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November 13, 2015

Daniel Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Sandpiper Pipeline Environmental Document Scope
Docket No. PL-6668/PPL-13-474

Dear Mr. Wolf,

In its August 4, 2015, Order recommencing the route permitting process for the North Dakota Pipeline Company, LLC proposed Sandpiper Pipeline project (Docket No. PPL-13-474), the Minnesota Public Utilities Commission requested that the Department of Commerce Environmental Review and Analysis (EERA) staff file a document outlining the scope of the environmental document to be prepared for the Sandpiper Pipeline and the time required to complete it.

In response to that request, EERA respectfully submits the attached *Draft Scoping Document for the Sandpiper Pipeline Environmental Review* for the Commission's consideration. The document includes only those route alternatives that the Commission had referred to hearing in its August 25, 2014, Order in this docket. However, EERA notes it has received additional route alternative suggestions through the Line 3 Replacement Project scoping process (Docket PL-9/PPL-15-137). EERA recommends that any routes accepted by the Commission for analysis and hearing in the Line 3 Replacement Project proceeding also be accepted into the Sandpiper docket for analysis and hearing.

EERA staff is available to answer any questions the Commission may have on this filing.

Sincerely,

A handwritten signature in black ink that reads "Deborah R. Pile". The signature is written in a cursive, flowing style.

Deborah R. Pile, Director
Energy Environmental Review and Analysis

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Draft Scoping Document
for
Sandpiper Pipeline Environmental Review
PUC Dockets PPL-13-474

Minnesota Department of Commerce
Energy Environmental Review and Analysis

November 2015

INTRODUCTION

On August 4, 2015, the Minnesota Public Utilities Commission (Commission) issued an order recommencing the route permitting process for the North Dakota Pipeline Company, LLC (NDPC) proposed Sandpiper Pipeline project (Docket No. PPL-13-474), and requested that the Department of Commerce (Department or DOC) Environmental Review and Analysis (EERA) staff file within 90 days a document outlining the scope of the environmental document to be prepared for the Sandpiper Pipeline and the time required to complete it.

The Sandpiper Pipeline project also requires a Certificate of Need (CN) from the Commission (Docket No. CN-13-473), and on September 30, 2015, the Minnesota Court of Appeals issued an opinion regarding CN environmental review requirements stating that, “Where route permit proceedings follow certificate of need proceedings, MEPA requires that an EIS must be completed before a final decision is made on issuing a certificate of need. Therefore, we reverse and remand to the MPUC to complete an EIS before a final decision is made to grant or deny certificate of need.”

In response to a request for comments from the Commission as to how to proceed in light of the Court’s opinion, the Department filed comments on October 30, 2015, recommending “that the Commission stay its decision on the CN until an Environmental Impact Statement (EIS) be completed for the Routing Proceeding.” The Department understands that the Commission will provide further guidance as to the form of environmental review it expects as part of this docket.

This Draft Scoping Document delineates the issues and analyses to be contained in an environmental document regardless of the form of environmental review the Commission ultimately orders. It is based on the project’s *Environmental Information Report* filed by NDPC on November 14, 2013, as part of its Route Permit Application, past Orders issued by the Commission, and input received through public meetings, comment periods and discussions with various state and federal agencies.

PROJECT DESCRIPTION AND PURPOSE

NDPC’s proposed Sandpiper Pipeline Project (Sandpiper) begins at Beaver Lodge Station, south of Tioga, North Dakota, extends to a new terminal facility to be constructed at Clearbrook, Minnesota, and then continues on to an Enbridge affiliate’s terminal and tank farm in Superior, Wisconsin.

The Project is comprised of a new 612-mile 24-inch and 30-inch outside diameter crude oil pipeline and associated facilities described as follows. Approximately 299 miles of the Project will be located in Minnesota.

From the North Dakota border in Polk County to Clearbrook, Minn., in Clearwater County, approximately 75 miles of 24-inch outside diameter (OD) steel pipe, with an average annual capacity of 225,000 barrels per day d(bpd), would generally parallel and be adjacent to NDPC’s existing Line 81.

The Sandpiper Pipeline segment between Clearbrook, Minnesota and the Wisconsin border, approximately 224 miles, will be 30-inch OD steel pipeline and have an annual average capacity of 375,000 bpd.

Between Clearbrook and the city of Hubbard, the NDPC preferred route generally parallels the existing Minnesota Pipeline Company right-of-way. Between the city of Hubbard and the Wisconsin border, the NDPC preferred route turns east, following portions of existing electrical transmission and railroad rights-of-way.

As part of the Project, NDPC also proposes to develop a new terminal facility in Clearbrook, Minnesota. The new terminal will consist of two crude oil storage tanks holding approximately 150,000 barrels (bbls) or 6,300,000 gallons each, two 500 horse power (HP) injection pumps to move up to 150,000 barrels per day (BPD) from the existing NDPC Line into Sandpiper, two 650 HP transfer pumps for delivery to NDPC, and three sets of leak detection meters. A new Clearbrook Pump Station will be located within the foot print of the new NDPC Clearbrook Terminal.

The project will include approximately 23 mainline safety valves.

ENVIRONMENTAL DOCUMENT SCOPING PROCESS

The Minnesota Environmental Quality Board (EQB) developed and approved of the pipeline routing rules (now Chapter 7852) as an alternative form of environmental review pursuant to the requirements of Minnesota Rules 4410.3600 [Alternative Review] on February 16, 1989. This environmental review process generally parallels the environmental review requirements of Minnesota Rules Chapter 4410, while providing for an integrated environmental review and permitting process, rather than two separate review processes (environmental and permitting).

This alternative form of environmental review includes a partial exemption process for projects anticipated to not have the potential for significant effects. Environmental review under this process is substantially similar to the Environmental Assessment Worksheet/negative declaration process of Minnesota Rules 4410.1200 through 4410.1700.

Projects with the potential for significant environmental effect are reviewed through the full permitting process. Environmental review under this process is substantially similar to EIS process of Minnesota Rules 4410.2000 through 4410.2800. Under the full permitting process, an environmental information report (Minnesota Rule 7854.2700) is submitted as part of the Route Permit Application; this document serves the function of the scoping Environmental Assessment Worksheet (EAW) in standalone environmental review processes. Scoping meetings are held and a *Comparative Environmental Analysis* is prepared, which evaluates both the issues raised through the scoping process and the alternative routes authorized by the Commission for consideration at public hearing.

Comments Received – Sandpiper

Between March 3, 2014, and March 13, 2014, Commission and EERA staff held seven public information/scoping meetings in seven of the nine counties crossed by the proposed Sandpiper Project, pursuant to Minnesota Rule 7852.1300. The Sandpiper *Environmental Information Report* was made available at those meeting, and was place in libraries and local government offices across the area and on EERA’s website. The deadline for filing comments on potential human and environmental impacts and alternative pipeline routes to be considered closed May 30, 2014.

Approximately 1087 comments from 940 unique commenters and organizations were received by the close of the comment period.

The “Written comments and proposed routes and route segments” received by April 4, 2014, and May 30, 2014, appear on DOC EERA website at:

- <http://mn.gov/commerce/energyfacilities/resource.html?Id=33940> (May 30, 2014)
- <http://mn.gov/commerce/energyfacilities//resource.html?Id=33833> (April 4, 2014)

The following table provides a “Comment Category Summary” of all the comments received by the comment deadline.

Comment Categorization Summary

Comment Category	Citizens	Organizations and Businesses	Local Units of Government	State Agencies	Tribal	Totals
General Opposition	402	55	1	0	1	459
General Support	30	5	1	1	0	37
Wants an EA/EIS	97	58	0	1	1	157
Extend Comment Period/More Mtgs	53	10	5	0	1	69
Need of Proj	20	1	0	0	0	21
State Parks	33	2	1	0	0	36
Trees/Forests	120	11	0	1	0	132
Wildlife	139	54	1	0	1	195
Impacts to Water Quality	320	29	4	2	2	357
General Env Concern	307	69	5	1	2	384
Soil and Soil Erosion	89	5	1	1	0	96
Organic Farms	133	9	1	0	0	143
General Agricultural Impacts	188	51	1	1	2	243
Health and Safety	93	10	2	1	1	107
Aesthetics	5	0	0	0	0	5
Tribal Concerns	83	45	1	0	4	131
Property Values	48	1	0	0	0	49
Cost of Easement	18	0	0	0	0	18
Tourism	51	5	1	0	0	57
Preference for an Alternative Route	309	30	4	2	2	347

Route Alternatives Received – Sandpiper

A route segment/alternative deviates from the applicant’s preferred route to address a commenter’s concern or issue. Fifty-four route alternatives (RA-01 through RA-54) were

proposed during the comment period. The alternatives were suggested by the NDPC, agencies and individuals.

NDPC submitted 23 of the 54 route alternatives in order to address individual landowner concerns, agency concerns, engineering constraints or constructability issues. The Minnesota Department of Natural Resources and Minnesota Pollution Control Agency also offered suggestions for routing options, including following Enbridge’s mainline corridor, the Great Lakes Natural Gas Pipeline, Highway 2 and the Soo Line railroad right-of-way. Some of these routing options vary in length from 30 to 205 miles. Many are shorter options submitted by landowners to address a specific concern related to location on their property.

Specific maps of each route alternative are included in Appendix A of the *Sandpiper Alternative Routes Summary Report* and are available at:

<i>Route Alternative</i>	<i>eDocket ID Number</i>	<i>DOC EERA Website</i>
RA-01 - RA-20	20147-10573-2	http://mn.gov/commerce/energyfacilities//resource.html?id=33938
RA-21 - RA- 41	20147-10573-3	
RA-41 - RA- 54	20147-10574-4	

In addition, eight system alternatives were proposed – alternates that propose a different configuration of pipelines for moving oil from the Williston Basin than NDPC’s proposal. The proposed system alternatives included routing the pipeline north or south of the NDPC’s proposed route. None of the system alternatives connected to the new Clearbrook terminal. Three of the system alternatives do not connect into the Superior Terminal.

One system alternative, SA-03, which was suggested by the Minnesota Pollution Control Agency (PCA) to avoid the lakes areas crossed by NDPC’s preferred route, was subsequently modified into a route alternative by including a connection to the new Clearbrook terminal.

Line 3 Meeting and Comments

July 1, 2015, the Commission accepted Enbridge Energy’s (Enbridge) applications for a CN and route permit (Docket No: PPL-15-137) for the Line 3 Pipeline Replacement Project as complete, initiating the two review processes for that project. As with Sandpiper, the route permit process for this proposal also triggers the preparation of an environmental document and information and scoping meeting. Since the preferred routes for the Line 3 and Sandpiper projects overlap between Clearbrook and Superior, the Line 3 scoping meetings provided an added opportunity to gather input on the Sandpiper scope.

Between August 11, 2015, and August 26, 2014, Commission and EERA staff held 15 public information/scoping meetings in 10 of the 12 counties crossed by the proposed Line 3 Replacement Project, pursuant to Minnesota Rule 7852.1300. A draft Scoping Document covering both the Sandpiper and Line 3 projects was made available at these meetings and on EERA’s website and eDockets. The deadline for filing comments on potential human and environmental impacts and alternative pipeline routes to be considered closed September 30, 2015. Comments received through that process were reviewed for use in this scoping document and appear on DOC EERA website at:

<http://mn.gov/commerce/energyfacilities//resource.html?id=34296>

Agency Coordination

In addition to formal comment periods and ongoing, routine communications, EERA staff also held a series of coordination meetings with state and federal agencies to identify issues to be addressed in the environmental document. The table below shows the meetings held to date, the meeting purpose and outcomes.

Agency Coordination Meetings for Sandpipe and Line 3			
Meeting	Date	Purpose	Outcomes
Agency Meeting 1	8/4/2015	(1) review process and status of Sandpiper and Line 3 pipeline projects; and (2) begin issue identification, including spill analysis	Review Keystone XL spill chapter and the Exponent Report on Keystone. Provide comments on Draft Scope.
Agency Coordination Meeting 2	9/29/2015	(1) discuss scoping methodologies and issues for Sandpiper and Line 3 and (2) begin spill modeling discussion and scoping	Intro to spill modeling and what was done for Keystone XL and the Exponent Report.
Agency Coordination Meeting 3	10/13/2015	Begin identifying sites for spill modeling. Sites under review include those suggested by modelers, EERA, and DNR/PCA.	None
Spill Modeling 1 (Agencies, Modelers, Applicant)	10/15/2015	Review of site selection criteria (representative sites across the preferred and alternative routes) and discussion of potential sites	(1) Selection of 3-D modeling sites (Mississippi R at Pallisade and Mississippi R at Little Falls). (2) Selection of four 2-D modelling site locations: Shell River Crossing at Twin Lakes, Red River, Sandy River, and Mosquito Creek. (3) Other sites to consider for the next meeting include a site along Hwy 2 (<i>Miss River @ White Oak or Miss River @ Ball Club</i>) and Snake River to St. Croix. Black Hoof River to Nemadji R. (4) Follow-up meeting will include final site selection and scenario inputs.
Spill Modeling 2 (Agencies, Modelers, Applicant)	11/4/2015	Finalize site selections and develop modeling scenario inputs.	7 sites selected for modeling; scenario inputs developed (seasonal conditions, oil types, worst case scenario definition)

Agency Coordination Meeting 4	11/5/2015	Review and discuss Impact Analysis Methodologies (IAM)	Agencies will provide comments to EERA on methodologies to incorporate into IAM.
Agency Coordination Meeting 5	11/17/2015	Line 3 Scope	

Tribal Coordination

In response to a request from the Mille Lacs Band of Ojibwe, the Department is establishing a tribal consultation process between the agency and the band concerning the potential impacts of the proposed pipeline projects.

PREPARERS

The environmental document will be prepared by the EERA staff, with the assistance of a consultant retained by the EERA. The consultant will be responsible for: compiling and reviewing the adequacy of data and reports, including those received from the proposer; preparing technical information on expected impacts of the Project; and preparing sections of the environmental document. The consultant may also generate or collect data relevant to issues in the environmental document. The names of those involved in preparation of the document will be listed.

SCHEDULE

A *tentative* schedule for development and issuance of the environmental document is outlined below. The schedule is contingent upon a number of factors; unforeseen circumstances may alter it.

Public Scoping Meetings (Sandpiper)	March 2014
Close of Public Comment Period	May 2014
PUC Identifies Sandpiper Routes for Analysis	August 2014
Draft Scoping Document (Sandpiper/Line 3)	July 2015
Public Scoping Meetings (Line 3)	August 2015
Close of Public Comment Period	September 2015
Sandpiper Scoping Document	November 2015
Public Comment Period	November 2015
PUC Review of Sandpiper Scoping Document	December 2015
Environmental Document Release	April 2016
Public Information Meetings	May 2016

SCOPE AND CONTENT OF ENVIRONMENTAL DOCUMENT

The pipeline routing rules, Minn. Rules, Chapter 7852, require the preparation of an environmental document after the Commission has identified route and route segments to

be considered at the public hearing and included in the environmental document (See MN Rule, part 7852.1500).

The environmental document is intended for: a) the Commission in its deliberations, b) the public, c) the public hearing, and d) as a document that informs and educates. It should:

- Present factual data and information in a clear, meaningful and useful manner that is easy to follow
- Identify measures necessary to avoid or mitigate adverse environmental effects

The issues outlined below will be analyzed in the environmental document for the proposed Sandpiper Pipeline project. The environmental document will describe the project and the human and environmental resources of the project area. It will provide information on the potential impacts of the project as they relate to the topics outlined in this scoping decision, including possible mitigation measures. It will identify impacts that cannot be avoided and irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The environmental document will discuss the relative merits of the preferred and route site alternatives studied in the environmental document using the criteria found in Minnesota Rule 7852.1900.

The environmental document will include a discussion of the human and environmental resources potentially impacted by the preferred route and the route alternatives described herein. Potential impacts, both positive and negative, of the preferred route and each alternative will be described. Based on the impacts identified, the environmental document will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The environmental document will describe any unavoidable impacts resulting from implementation of the proposed project.

I. DESCRIPTION OF THE PROPOSED PROJECT AND APPLICANT

The Sandpiper project will be described, including the applicant, project purpose, route width, right-of-way requirements, associated facilities (including pump stations), costs, and construction, restoration, operation and maintenance procedures.

Proposed best management practices for construction and normal operations will be described and evaluated, including environmental control plans, agricultural mitigation plans, integrity management plans and incident response/emergency management plans. The applicant's regulatory compliance and incident response history will be presented and evaluated.

The environmental document for the proposed project and approved route alternatives will evaluate the *Environmental Information Report* and supporting documentation. Supporting documents include, the Environmental Protection Plan and best management practices (BMPs), Ag Mitigation Plan, Unanticipated Discoveries Plan, Roads Crossed by the Preferred

Route, and Waterbodies Crossed by the Preferred Route¹. Recommended mitigation measures for any anticipated impacts or practices will be identified.

II. PERMITS AND APPROVALS

Known governmental permits and approvals required for the proposed project along with the unit of government responsible for each decision will be identified, including those associated with the Commission's Certificate of Need and Pipeline Route Permit processes. As per the Commission February 11, 2014, Order², the environmental document will include a discussion of the proposed project's compliance with applicable statutes and rules, and recommendations for permit language, including language specifically drafted for certain routes.

III. ALTERNATIVES TO THE PROJECT

The environmental document will compare potentially significant impacts of the proposed pipeline project with those of other reasonable alternative to the proposed project. Alternatives that would not meet the underlying need for or purpose of the project will be excluded. The option of transporting crude oil from North Dakota to the Clearbrook terminal and Superior, Wisconsin, by rail and truck will be analyzed. The alternative of no action will be addressed.

IV. ROUTE ALTERNATIVES

In its August 25, 2014, Order, the Commission accepted 53 Sandpiper route alternatives recommended by EERA in its July 17, 2014, comments and recommendations (Sandpiper Alternative Routes Summary Report) and system alternative SA-03 as modified by the EERA for evaluation in the environmental document. The Commission also accepted the seven expanded route width areas recommended by EERA and the expanded route width for Carlton County 2 requested by NDPC. [See attached tables and maps and EERA website description of the alternatives:

<http://mn.gov/commerce/energyfacilities//resource.html?Id=33938>.] The environmental document will analyze both the Sandpiper Pipeline and Line 3 Replacement project, cumulatively and separately, for all alternatives between Clearbrook and Superior.

¹ See NDPC Route Application(<http://mn.gov/commerce/energyfacilities//resource.html?Id=33761>)

²Commission Order, dated February 11, 2014, See eDockets, Document ID [20142-96351-01](http://mn.gov/commerce/energyfacilities//resource.html?Id=20142-96351-01), p. 8.

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

Data and analyses in the environmental document will be commensurate with the importance of potential impacts and the relevance of the information to a reasoned choice among alternatives and to the consideration of the need for mitigation measures.³ The relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the environmental document will be considered in the analysis. Less important material may be summarized, consolidated or simply referenced.

If information about potentially significant environmental effects is essential to a reasoned choice among alternatives and is not known, cannot be obtained, or the means to obtain it is not known, the environmental document will include a statement that such information is incomplete or unavailable and the relevance of the information in evaluating potential impacts or alternatives, a brief summary of existing credible scientific evidence that is relevant to evaluating the potential significant environmental impacts; and an evaluation of such impacts from the preferred route and route alternatives based upon theoretical approaches or research methods generally accepted in the scientific community.⁴

The environmental document will take into account the potential impacts of both the Sandpiper Pipeline and Line 3 Replacement project, cumulatively and separately, including impacts relative to the right-of-way needed to collocate the two lines between Clearbrook and Superior along the preferred route and all alternatives, and specific characteristics of the pipelines and products to be transported through them.

Resources to be evaluated are classified into the following major resource types. The specific resource features for each type are in parentheses.

- Human Settlement (aesthetics/visual resources, housing, noise, property values, zoning/land use compatibility, population, income, environmental justice, existing contaminated sites)
- Transportation and Public Services (roads, public utilities, emergency services, airports, schools, churches)
- Economics (mining, agriculture, forestry, recreation and tourism)
- Cultural Resources (archaeological, historical, cultural values, treaty areas)
- Natural Environment (air, water, wetlands, soil, natural land and habitat)
- Rare and Unique Biological Resources (listed species, state natural heritage sites, Species of Greatest Conservation Need [SGCN], scientific and natural areas)
- High Consequence Areas (populated, drinking water, sensitive ecological areas)

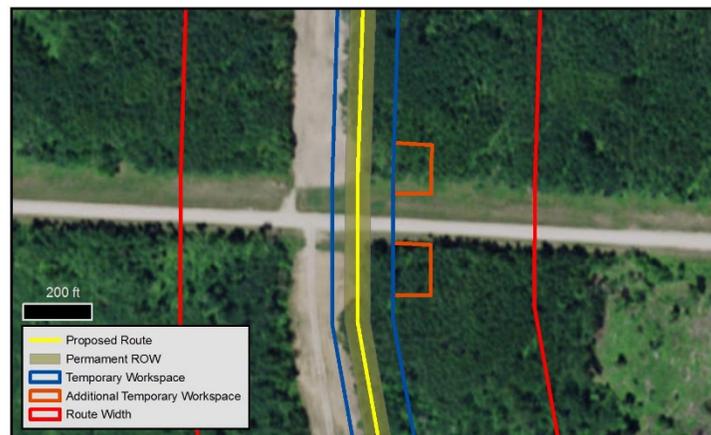
No field level data collection will be performed for any of the route alternatives. Field data for the Applicant's preferred route has been completed by the Applicant. Publicly available

³ Minnesota Rule 4410.2300.

⁴ Minnesota Rule 4410.2500.

data will be used to compare routes and will include existing federal, state and local government sources.

The scale of analysis will include a regional analysis area (RAA) to describe resources and potential impacts that may occur beyond the area of disturbance for construction and the permanent ROW, and an alignment analysis area (AAA). Analysis areas are outlined for each resource type in Attachment 1A. The AAA is focused on the land and alignment of various facilities within the proposed route width. It is illustrated below. The route width is the broadest area of land at 725 feet across and spanning possible locations of pipelines, temporary construction and the permanent ROW.



The RAA is generally measured from the proposed route centerline of the AAA; analysis at this regional scale is intended to put the resources in perspective, such as, for example, noting that a particular wetland in the AAA is part of a larger complex or that prime farmland extends throughout the area. Quantitative analysis at this regional scale will count, measure or otherwise present features a certain distance beyond the alignment centerline. The RAA will vary depending on the resource, but will be applied equally across all alternatives for a particular resource. For example, the RAA for some resources may be the entire county and for others may be a specified distance from the centerline (details can be found in Attachment 1). Resources within the AAA and RAA will be presented, along with information on quality and function of those resources, and potential impacts of the preferred and alternative routes analyzed.

The Sandpiper Route Permit Application includes the location of:

- Pipeline construction and permanent ROW,
- Extra work/staging areas,
- Access roads,
- Pipe and contractor yards, and
- Aboveground facilities (pump stations).

Detailed pipeline construction and operation features are not available for the major route alternatives accepted for analysis. General pipeline construction and pump station spacing will be analyzed using the same spatial footprint as the Applicant's preferred route.

HUMAN SETTLEMENT

Qualitative comparison of major route alternatives will be conducted for property values, human populations and income comparisons. Local land use plans will be identified. Potential aesthetic impacts will be addressed using federal guidelines applicable to federal forest areas and other unique aesthetic viewsheds that could be altered. Sensitive human settlement noise receptors will be assessed using state standard methods. Land type conversion as a result of project construction will be analyzed across all routes and route alternatives.

Laws, Statutes and Rules

Human settlement criteria will be evaluated pursuant to the following laws and rules: MEPA criteria for analysis (M.S. 116D); U.S. Forest Service (USFS) guidelines; Pipeline routing (M.R. 7852.1900); Noise Pollution Control (M.R. 7030), Executive Order 12198 Council on Environmental Quality Guidelines, and Hazardous Waste Generation (M.R. 7045).

Data Sources Identified

The 2010 U.S. census data will be the primary source data for demographic, housing and property value analysis. Supplemental data will be obtained from local and regional land use plans, development plans and discussion with local officials for zoning and land use analysis. Visual resource analysis will use USFS guidelines. Noise impacts will be assessed according to state standards on identified receptors. Environmental justice analysis will use Minnesota Department of Employment and Economic Development 2010 U.S. census datasets, and the most recent American Community Survey of the U.S. Census Bureau. Zoning and land use will be assessed qualitatively to identify possible current and future conflicts.

Housing

Evaluation of residential housing impacts includes an estimate of the number of homes within a certain distance of the pipeline and any displaced homes. Impacts to homes as a result of changes in access resulting from construction will also be evaluated. Any residences or other buildings located within the Applicant's Preferred Route and other route alternatives will be identified. The potential for a resulting displacement of residences or other human activities will be assessed. The location and proximity of residences or other structures will be reviewed using aerial photography and analysis and proximity tools in ArcGIS.

Property Values

Relative differences in property values among major route alternatives will be assessed. The construction and operation of a pipeline system can have effects on existing property values. Property values are influenced by site-specific factors and local and national market conditions. Existing literature and datasets will be used to assess effects.

Population

Current and projected future distribution of human populations will be characterized. The sizes and distribution of incorporated areas will be summarized.

Environmental Justice

Disproportionately high and adverse impacts on minority and low-income populations with respect to human health and the environment will be assessed.

Income

Income levels in the counties of the Project region, including all major route alternatives, will be described. Median income levels among the major population groups will be compared.

Planning and Zoning

Minnesota statutes provide local governments with zoning authority to promote the public health and general welfare and MS 299J.05 provides for pipeline setback ordinances. County records will be reviewed to determine existing land-use plans and zoning ordinances or development codes along the Applicant's Preferred Route and other route alternatives to determine whether location of the proposed facilities is consistent with current zoning and ongoing land uses.

Aesthetics

Aesthetic and visual resources include the physical features of a landscape such as land, water, vegetation, animals and structures. Resources will be identified at an RAA consistent with USFS guidelines for visual resource analysis. The impact assessment will also describe the visual changes that will occur if the pipeline and associated facilities are built. Mitigation measures, where adverse visual effects are identified, will be addressed. The relative scenic value or visual importance of these features will be assessed and impacts assessed based on distance to Project structures, viewshed perspective, and duration of view impairment. The location and proximity of these resources to the Project will be reviewed using spatial analysis tools in ArcGIS.

Noise

The potential for long-term operational pump station, and associated substation, noise impacts will be assessed by considering the sound level increase over existing levels. Receptors, such as homes, that may be impacted by changes in noise levels as a result of pumping stations will be evaluated for compliance with the state noise standard.

Existing Contaminated Sites

Documented sites of environmental contamination will be assessed. The greatest potential

for impact would be the inadvertent excavation of preexisting environmental contaminants. To determine the potential presence of preexisting contamination, data will be collected from the U.S. Environmental Protection Agency (EPA) Facility Registration Service (FRS). This exchange network is a partnership among states, tribes, territories and the EPA to facilitate the exchange of environmental information throughout the country. Readily available Minnesota databases residing with Minnesota Department of Transportation (MnDOT), Minnesota Pollution Control Agency and other state agencies will also be obtained. For route comparison purposes, counts of sites with preexisting contamination (if any) will be developed using spatial analysis tools within ArcGIS.

TRANSPORTATION AND PUBLIC SERVICES

Public service features include schools, medical facilities, religious facilities, fire and police stations and transportation networks (such as roads, airports and railroads), which serve the daily needs of residents in the community. These important features are located throughout all of the route alternatives under consideration.

Laws, Statutes and Rules

These features are being evaluated pursuant to Utility Permit (M.R. 8810), Hazardous Materials Incidence Response (M.R. 7514), Airport zoning standards (M.R. 8800.24), Pipeline routing criteria (M.R. 7852.1900), and M.S. 138 (Historic Sites).

Data Sources Identified

The data used to establish baseline community features will be derived from a variety of federal, state and local sources. Data for emergency services will be collected from the U.S. Geological Survey (USGS) National Structures Datasets (NSD); cemeteries and church data will be derived from ESRI and other sources; highway data will be collected from USGS Topologically Integrated Geographic Encoding and Referencing (TIGER) data (and other sources); airport data will be collected from the Federal Aviation Administration's (FAA's) National Flight Data Center (and other sources); and schools data will be acquired from Minnesota databases.

Counts of features will be developed using spatial analysis tools within ArcGIS. Roadway crossings will be quantified and classified as state, federal, county and local. Roads intersecting route alternatives will be quantified by road class designation. Utility crossings of route alternatives pursuant to state regulations for a Utility Permit will be quantified. Emergency service plans will be identified and qualitatively discussed for each major route alternative area, and a tabulation of plans and characteristics will be compared to emergency response plans from the Applicant for identifying gaps and inconsistencies per state and federal rules. Airport types and locations will be quantitatively compared, as will schools and churches.

Roadways

Comparison of route alternatives with various road classes will be performed. Compatibility of the proposed pipeline crossings of roads with MnDOT's utility accommodation policy will be performed to ensure that the proposed Project, if constructed and operated, would not

interfere with the flow of traffic or the safe operation of vehicles.

Public Utilities

To assess the potential impact of the Applicant's Preferred Route and other route alternatives on public utilities that serve residents and businesses in the Project area, existing electric and natural gas utilities that could be crossed or affected by the proposed Project will be identified. Presence of power-generating facilities located in the vicinity of routes will also be reviewed.

Emergency Services

Law enforcement agencies, city and community fire departments, volunteer fire departments, rural fire departments, and fire protection districts along the Applicant's Preferred Route and other route alternatives will be identified. Hospitals, emergency response centers, emergency medical services and ambulance districts will also be identified. Potential impacts will be evaluated particularly as they relate to accidental spill releases.

Airports

The locations of airports and private landing strips in the vicinity of all of the route alternatives will be identified. Setbacks and other requirements of these facilities will be evaluated.

ECONOMICS

Regional economies for the preferred and alternative routes in Minnesota will be evaluated for their regional and Project-specific importance. An overview of the region-wide financial contribution of these economies will be provided. Mapping will be used to show the regional locations of land areas contributing to these economies. Evaluation of economic impacts will include cost estimates of the preferred route and alternatives and impact to local and regional economies.

Laws, Statutes and Rules

Economic criteria are being evaluated pursuant to the following laws and rules: Protecting Public Facilities and Agricultural Land (M.S. 216 G.07), Agricultural Impact Mitigation Plan Permit (M.S. 216B.243, subd 7), Noxious Weed Management Plan (18G.04), Pipeline routing (M.R. 7852.1900), and Wild, Scenic, and Recreational Rivers (M.R. 6105).

Data Sources Identified

The 2011 USGS National Land Cover Database and additional detailed information on existing land use and zoning will be obtained from counties and municipalities crossed by the route alternatives. Information on prime and unique farmland will be obtained from Natural Resources Conservation Service (NRCS), and information on parcels participating in the Farm Service Agency Conservation Reserve Program will be obtained from the U.S. Department of Agriculture (USDA). Information on U.S. Army Corps of Engineers, U.S. Department of Interior and other federal recreational and public use areas will be obtained.

This will include landscape-scale conservation systems such as the tallgrass prairie conservation area. Readily available database information will also be obtained from the Minnesota Geospatial Information Office (MnGeo), Minnesota Department of Agriculture (agricultural resource types), Minnesota Department of Natural Resources (DNR) (forest inventory data, forest stewardship sites, minerals, public use recreation designations such as PRIM and tourism centers), University of Minnesota 2011 Forest Products Industry Report and Minnesota Office of Tourism.

Land cover datasets will be used to divide areas into the four major economic land uses in the region. This will be presented at a regional scale. Qualitative comparison will be made for the predominant economies in the Project region and the relative differences among major route alignments.

Recreation and tourism data will be obtained from sources such as Minnesota DNR, Minnesota Department of Employment and Economic Development, the University of Minnesota Tourism Center, and Minnesota Department of Revenue Leisure and Hospitality Industry Reports.

Agriculture

Agricultural areas, including prime farmland and crops in the project region will be described. Both short and long-term impacts and mitigation of pipeline construction and operation will be analyzed, including potential impacts to potatoes, wild rice, specialty crops and organic and transitional operations.

Forestry

Timber resources and forest areas in the Project region will be described and mapped, including ownership. Potential impacts to the forest products economy will be discussed, particularly regarding land permanently removed from forestry by the pipeline right-of-way as well as access concerns for on-going forest management activities.

Mining

Minnesota's mining resources include ferrous and non-ferrous metals, high-quality granite, limestone, sand and gravel, and peat. Locations and types of mining resources, active mines and readily available mineral lease data will be mapped and summarized for the Project region, and potential impacts discussed.

Recreation and Tourism

Regional tourism, including public recreation lands, percent of housing serving as vacation/second homes and other special use areas will be identified. Centers of tourism economy will be identified, including "destination" locations, such as the Brainerd Lakes area. The economic impact of recreational tourism regionally and locally will be analyzed within the RAA.

CULTURAL RESOURCES

Cultural resources include archaeological resources, historic resources, cultural values (including Traditional Cultural Properties [TCPs]) and treaty areas. Archaeological resources include historic and precontact artifacts, structural ruins, or earthworks and are often partially or completely below ground. Historic resources include extant structures, such as buildings and bridges, as well as districts and landscapes. Potential impacts to cultural resources will be evaluated across the preferred route and route alternatives.

Laws, Statutes and Rules

Cultural resources are being evaluated pursuant to M.S. 138 (historic and archaeological sites) and M.R. 7852.1900 (pipeline routing criteria).

Data Sources Identified

Information concerning cultural resources will be obtained from the cultural resources survey that is being conducted for the Applicant's Preferred Route. It is anticipated that the survey report will include information regarding archaeological sites, historic resources, and properties of cultural value for the Applicant's Preferred Route. The Minnesota State Historic Preservation Office (SHPO) maintains records of known archaeological and historic resources, which will be consulted for the route alternatives. The Minnesota SHPO inventory files to be reviewed include: History/Architecture Inventory, History/Architecture Reports, Archaeological Sites, and Archaeological Reports. In addition, historical maps (General Land Office, USGS, etc.), aerial imagery and online libraries will be used for additional information.

Archaeological, Historical, Cultural

Counts and categories of the resources within the Applicant's Preferred Route and the route alternatives will be developed using spatial analysis tools within ArcGIS. Direct and indirect impacts to cultural resources will be evaluated for resources in the AAA. Appropriate mitigation measures to reduce impacts from pipeline construction and operation and accidental releases will be recommended as necessary.

Cultural resources that are eligible, listed or unevaluated for listing in the Minnesota State Historic Sites Network and the Minnesota State Register of Historic Places will be included in the impacts assessment. In addition, impacts to resources that are eligible, listed or unevaluated for listing in the National Register of Historic Places (NRHP) will also be assessed. The National Historic Preservation Act (Public Law 102-575) defines the term "historic property" to include districts, sites, buildings, structures, landscapes and objects included in or eligible for the NRHP.

NATURAL ENVIRONMENT

Natural environment broadly encompasses air, water and biological resources. A list of some of the specific natural resource features to be analyzed in the environmental document (as identified through public comment) can be found in Attachment 1B.

Laws, Statutes and Rules

The following laws, rules and guidelines provide the basis for analysis and evaluation of Project effects: MEPA criteria for analysis (M.S. 116D), pipeline routing (M.R. 7852.1900), State Implementation Plan (Clean Air Act [CAA] Title I section 1 attainment), Air Emission Inventory (M.S./M.R. 116.091, 116.07/7019.3000), Capped Emissions Permit (M.R. 7007.1140–7007.1148), Wetlands Conservation Act (M.S./M.R. 103G/8420), Wild, Scenic, and Recreational Rivers (M.R. 6105), Outstanding Resource Value Waters (M.R. 7050.018), Public Waters (M.S. 103G.245), Watershed Restoration and Protection Strategy/Total Maximum Daily Loads (WRAPs/TMDLs) (Minnesota Pollution Control Agency [MPCA]: Clean Water Act [CWA] 103(d)), Watershed management (M.S. 103D/108/110B), Clean Water Legacy Act (M.S. 114D), Floodplain Management (M.S. 104), Groundwater Protection (M.S. 103H), Appropriation Permit (M.S. 103G.271), National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit (M.S./M.R. 115-116/7001, 7090), Native Prairie Bank (M.S. 84.96), Noxious Weed Management Plan (18G.04), and Wildlife Management (M.R. 6230).

Data Sources Identified

Natural land cover data sources are the 2011 USGS National Land Cover Database, GAP land cover, locations of Wildlife Management Areas (WMAs), Waterfowl Production Areas (WPAs) and DNR prairie conservation easements. Water resources data will be obtained from readily available databases residing with state and federal sources, including MnGeo, waterbody data from the USGS National Hydrography Flowline and Waterbody Database (NHD), U.S. National Atlas Water Feature Line dataset, EPA's Impaired Streams Database, and the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Database and Minnesota NWI update. Where database information is readily available, wetlands will be tagged as associated with the MPCA wetland quality monitoring program, state or federal wetland banking program, and MPCA watershed-based TMDL Implementation Plan or WRAP areas in or near the routes. Wetlands that have a calcareous fen or are designated as wild rice wetlands will be tagged. Readily available databases will be used to tag wetlands associated with Minnesota Wetland Conservation Act or other state or federally funded easement and management plans.

Additional databases for identification and assessment of lake, stream and river resources may include DNR Public Waters Inventory, DNR LakeFinder, DNR Hydrography, Minnesota Trout Streams, Statewide Altered Watercourse, Federal Emergency Management Agency (FEMA) Floodplain, 305b Assessments of Stream Conditions, MPCA sentinel lake designations, TMDL watersheds and waterbodies, Outstanding Resource Value Waters, and Watershed District and Watershed Management Organization boundaries. The MPCA's Index of Biological Integrity will be used to evaluate the quality of rivers and streams crossed by the preferred and alternative routes. Number of lakes and counts of river and stream crossings of various designations will be used for comparing routes.

Karst and other geologic landform datasets will be used to assess groundwater sensitive areas. Minnesota Department of Health, Minnesota Geological Survey, MnGeo, and DNR Data Deli databases will be used to assess the proximity of routes to groundwater sensitive areas, wells and source protections areas.

Potential impacts to resources will be quantified using spatial analysis tools in ArcGIS. Appropriate mitigation measures to reduce impacts from pipeline construction and operation and accidental releases will be recommended.

Air Quality

Air quality impacts associated with construction and operation of the proposed Project and associated facilities include emissions from fugitive dust, fossil-fuel fired equipment, and pipeline and tank evaporation losses. The air quality impacts analysis will include a review and estimate of the emission inventory of all criteria pollutant, greenhouse gas and hazardous air pollutant emissions related to construction and operation of the proposed Project. Air quality impacts will be reviewed in light of federal and state local air pollution standards and regulatory requirements, where applicable. Where no regulatory standards can be applied, comparative thresholds will be used. The identification of air quality impacts will take into consideration other factors such as the uniqueness of a particular location and existing environmental conditions.

Water Resources: Quality, Watersheds, Floodplains

Streams and rivers, lakes, groundwater, and floodplains will be identified and compared across route alignments. Additionally, special resources for which federal and state laws govern restoration and protection will be identified. This includes outstanding resource value waters, sentinel lake watersheds, impaired waters for which state and federal monies are being spent, and resources being protected and restored under Minnesota's Constitutional Amendment for Clean Water, Land and Legacy. Measures to minimize adverse effects include using sound erosion control and stormwater management practices and reducing floodplain encroachment and increases in the height of the regional (100-year) floodplain elevation. Properly minimizing adverse effects requires assessment of existing conditions such as water quality, fishery resources, floodplain functions and values, watershed stability, potential undesirable outcomes to these conditions, and proposed measures to minimize the adverse effects.

The extent to which erosion control and storm water management measures, that is, Best Management Practices (BMPs) or specific erosion control and storm water management commitments, are proposed depends on a variety of factors, including, construction time frame and the extent of water and floodplain resources in the Project's area of effect.

Wetlands

Wetlands will be identified according to the NWI and Minnesota updates where available. USDA NRCS Farm Service Agency data may be readily available. Special feature wetlands will be identified as wild rice wetlands, calcareous fens and state or federal wetland bank sites.

Wetland boundaries are available for the Applicant's Preferred Route from wetland boundary determinations or delineations conducted in accordance with the USACE, the agency that authorizes Section 404 wetland permits.

Natural Communities and Habitat

Native flora and wildlife habitat will be characterized in the overall Project region, within the RAA and AAA. GAP land cover, ecological subsections and public designated areas for wildlife such as WMAs, federal, state, and locally identified conservation or habitat areas will be identified.

Soil Resources

Soil orders in the Project region will be summarized and mapped. To determine potential impacts to major soil classifications, soils data will be obtained from the NRCS's Major Land Resource Areas (MLRA) database. Acreage of soil orders and some lower order classifications along each route alternative will be estimated using spatial analysis tools in ArcGIS. The Digital General Soil Map of the United States or STATSGO2 will aid in the development of particular soil quality information.

RARE AND UNIQUE NATURAL RESOURCES

Biological resources with special protection and management will be analyzed as a distinct subset of natural environment. These include: state and federally listed threatened and endangered species, state natural heritage sites, species of greatest conservation need, state scientific and natural areas, and Minnesota Biological Survey sites of Biodiversity Significance.

Laws, Statutes and Rules

Rare and unique natural resources are being analyzed pursuant to the following laws and rules: Minnesota DNR: Takings Permit (for Endangered or Threatened Species)(M.S./M.R. 84.0895/6212.1800), Endangered Species Act (Section 7), Critical Habitat (M.S./M.R. 84.033/6136), Tomorrow's Habitat for the Wild and Rare, Scientific and Natural Areas and Critical Habitat (M.S./M.R. 84.033/6136), and MEPA criteria for analysis (M.S. 116D).

Data Sources Identified

Natural heritage data will come from the NHIS, and include spatial data on listed species. Scientific and natural area locations will come from the DNR data sources. GAP land cover and methods from Tomorrow's Habitat for the Wild and Rare will be used to identify SGCN habitat. Each of these features will be quantified according to the number intersected by the AAA. Regional-scale comparison will vary based upon the available dataset. Data will be available on a county basis except that determination of SGCN habitat polygons will be based on analysis within 5 miles of the alignments.

State and Federally Listed Threatened and Endangered

To determine impacts on state and federally listed threatened and endangered species, data would be collected from the USFWS Information, Planning, and Conservation System (IPaC) at the county level. In addition, USFWS Species Fact Sheets, USFWS Critical Habitat data, and Natural Heritage data will also be reviewed.

State Natural Heritage Sites

In addition to listed species location data, NHIS licensed data provides for identification of high-quality native plant communities, animal aggregations, and other important ecological and landform features. These data will be analyzed using ArcGIS to spatially plot their locations in relation to the Applicant's Preferred Route and route alternatives. Data displayed on maps or in tables will be in compliance with the data privacy requirements of the NHIS license.

Species of Greatest Conservation Need

Minnesota's State Wildlife Action Plan identifies SGCN habitat. The associated land use cover data will be obtained and used to assess impacts to SGCN habitat.

State Scientific and Natural Areas

Minnesota's geospatial data on scientific and natural areas will be obtained. These data will be analyzed using ArcGIS to spatially plot their locations in relationship to the Applicant's Preferred Route and alternatives.

HIGH CONSEQUENCE AREAS AND NATURAL DISASTER HAZARD AREAS

The consequences of an inadvertent release of product (natural gas, crude oil, refined products, etc.) from a pipeline can vary, depending on where the release occurs and the product involved. These releases may adversely impact or damage human health and safety, the environment and personal property.

HCA are areas and features where a release may have the most significant adverse consequences. HCAs for hazardous liquid pipelines include:

- Populated areas – including both high population areas (called “urbanized areas” by the U.S. Census Bureau) and other populated areas (areas referred to by the Census Bureau as a “designated place”).
- Drinking water sources – including those supplied by surface water or wells and where a secondary source of water supply is not available. The land area in which spilled hazardous liquid could affect the water supply is also treated as an HCA.
- Unusually sensitive ecological areas – including locations where critically imperiled species can be found, areas where multiple examples federally listed threatened and endangered species are found, and areas where migratory water birds concentrate.

Natural Disaster Hazard Zones are areas that present a higher risk of failure in the event of a flood or landslide. These Natural Disaster Hazard Zones are defined as being Low, Medium or High risk.

Laws, Statutes and Rules

High-Consequence Areas (HCAs) and Natural Disaster Hazard Areas are defined by the U.S. Department of Transportation's (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). Federal pipeline safety regulations use the concept of HCAs to

identify areas and features where a release may have the most significant adverse consequences. The operator of a pipeline is required to devote additional resources and analysis to maintaining integrity of the pipeline in these identified areas.

Data Sources Identified

HCA data on populated areas and flood and landslide hazard data will be collected from PHMSA National Pipeline Mapping System. Drinking water and ecological HCAs data will be provided by Enbridge Energy, as access to these data is restricted. Counts of the areas and acres within each alternative route will be developed using spatial analysis tools within ArcGIS.

VI. CUMULATIVE EFFECTS

Cumulative effects are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions and are to be addressed pursuant to M.R. 7852.1900, Subp. 3. for pipeline routing. The purpose of the cumulative effects analysis is to identify any proposed Project effects that, when combined with other effects to resources in the region, may cumulatively through incremental impacts become significant. Adverse impacts that cannot be avoided and irreversible and irretrievable commitments of resources also will be presented.

The cumulative effects methodology will:

- Identify other actions affecting the resources, ecosystems (including aquatic ecosystems) and human settlements of concern;
- Characterize impacted resources identified in terms of their response to withstand change and capacity to withstand stress;
- Identify the important cause and effect relationships between human activities and resources;
- Modify alternatives to mitigate significant cumulative effects.

Not all actions would have cumulative effects in all resource areas. Potential effects for such actions will be discussed in terms of the potentially affected resources. When the effects of a reasonably foreseeable action cannot be quantified, qualitative assessments will be provided. Past and present projects and their effects will be included as part of the baseline status of environmental resources presented in the analysis of alternatives.

In addition, the environmental document will take into account the potential cumulative impacts of both the Sandpiper Pipeline and Line 3 Replacement project, including impacts relative to the right-of-way needed to collocate the two lines between Clearbrook and Superior along the preferred route and all alternatives.

As proposed, the Line 3 Replacement Project will replace 282 miles of 34-inch pipeline with 337 miles of new 36-inch diameter pipeline. Line 3 was originally constructed as a series of loops beginning in 1962 and placed into service in 1968.⁵ The integrity management plan

⁵ See Chapter 2 of the Line 3 Replacement Route Permit Application to the Minnesota Public Utilities Commission.

for Line 3 has seen an increasing number of integrity digs and repairs in recent years. Starting in 2008, Enbridge voluntarily reduced the pressure and capacity of Line 3 to 390 thousand barrels per day (bpd). The Line 3 Replacement Project will restore the line to its historical operating capacity of 760,000 bpd from its current capacity of 390,000 bpd.

Associated facilities for the project include upgrading four existing pump stations and adding an additional four pump stations at new locations. The project will also include 27 safety valves.

Enbridge's preferred route for the Line 3 Replacement Pipeline follows the existing Enbridge mainline corridor west of Clearbrook, Minnesota, in Kittson, Marshall, Pennington, Red Lake, Polk and Clearwater counties to the terminal in Clearbrook. East of Clearbrook, the preferred route follows approximately 75 percent of existing utility corridors in Hubbard, Wadena, Cass, Crow Wing, Aitkin and Carlton counties. If a route permit is issued for the preferred route of the Sandpiper Pipeline, Line 3 will be adjacent to Sandpiper east of Clearbrook to the Minnesota/Wisconsin border; existing Line 3 will be permanently deactivated and remain in place.⁶

Cumulative impacts of high voltage transmission lines and substations needed to serve proposed Sandpiper pump stations also will be analyzed. Other reasonably foreseeable projects will be identified by searching local land use plans, current permit applications and approved, but not built, projects in the areas of the preferred and alternative routes.

VII. IMPACT OF ROUTINE CONSTRUCTION AND OPERATION

In the analysis of route alternatives, AAA impacts will be discussed as construction or operationally related. Opportunities for avoiding impacts by adjusting the ROW will be evaluated. Construction-related impacts will be identified by reviewing the Applicant-proposed Project description details. Impacts could be from access to facilities and services, vehicle emissions and fugitive dust, noise, erosion and sedimentation, soil compaction, construction solid waste/hazardous waste, vibration, and vegetation clearing. Construction material sources (borrow sites) and major utility adjustments are possible additional construction-related impacts to be considered.

The Project would require the use of heavy equipment to clear land, dig ditches, install and backfill pipe, construct ancillary facilities, and revegetate. These impacts would occur wherever the route is located. However, these impacts can be mitigated by construction measures, such as limiting construction work hours, using BMPs to control soil erosion, minimizing the removal of vegetation, and remediating soil compaction and other soil disturbances. The potential spread of invasive species due to construction and the movement of equipment along the project route will be evaluated. Mitigation measures necessary to reduce the spread of invasive species will be identified.

⁶ See Chapter 6 of the Line 3 Replacement Route Permit Application to the Minnesota Public Utilities Commission.

Operational impacts can exist for the life of the Project. These changes could be aesthetic/viewshed, land use restrictions, vegetative cover change in the managed ROW and associated habitat, drainage patterns, soil quality, and loss of resources. Some impacts that are unavoidable can be mitigated, such as recovery of cultural artifacts and filled wetlands.

VIII. METHOD FOR ASSESSING IMPACTS OF CRUDE OIL RELEASES

Various approaches to evaluate the impacts of a crude oil release (large volume and small or pinhole leaks) will be applied to the preferred and alternative route alignments. Impact assessments will be based on literature reviews on large and small release volumes, including relevant case studies; a general analysis of impacts from a release to resources along the preferred and alternative routes, including impacts to groundwater; the probability of a release; and site specific modeling of representative sites that can be used to make general comparisons to other locations. Resources to be considered in the analysis include, but are not limited to residential structures, populated areas, water and biological resources, cultural resources and high consequence areas (HCAs).

Large Volume Spill General Methods

Large volume spill analysis will consist of spill modeling and a summary and application of methods of spill impacts from other projects, such as the Keystone XL EIS, and the *Ecological and Human Health Risk Assessment of Pipeline Releases* along Line 3 in Canada. Spill incident findings and remediation efforts from investigations near Bemidji, Minnesota, by the U.S. Geological Survey, and the National Transportation Safety Board report on the Marshall, Michigan, spill and other case studies will also be used in the analysis

The applicant, North Dakota Pipeline Company, will provide data on maximum spill volumes, spill frequency, and the types of crude oil being transported based upon the proposed engineering and operations for each pipeline. This information will be applied to all large volume spill impact analysis methods. Using these data, an estimated large volume spill footprint will be established based on methods from other current or recent past investigations, including those used by Exponent in a review of the Keystone XL Final EIS. The methods will consider general geomorphic conditions in Minnesota to develop a general spill footprint. The analysis will also include the review of data on crude oil releases from the PHMSA database.

Large Volume Spill Modeling

Spill modeling will be conducted by RPS ASA, a global science and technology consulting firm specializing in, environmental modeling, using OILMAPLAND and SIMAP modelling software. OILMAPLAND is a land and surface water spill model system (two-dimensional) that simulates oil and chemical releases from pipelines and storage facilities, providing a modeling tool for oil spills that occur on land and then migrate to streams and lakes. SIMAP provides detailed predictions of the three-dimensional trajectory, fate, biological effects, and

other impacts of spilled oil and fuels in aquatic environments. Both modeling programs meet PHMSA regulatory requirements.

To assess potential impacts associated with an accidental release, the Applicant will provide maximum spill volumes estimates at seven representative sites along the preferred and alternate routes assuming a complete pipeline rupture. Data generated from modeling representative sites, will be used to make broad environmental comparisons among and across routes in areas with similar features. At five of the seven sites, a two-dimensional oil spill trajectory and dispersion model (OILMAPLAND) will be used to estimate the potential spread of a projected maximum crude oil spill across land and into nearby watercourses and waterbodies. At two of the seven sites, a three-dimensional oil spill trajectory, dispersion, and vertical mixing model (SIMAP) will be used to estimate the potential spread of the maximum crude oil spill across land and into nearby watercourses and waterbodies as well as the potential mixing of oil and sediment in the water column.

The models will be run for a set of scenarios that include the following crude oil types: light sweet Bakken crude oil, Cold Lake Blend and Cold Lake Winter Blend. These crude oils represent a range of oil densities and chemical composition. Additional modeling parameters include seasonal variation to capture water flow volumes (high flow, low flow, and snow/ice covered), and a 24 hour model run with outputs at 6, 12 and 24 hours. The combinations of model inputs will result in more than 40 modeling scenarios from which to analyze potential impacts to resources along route alternatives.

The following maps and associated table provide an overview of sites selected for modeling. Sites were chosen to represent a range of environmental factors, such as agricultural land, forests, urban areas and wild rice lakes, as well as a range of surface waters (rivers, lakes, streams and wetlands). Site specific details can be found on each site map.

Small Leaks

Small or pinhole leaks will be evaluated qualitatively through a combination of literature review and relevant case studies. Factors for evaluation will include volume of the release, the length of time for detection, and the types of effects on groundwater, surface water and soils. Types of remediation and recovery, if applicable, will also be presented.

Potential impacts to shallow groundwater resulting from small (pinhole) leaks will be assessed qualitatively using the key findings of work done previously in Exponent's risk assessment of the Keystone XL Pipeline. Exponent used a numerical hydrocarbon spill screening model (HSSM) to evaluate a small leak from a high-pressure crude oil pipeline. The model considered a small leak of approximately 28 barrels per day and determined it would reach the ground surface within several months and that a partitioned benzene plume resulting from the leak could potentially travel up to 600 feet downgradient. To be conservative, potential groundwater resources within 1,000 feet of the potential centerline of the pipelines will be qualitatively assessed. The assessment will focus on areas where groundwater within 1,000 feet is influent to streams or other waterbodies or where shallow

groundwater wells are present. Minnesota data layers used to analyze potential leaks will include source water protection areas and groundwater sensitive areas.

IX. RELATIVE MERITS OF ALTERNATIVES

As per the Commission February 11, 2014, Order, the environmental document will⁷:

- Analyze how well each route alternative meets the routing permit selection criteria set forth in statute and rule.
- Identify routes with common or similar environmental consequences.
- Identify routes that:
 - Require no environmental mitigation
 - Have negative environmental consequences that would need mitigation, together with alternative mitigation strategies
 - Have negative environmental consequences that cannot be mitigated
 - Have fatal flaws.

The routing permit selection criteria, pursuant to Minn. Rule 7852.1900 comprise the following:

- A. human settlement, existence and density of populated areas, existing and planned future land use, and management plans;
- B. the natural environment, public and designated lands, including but not limited to natural areas, wildlife habitat, water, and recreational lands;
- C. lands of historical, archaeological, and cultural significance;
- D. economies within the route, including agricultural, commercial or industrial, forestry, recreational, and mining operations;
- E. pipeline cost and accessibility;
- F. use of existing rights-of-way and right-of-way sharing or paralleling;
- G. natural resources and features;
- H. the extent to which human or environmental effects are subject to mitigation by regulatory control and by application of the permit conditions contained in part 7852.3400 for pipeline right-of-way preparation, construction, cleanup, and restoration practices;
- I. cumulative potential effects of related or anticipated future pipeline construction; and
- J. the relevant applicable policies, rules, and regulations of other state and federal agencies, and local government land use laws including ordinances adopted under Minnesota Statutes, section 299J.05, relating to the location, design, construction, or operation of the proposed pipeline and associated facilities.

⁷Commission Order, dated February 11, 2014, See eDockets, Document ID [20142-96351-01](#), p. 8.

Attachment 1A. Resources to be Evaluated and Assessment Methods

Major Resource	Resource Feature	Datasets and Data Sources	Quantitative Unit of Comparison	Regional Analysis Area (distance beyond centerline or counties intersected by alignment) for Project Impacts	Alignment Analysis Area (will route width, ROW, and temp const. staging be compared?) for Project Impacts	Spill Impact Analysis	Regulatory Driver (law, statute, rule, guidance plan)
Human Settlement							
	Aesthetics and Visual Resources	For Federal land crossings, apply USFS Visual Resource (Aesthetic) Management System [example application: http://www.blm.gov/style/medialib/blm/nv/nepa/ruby_pipeline_project/rod/attachment_d/appendix_p.Par.59817.File.dat/Appendix%20P%20part%201%20.pdf]	# homes/parks/reststops; #federal lands for which stnds apply	USFS standard	yes	no	MEPA criteria for analysis (M.S. 116D); USFS Guidelines
	Housing	Aerial photography + applicant's EIR	# of residential structures	1000 feet (tentatively)	yes	yes	Pipeline routing (M.R. 7852.1900)
	Noise	State noise standards and guidelines for sensitive receptors	# of sensitive receptors	per state standards	yes	no	MEPA criteria for analysis (M.S. 116D); Noise Pollution Control (M.R. 7030)
	Property Value	Minnesota County datasets applied on a county basis	none - qualitative analysis	whole county intersected by an alignment	no	no	MEPA criteria for analysis (M.S. 116D)
	Zoning and Land Use Compatibility at the Local Level	County and incorporated area records	none - qualitative for identifying permits and approvals	whole county intersected by an alignment	no	no	MEPA criteria for analysis (M.S. 116D)
	Population	US Census data, 2010; MN DEED; American Community Survey	# of incorporated areas (broken out by size class)	5 miles	yes	yes	Pipeline routing (M.R. 7852.1900)
	Income		median income	whole county intersected by an alignment	no	no	Council of Environmental Quality Guidelines; MEPA criteria for analysis (M.S. 116D)
	Environmental Justice	US Census data, 2010; MN DEED	tabulation by race classes and population	whole county intersected by an alignment	no	no	E.O. 12198; Council of Environmental Quality Guidelines; MEPA criteria for analysis (M.S. 116D)
	Existing Contaminated Sites	USEPA facility registration service; MnDOT	# units of preexisting contaminated sites	5 miles	yes	yes	Hazardous waste generation (M.R. 7045); MEPA criteria for analysis (M.S. 116D)
Transportation and Public Services							
	Roadways	State highway and county highway system files; Roads MnDOT TIS	# of crossings	none	yes	no	M.R. 8810 Utility Permit
	Public Utilities	datasets for electric, gas utilities, generating facilities, water/sewer	# of utility features	area of analysis per regulations	yes	yes	Utility Permit (M.R. 8810); Minn. Stats. 84.415 and Minnesota Rules 6135 (crossing public lands and waters)
	Emergency Services	USGS national structures dataset; MnDOT	qualitative	none	no	yes	Hazardous materials incidence response (M.R. 7514)
	Airports	FAA national flight data center; MnDOT GIS data; NAVAIDS Airports, Runways	# of airports or landing strips	per airport regulations area of analysis	yes	no	Airport zoning stnds (M.R. 8800.24)
	Schools	Mn databases; USGS GNIS Schools	# units	1 mile	yes	no	Pipeline routing (M.R. 7852.1900)
	Churches (incl. cemetery)	ESRI and other sources; USGS GNIS Churches and Cemeteries	# units	1 mile	yes	no	M.S. 138 (historic sites)
Economics							
	Agriculture	2011 USGS National Land Cover Database; NRCS prime and unique farmland; agricultural land; FSA CRP; MDA (ag water quality certified farms, on-farm research farms, organic production/certification farms); GAP landcover; NRCS SSURGO data by county; USDA CropScape; MN Agricultural Statistics Division	proportion of land cover	whole county intersected by an alignment	yes	no	Protection public facilities and agricultural land M.S. 216G.07; Agricultural Impact Mitigation Plan Permit (M.S. 216B.243, subd 7); Noxious Weed Management Plan (18G.04)
	Forestry	2011 USGS National Land Cover Database; MnDNR (forest resource types, forest stewardship plan locations), MnGeo GAP land cover	proportion of land cover	whole county intersected by an alignment	yes	no	Pipeline routing (M.R. 7852.1900)
	Mining	2011 USGS National Land Cover Database; MnGeo; MnDNR GAP land cover	# mineral leases/mine permits	whole county intersected by an alignment	yes	no	Pipeline routing (M.R. 7852.1900); Surface leases (M.R. 6125.07)
	Recreation and Tourism	2011 USGS National Land Cover Database; USACE recreation and public use areas parks, sild and scenic rivers, etc); USDI federal lands; northern tallgrass prairie reserve; Mn Office of Tourism; GAP landcover; State Trails of MN	# of recreation/tourism designated land cover types	whole county intersected by an alignment	yes	no	Pipeline routing (M.R. 7852.1900); Wild, Scenic, and Recreational Rivers (M.R. 6105)
Cultural Resources							
	Archaeological Resources	Applicant data; MN SHPO, State Historic Site Network, Register of Historic Places (state/national)	# sites intersected	SHPO stnds	yes	no	M.S. 138 (historic and archaeological sites)
	Historic Resources	Applicant data; MN SHPO, State Historic Site Network, Register of Historic Places (state/national)	# sites intersected	SHPO stnds	yes	no	M.S. 138 (historic and archaeological sites)
	Cultural Values	TCP data sources	none - qualitative discussion	none	no	no	Pipeline routing (M.R. 7852.1900)
	Treaty Areas	TCP data sources	none - qualitative discussion	none	no	no	Pipeline routing (M.R. 7852.1900)
Natural Environment							
	Air Quality	Applicant data; attainment area datasets	existence/absence of a nonattainment area	whole county intersected by an alignment	no	no	MPCA: State Implementation Plan (CAA Title I section 1 attainment); Air Emission Inventory (M.S./M.R.; 116.091, 116.07/7019.3000); MPCA: Capped Emissions Permit (M.R. 7007.1140-7007.1148)
	Wetlands	datasets: NWI/NWI Mn update; Circular 39 Classification; special feature wetlands: MPCA wetland WQ monitoring sites; wetland bank sites; Calcareous fen sites; wild rice	# units of special feature wetlands; # cowardin type classes; acres by types	5 miles	yes	yes	Wetlands Conservation Act (M.S./M.R. - 103G/8420); MEPA criteria for analysis (M.S. 116D); Pipeline routing (M.R. 7852.1900); Fen Management Plan (M.S. 103G.223); Rare Wetland Communities (M.R. 8420.0515, Subp. 3)
	Waterbodies	USGS National National hydrography Flowline and Waterbody Database, US National Atlas Water Feature Line dataset; EPA/MPCA Impaired Streams Database; PWI sites MN Public Water Waters - Watercourses and Water Basins; ORVW sites; IBI statewide maps	# and proportion of total size	5 miles	yes	yes	Wild, Scenic, and Recreational Rivers (M.R. 6105); Outstanding Resource Value Waters (M.R. 7050.018); Public Waters (M.S. 103G.245); MEPA criteria for analysis (M.S. 116D); Pipeline routing (M.R. 7852.1900)
	Watersheds	Watershed TMDLs/Watershed Restoration and Protection Plan watersheds; MN WD and WMO jurisdictions	qualitative	5 miles	yes	yes	WRAPs/TMDLs (MPCA: CWA 103(d)); Watershed management (M.S. 103D/108/110B)
	Clean Water Funds sites	BWSR CWF study areas with defined map unit	# sites	county (BWSR database is by county)	yes	yes	Clean Water Legacy Act (M.S. 114D)
	Floodplains	FEMA maps	# sites or areas	FEMA stnds	yes	yes	Floodplain Management (M.S. 104)

Major Resource	Resource Feature	Datasets and Data Sources	Quantitative Unit of Comparison	Regional Analysis Area (distance beyond centerline or counties intersected by alignment) for Project Impacts	Alignment Analysis Area (will route width, ROW, and temp const. staging be compared?) for Project Impacts	Spill Impact Analysis	Regulatory Driver (law, statute, rule, guidance plan)
	Groundwater	MDH well and source protection areas; applicant (storage tanks per pump station or other facility projected for each alignment); Karst Features - Inventory Points; Ground Water Contamination Susceptibility in Minnesota	# sites or areas	5 miles	yes	yes	Groundwater Protection (M.S. 103H); Appropriation Permit (M.S. 103G.271)
	Soil Resources	NRCS MLRA database; STATSGO2	qualitative	none	no	yes	MPCA: NPDES/SDS Permit (M.S./M.R. - 115-116/7001, 7090)
	Natural Communities and Habitat						
	Native Flora	DNR ECS subsection (land type phase where available); DNR mapped prairie conservation easements or other mapped vegetation (excluding rare/unique); DNR ECS; MCBS Railroad Prairies; GAP landcover; DNR Calcareous Fens	# sites of mapped native flora	5 miles	yes	yes	MEPA criteria for analysis (M.S. 116D); Pipeline routing (M.R. 7852.1900); Native Prairie Bank (M.S. 84.96)
	Invasive species	MDA or County mapped areas of noxious weed infestations' MNDNR mapped invasive species areas (zebra mussels, etc)	qualitative	none	no	no	Noxious Weed Management Plan (18G.04)
	Designated Habitat	DNR State Wildlife Management Areas; WPAs; BWSR State Funded Conservation Easements; state easements; other mapped game animal special use areas; USFWS migratory bird datasets; trout streams	# of sites	5 miles	yes	yes	MEPA criteria for analysis (M.S. 116D); Wildlife Management (M.R. 6230)
Rare and Unique Resources							
	State and Federally Listed	USFWS general listed species regions and critical habitat areas; NHIS database; Critical Habitat poly; NHIS polygon and point data	# units of NHIS polygons/points; # federal habitat areas	county	yes	yes	MNDNR: Takings Permit (for Endangered or Threatened Species)(M.S./M.R. - 84.0895/6134, 6212.1800 - 6212.2300); Endangered Species Act (Section 7)
	State Natural Heritage and Other Significant Sites	NHIS database non species data (aggregation areas, etc) NHIS polygon and point data	# units	county	yes	yes	MEPA criteria for analysis (M.S. 116D); Critical Habitat (M.S./M.R. - 84.033/6136)
	Species in Greatest Conservation Need	GAP land cover/DNR SWAP datasets (2015/2016 update); Native Plant Communities; MBS Sites of Biodiversity Significance; MN Prairie Conservation Plan and Glacial Lake Agassiz features	# units	5 miles	yes	yes	Tomorrow's Habitat for the Wild and Rare; MEPA criteria for analysis (M.S. 116D)
	Scientific and Natural Areas	DNR datasets for SNAs	# units	county	yes	yes	Scientific and Natural Areas and Critical Habitat (M.S./M.R. - 84.033/6136); MEPA criteria for analysis (M.S. 116D)
High Consequence Areas							
	Populated Areas	PHMSA national pipeline mapping system	# sites and size	no	no	yes	USDOT PHMSA regulations
	Drinking Water Sources	Enbridge Energy (data restricted source)	# sites and size	no	no	yes	USDOT PHMSA regulations
	Unusually Sensitive Ecological Areas	Enbridge Energy (data restricted source)	# sites and size	no	no	yes	USDOT PHMSA regulations
	Natural disaster hazard zones	PHMSA national pipeline mapping system	# sites and size	no	no	yes	USDOT PHMSA regulations

ATTACHMENT 1B: Resource Features Identified in Public Comments

Resource Name	County	Resource Name	County	Resource Name	County
Water Resources					
Red Lake River	Red Lake County	Fishhook Chain of Lakes	Becker	St. Louis River	Carlton
Spring Brook/Spire Valley AMA / Scout Camp Pond + (fish hatchery)	Cass	Erie Lake	Becker	Blackhoof River, Mud Lake	Carlton
Headwater springs of Roosevelt Lake	Cass	Clearwater River	Clearwater	Tamarack area of Aitkin and Carlton county border +	Aitkin/Carlton
Pine River and watershed	Cass	Upper Rice Lake	Clearwater	Moose Horn River tributary to Hanging Horn Lake and Moosehead Lake	Carlton
LaSalle Creek, AMA, State Rec. Area +	Cass	Crow Wing River	Wadena	Hay Creek	Pine
South Fork	Cass	Shell River (Miss R tributary)	Wadena	Salo Marsh/Sandy River/Sandy River Flowage/Big Sandy Lake system +	Aitkin
Cass Lake	Cass	Long Prairie River	Todd	Willow River, White Elk Creek, Flowage Lake	Aitkin
Miss River headwaters +	Hubbard/Cass	Moose River	Beltrami	Fifty Lakes	Crow Wing
Straight River and watershed +	Becker/Hubbard	Villard WMA	Pope	Whitefish Lake watershed	Crow Wing
Hay Creek	Hubbard				
deer winter cover complex in sections 31 and 32 of Badoura Township and section 36 of Crow Wing Lake Township					
Cultural and Human Settlement Resources					
Bakwa manoomin land area (wild rice)	multiple	North Country Trail (recreational)	multiple	Itasca State Park (recreational)	Hubbard
East Lake (community)	Aitkin	Rice Lake (community)	St. Louis	Camp Ripley	Morrison
Anishinaabe Akiing (cultural)	multiple				

+ Place identified in multiple comments

ATTACHMENT 2A: ROUTE ALTERNATIVE DESCRIPTIONS

North Dakota to Clearbrook

The North Dakota to Clearbrook area includes five route alternatives. A brief summary of the comment regarding the route alternative and the justification for moving forward with the alternative is included below.

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-01	Polk	North Dakota to Clearbrook	Co-locating the proposed pipeline with the existing line 81 would reduce habitat fragmentation and there would be fewer cumulative effects	Addresses DNR concerns regarding fragmentation and stream erosion. Impacts new property owners.		186.1	PC	3.76
RA-02	Polk	North Dakota to Clearbrook	Route alternative requested to move pipeline further away from property owner house, Wants pipeline to be 700 feet away from home instead of 200 feet	The route alternative impacts the same environmental features as the proposed route and new landowners are impacted.	5/30 #1 E-12		EPC	1.61
RA-03	Polk	North Dakota to Clearbrook	Route alternative requested to minimize impacts to agricultural research sites. Avoidance of "Field 18" and moving north to drainage ditch in "Field 17" to make sure field 18 can still be used in future research	Addresses University of Minnesota's concern regarding future use of field research plots and does not impact new property owners.	5/30 #2 E-13	66	EPC	1.88
RA-04	Polk	North Dakota to Clearbrook	Route alternative to avoid an overhead power line.	Route alternative increases safety during construction. Environmental impacts are the same and no new landowners are impacted.	5/30 #3 E-14		ED	0.23
RA-05	Clearwater	North Dakota to Clearbrook	Route alternative requested to accommodate refinement of facility design at the Clearbrook Terminal.	Route alternative impacts the same environmental features as the proposed route and no new landowners are impacted.	5/30 #4 E-15		ED	0.33

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² Justification: The justification column describes why the route alternative is being carried forward for further analysis.

³ Enbridge Alternative: The Enbridge alternative column tracks routes developed to address commenter concerns by Enbridge according to their letter submittal dates of 4/4 or 5/30.

⁴ Comment Source: PC = Public comment submitted route during comment period; EPC = Public comment submitted route during comment period, Enbridge submitted route that addresses the comment; ELO = Enbridge submitted route that addresses an unknown landowner concern; ED = Enbridge submitted route that addresses an engineering design concern.

Clearbrook to Wisconsin

The Clearbrook to Wisconsin includes three route alternatives from Clearbrook to just west of the Wisconsin/Minnesota border following either existing pipelines or going north around several lakes and the Leech Lake Band of Ojibwe Reservation.

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-06	Clearwater, Beltrami, Koochiching, Itasca	Clearbrook to Wisconsin	The pipeline should be routed to the north around the lakes area.	Addresses commenters concerns regarding lakes area impacts. Route alternative would impact the Chippewa National Forest (CNF), state forest land and the Dishpan Wildlife Management Area (WMA).		3.1	PC	205.52
RA-07	Clearwater, Beltrami, Koochiching, Itasca	Clearbrook to Wisconsin	The pipeline should be routed with existing pipelines along highway 2. (Enbridge's mainline)	Addresses commenter's DNR and PCA concerns regarding lakes area impacts. Route alternative would impact the CNF and the Leech Lake Band of Ojibwe Reservation (LLBO). In addition, the alternative would cross several populated areas.		3.2	PC	179.82
RA-08	Great Lakes Gas Pipeline	Clearbrook to Wisconsin	The pipeline should be routed with existing Great Lakes pipelines that run generally south of Hwy 2 through Beltrami, Cass, Itasca and St Louis Counties	Addresses DNR concerns regarding lakes area impacts and utilizing existing corridors. Route alternative would impact the CNF, the Leech Lake Band of Ojibwe Reservation (LLBO). In addition, the route would cross several populated areas and is space limited due to other utilities within the corridor.		186.8	PC	174.22
SA-03-AM (as modified)	Clearwater, Wadena, Todd, Morrison, Benton, Mille Lacs, Isanti, Pine, Carlton	Clearbrook to Wisconsin	Pipeline should avoid lakes area and follow existing pipelines.	Partially addresses MDNR and MPCA concerns regarding the lakes area crossed by preferred route.		182	AGENCY	225

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Clearbrook to Aitkin County

The Clearbrook to Aitkin County area includes 10 route alternatives. Several of the alternatives were developed to avoid sensitive resources in the Big LaSalle Lake and LaSalle Creek area.

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-09	Clearwater Hubbard	Clearbrook to Aitkin County	Alternative route starting in Section 11 of Itasca Township in Clearwater County and Hattie Township in Hubbard County to avoid the Big LaSalle Lake area.	Avoids the Big LaSalle Lake area, however, impacts new property owners.		194	PC	8.05
RA-10	Clearwater	Clearbrook to Aitkin County	Big La Salle Creek alternative, lack of access near crossing of LaSalle Creek could result in delayed spill response times, suggest moving route to a crossing that is more accessible	Addresses PCA concern for more accessible crossing, farther away from Big LaSalle Lake. Alternative recommended would impact new property owners.		182.1	PC	6.83
RA-11	Clearwater	Clearbrook to Aitkin County	Route Alternative proposed to accommodate a landowner request to avoid the lake.	This re route reduces impacts to lake front property and is further away from Big LaSalle Lake. No new landowners will be impacted.	4/4 #1 E-1		ELO	0.90
RA-12	Hubbard	Clearbrook to Aitkin County	Route alternative is being requested to remove a temporary workspace from adjacent land.	Route alternative requested by landowner because it would impact fewer property owners. No new landowners will be impacted.	4/4 #2 E-2		ELO	0.34
RA-13	Hubbard	Clearbrook to Aitkin County	Route alternative requested to route through North Dakota Pipeline Company land recently purchased.	Re-route environmental impacts are the same and no new landowners are impacted.	5/30 #5 E-16		ED	0.18
RA-14	Hubbard	Clearbrook to Aitkin County	Route alternative being requested because two property owners want the pipeline further away from structures.	Re-route does not involve new landowners; however, it does move the route onto an existing landowner's property. This alternative would avoid taking down two barns.	4/4 #3 E-3		ELO	1.57
RA-15	Hubbard	Clearbrook to Aitkin County	Twin Lakes route alternative, lack of access near Twin Lakes and Shell river could result in delayed spill response times. Twin Lakes are identified as wild rice lakes by the DNR.	Addresses PCA concern for more accessible crossing. Alternative recommended would impact new property owners and traverse an area of center pivot irrigation. It would also be closer to the town of Hubbard.		182.2	PC	9.46
RA-16	Hubbard, Wadena	Clearbrook to Aitkin County	Enbridge provided a route to avoid the Crow Wing WMA due to easement restrictions.	Addresses DNR concerns of avoiding the WMA. Alternative would impact new landowners.	E-24		ELO	10.46

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-17	Cass	Clearbrook to Aitkin County	Route Alternative being proposed to avoid a large wetland complex in Foot Hill State Forest.	Route alternative would impact 1 wetland the original route impacts 2. Both the original and alternative are within the Foot Hill State Forest.	4/4 #4 E-4		ED	0.41
RA-18	Cass	Clearbrook to Aitkin County	Route alternative requested to accommodate changes to engineering design to add a pipeline inspection gauge launcher and receiver trap.	Route alternative environmental impacts are the same and no new landowners are impacted.	5/30 #6 E-17		ED	0.18
RA-19	Cass	Clearbrook to Aitkin County	Route alternative requested that the pipeline be constructed near an existing fence line.	Route alternative impacts more greenfield than the original route and does not affect new landowners.	5/30 #7 E-18		ELO	1.11
RA-20	Aitkin	Clearbrook to Aitkin County	DNR requested a wider route south of the Spire Valley Fish Hatchery to minimize impacts the hatchery.	The wider route provides flexibility to address DNR concerns about the fish hatchery.		186.3	PC	1.25

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Aitkin County

The Aitkin County area includes twenty three route alternatives. Several of the route alternatives suggested in this area were landowner requests that the pipeline avoid structures on their property. In addition, a number of the route alternatives suggested avoid sensitive natural resources.

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-21	Aitkin	Aitkin County	DNR recommended the Aitkin County Power Line as a route alternative to eliminate concerns regarding Sandy River fisheries and wild rice habitat as well as trout stream habitat. This would also avoid 3.1 miles of WMA's and follows existing corridor.	Addresses DNR concerns regarding the fisheries and habitat impacts, however, it does impact new property owners.		186.5	PC	53.88
RA-22	Aitkin, St Louis, Carlton	Aitkin County	DNR recommended a route alternative that would avoid critical habitat in the Big Sandy lake watershed as well as Grayling Marsh WMA, McGregor WMA, Lawler WMA and Salo Marsh WMA.	Addresses DNR concerns related to resources in the area follows existing corridors, however, impacts new property owners.		186.6	PC	38.82
RA-23	Aitkin	Aitkin County	The Aitkin County Soo Line Route Alternative was considered in the Enbridge January 31, 2014 Permit Application but removed from further analysis by the company.	The Soo Line Route Alternative removed from further analysis by Enbridge is being carried forward into the route analysis because it was recommended by several landowners throughout the comment period and it would parallel the existing ATV trail.			PC	31.13
RA-24	Aitkin	Aitkin County	Commenter proposing route alternative to minimize forest fragmentation and avoid old growth forests in the Hill River State Park	Route impacts less greenfield. The applicant proposed route and the suggested route alternative are both located in the Hill River State Park.	4/4 #5 E-5	186.2	EPC	1.65
RA-25	Aitkin	Aitkin County	Commenter would like the route to move to the east across wetland (former rice paddy areas) to preserve all high land for future building plans.	Addresses landowner concern. Alternative recommended would not impact new property owners.	5/30 #8 E-19	229	EPC	0.61
RA-26	Aitkin	Aitkin County	Commenter would prefer route alternative that would veer south and southeast from the intersection of US Highway 169 and CSAH 3 west of Palisade.	Route alternative impacts state forest land and new landowners.	4/4 #6 E-6	262	EPC	3.41
RA-27	Aitkin, Carlton	Aitkin County	DNR is recommending that the analysis includes the Soo line to avoid the McGregor SNA and the Sandy River watershed	Addresses DNR concerns related to the McGregor SNA and the Sandy River Watershed.		186.4	PC	13.23
RA-28	Aitkin	Aitkin County	Commenter suggested a route alternative that turns south in Aitkin County and meets back with the proposed route to the east.	There was a map submitted during the comment period without a written comment attached. Based on the aerial image the proposed route was suggested to avoid gravel pits.		757	PC	3.50

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-29	Aitkin	Aitkin County	Commenter suggested a route alternative suggested accommodating landowner request related to future home sites along the road.	Route alternative would impact more greenfield and wetland. There would be no new landowner impacts.	4/4 #7 E-7		ELO	0.66
RA-30	Aitkin	Aitkin County	Route alternative requested to avoid bending the pipeline in the road ditch which could impact the integrity of the roadway.	Route alternative environmental impacts would be the same and no new landowners are impacted.	5/30 #9 E-20		ELO	0.07
RA-32	Aitkin	Aitkin County	Commenter is requesting that the pipeline be located on Aitkin County Tax forfeit land which avoids an Old Growth Forest.	Addresses commenter concerns which would avoid the old growth forest would put route alternative on tax forfeit land.		75	PC	0.45
RA-33	Aitkin	Aitkin County	Commenter would like the pipeline moved east to the back edge of his property where it joins with the Peat Plant.	Addresses commenter concern and would impact new property owners.		89	PC	1.80
RA-34	Aitkin	Aitkin County	Commenter suggesting shifting the pipeline north into the tree line.	Addresses commenter concern regarding distance from home. Alternative recommended would impact new property owners.		2.1	PC	2.22
RA-35	Aitkin	Aitkin County	Commenter suggesting route alternative that would cut south on township road 270th and traverse east until it meets with the proposed route.	Addresses commenter concern regarding distance from home. Alternative route would impact new property owners and potentially impact a peat farm.		2.2	PC	1.72
RA-36	Carlton	Aitkin County	Commenter suggesting a route alternative to shift the pipeline to the north into tree line.	Route alternative environmental impacts are the same as the proposed route and no new landowners are impacted.	5/30 #10 E-21		ELO	0.38
RA-37	Aitkin, Carlton	Aitkin County	Commenter suggesting Route Alternative that would parallel Hwy 210 after mile marker 550 then turn south to reconnect with the proposed route south of Cloquet.	The recommended route alternative would follow existing corridor, avoiding the Salo Marsh and Lawler WMA.		756.1	PC	38.68
RA-38	Aitkin, Carlton	Aitkin County	Commenter suggested a Route Alternative to avoid the Salo Marsh WMA.	Route alternative avoids the Salo Marsh WMA and does not impact new property owners.	5/30 #11 E-22		ELO	6.73
RA-20	Aitkin	Aitkin County	DNR requested a wider route south of the Spire Valley Fish Hatchery to minimize impacts the hatchery.	The wider route provides flexibility to address DNR concerns about the fish hatchery.		186.3	PC	
RA-21	Aitkin	Aitkin County	DNR recommended the Aitkin County Power Line as a route alternative to eliminate concerns regarding Sandy River fisheries and wild rice habitat as well as trout stream habitat. This would also avoid 3.1 miles of WMA's and follows existing corridor.	Addresses DNR concerns regarding the fisheries and habitat impacts, however, it does impact new property owners.		186.5	PC	53.88

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-22	Aitkin, St Louis, Carlton	Aitkin County	DNR recommended a route alternative that would avoid critical habitat in the Big Sandy lake watershed as well as Grayling Marsh WMA, McGregor WMA, Lawler WMA and Salo Marsh WMA.	Addresses DNR concerns related to resources in the area follows existing corridors, however, impacts new property owners.		186.6	PC	38.82

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Carlton County

The Carlton County area includes thirteen route alternatives. Many of the route alternatives from landowners request that the pipeline avoid structures on their property.

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
RA-39	Carlton and Aitkin	Aitkin County	Commenter would prefer route alternative that veers south of proposed route near Salo Marsh WMA Impoundment to avoid mineral development land.	Addresses commenter concern. Alternative recommended would impact new property owners, the Salo Marsh, and State Forest Land.		183	PC	9.01
RA-40	Carlton	Carlton County	Commenter suggested a route to use county land to the north of property owners land.	Addresses commenter concern regarding distance from home. Alternative recommended would not impact new property owners.		756.2	PC	1.04
RA-41	Carlton	Carlton County	Commenter suggested shifting the pipeline south to avoid a beaver dam.	Addresses commenter concern regarding the impacts to the beaver dam. Alternative recommended would not impact new property owners.	4/4 #23 E-23		ELO	0.61
RA-42	Carlton	Carlton County	Commenter requesting to co-locate pipeline with an existing power line corridor.	Addresses commenter concern. Alternative recommended would impact new property owners.		152	PC	3.48
RA-43	Carlton	Carlton County	Commenter suggesting to move pipeline to north side of Hwy 61, co-locating it with a utility corridor.	Addresses commenter concerns regarding continuity of utility corridors. Alternative recommended would impact new property owners.		34	PC	3.08
RA-44	Carlton	Carlton County	Commenter suggested following and existing utility corridor on the north side of Highway 61 to avoid the Blackhoof watershed.	Addresses commenter concern regarding groundwater flow around the watershed. Alternative recommended would impact new property owners.		97.1	PC	7.66
RA-45	Carlton	Carlton County	Commenter suggested following south side of Highway 61 to avoid the Blackhoof Watershed	Addresses commenter concern regarding ground water flow around the watershed. Alternative recommended would impact new		97.2	PC	7.13

Route Alternative Number	County	Project Section	Comment ¹	Justification ²	Enbridge Alt ³	Comment Database Number	Comment Source ⁴	Length (miles)
				property owners.				
RA-46	Carlton	Carlton County	Commenter suggested shifting the pipeline to the south, running parallel to County Road 61.	Addresses commenter concern. Alternative recommended would impact new property owners.		121	PC	1.91
RA-47	Carlton	Carlton County	Route alternative requested moving the pipeline south to avoid a grove of trees.	Addresses commenter concern regarding distance from the trees. Alternative recommended would not impact new property owners.	4/4 #8 E-8		ELO	0.85
RA-48	Carlton	Carlton County	Commenter suggested shifting the pipeline to the other side of I-35 to avoid cutting off access road.	Addresses commenter concerns regarding road access. Alternative recommended would impact new property owners.		68	PC	1.28
RA-49	Carlton	Carlton County	Commenter requested to follow the south sides of I-35 and Highway 61 to distance pipeline from multiple properties.	Addresses commenter concern. Alternative recommended would impact new property owners.		162	PC	5.96
RA-50	Carlton	Carlton County	Commenter requested to reduce the number of Blackhoof River crossings.	Addressed commenter concern reducing river crossings down from 4 to 1. Increases wetland and greenfield impacts. Alternative recommended would not impact new landowners	4/4 #11 E-9		PC	0.56
RA-51	Aitkin	Carlton County	Commenter proposed shifting the pipeline north to follow the tree line and distance it from homesteads.	Addresses commenter concern regarding distance from home. Alternative recommended would impact new property owners.		1.2	PC	1.41

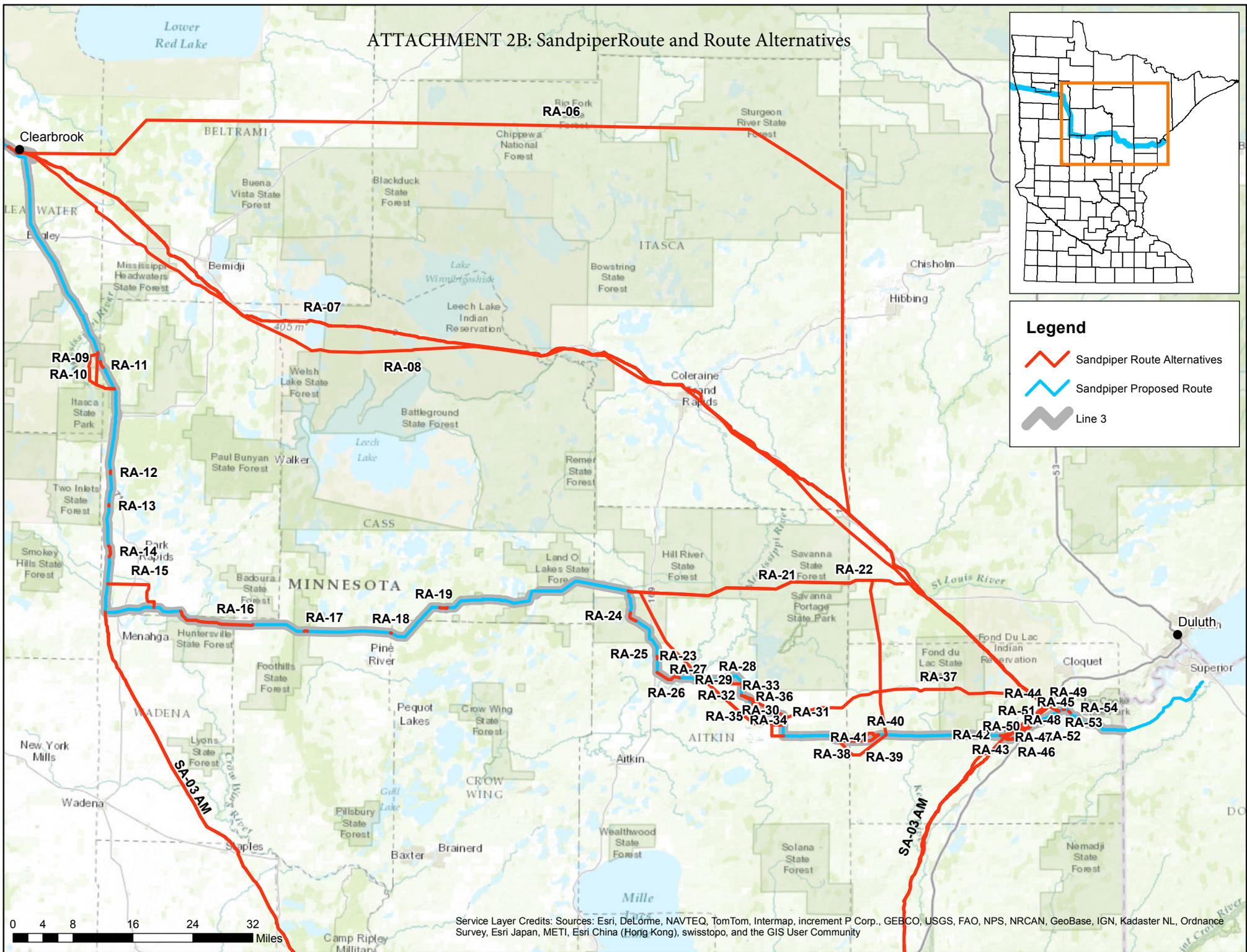
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² Justification: The justification column describes why the route alternative is being carried forward for further analysis.

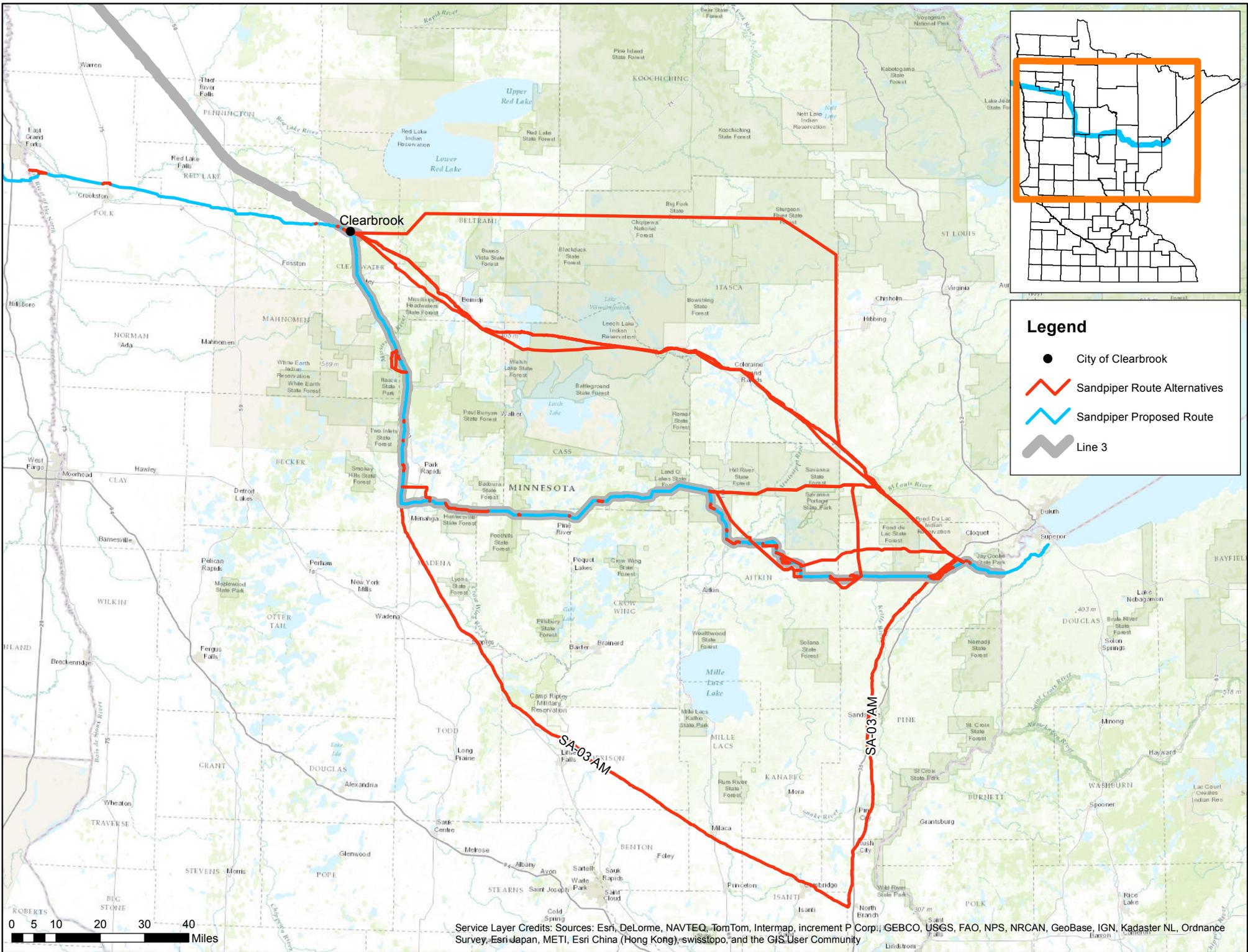
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ATTACHMENT 2B: Sandpiper Route and Route Alternatives



Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



Legend

- City of Clearbrook
- Sandpiper Route Alternatives
- Sandpiper Proposed Route
- Line 3

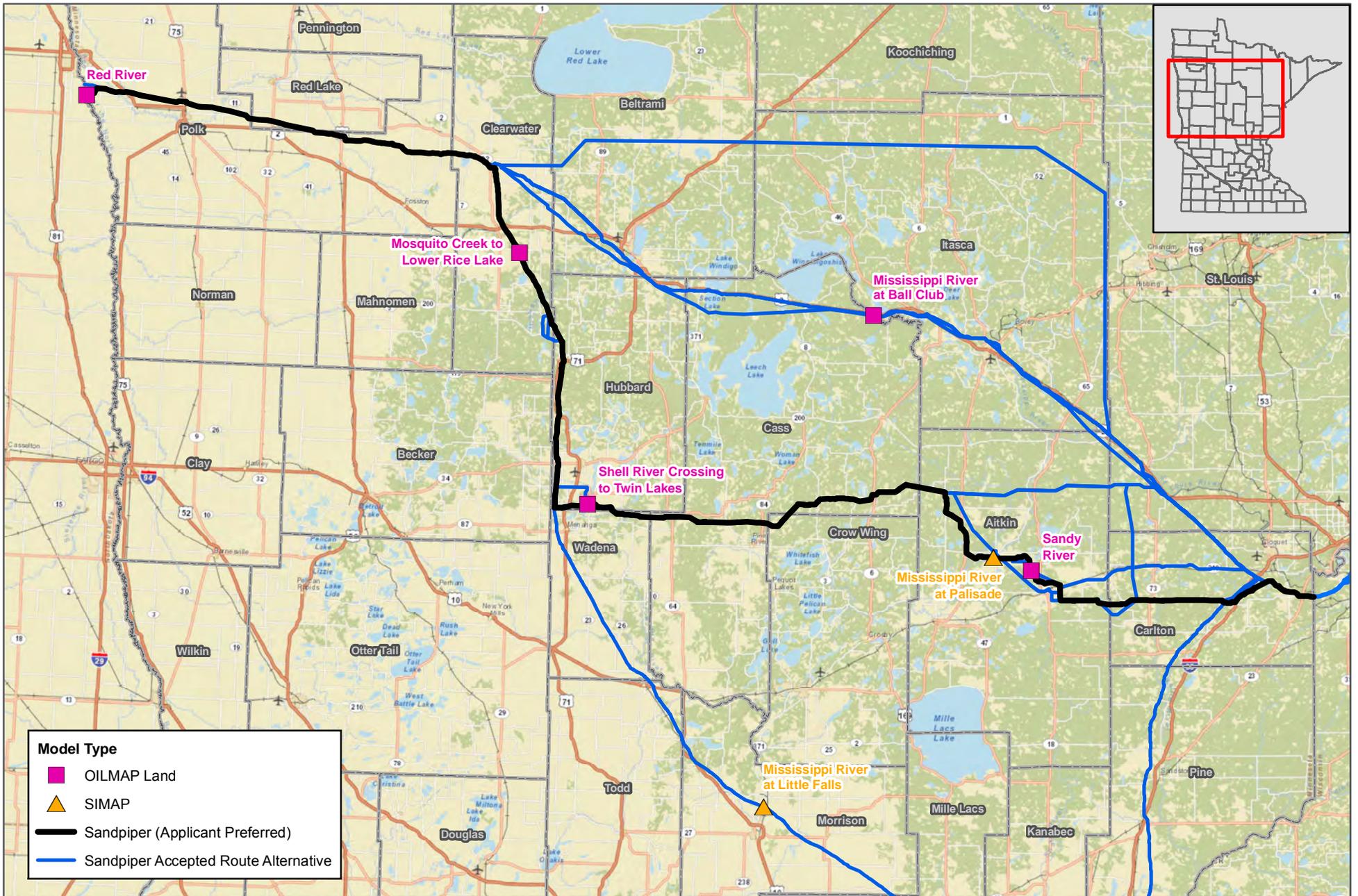
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Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp.; GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

L3RP and SPP Identified Sites for Modeling and Representative Seasonal Conditions

SIMAP Scenario
OILMAP Land Scenario

Preferred or Alternate Route	N	W	Name	Municipality	Description	RICE	AG	FOREST	URBAN	Mississippi	MN EcoRegion			River Width			River Length to Nearest Waterbody		Watercourse Characteristics			Uses					
											Province	Section	Subsection	Small (<10 m)	Medium (10-50 m)	Large (>50 m)	Short (<5 km)	Long (>5 km)	Flat Water	Rapids / Falls	Lake	Recreational	Drinking Water	Populated Area	Sensitive Ecosystem		
A	46.048333	94.342	Mississippi River at Little Falls	Little Falls	Water crossing at Little Falls into Mississippi River (~250 m wide) with forested banks buffering agriculture and urban areas (Little Falls). The dam and falls at Little falls could potentially entrain a large amount of oil if released.		X		X	X		Eastern Broadleaf Forest Province	Minnesota & NE Iowa Morainal	Anoka Sand Plain			X		X		X	X	XX		X	X	
P	46.698284	93.49499	Mississippi River at Palisade	Palisade	Water crossing of the Mississippi River (~75 m wide) approximately 1.5 km S of Palisade. Sinuous channel and oxbows, some turbulent stretches of water, and forest and some agriculture lining the banks.		X	X		X		Laurentian Mixed Forest Province	N. Minnesota Drift & Lake Plains	Tamarack Lowlands		X		N/A	N/A		X			X	~	~	X
P	47.825692	96.98722	Red River	Grand Fork	Water crossing of Red River which flows north through a moderately sinuous channel with a width of 40-60 m. The river passes through Grand Forks and has patchy forested regions along the banks. The river passes through areas predominantly used for agriculture.			X	some	X		Prairie Parkland Province	Red River Valley	Red River Prairie			X	N/A	N/A	X			X	X	X	X	
P	47.460381	95.30659	Mosquito Creek to Lower Rice Lake	Bagley	Seasonal water crossing that forms drainage into Mosquito Creek (~1 m wide) with marshy grassland and sporadic forest cutting through agriculture and nature preserves to Lower Rice Lake (~1 x 6.5 km) with a large amount of wild rice.	X	X					Laurentian Mixed Forest Province	N. Minnesota Drift & Lake Plains	Chippewa Plains	X			X	X	X	X	X		X	X		
P	46.819605	95.04298	Shell River Crossing to Twin Lakes	Hubbard	Water crossing of the Shell River (~25 m wide) through a straight marshy channel in agricultural land leading to Upper Twin and Lower Twin Lakes. The lakes contain wild rice, have forest along the shores, and many houses lining Lower Twin Lake.	X	X	X				Laurentian Mixed Forest Province	N. Minnesota Drift & Lake Plains	Pine Moraines & Outwash Plains		X		X		X		X	X			X	
P	46.626342	93.24309	Sandy River	McGregor	Water crossing of (~10 m wide) Sandy River flowing to the west through a bifurcated channel with one sinuous channel and another straight drainage type ditch. The waterway is mainly lined by marshy grasses and wetland with some forests. The river flows through Steamboat and Davis lake to Flowage Lake and eventually Big Sandy Lake. The region is known to contain fish spawning habitat.			X				Laurentian Mixed Forest Province	N. Minnesota Drift & Lake Plains	Tamarack Lowlands	X	X		X	X	X	X	X				X	
A	47.323602	93.95964	Mississippi River at Ball Club	Ball Club	Water crossing through sinuous (~25 m wide) channel of the Mississippi River with oxbows through extensive wetlands leading to Lake Winibogoshosh.	?		X		X		Laurentian Mixed Forest Province	N. Minnesota Drift & Lake Plains	Chippewa Plains		X		X	X	X	X	XX		X	X		



Model Type

- OILMAP Land
- ▲ SIMAP
- Sandpiper (Applicant Preferred)
- Sandpiper Accepted Route Alternative



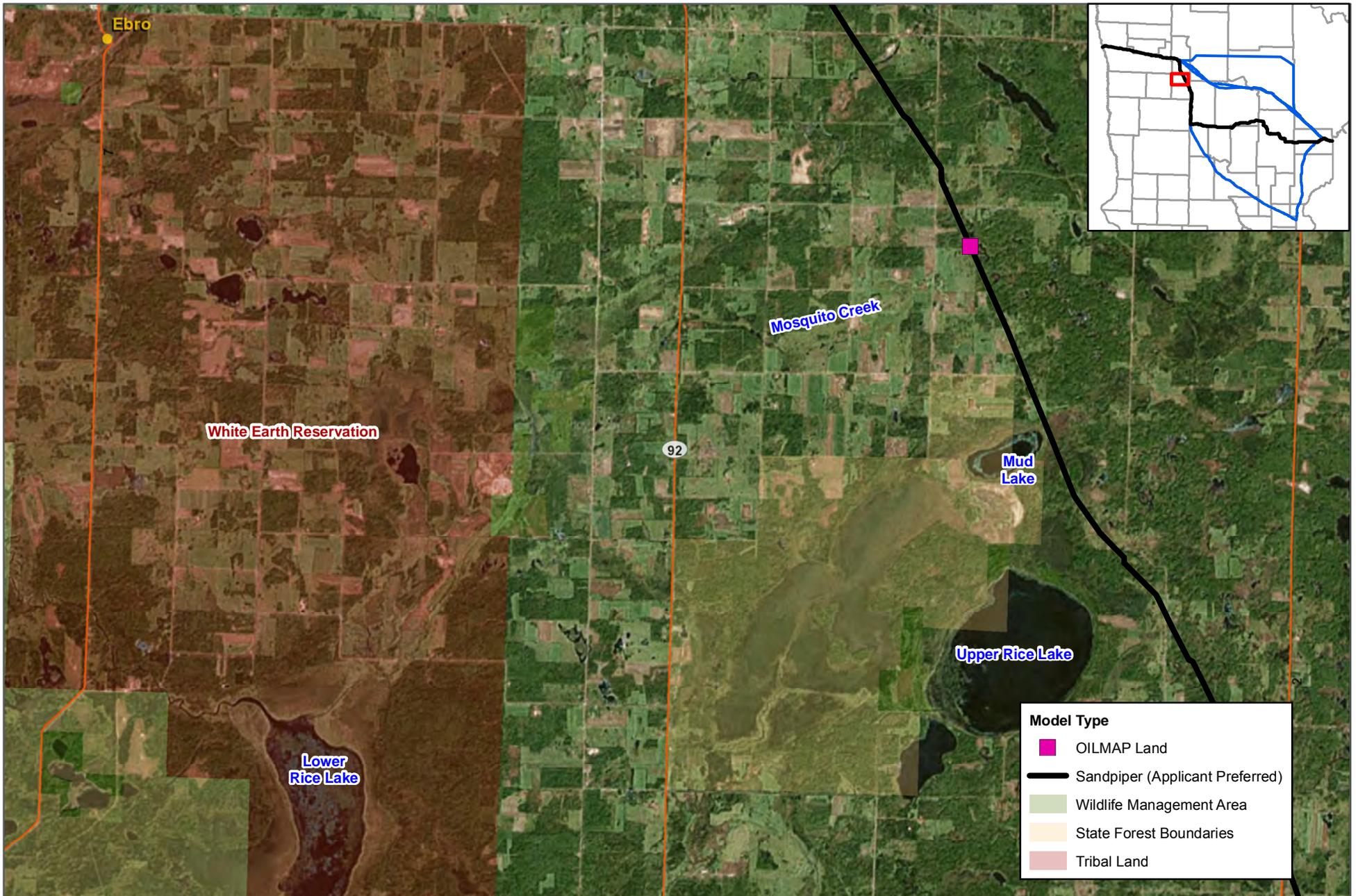
Basemap: ESRI Street Map

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Spill Model Locations



801 Second Avenue Suite 700, Seattle, WA 98104
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 www.cardno.com



Model Type

- OILMAP Land
- Sandpiper (Applicant Preferred)
- Wildlife Management Area
- State Forest Boundaries
- Tribal Land



Basemap: NAIP for Minnesota (2013)

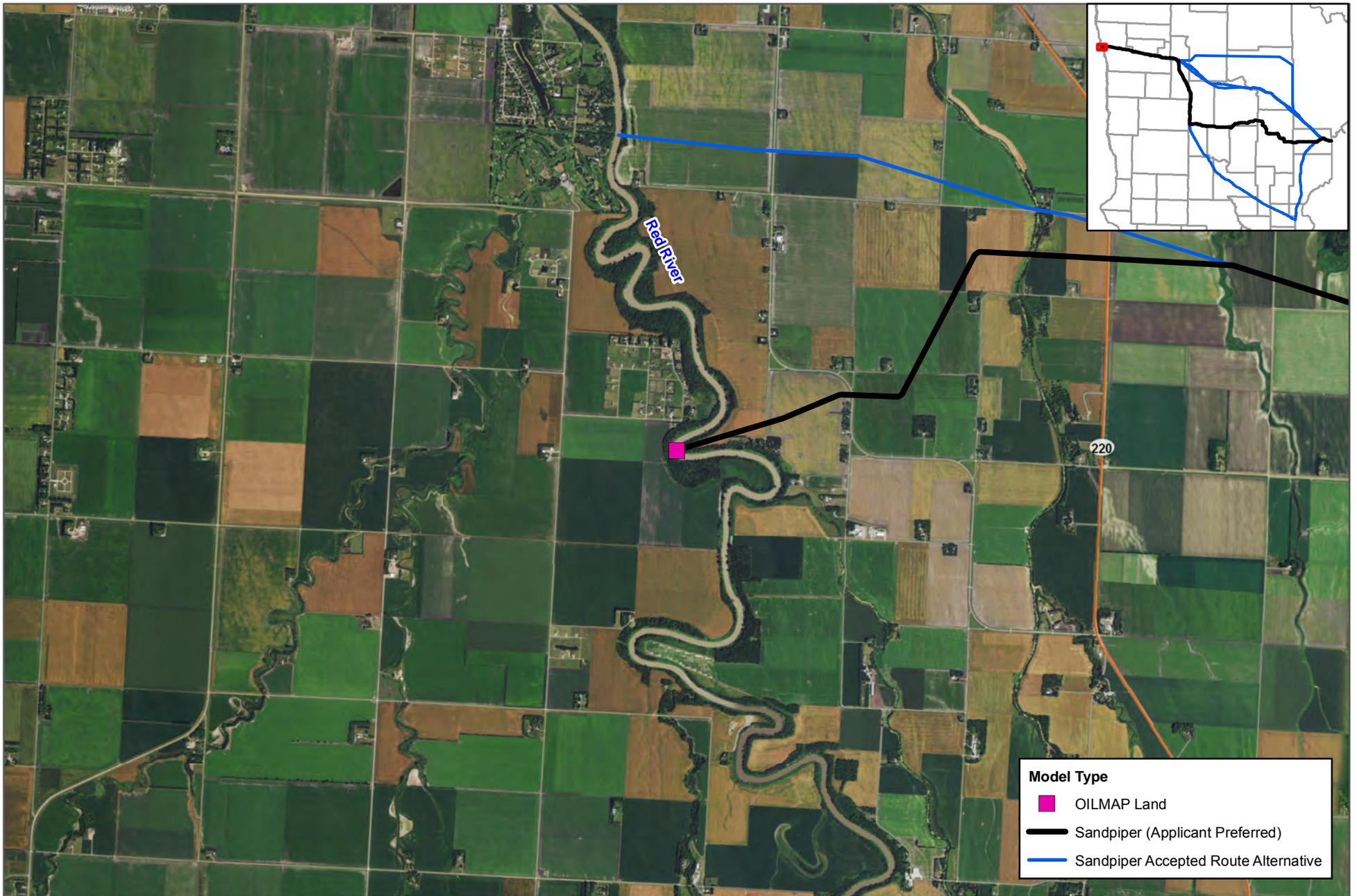
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Mosquito Creek to Lower Rice Lake

Clearwater County



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Model Type

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- Sandpiper (Applicant Preferred)
- Sandpiper Accepted Route Alternative

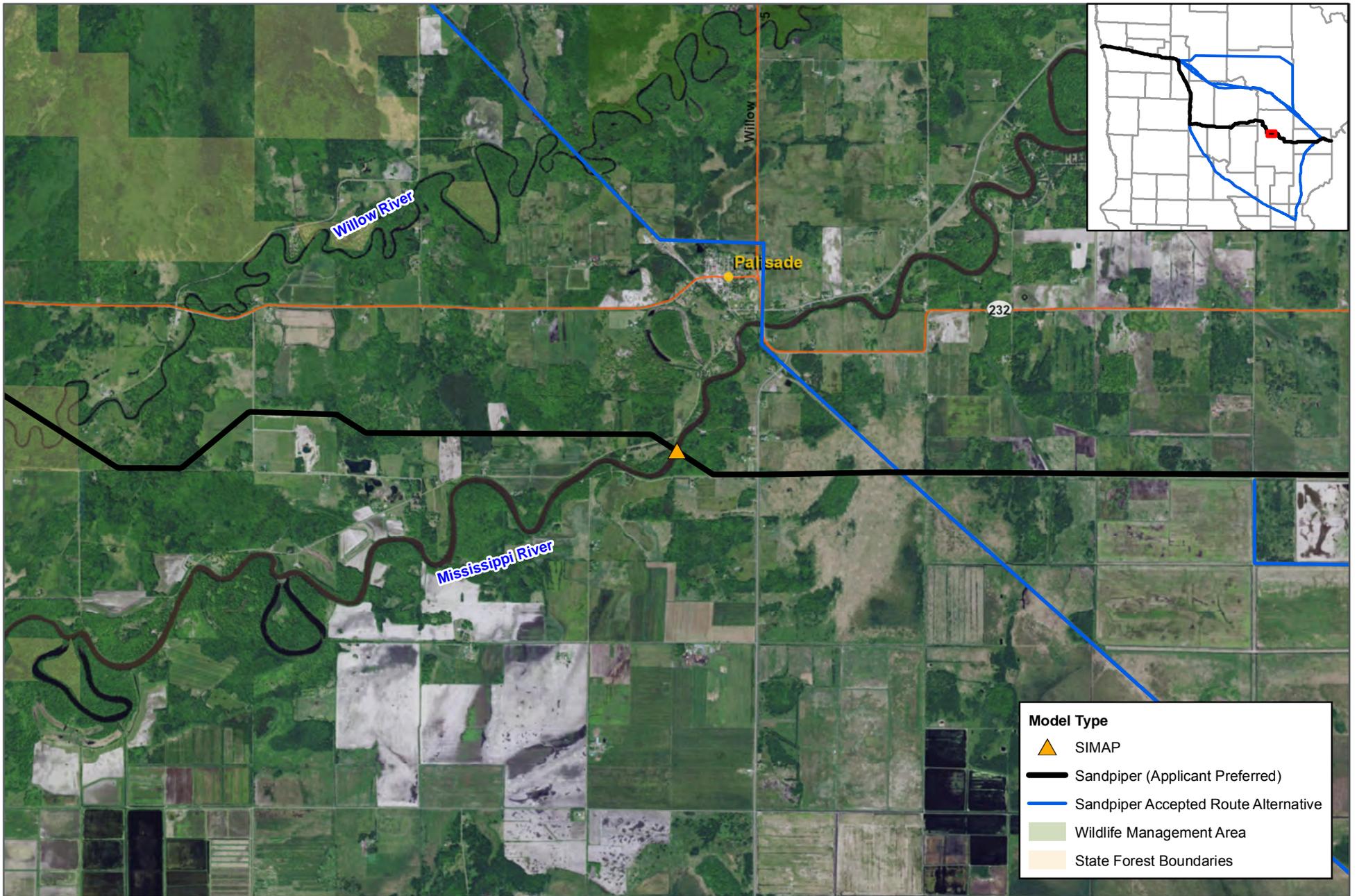
Basemap: NAIP for Minnesota (2013)

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Red River
Polk County



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www.cardno.com



Model Type

-  SIMAP
-  Sandpiper (Applicant Preferred)
-  Sandpiper Accepted Route Alternative
-  Wildlife Management Area
-  State Forest Boundaries



Basemap: NAIP for Minnesota (2013)

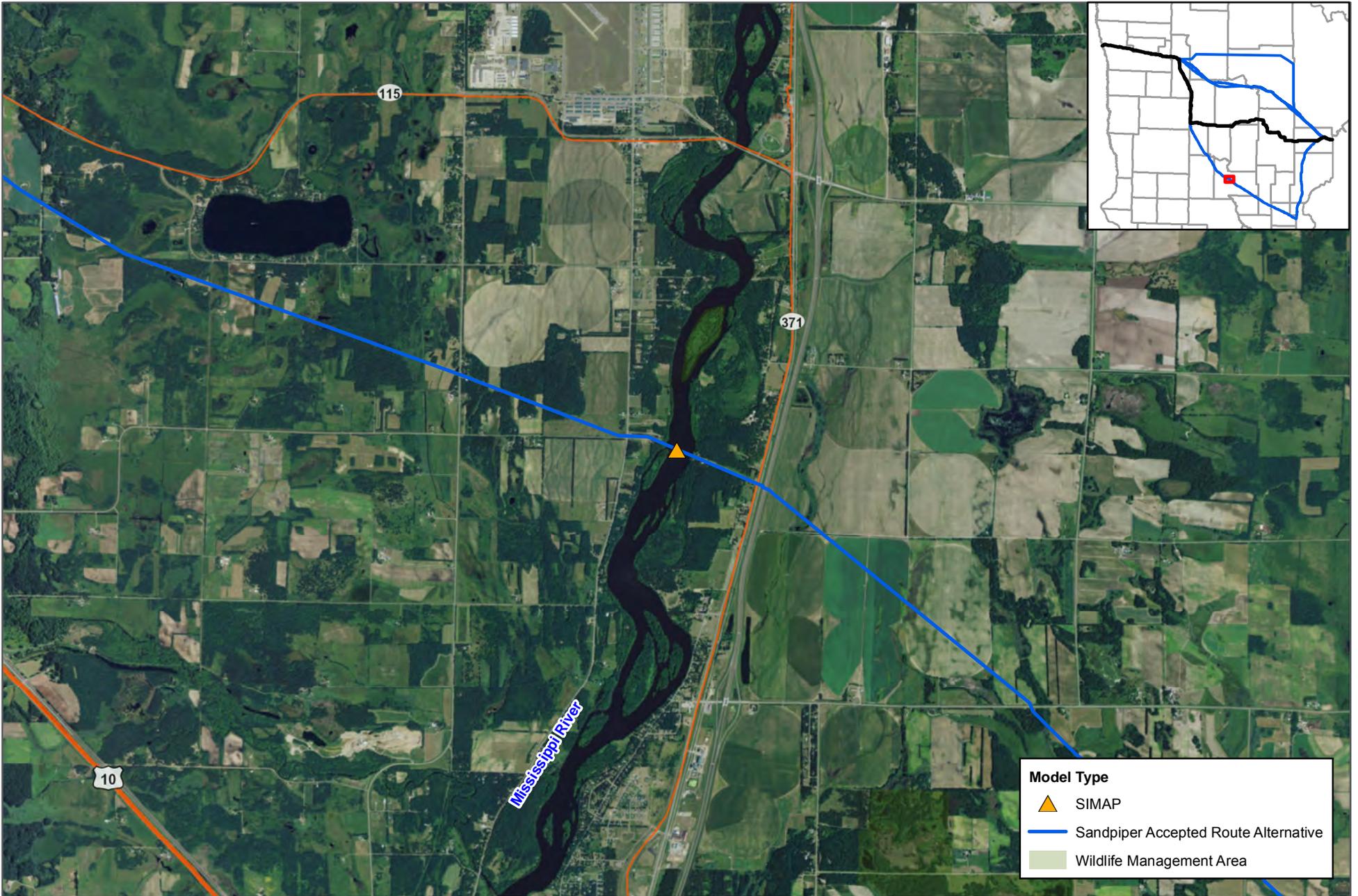
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Mississippi River at Palisade

Aitkin County



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 www.cardno.com



Model Type

-  SIMAP
-  Sandpiper Accepted Route Alternative
-  Wildlife Management Area

Basemap: NAIP for Minnesota (2013)

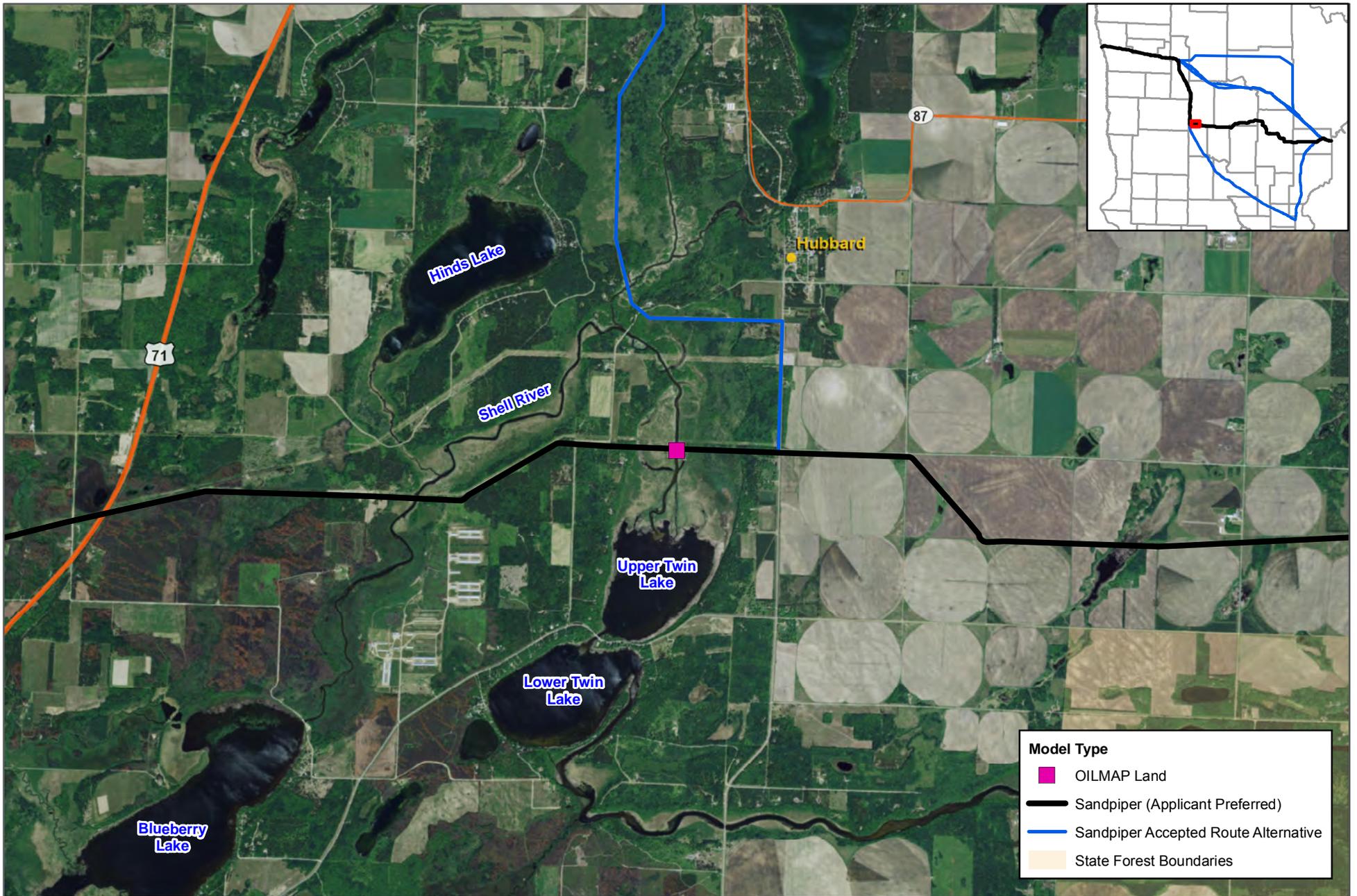
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Mississippi River at Little Falls

Morrison County




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Model Type

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- Sandpiper (Applicant Preferred)
- Sandpiper Accepted Route Alternative
- State Forest Boundaries



Basemap: NAIP for Minnesota (2013)

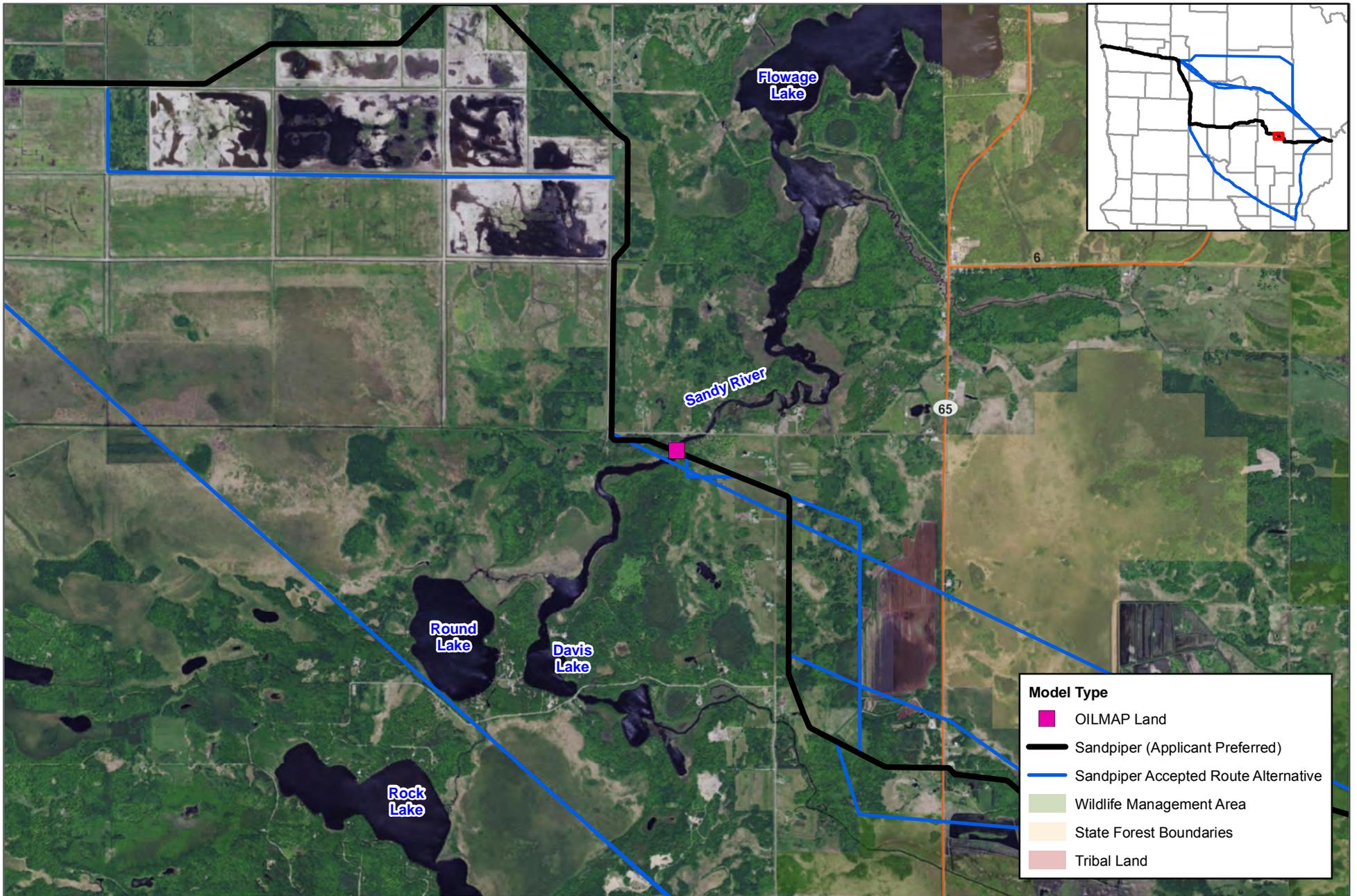
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Shell River Crossing to Twin Lakes

Hubbard County



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Model Type

- OILMAP Land
- Sandpiper (Applicant Preferred)
- Sandpiper Accepted Route Alternative
- Wildlife Management Area
- State Forest Boundaries
- Tribal Land



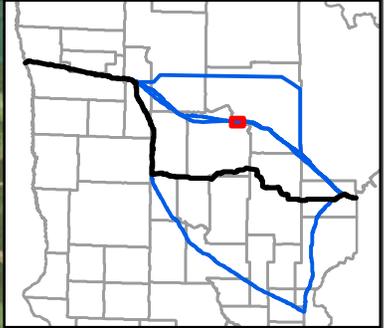
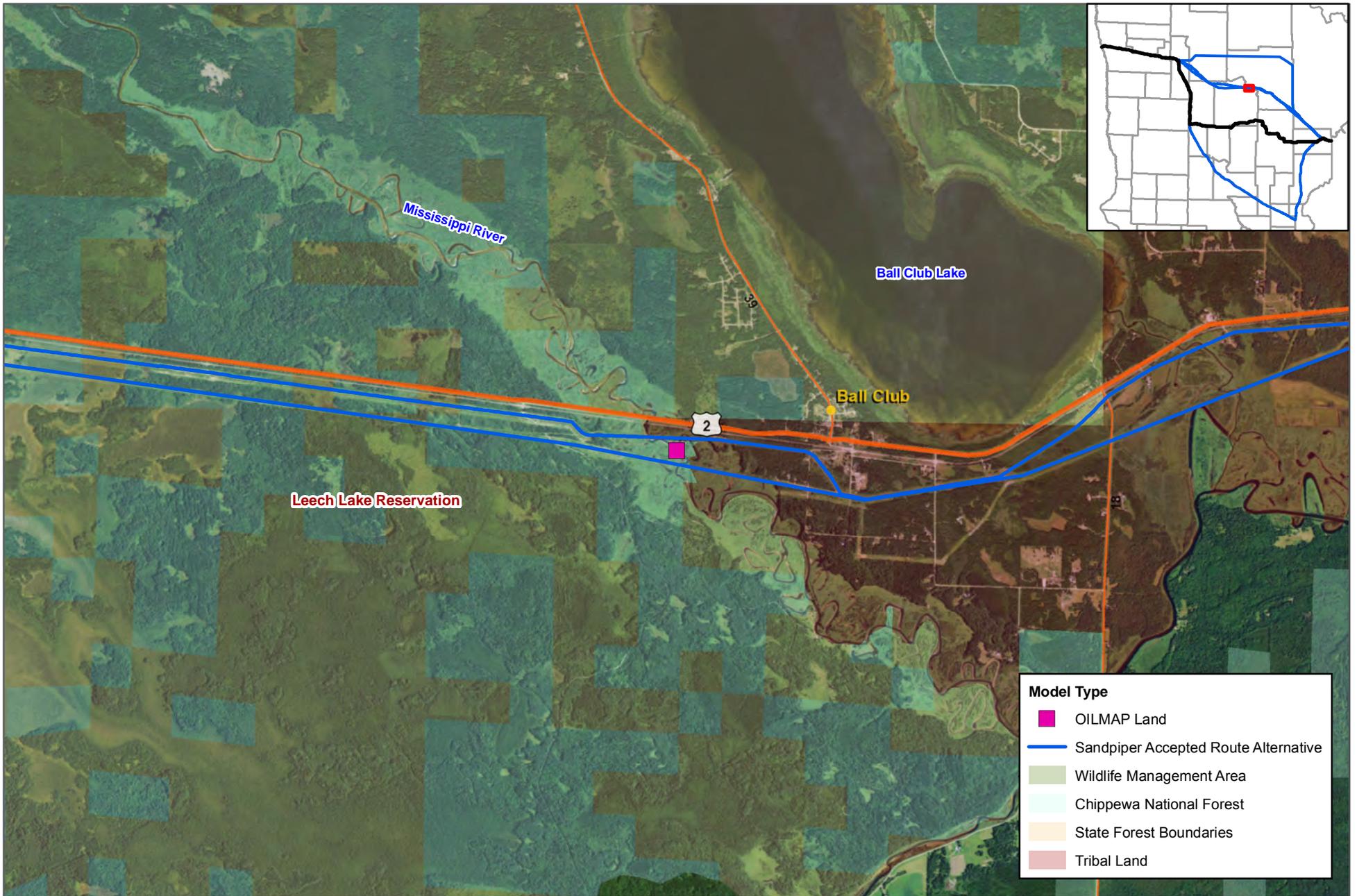
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Sandy River Aitkin County



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 www.cardno.com



Model Type

- OILMAP Land
- Sandpiper Accepted Route Alternative
- Wildlife Management Area
- Chippewa National Forest
- State Forest Boundaries
- Tribal Land



Basemap: NAIP for Minnesota (2013)

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Mississippi River at Ball Club Itasca and Cass Counties



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