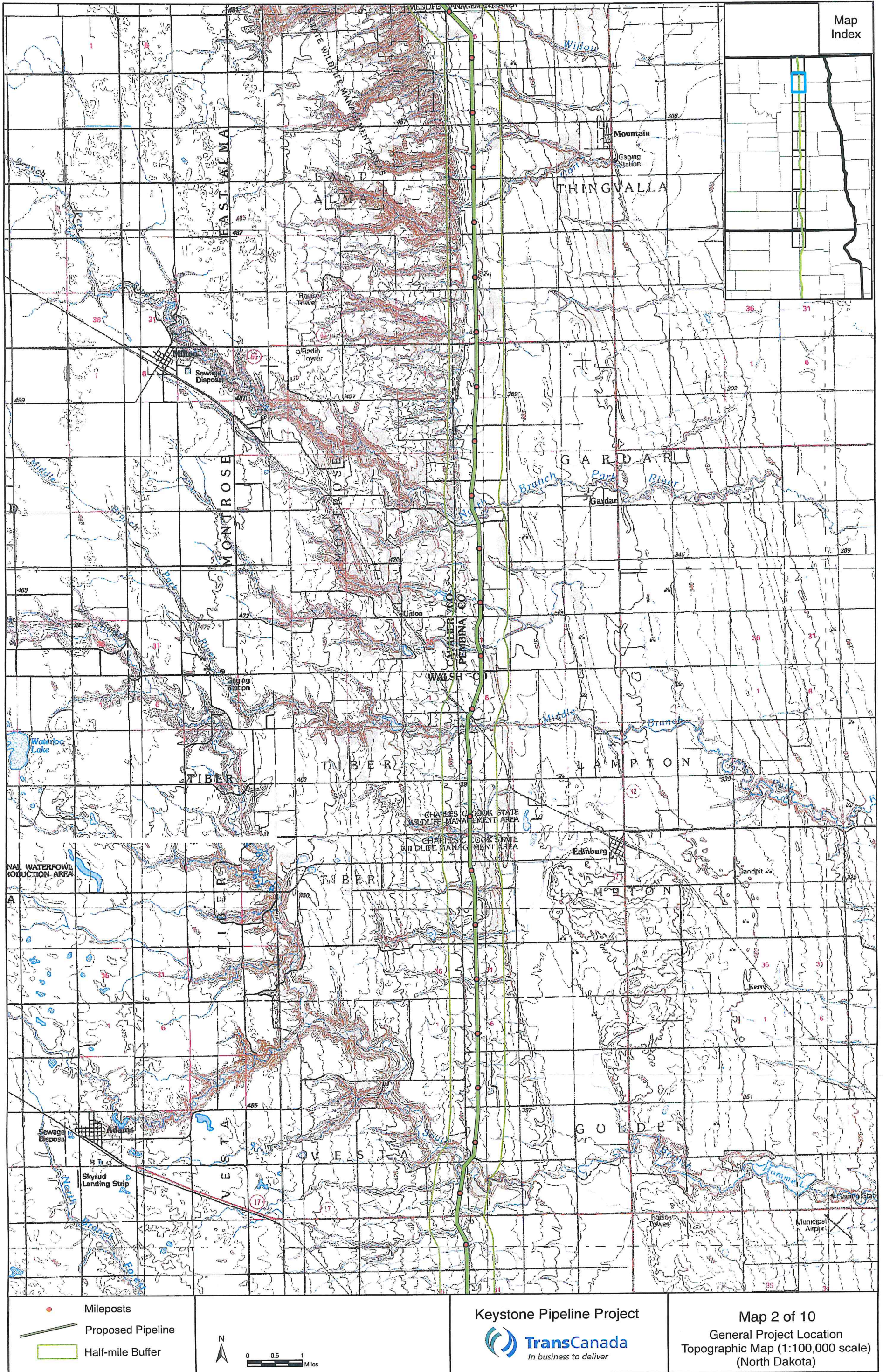
North Dakota Land Ownership

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- ▭ Native American Lands (2000)
- ▭ State Park and Recreation (3100)
- ▭ State School Lands (3200)
- ▭ ND Game and Fish (3400)
- ▭ State Agricultural Experiment (3500)
- ▭ State Forest Land (3600)
- ▭ University of ND (3700)
- ▭ Local Government (5000)
- ▭ City Parks (5100)
- ▭ County Parks (5200)
- ▭ Audubon Society Preserves (6100)
- ▭ Nature Conservancy (6302)
- ▭ Private (7000)
- ▭ Private Conservation (7100)
- ▭ Water (8000)



Keystone Pipeline Project
TransCanada
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Map 1 of 10
 General Project Location
 Land Ownership
 (North Dakota)

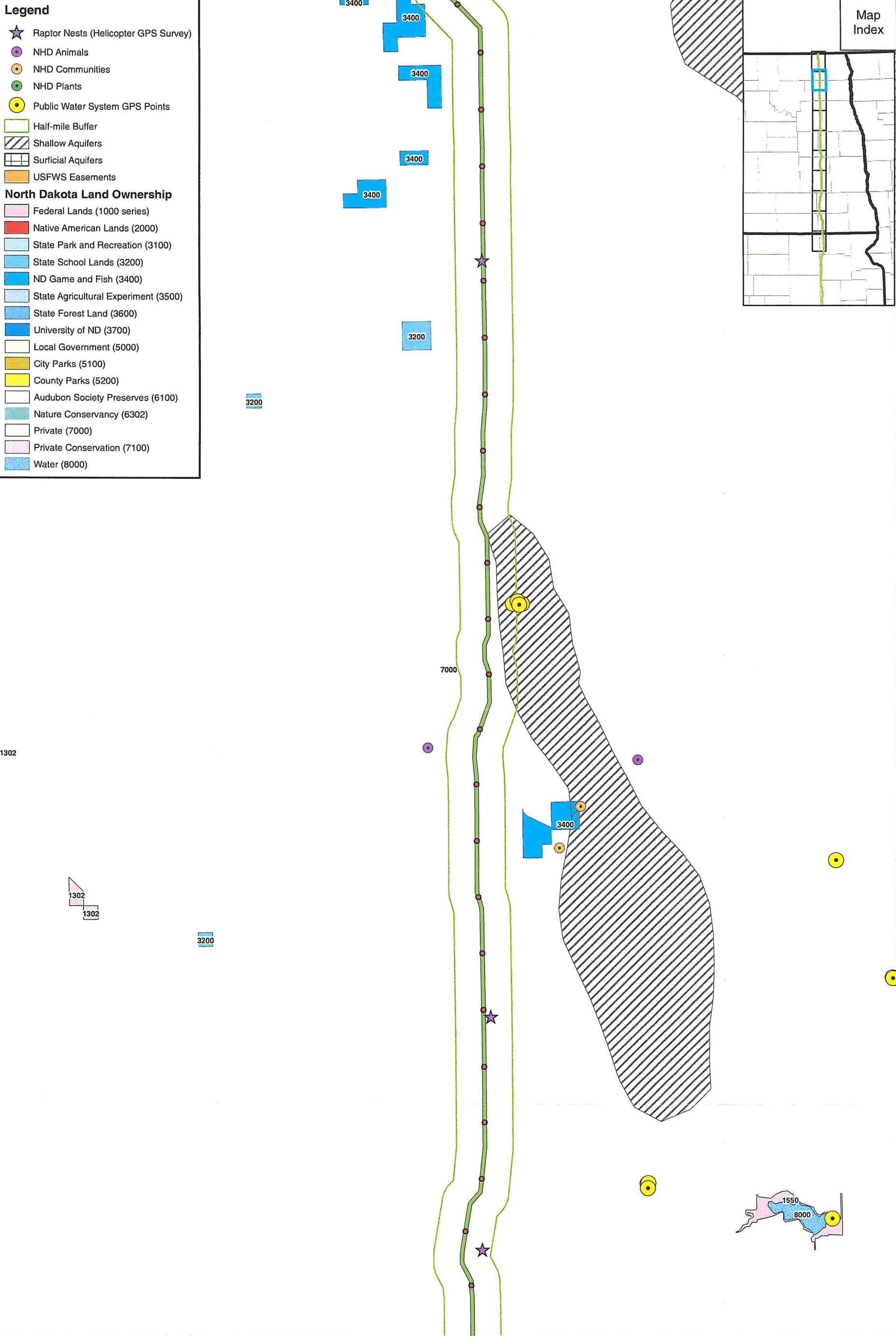
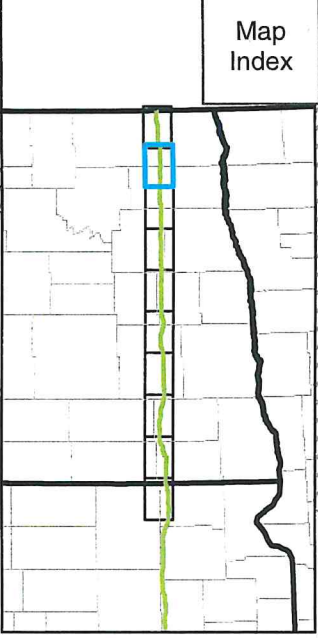


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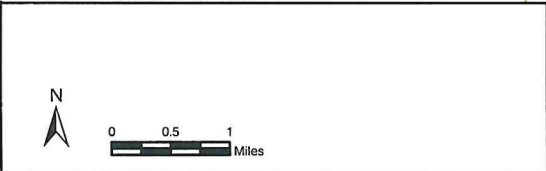
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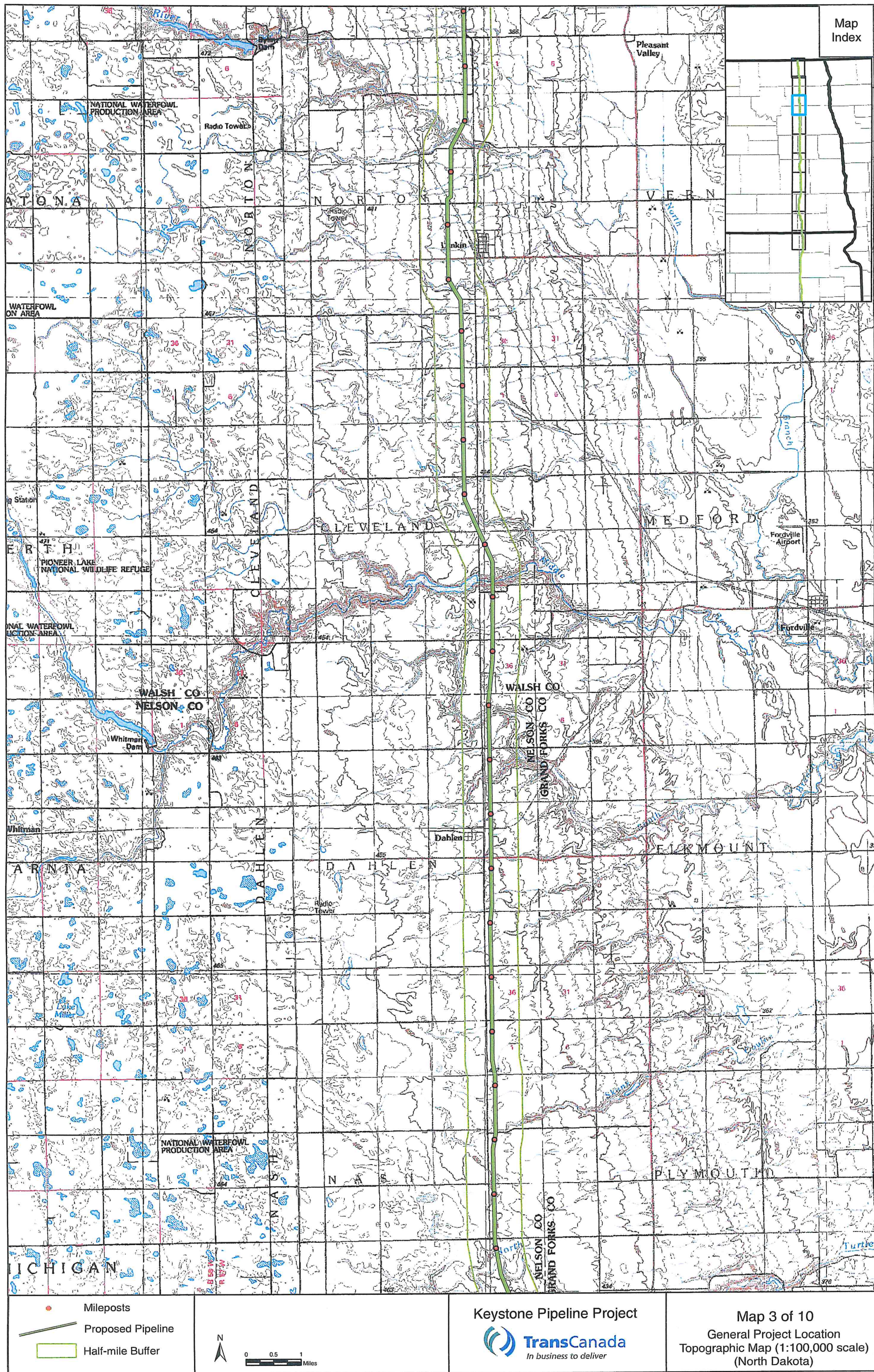


- Mileposts
- ▬ Proposed Pipeline

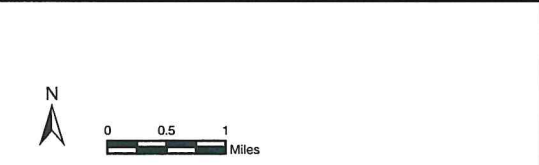
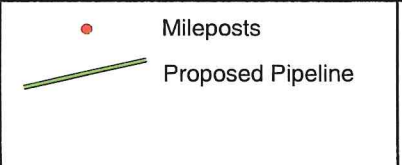
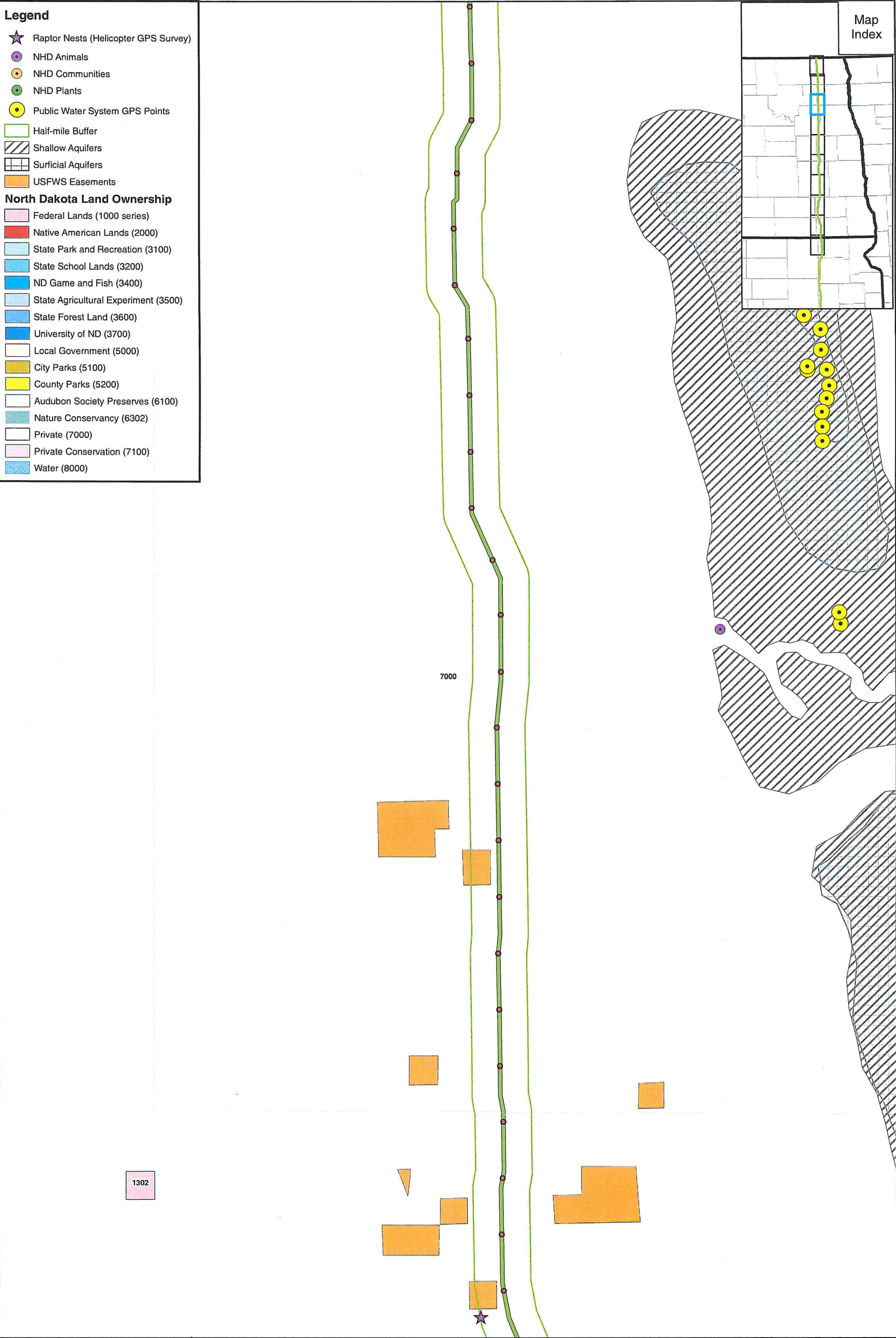
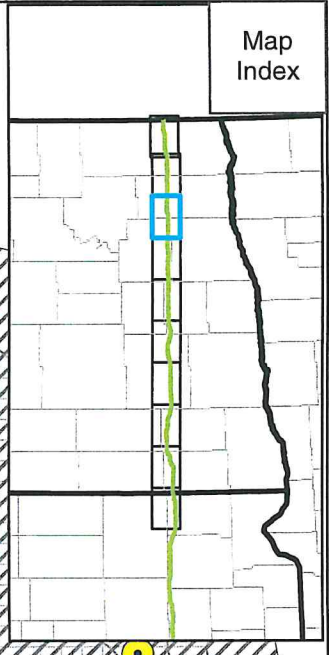


Keystone Pipeline Project

Map 2 of 10
General Project Location
Land Ownership
(North Dakota)



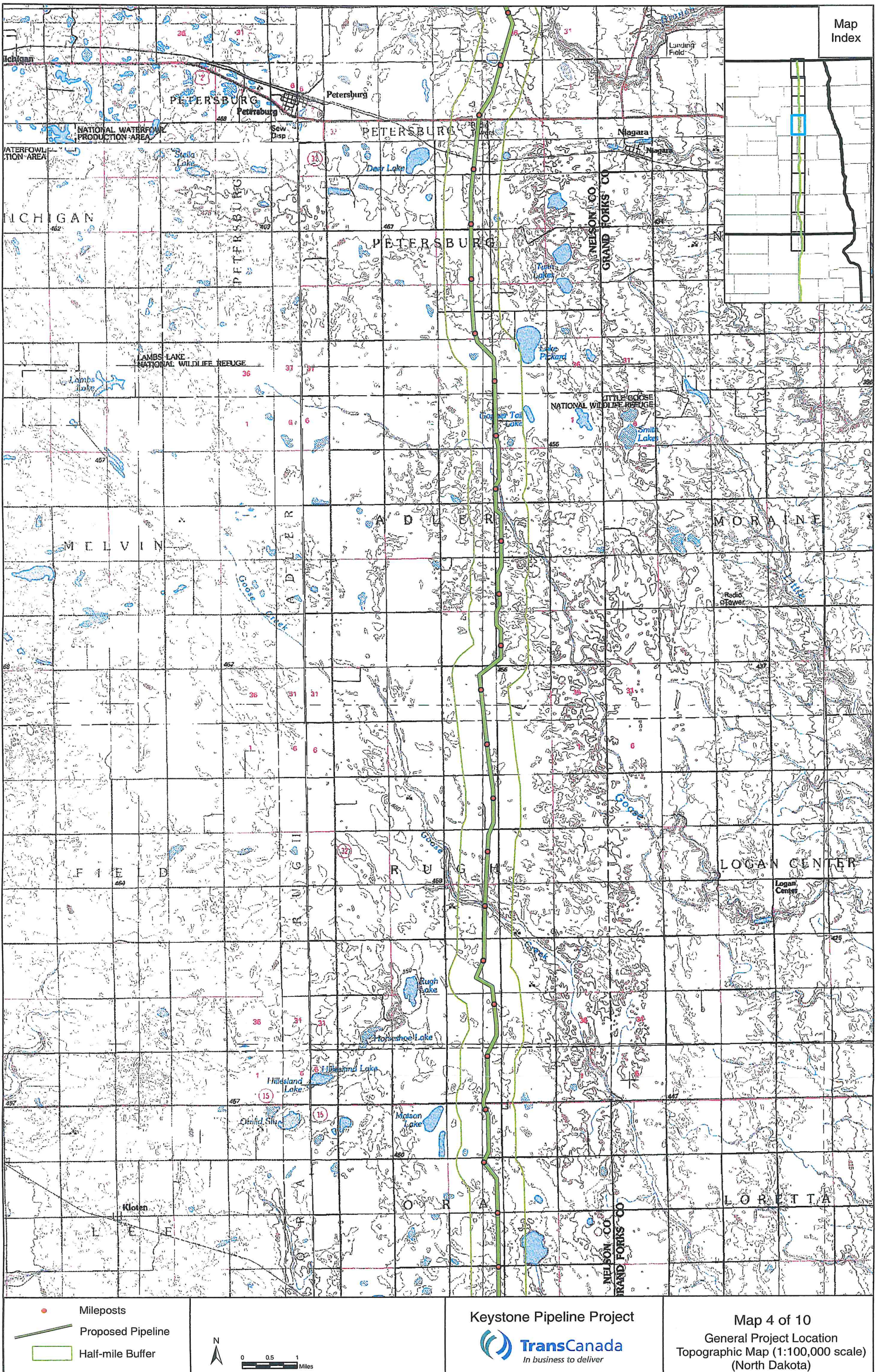
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Keystone Pipeline Project

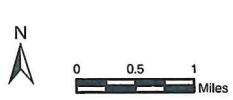
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Map 3 of 10
General Project Location
Land Ownership
(North Dakota)



Map Index

- Mileposts
- Proposed Pipeline
- Half-mile Buffer

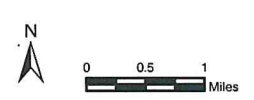
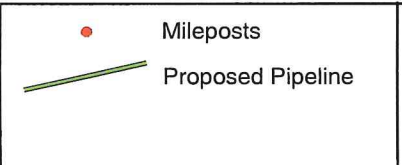
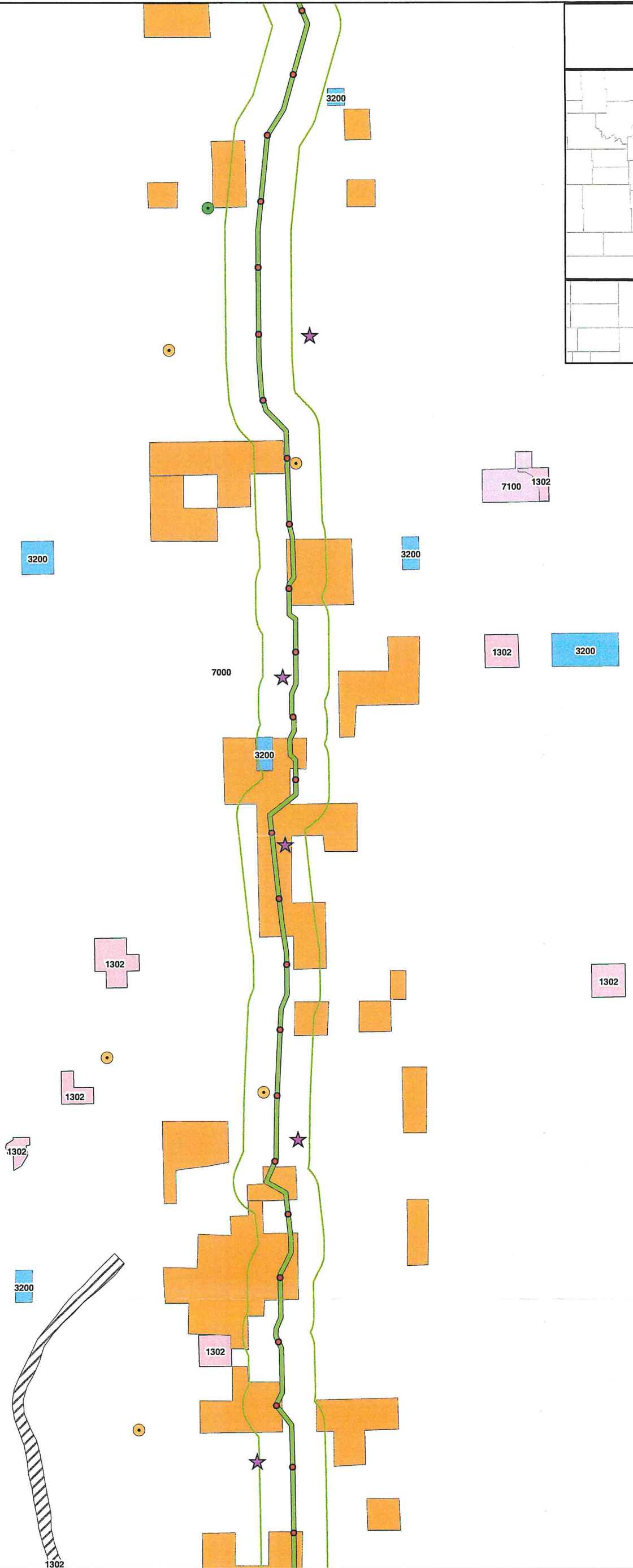
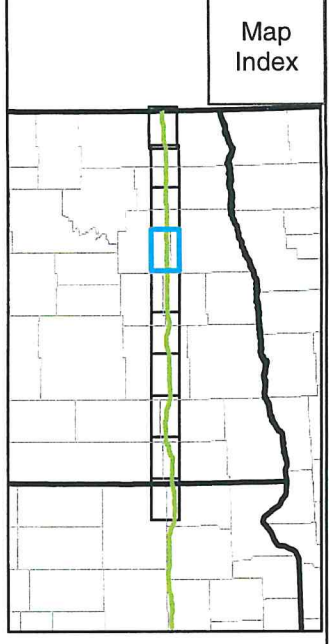


Keystone Pipeline Project

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Map 4 of 10
 General Project Location
 Topographic Map (1:100,000 scale)
 (North Dakota)

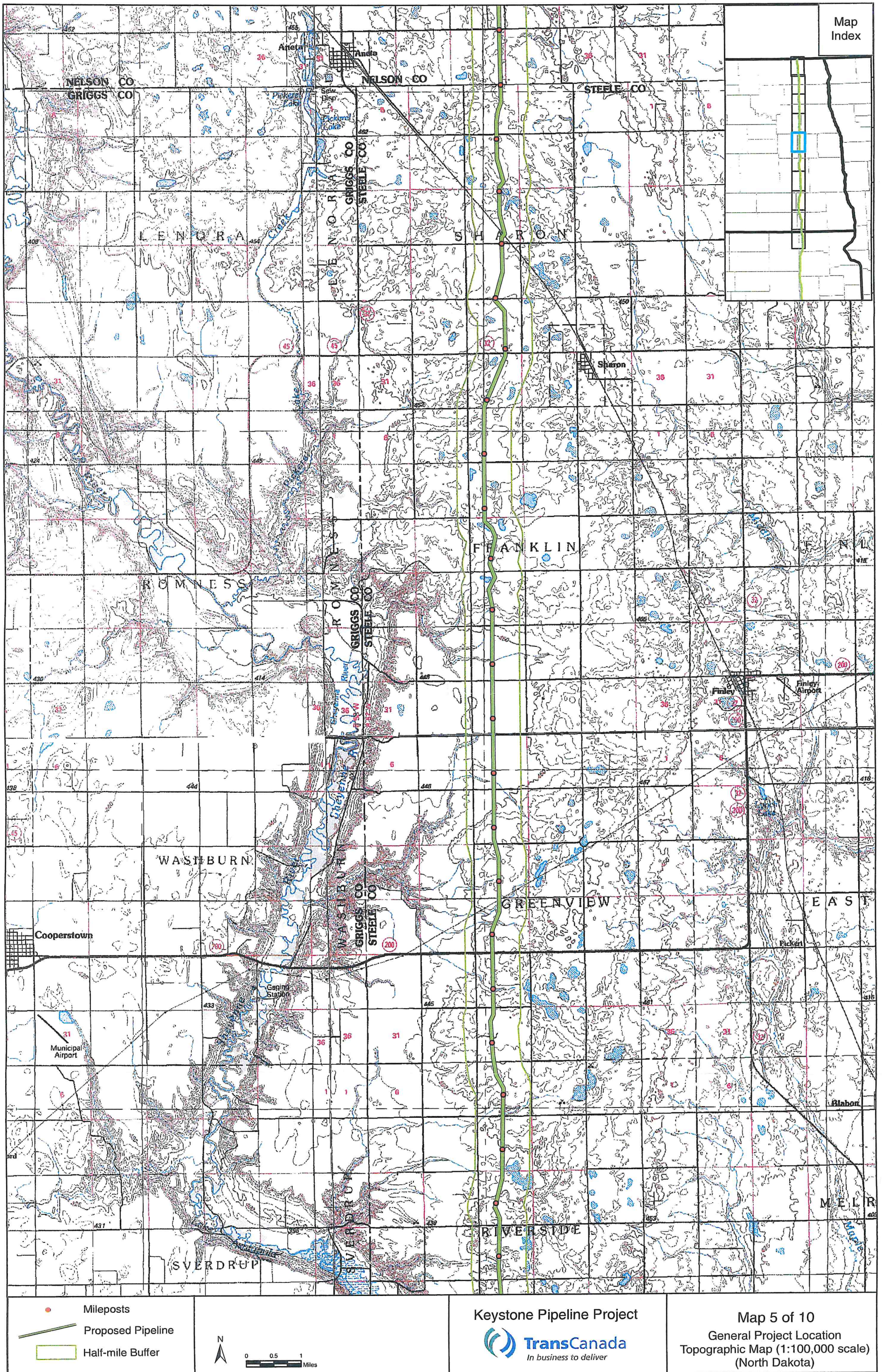
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Keystone Pipeline Project

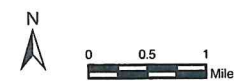
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Map 4 of 10
 General Project Location
 Land Ownership
 (North Dakota)



Map Index

- Mileposts
- Proposed Pipeline
- Half-mile Buffer

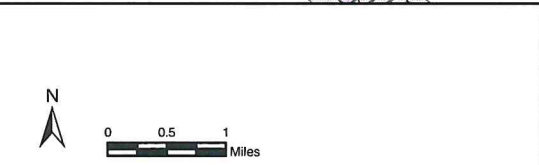
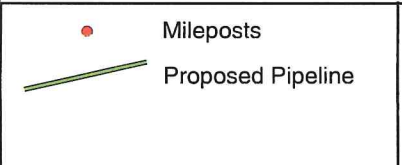
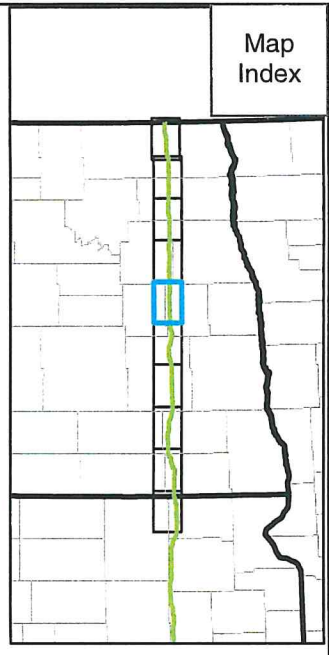


Keystone Pipeline Project

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Map 5 of 10
 General Project Location
 Topographic Map (1:100,000 scale)
 (North Dakota)

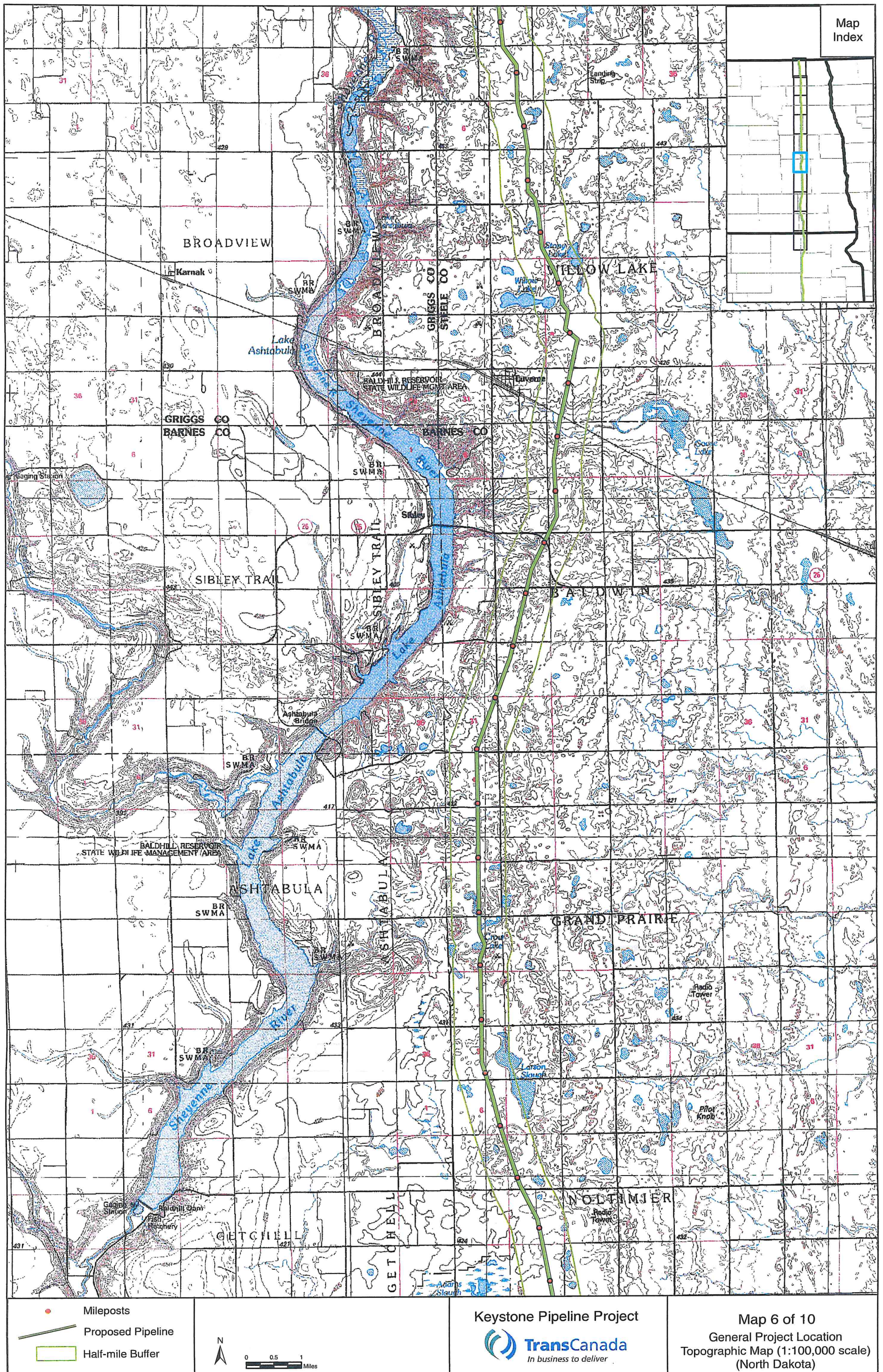
- Legend**
- ★ Raptor Nests (Helicopter GPS Survey)
 - NHD Animals
 - NHD Communities
 - NHD Plants
 - Public Water System GPS Points
 - ▭ Half-mile Buffer
 - ▨ Shallow Aquifers
 - ▧ Surficial Aquifers
 - ▭ USFWS Easements
- North Dakota Land Ownership**
- ▭ Federal Lands (1000 series)
 - ▭ Native American Lands (2000)
 - ▭ State Park and Recreation (3100)
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 - ▭ Nature Conservancy (6302)
 - ▭ Private (7000)
 - ▭ Private Conservation (7100)
 - ▭ Water (8000)



Keystone Pipeline Project

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Map 5 of 10
General Project Location
Land Ownership
(North Dakota)



Keystone Pipeline Project

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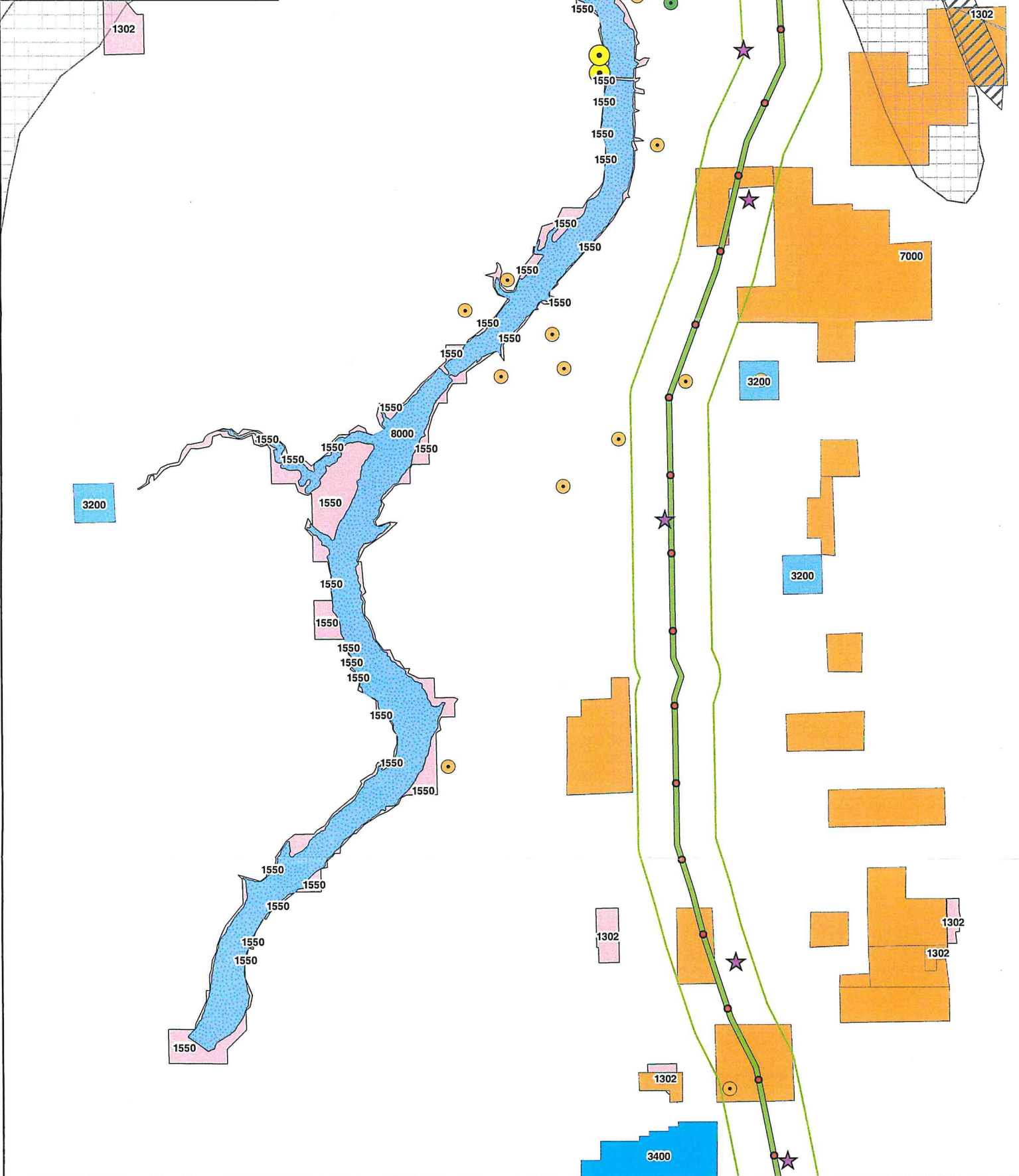
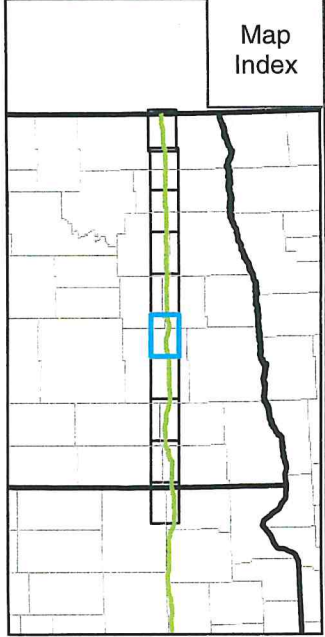
Map 6 of 10
 General Project Location
 Topographic Map (1:100,000 scale)
 (North Dakota)

Legend

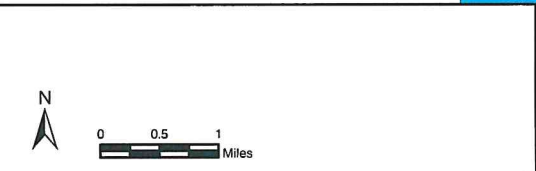
- ★ Raptor Nests (Helicopter GPS Survey)
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North Dakota Land Ownership

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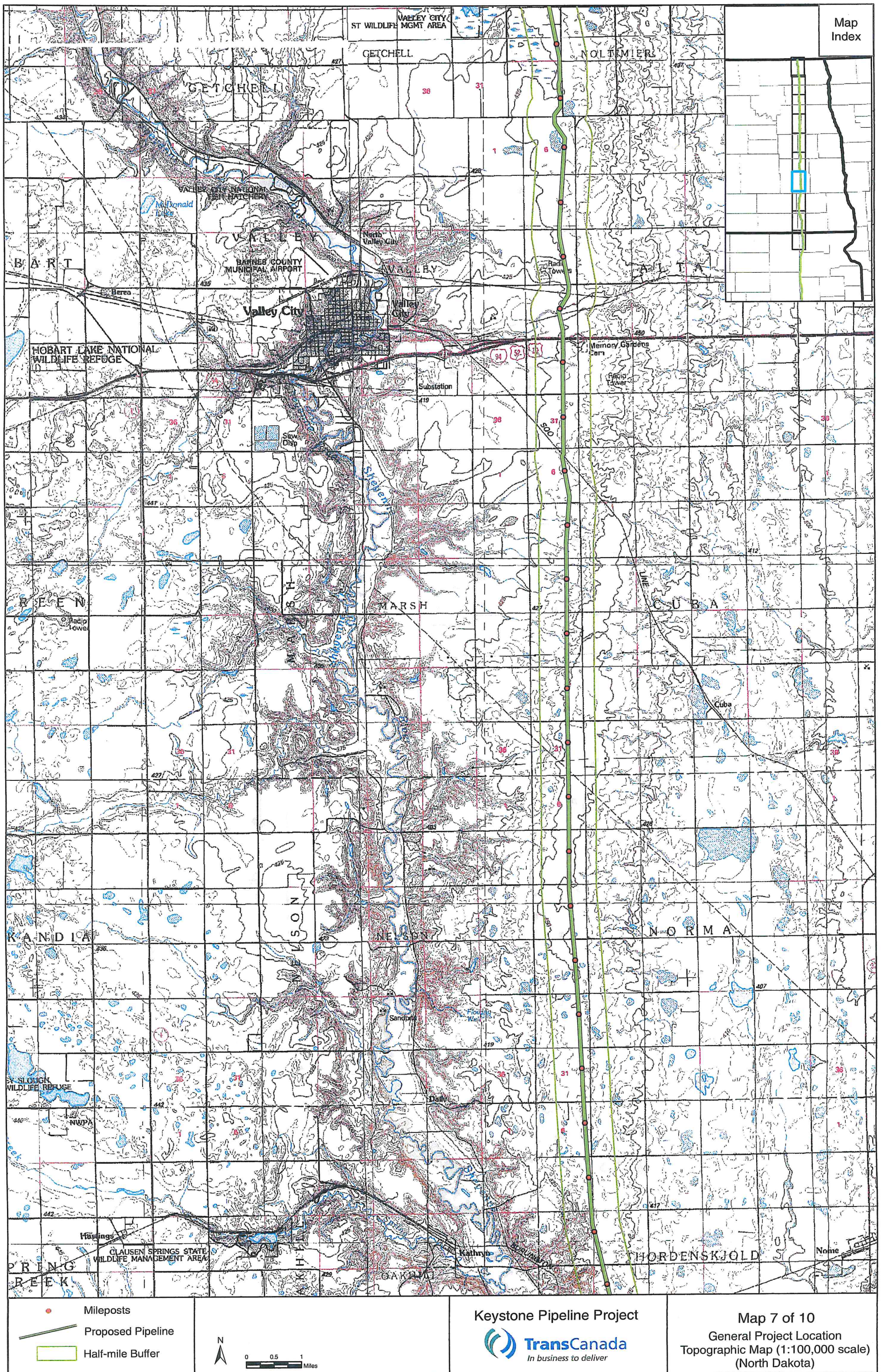


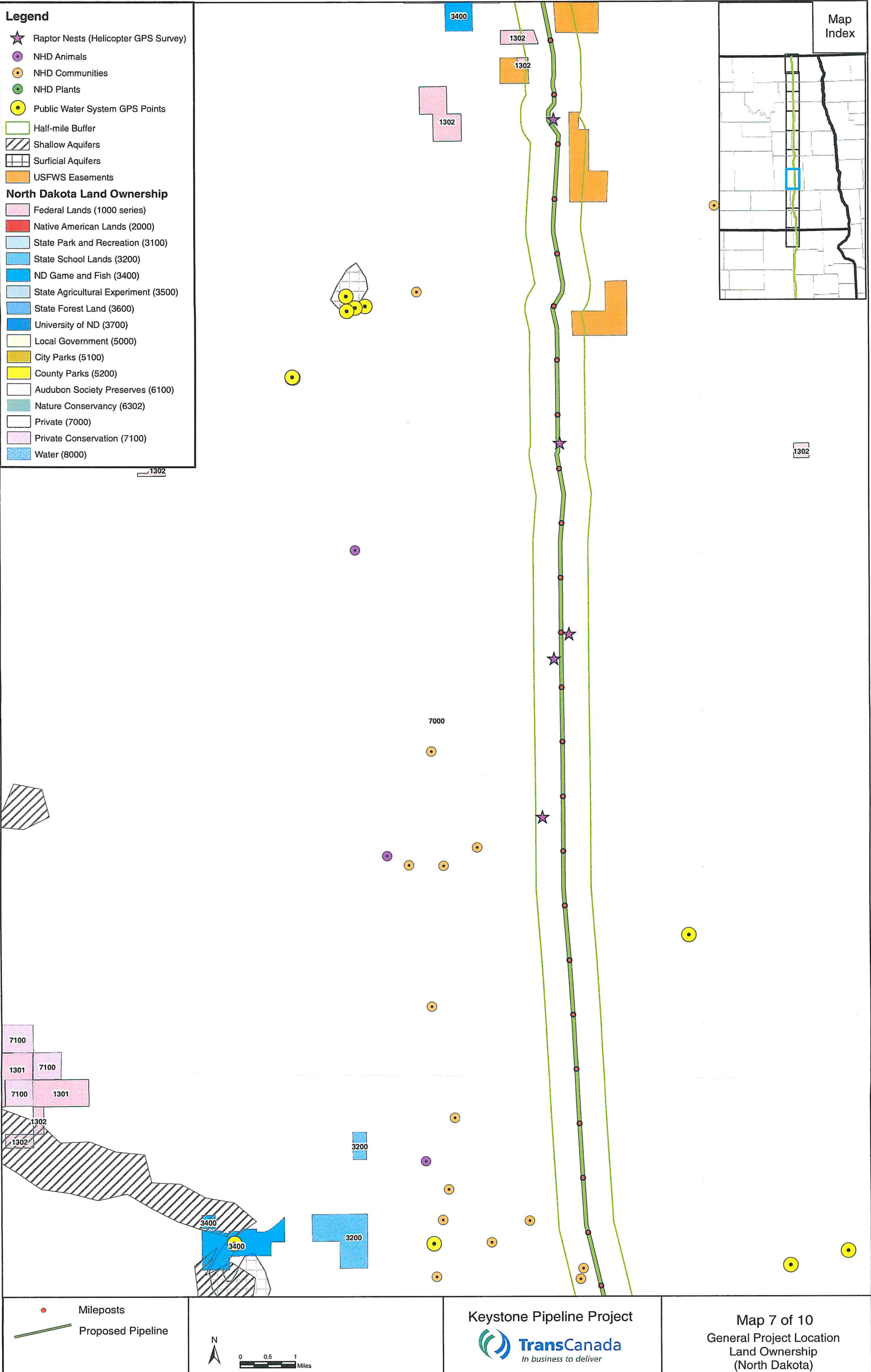
- Mileposts
- Proposed Pipeline



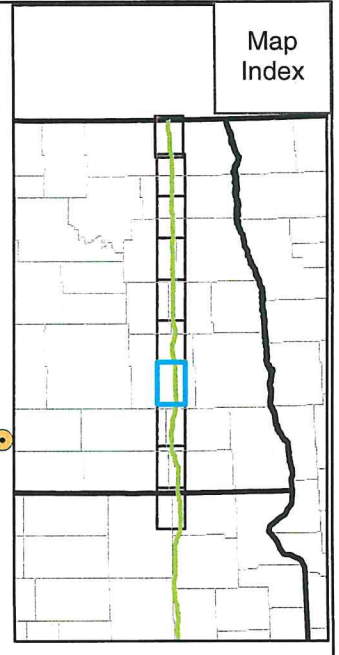
Keystone Pipeline Project

Map 6 of 10
General Project Location
Land Ownership
(North Dakota)

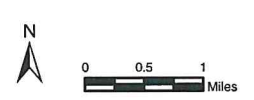




- Legend**
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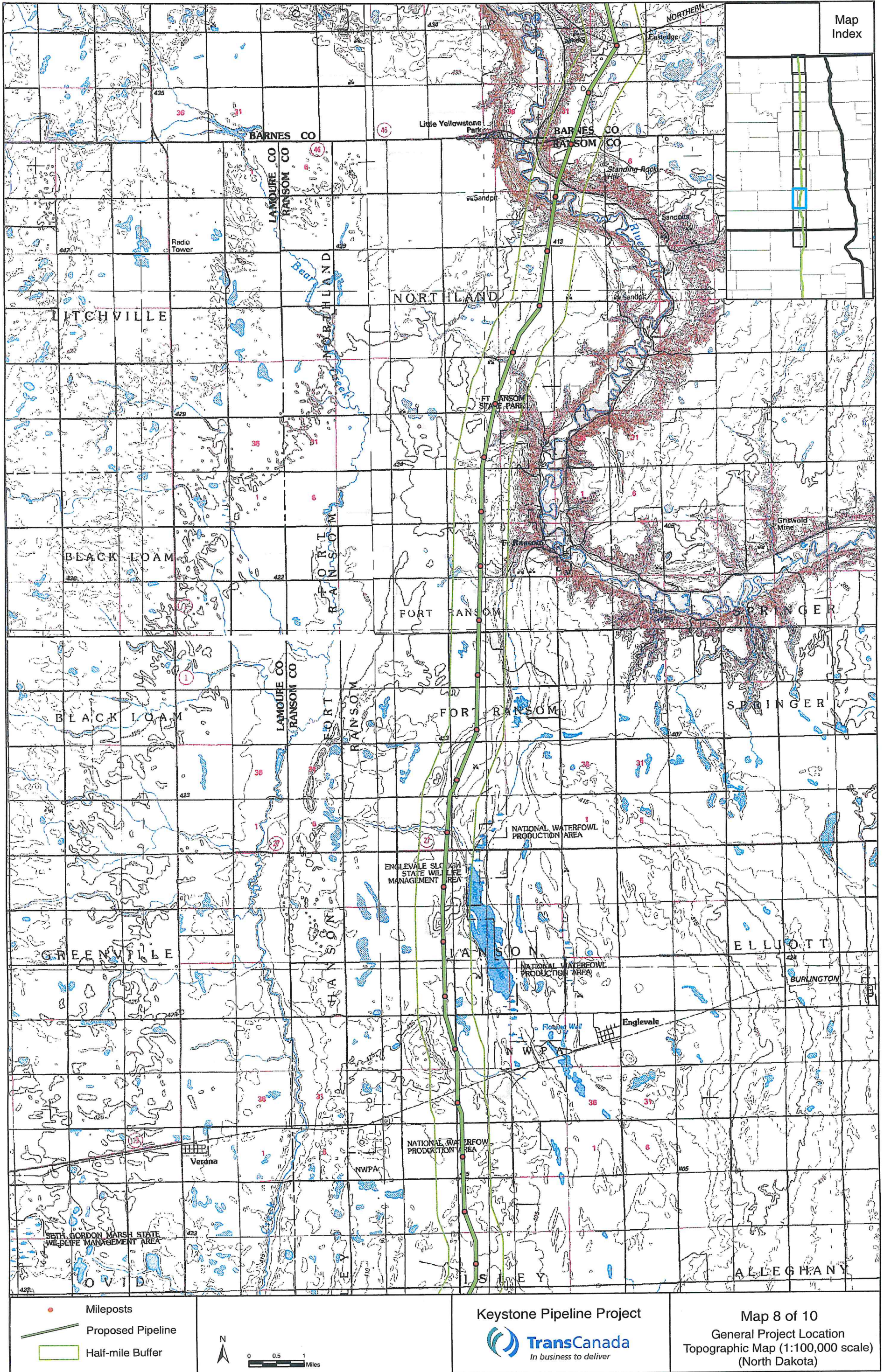


- Mileposts
- Proposed Pipeline



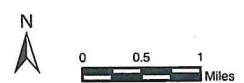
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Map 7 of 10
 General Project Location
 Land Ownership
 (North Dakota)



Map Index

- Mileposts
- Proposed Pipeline
- Half-mile Buffer



Keystone Pipeline Project

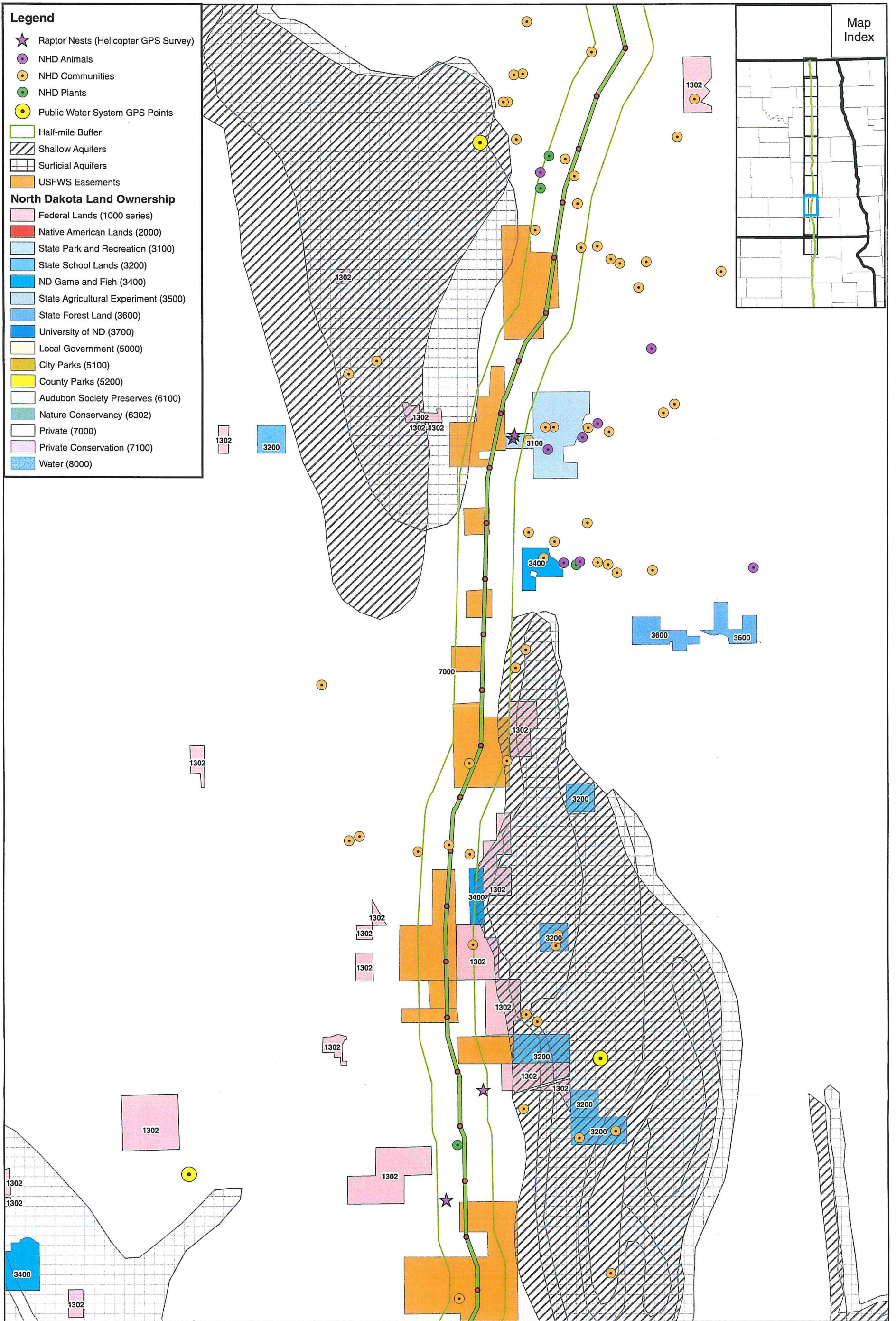
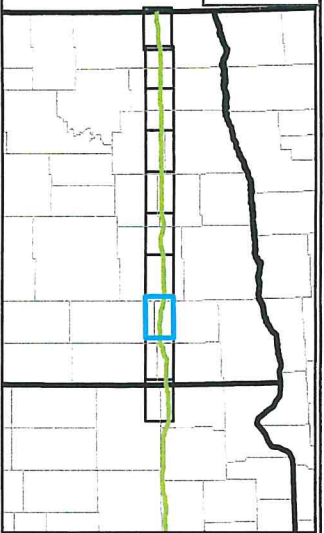
In business to deliver

Map 8 of 10
 General Project Location
 Topographic Map (1:100,000 scale)
 (North Dakota)

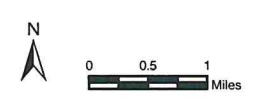
Legend

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Map Index



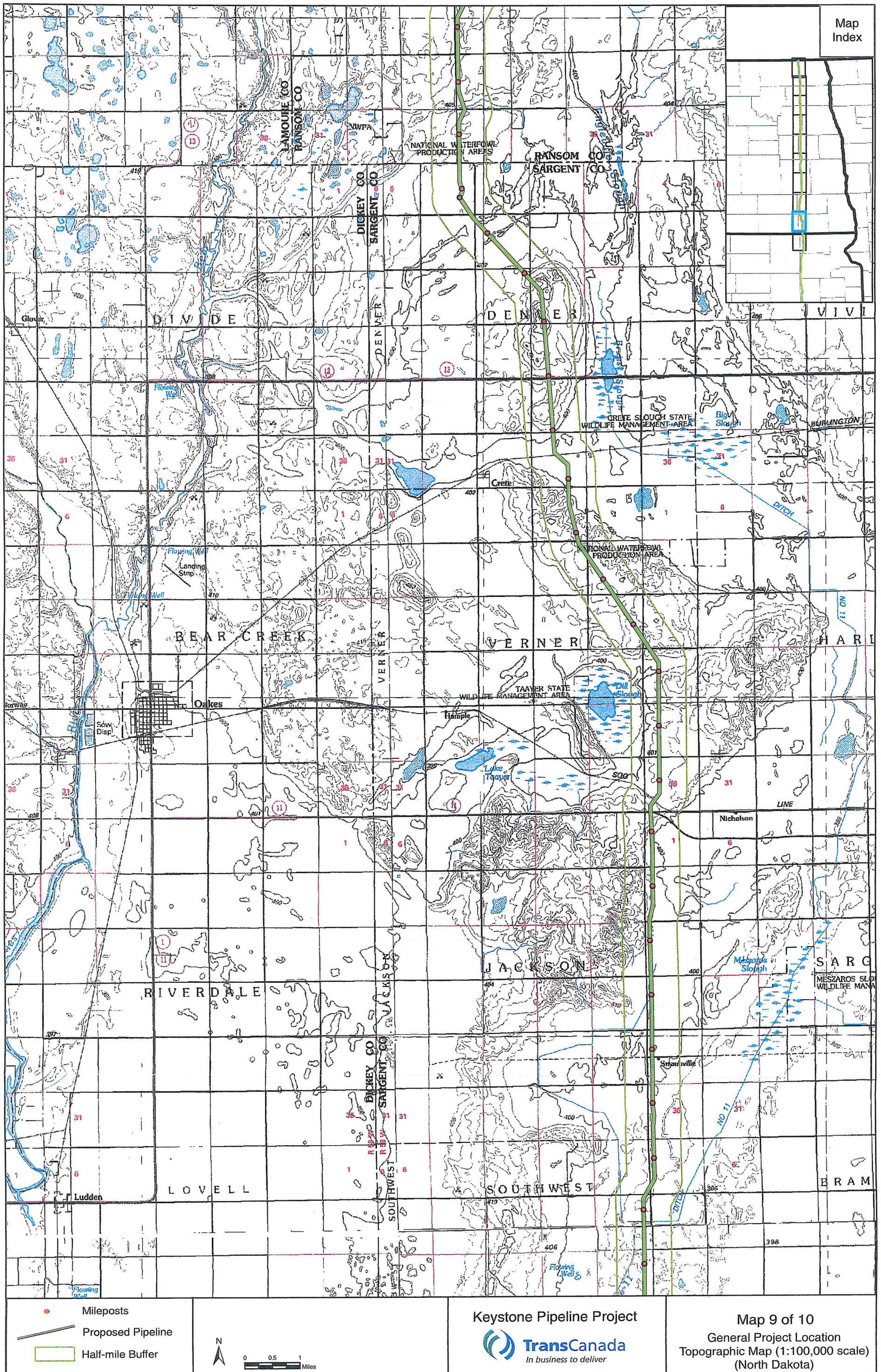
- Mileposts
- Proposed Pipeline



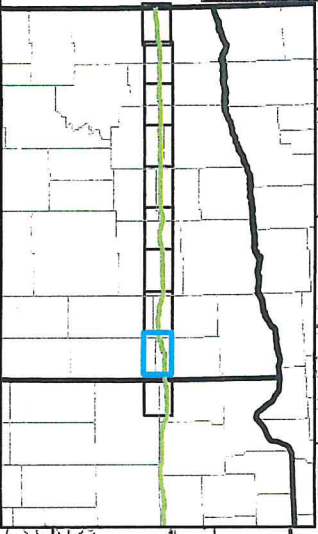
Keystone Pipeline Project

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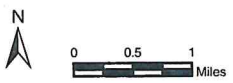
Map 8 of 10
 General Project Location
 Land Ownership
 (North Dakota)



Map Index



- Mileposts
- Proposed Pipeline
- Half-mile Buffer



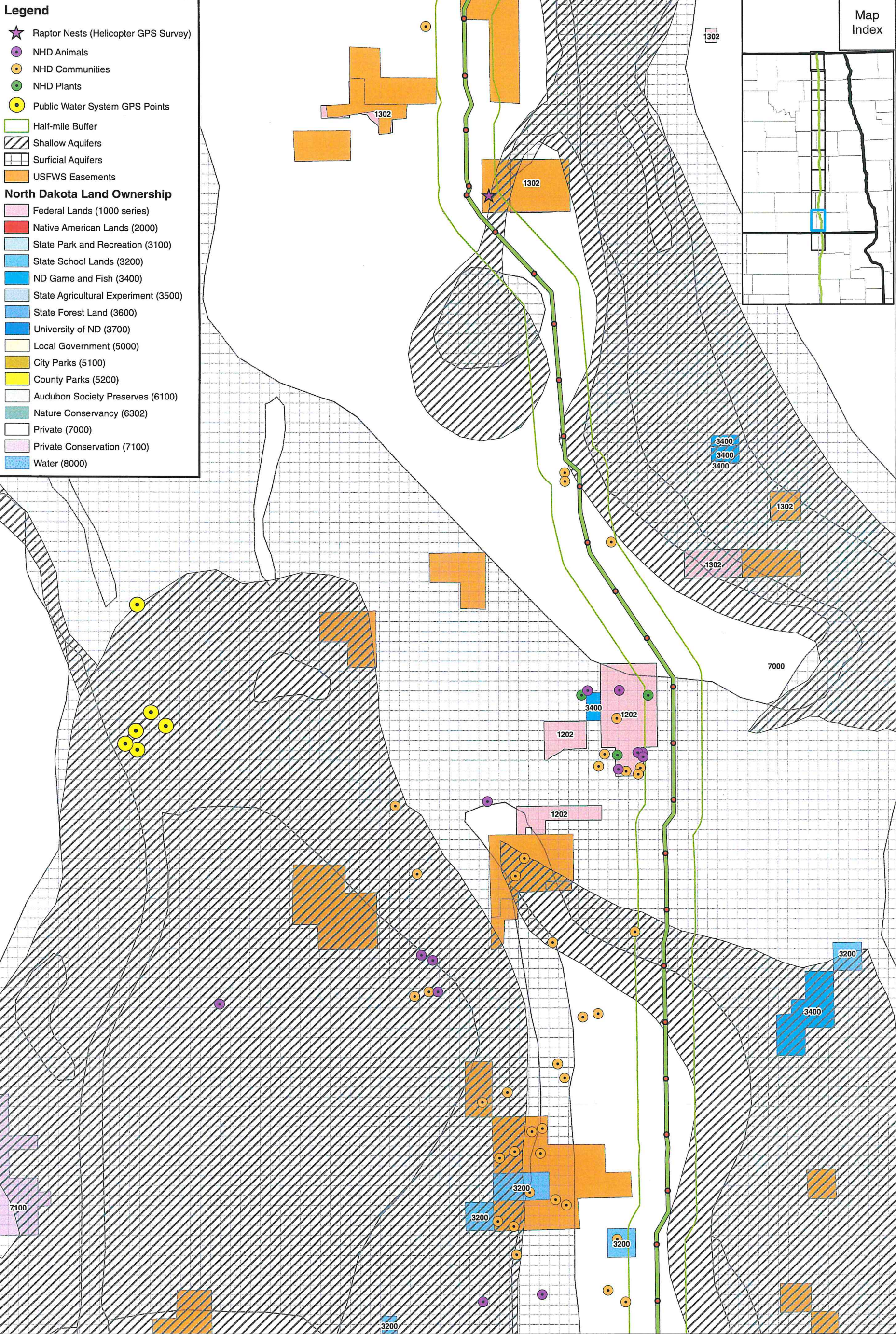
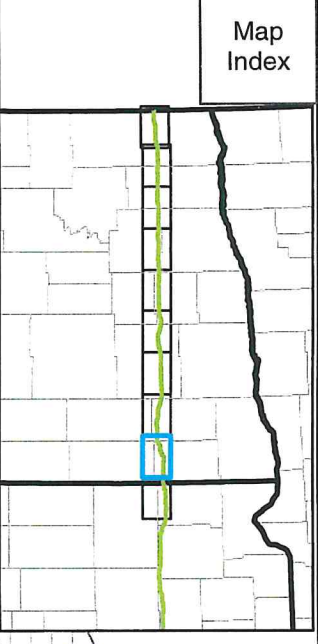
Keystone Pipeline Project



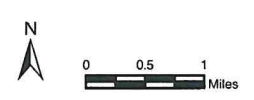
Map 9 of 10
 General Project Location
 Topographic Map (1:100,000 scale)
 (North Dakota)

Legend

- ★ Raptor Nests (Helicopter GPS Survey)
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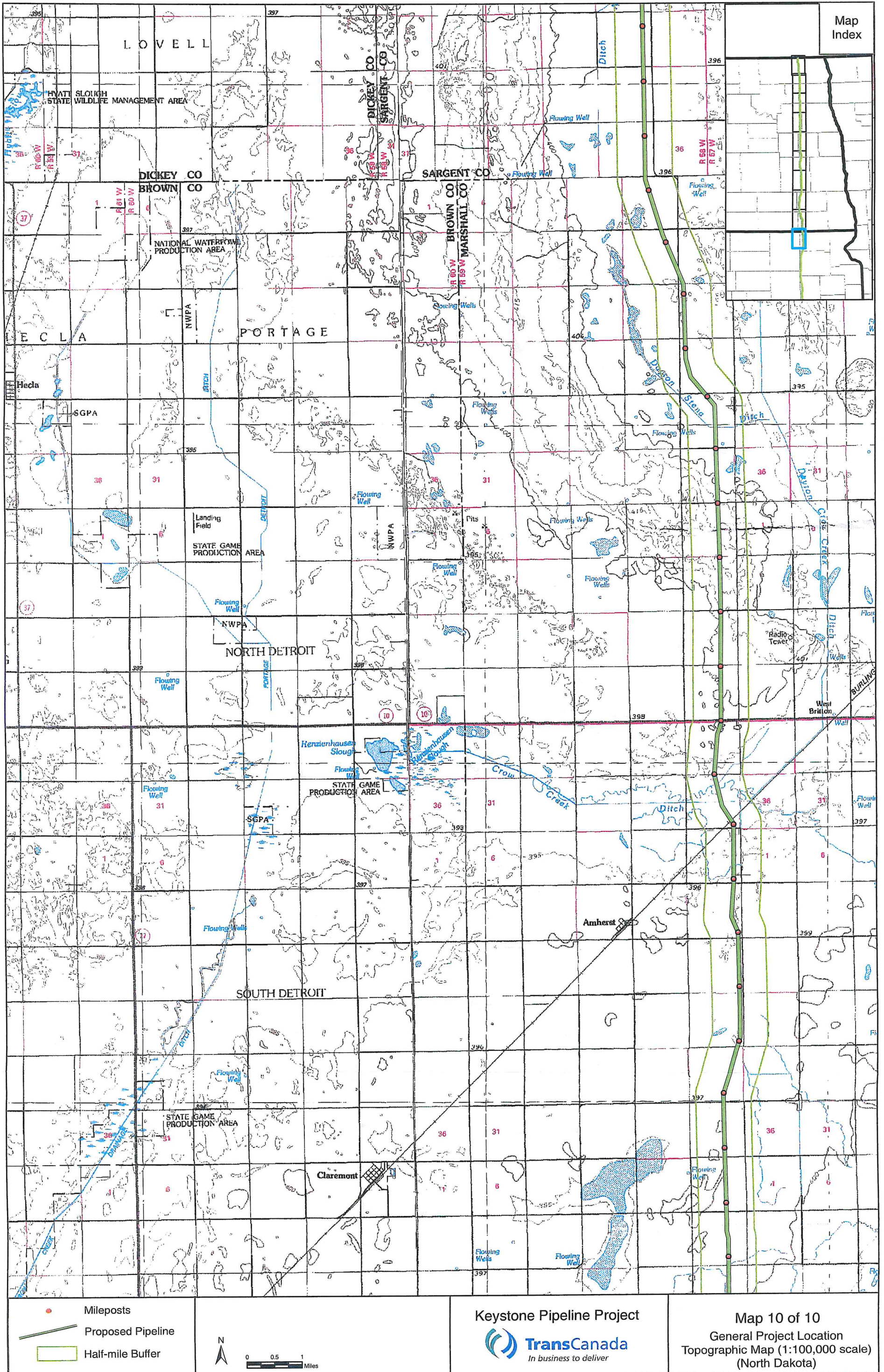


- Mileposts
- Proposed Pipeline



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Map 9 of 10
 General Project Location
 Land Ownership
 (North Dakota)



Legend

- ★ Raptor Nests (Helicopter GPS Survey)
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- NHD Plants
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- Mileposts
- ▬ Proposed Pipeline

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Keystone Pipeline Project

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Map 10 of 10
General Project Location
Land Ownership
(North Dakota)

Appendix G

Construction Mitigation and Reclamation (CMR) Plan

(see DVD)

Appendix H

Keystone Pipeline Parameters

(see DVD)