Dominion City to Altona Gas Transmission Pipeline

Environmental Assessment Report

Prepared by Manitoba Hydro on behalf of its wholly owned subsidiary, Centra Gas Manitoba Inc.

Asset Planning and Delivery

Transmission and Distribution
Environment and Engagement

December 2024

Prepared for:

Environmental Approvals Branch

Land acknowledgement

Manitoba Hydro operates throughout Manitoba, on the original territories of the Anishinaabe, Cree, Anishininew, Dakota, and Dene peoples and the National Homeland of the Red River Métis. We acknowledge these lands and pay our respects to the ancestors of these territories. We also acknowledge the ancestral lands of the Inuit in northern Manitoba.

The proposed Dominion City to Altona gas transmission pipeline is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives these nations share throughout the project.

Executive summary

Manitoba Hydro has developed this report on behalf of its wholly owned subsidiary, Centra Gas Manitoba Inc., to outline the environmental assessment carried out for the Dominion City to Altona gas transmission pipeline. This report outlines the proposed project, project engagement, the biophysical and socioeconomic environments in which the project will be built and operated, the potential effects of the project, and our assessment of the significance of those effects.

Using input from project engagement and drawing from our experience with the construction of gas transmission lines and proven mitigation, we feel the proposed project meets the intent of sustainable development. We also feel that the proposed project will be undertaken in a manner that protects and maintains the environment and its ability to sustain a high quality of life, including social and economic development, recreation, and leisure for present and future generations.

The South Loop pipeline system has reached capacity and requires expansion to accommodate observed growth in the area including urban expansion, the growth of cereal crop production as well as some users switching from other fuels to natural gas. Manitoba Hydro used a decision tool to determine an 8" steel pipeline provided the best overall value to the company.

The scope of the project consists of the construction, operation, and decommissioning of a new and approximately 38.7 km long, 8-inch steel gas transmission natural gas pipeline located approximately 7.5 km east of Dominion City and terminating just north of the Town of Altona. The proposed pipeline traverses the Rural Municipalities of Emerson-Franklin, Montcalm, and Rhineland. The project will also require the following:

- expansion of the existing gate station east of Dominion City, the point of connection (*i.e.,* tie-in) to TC Energy
- two new control points and the decommissioning of one existing control point
- expansion of two existing control points

The proposed Dominion City to Altona gas transmission pipeline is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives these nations share throughout the project.

The assessment process was developed through a review of regulations, current environmental assessment practices, experience undertaking assessment of similar projects, site visits and feedback received during project engagement.

Based on the above, the environmental assessment was focused on the following valued components:

- Important sites
- Vegetation
- Wildlife and wildlife habitat
- Commercial agriculture
- Health and well-being
- Economic opportunities
- Infrastructure and community services

The proposed project traverses approximately 1.2 ha of Crown land, which is comprised entirely of drains.

Potential effects to the natural environment are limited as most of the proposed project area is previously disturbed and developed. Land cover in the proposed transmission line right-of-way is dominated by agricultural cropland (>95%). The few areas of natural habitat crossed by the proposed project include shelterbelts and riparian areas near watercourses/drains. However, these natural areas will not be directly affected because the proposed pipeline will be installed using horizontal directional drilling in these areas. The proposed project will tie into an existing pipeline previously installed beneath the Red River. As a result, there will be no ground disturbance on lands within the Roseau River First Nation or the riparian area adjacent to the Red River.

The proposed project has low potential to affect rare plants, wildlife, or wildlife habitat as the project is routed within previously disturbed and developed areas.

Project construction will adversely affect agricultural operations. There will be a small loss of agricultural land around the above ground structures. Construction will cause a short-term disruption to agricultural activities for one growing season.

Project construction will potentially affect health and well-being through a temporary decrease in air quality and increase in noise during construction activities. The construction and ongoing presence of the project may alter community well-being through potential stress and safety concerns about potential project accidents or malfunctions.

Economic opportunities anticipated to result from the project include opportunities for employment and local spending on goods and services.

The project is anticipated to result in small increases in the strain on local infrastructure and services, mainly during the construction phase.

Manitoba Hydro's environmental protection program and associated protection plans, including project specific mitigation measures, have been adapted and updated to minimize the overall impacts of the project. Based on Manitoba Hydro's planned mitigation and past outcomes from similar projects in southern Manitoba, the overall assessment conclusion is that the proposed project's effects to the environment will be not significant and that the project meets the intent and purpose of sustainable development.

Authors’ acknowledgement

Staff from the following Manitoba Hydro departments and external consultant companies contributed to the preparation of this environmental assessment report.

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Acronyms and abbreviations

AOCs	Areas of concern
AQMS	Air quality management system
CAAQS	Canadian ambient air quality standards
CCME	Canadian Council for Ministers of the Environment
CEnvPP	Construction Environmental Protection Plan
CHRPP	Culture and Heritage resource Protection Plan
COSEWIC	Committee on the Status of Endangered Wildlife
CSA	Canadian Standards Association
GCM	Global climate model
GDP	Gross domestic product
GHG	Greenhouse Gas
GWL	Global warming levels
HDD	Horizontal directional drilling
HRB	Historic Resources Branch
LAA	Local assessment area
MASC	Manitoba Agricultural Services Corporation
MBCA	*Migratory Birds Convention Act*
MBCDC	Manitoba Conservation Data Centre
MBESEA	*Manitoba Endangered Species and Ecosystems Act*

MMTP	Manitoba-Minnesota Transmission Project
OPR	Onshore pipeline regulations
PDA	Project development area
ppm/PM	Parts per million
PR	Provincial Road
PTH	Provincial Trunk Highway
RAA	Regional assessment area
RHA	Regional health authority
RM	Rural Municipality
ROW	Right-of-way
RRAFN	Roseau River Anishinabe First Nation
RTAC	Roads and Transportation Association of Canada
SAR	Species at Risk
SARA	*Species at Risk Act*
SCN	Soybean cyst nematode
SOCC	Species of Conservation Concern
SOP	Standard Operating Procedure
VC	Valued component
VOC	Volatile organic compound
WCW	Water control works
WMA	Wildlife Management Area

WQI	Water quality index

Glossary

Term	Definition
Accident	An unexpected and unintended interaction of a project component or activity with environmental, health-related, social, or economic conditions (Impact Assessment Agency 2024)
Biosecurity	Management practices that can help minimize and/or control the introduction, transfer or multiplication of pests (e.g., weeds, diseases) in crops and livestock.
Commercial Agriculture	For profit production of crops and livestock.
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	An independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction. Members are wildlife biology experts from academia, government, non-governmental organizations and the private sector responsible for designating wildlife species in danger of disappearing from Canada.
Direct effect	An environmental effect that is: • A change that a project may cause in the environment; or • Change that the environment may cause a project. It is a consequence of a cause-effect relationship between a project and a specific environmental component.

Ecoregion	Characterized by distinctive regional ecological factors including climate, physiography, vegetation, soil, water, and fauna.
Ecozone	An area of the earth's surface representative of large and very generalized ecological units characterized by interactive and adjusting abiotic and biotic factors.
Effects of the environment on the project	Effects that may result from forces of nature physically interacting with a project or hampering the ability to conduct projects activities in their normal, planned manner
Engaged audiences	Includes all groups engaged on the project: First Nations, the Manitoba Métis Federation, and interested parties.
Gross Domestic Product	The total value of goods produced and services provide in a country during one year.
Heritage resources	Heritage resources refer to physical, cultural, and natural elements considered valuable and preserved for their historical, cultural, scientific, or aesthetic significance
Important sites	Important sites include heritage resources as defined and protected by Manitoba's *Heritage Resources Act (1986)* as well as a broad range of cultural sites and features understood to be important to First Nations peoples and Red River Métis citizens in the area.
Intangible cultural heritage	Intangible cultural heritage is defined by UNESCO to include traditions and living

	expressions transmitted from one generation to the next (UNESCO 2023).
Interested party	Individuals or groups with potential feedback, interests, data to share, and/or the ability to share information, potentially impacted by the project. Used instead of stakeholder.
Malfunction	A failure of a piece of equipment, a device, or a system to operate as intended (Impact Assessment Agency 2024)
Mitigation	Means measures to eliminate, reduce, control, or offset the adverse effects of a project, and includes restitution for any damage caused by those effects through replacement, restoration, compensation, or any other means (Impact Assessment Act, 2019).
Species at Risk (SAR)	Is an extirpated, endangered, threatened, or species of special concern as defined by the *Species at Risk Act*.
Species of conservation concern	Species that are rare, disjunct, or at risk throughout their range in Manitoba and in need of further research. The term also encompasses species that are listed under (Manitoba) *The Endangered Species and Ecosystems Act Manitoba*, (federal) *Species at Risk Act*, or that have a special designation by the Committee on the Status of Endangered Wildlife in Canada.
Tangible important sites	Tangible important sites include sites or objects of cultural, historical, spiritual, or sacred importance. Certain land types and interests such as unoccupied Crown land and land available for

	Treaty Land Entitlement opportunities are also considered.

1.0 Introduction

This environmental assessment (EA) report outlines the assessment of potential effects of the proposed Dominion City to Altona gas transmission pipeline, which requires a provincial Class 2 Environment Act Licence.

Manitoba Hydro is proposing to construct a new 8-inch steel natural gas transmission pipeline. The pipeline is proposed to span approximately 38.7 km, starting at an existing gate station (the connection point (*i.e.,* tie-in) with the supplier, TC energy) located approximately 7.5 km east of Dominion City in the Rural Municipality of Emerson, and terminating at a control point north of the town of Altona in the Rural Municipality of Rhineland.

The project also includes work on above-ground components including expansion of existing control points, relocation of an existing control point, and installation of a new control point. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201.

The planned in-service date of the proposed project is 2027.

The proposed project is described in detail in Chapter 2.0 (Project description) and illustrated in Map 2-1.

1.1 Regulatory framework

Manitoba Hydro projects are subject to provincial and federal regulations. The following sections outline the regulatory frameworks relevant to the proposed project.

1.1.1 Provincial regulatory framework

Pipelines greater than 10 km, or located in environmentally sensitive areas, are considered Class 2 developments in the provincial Classes of Development Regulation (M.R. 39/2016). As a Class 2 development, the proposed Dominion City to Altona Gas transmission pipeline project requires a provincial licence under *The Environment Act* to proceed.

This environmental assessment report forms part of Manitoba Hydro's Environment Act Proposal for the project and has been compiled in accordance with Manitoba Environment and Climate Change's Environment Act Proposal Report Guidelines (June 2023).

1.1.2 Federal regulatory framework

Federally, the project is not considered a physical activity under the Physical Activities Regulations SOR/2019-285 and therefore does not trigger an environmental assessment under *The Impact Assessment Act*.

1.1.3 Municipal planning

The proposed project is in the Rural Municipalities of Emerson-Franklin, Montcalm, and Rhineland. These municipalities have their own municipal by-laws (laws, regulations, or rules of a local government), adopted under provisions of *The Planning Act (Manitoba)* and the Provincial Planning Regulation (M.R. 81/2011), that administer land use planning, zoning and approvals for lands.

As a Crown corporation, Manitoba Hydro is generally exempt from *The Planning Act* and its regulations in terms of development planning. Manitoba Hydro is therefore not bound by municipal development plans but seeks to engage cooperatively with municipalities to limit conflicts between Manitoba Hydro projects and municipal development plans.

1.2 Manitoba Hydro mission and goals

Manitoba Hydro's Mission is to "Help all Manitobans efficiently navigate the evolving energy landscape, leveraging their clean energy advantage while ensuring safe, clean, reliable energy at the lowest possible cost." For more than 50 years Manitoba Hydro's projects have primarily focused on the development of renewable hydroelectric power and have played a major role in the development of the provincial economy and the province.

Centra Gas is the principal distributor of natural gas in the province of Manitoba and is a wholly-owned subsidiary of Manitoba Hydro. Centra Gas' mandate is to supply natural gas is a safe, cost-effective, reliable, and environmentally appropriate manner.

Manitoba Hydro operates based on our foundational principles of safety, environmental leadership, respectful engagement with interested parties and communities, and respect for each other. Safety remains our top priority in everything we do.

The energy services that Manitoba Hydro offers Manitobans rely on natural resources which are of critical importance to us all, which is why environmental leadership is identified as a key principle of our business.

Manitoba Hydro will consider the environmental impacts of our activities, products, and services. To deliver on this commitment effectively, we employ an Environmental Management System (EMS) that aligns with ISO 14,001 Standard:

- ensuring that the work performed by our employees and contractors meets environmental, regulatory, contractual, and voluntary commitments
- recognizing the needs and views of its interested parties and ensuring that relevant information is communicated
- assessing its environmental risks to ensure they are managed effectively
- reviewing its environmental objectives regularly, seeking opportunities to improve its environmental performance
- considering the life cycle impacts of its products and services
- ensuring that its employees and contractors receive relevant environmental training
- fostering an environment of continual improvement

1.3 Purpose of the document

The purpose of this report is to support Manitoba Hydro's application for a Class 2 development licence under *The Environment Act (Manitoba)*, to construct and operate the Dominion City to Altona gas transmission pipeline.

For Class 2 developments, proponents are required to submit a cover letter, an Environment Act Proposal Form, an EA report, and an application fee to Manitoba Environment and Climate Change's Environmental Approvals Branch.

This EA report, forming part of Manitoba Hydro's Environment Act Proposal for the project, identifies and assesses the potential effects of the project and identifies the mitigation measures that will be used to address adverse environmental effects and enhance benefits associated with the project.

1.4 Environmental assessment report outline

The sections of this report that follow begin with a project description in Chapter 2.0 that discusses the various components of the Dominion City to Altona gas transmission pipeline as well as the activities that will be involved during construction, operations, and decommissioning of the project.

Chapter 3.0 provides an overview of the methods used to conduct the environmental assessment for the project. This includes a description of the scope, temporal and spatial boundaries as well as how valued components were identified. Methods used to predict project effects on valued components, identify mitigation, characterize residual effects, and undertake cumulative effects assessment are also outlined in this chapter.

Chapter 4.0 describes the engagement process undertaken for the project, including the purpose, goals and objectives, methods, and a summary of feedback received to date.

Chapter 5.0 provides existing condition information for aspects relevant to the environmental assessment that are broad or not covered in individual valued component (VC) chapters (e.g., climate, physiography and drainage geology, soils, land and resource use, communities and historical and cultural setting).

The following sections assesses the potential project effects on the valued components identified for the project including important sites (6.0), vegetation (7.0), wildlife and wildlife habitat (8.0), commercial agriculture (9.0), health and well-being (10.0), economic opportunities (11.0) and infrastructure and community services (12.0). In addition, this chapter identifies mitigation measures, characterizes residual effects, assesses future climate change scenarios.

Chapter 13.0 summarizes greenhouse gases and climate change information compiled for the project.

Chapter 14.0 discusses the effects of the environment on the project and Chapter 15.0 outlines unplanned events that may occur as the result of project activities (i.e., accidents and malfunctions).

Chapter 16.0 describes the environmental protection program developed for the project, including the various plans, roles, and communication protocols that will be in place to mitigate project activities and effects.

Chapter 17.0 provides a conclusion for the environmental assessment, and Chapter 18.0 lists the references from which information was drawn for the assessment, and the report closes with appendices.

2.0 Project description

The proposed project consists of construction of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km to the east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River. Construction is anticipated to take approximately 12 months.

The proposed project traverses approximately 1.2 ha of Crown land, which is comprised entirely of drains.

2.1 Project need and alternatives

Dominion City to Altona is part of the South Loop system[1], which connects to the TC Energy system at existing gate stations near both Dominion City and Oakville. There are two existing 4” pipelines running from Dominion City to Altona within existing easement built in 1962 and 1989.

The South Loop system has reached capacity and requires expansion to accommodate observed growth in the area including urban expansion, the growth of cereal crop production as well as some users switching from other fuels to natural gas.

Gas compression was considered in the planning stage, but this has higher operating costs. Trucked liquified natural gas was considered to help with peak use. Estimates indicated operational costs for trucked liquified natural gas to meet load forecasts were costly, resulting in the highest cost.

Manitoba Hydro used their corporate value framework to systematically compare the value of each option. The 8” steel pipeline provided the best

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[1] The South Loop system consists of two gate stations connecting to the TC Energy system, with 150 km of pipeline between the two stations. It includes pressure regulating stations, farm taps and branches off the main loop that feed peripheral communities.

overall value to the company and was therefor selected as the preferred option.

2.2 Scope

The project involves constructing approximately 38.7 km of new 8″ steel transmission pipeline which will include:

- the expansion of the existing gate station footprint east of Dominion City within NW-18-2-4-E, tie-in to TC Energy, and installation of above-ground components
- new control point installation within NE-14-2-2-E
- a control point relocation which includes new control point installation and existing control point decommissioning within NW-17-2-1-W
- expansion of existing control points: one in NW-14-2-1-E and another in RL-126-AG and RL-127-AG

2.2.1 Out of scope ancillary activities

Manitoba Hydro must undertake ancillary activities to inform the design of the proposed new gas pipeline. Manitoba Hydro routinely carries out these activities as part of general utility operations, and they are understood to have little to no environmental effects. These activities are therefore not considered within the scope of this environment assessment report. These activities include:

- Utility locates
- Geotechnical investigations within the road allowance and right-of-way
- Soil surveys
- Land surveying to establish the centerline of the proposed right-of-way, flag the edges of the proposed right-of-way, and establish the footprint for control structure construction and gate station expansion

These activities adhere to existing provincial and municipal regulations. Any environmental damages caused during these activities will be remediated, as per Manitoba Hydro operational policies.

2.3 Design considerations

Design and construction of the project will meet or exceed standards as set out by the Canadian Standards Association (CSA Z662:23) along with Manitoba Hydro depth of cover standards.

2.4 Pipeline routing

Functionality, design optimization, construction conditions, operations and maintenance, and considered when routing transmission pipelines.

The final preferred route for the project is shown on Map 2-1.

The pipeline route largely parallels an existing pipeline right-of-way (Map 2-1). Careful consideration was made in final routing to avoid homes, above-ground infrastructure, and shelterbelts.

2.5 Pipeline right-of-way

Right-of-way width is determined in part by the American Petroleum Institute Guidelines for Property Development, which provides guidelines on right-of-way width, to protect public safety.

Manitoba Hydro has an existing 10 meter easement for two 4” lines built in 1989 and 1962. An additional 10 meter easement will be needed to the north and 20 meters needed to the south of existing easement.

The right-of-way width for the project will be 40 meters when following existing easement (30 meters of new easement, 10 meters of existing), and up to 50 meters when not following existing easement.

2.5.1 Easement procurement and compensation

This section outlines the easement and procurement process for obtaining land rights to construct and operate the transmission pipeline. It describes private land easement and compensation, namely land compensation, construction damage compensation, structure impact compensation, and ancillary damage compensation.

An easement agreement provides Manitoba Hydro the right to enter and use the right-of-way for construction, inspection, maintenance, repair, or replacement of the gas transmission pipeline facilities. This right is obtained through easement of privately owned lands, by a Crown land reservation, or a pending easement for right of use on provincial Crown land.

Manitoba Hydro begins the process of acquiring easements from landowners during the project planning process once a transmission pipelines final preferred route is identified.

The landowner can continue to use the land within the right-of-way (e.g., for farming, grazing, recreation, or other compatible uses) if the activity will not compromise safety requirements or hamper pipeline operation. Landowners are not permitted to plant trees, construct buildings, or place other structures within the easement area without prior approval from Manitoba Hydro.

2.6 Project components

This section describes each component of the project including:

- Existing gate station tie-in
- Pipeline
- Valve sites/control points
- Marshalling yards
- Crossings
- Tie-ins

2.6.1 Existing gate station tie-in

An existing gate station (Photo 2-1) is located on NW-18-2-4-E, approximately 7.5 kilometers east of Dominion City. The existing gate station footprint will be expanded by approximately 15 meters by 45 meters to the south to allow for tie-in to TC Energy and installation of above-ground valve components.

Photo 2-1: Dominion City gate station

2.6.2 Pipeline

The pipeline will be 8″ steel transmission pipeline running from a gate station east of Dominion City to a control point north of Altona. The pipeline will be installed by horizontal directional drilling beneath crossings, trenching the remainder. Trenching will be approximately 1.3 meters in depth with a minimum 1 meter depth of cover.

2.6.3 Valve sites/control points

Control points are above-grade assemblies with one or more valves that enables the control of gas flow (Photo 2-2). Pipeline inspection gauge (also known as a “pig”) launchers will be installed at the Altona control point and Dominion City gate station, which allows for a device called a “pig” to pass through the pipeline. There are various types of pigs that can clean the lines internal surface, gauge pipeline condition, or gather data and detect corrosion or imperfections while passing through the line.

Photo 2-2: Example of control point and pig launcher

2.6.4 Marshalling yards

Marshalling yards will be established to store equipment and construction materials nearby the construction site. Marshalling yard locations will be determined after a contractor is hired for the project.

2.6.5 Crossings

Crossing drains, pipelines, rail, roads, and below-ground infrastructure will be done by horizontal directional drilling. Table 2-1 outlines the locations of planned horizontal directional drilling locations. Additional crossing sites may be identified during construction.

Table 2-1: Crossings to be completed by horizontal directional drilling

Crossing	Quarter section (if applicable)
Manitoba Hydro (Centra) Transmission Pipelines	NW-17-2-1W
Manitoba Hydro Overhead 66kV	NE-17-2-1W
Canadian Pacific Railway (Gretna Subdivision)	NE-17-2-1W Requires CPKC crossing agreement
Hwy Crossing PTH 30	Between NE-17-2-1W and NW-16-2-1W Requires MTI crossing agreement
Manitoba Hydro Communication Line	NW-16-2-1W
Imperial Oil Pipeline	NE-15-2-1W Requires crossing agreements
Manitoba Hydro (Centra) Distribution Pipeline	NW-16-2-1E
St. Joseph Windfarm HV cables	NW-15-2-1E, NE-15-2-1E (locations not known)
St. Joseph Windfarm HV cables	NE-14-2-1E, NW-13-2-1E, NE-12-2-1E
Manitoba Hydro Overhead 66kV	NW-13-2-1E
TCPL Plan 6063	NE -13-2-1 E
Manitoba Hydro (Centra) Distribution Pipeline	NW-18-2-2E

Riviere aux Marais WCW Works	SE-18-2-2E Requires MTI crossing agreement
PTH 75	SW-17-2-2E Requires MTI crossing agreement
Canadian National Railway Company (Letellier Subdivision)	SW-17-2-2E Requires CN Railway crossing agreement
Manitoba Hydro Communication line	SW-17-2-2E
Manitoba Hydro Overhead Transmission Line (L20D)	SW-17-2-2E
Manitoba Hydro (Centra) Distribution Pipeline	NE-17-2-2E
Canadian Pacific Railway (Emerson Subdivision)	NE-17-2-3-E Requires CPKC Crossing agreement
Manitoba Hydro (Centra) Transmission Pipeline	NE-17-2-3E
PR 200	Between NE-17-2-3-E and NW-16-2-3E Requires MTI crossing agreement
Main Drain	NW-16-2-3E Requires MTI crossing agreement
Manitoba Hydro Overhead Transmission Line (G79L)	NE-14-2-3E
Harlow Drain	NW-13-2-3E Requires MTI crossing agreement
Manitoba Hydro (Centra) Distribution Pipeline	NE-13-2-3E
TransCanada (Now TCE) Pipeline Crossings (2 pipeline crossings)	NW-18-2-4E Requires TCE crossing agreement
Utilities	Multiple locations
Overhead distribution powerlines	Multiple locations
Municipal roads	Multiple locations
Farm taps	Multiple locations

2.7 Project activities

This section describes the project activities that will take place during each the construction, operations, and decommissioning phases.

2.7.1 Construction

2.7.1.1 Schedule

Construction is proposed to commence in summer of 2026 and will require approximately 12 months to complete. Project in-service is anticipated for late 2027. Table 2-2 illustrates the anticipated construction schedule, including key construction activities.

Table 2-2: Construction schedule						
Construction activities	2026			2027		
	Summer	Fall	Winter	Spring	Summer	Fall
Mobilization and staff presence						
Vehicle/equipment use						
Access development						
Marshalling yards						
Right-of-way preparation (survey/flagging, clearing of vegetation, topsoil stripping)						
Pipe installation (trenching and lowering)						
Horizontal directional drilling						
Testing (pressure testing)						
Backfilling and contouring						
Gate station and valve site connections (temporary bypass and hot tap installation, fencing, compaction of subsoil, gravel application)						
Clean-up and reclamation						

2.7.1.2 Mobilization and staff presence

Mobilization includes the movement of Manitoba Hydro and contractor staff, vehicles, and equipment to the job site. It also includes the presence of workers staying in the local community, including their commute to and from the work site. No construction work camps are planned for this project.

Mobilization will be ongoing throughout the construction phase as different types of equipment will be required for specific project activities like topsoil stripping, pipeline stringing, installation, and horizontal directional drilling. Based on the planned construction schedule, up to 200 workers are anticipated to work on the project during peak construction.

2.7.1.3 Vehicle and equipment use:

Construction equipment may include the following:

- Materials delivery trucks and trailers
- Grader or dozer for topsoil stripping
- Drill rigs for horizontal directional drilling at crossings
- Excavators with bucket attachment for trenching
- Pipelaying crane or excavator to lower pipeline into trench
- Welding trucks and equipment
- Other smaller equipment for transportation and other minor tasks, as required

2.7.1.4 Access development

Access to the right-of-way will typically be from adjacent or intersecting roadways, existing approaches, or trails. The development of construction access routes, drainage facilities, and erosion and sediment control plans will be developed by the contractor, subject to provincial and municipal regulations, the project Environment Act Licence, and the access management plan referenced in the Environmental Protection Program. Manitoba Hydro will secure all provincial permits as required. Manitoba Transportation and Infrastructure will be contacted for access from provincial highways.

2.7.1.5 Marshalling yards

Marshalling yards may be established near the route for the storage and assembly of construction materials and equipment for eventual deployment to the construction site.

2.7.1.6 Right-of-way preparation

Preparations of the right-of-way prior to construction may include the following:

- Surveying and flagging the right-of-way pipeline alignment, above grade valve site/control points, and areas for the temporary work areas.
- Clearing of any shrub or tree cover that may be required will also be determined prior to construction activities.
- On agricultural land, topsoil will be removed in a manner to reduce mixing of topsoil with subsoil and either stored in stockpiles or windrowed along the right-of-way in locations where it will not be disturbed or contaminated. The topsoil will be stripped to the full depth of the topsoil in all excavation areas.

2.7.1.7 Pipeline stringing

The pipe will be strung or placed along the proposed route and welded above-grade.

<u>Welding</u>

Welding will be required for pipe joints, reducers, elbows, flanges, etc., including aligning, necessary cutting, and bevelling.

<u>Non-destructive Testing</u>

Non-destructive inspection of the pipeline will be done by visual and radiographic means.

<u>Testing of Tie-ins</u>

All circumferential butt weld tie-ins will be 100% radiographically inspected.

<u>Coating and Wrapping</u>

Steel pipe and fittings will have coatings installed to protect from corrosion. All buried steel valves and fittings will be externally coated and wrapped using either petrolatum tape or visco-elastic tapes.

2.7.1.8 Pipeline installation

Trenching is done using an excavator to a depth of approximately 1.3 meters and a width of 1 meter (Photo 2-3). Most of the pipeline will be welded above-grade and lowered into place using an excavator or pipelaying crane.

Photo 2-3: Trenching and lowering in pipe

2.7.1.9 Horizontal directional drilling

Road crossings, rail lines, and waterways will have pipe installed by directional drilling (Photo 2-4) to minimize ground disturbance in these areas.


Photo 2-4: Horizontal directional drilling

2.7.1.10 Pipeline testing

<u>Testing and purging</u>

Prior to putting the pipeline into service, the line will be pressure-tested with water to assess the strength of the pipeline (i.e., hydrostatic testing) and to check for possible leaks. Hydrostatic testing, including the disposal of water used for testing, will be conducted as per Manitoba Hydro's Environmental Protection Plan (EPP) for the Project and Manitoba Hydro Standard 620.05.

Purging activities will be done in accordance with Manitoba Hydro Natural Gas Standard 611.01 and CSA Z662-11 Oil and Gas Pipeline Systems. All piping, valves, and appurtenances will be pressure tested in place after installation, prior to operation.

Hydrostatic pressure testing

Pressure testing is done before putting the pipeline into service to test strength and to check for leaks. The pressure test will adhere to specifications described in the engineered construction drawings. If not outlined, the minimum test pressure at any point in the pipeline shall be:

- Up to 1.4 times the specified maximum operating pressure for the strength test
- 1.1 times the specified maximum operating pressure for the leak test of hot tap fittings

Hydrostatic pressure testing will be conducted as follows:

- before hydrostatically pressure testing the pipe, a pig will be placed ahead of the water column during filling to prevent air pockets
- water will be introduced into the pipe
- after the fill is complete, the pipe will be stabilized before testing begins
- when the stabilization is complete, the pressure will be brought to test pressure according to the test plan
- after testing, the pressure testing devices will be removed and the pipe will be dewatered using a pig and compressed air. The pipe will be dewatered in a manner that:
    - Properly captures and disposes of any fluid with a freezing point depressant
    - Discharges from the lowest end of the pipeline section
    - Uses compressed air to displace the water and utilizes a pig to separate the air from the water
- The pipe will then be dried. Dry compressed air will be used during the drying procedure

After a test section has been dewatered and dried, a slug of methanol will be loaded between two pigs and run through the section. The methanol wash will be recovered at the end of the section. The methanol or water methanol mix will be disposed of in accordance with environmental regulations. No methanol or water methanol mix will be discharged onto the ground or into a watercourse.

2.7.1.11 Backfilling and contouring

After the pipeline is lowered into the trench, backfilling will be completed by first placing sub-soil, followed by separately stockpiled or windrowed topsoil to limit mixing. Topsoil will be contoured to promote similar grade and drainage as pre-construction.

2.7.1.12 Gate station and valve site connections

Temporary bypass installation

To maintain a constant flow of natural gas in the existing transmission pipelines throughout construction, a bypass installation is required. Welded fittings will be installed to accommodate temporary connections of pipe/hoses. This will allow the disconnection of the existing pipeline segment to permit installation of new pig launcher or control point. Once the new pipeline is completed, the bypasses will be removed.

Hot tap installation

Fittings installed to allow for pipeline segment isolation and de-energization for pig launcher installation.

Fencing

Existing fencing around Dominion City gate station will be extended to house the new pig launcher assembly within expanded footprint.

Compaction of subsoil

Compaction of backfill material at 6-inch lifts until reaching grade, as per construction drawings.

Gravel application

Limestone gravel will be applied and graded as per construction drawings.

2.7.1.13 Clean-up and reclamation

The final step in construction is demobilizing the workforce from an area. Demobilization includes the movement of Manitoba Hydro and contractor staff, vehicles, and equipment from the job site, as well as clean-up (and if required rehabilitation) of the right-of-way, marshalling yards, and access routes. Once the transmission pipeline is constructed, all excess materials and equipment, including debris and unused supplies, will be dismantled, if required, removed from the site, and disposed of according to provincial and municipal regulations. Rehabilitation of any disturbed sites will be undertaken as required. All cleanup and rehabilitation activity will be subject to the requirements of the environmental protection program, described in Chapter 16. Demobilization will be ongoing throughout construction phase as different types of equipment will be required for specific activities such as pipeline welding, horizontal directional drilling at crossings, and construction of above-ground control points.

After the pipeline and valve sites are installed, subsoil will be replaced, follow by topsoil will being re-spread and leveled in disturbed areas to allow surface land use to resume to pre-disturbance conditions. Other areas of exposed soils resulting from project construction activities, will be remediated to pre-construction conditions.

2.7.2 Operation and maintenance

2.7.2.1 Presence of pipeline, gate station, and valve sites

The pipeline will be designated to operate continuously, though pressure will vary with natural gas load requirements. To maintain the pipeline in a safe and reliable operating condition, regular inspections and maintenance will occur.

2.7.2.2 Vehicle and equipment use

Refer to sections 2.7.1.2 (Mobilization and staff presence), and 2.7.1.3 (Vehicle and equipment use).

2.7.2.3 Ground pipeline patrols

Once the proposed pipeline is operational, Manitoba Hydro implements an Integrity Management Program that assesses potential risk to the pipeline and specifies programs to monitor pipeline condition. This includes:

- Depth of cover surveys
- Cathodic protection monitoring
- Leak detection surveys

<u>Depth of cover surveys</u>

Measurements of soil cover above the pipeline are taken to assess potential risk to damaging the pipeline from erosion or typical land use activities.

<u>Cathodic protection monitoring</u>

Surveys are typically completed on foot by collecting data with a handheld device at predetermined intervals. The data collected assesses the effectiveness of the pipelines cathodic protection system, which protects the pipeline from corrosion.

Leak detection surveys

Inspection of entire length of the pipeline, completed on foot by using a gas detection device.

2.7.2.4 Valve operation checks

Operation and maintenance activities that will occur for the new above grade valve assemblies include:

- Leak checks and equipment maintenance every 12-18 months
- Snow clearing of the site if necessary
- Supervisory Control And Data Acquisition (SCADA) monitoring - is the remote control of equipment at the site and monitoring that will identify emergency situations that are occurring on the pipeline (i.e. damage to the pipeline). In the event damage has occurred, the SCADA monitoring will trigger alarms at specific low-pressure settings and the appropriate personnel will be notified to respond to the situation immediately.

2.7.2.5 Vegetation management

Surface conditions along pipeline right-of ways are maintained to allow ready access by personnel and maintenance vehicles for maintenance and inspection. This means controlling any vegetation that would impede truck travel or prevent clear aerial visibility. A right-of-way with managed vegetation will help to identify the presence of a pipeline to the public, which forms part of a damage prevention strategy. As this project is primarily routed through cultivated agricultural land, limited vegetation management activities are anticipated.

2.7.3 Decommissioning and restoration

When the project reaches end of life or is no longer required, it will be decommissioned. The following sections describe the decommissioning process. This process aligns with the Canadian Energy Regulators "Guidance Notes for the Decommissioning Provisions under the Onshore Pipeline Regulations (OPR) (CER 2020).

2.7.3.1 Vehicle and equipment use

Refer to sections 2.7.1.2 (Mobilization and staff presence), and 2.7.1.3 (Vehicle and equipment use).

2.7.3.2 Pipeline disconnection

At end of life, the pipeline will be isolated and disconnected from the natural gas transmission system. To isolate and disconnect the pipeline, Manitoba Hydro typically:

<u>Isolate:</u>

The pipeline, or segments of the pipeline, would be isolated using valves at the constructed control points.

<u>Purging/flaring:</u>

When decommissioning, purging is done to replace natural gas with air. Natural gas will be purged rather than vented wherever possible. When purging a service line, main or pipeline out of service, natural gas shall first be conserved, secondarily, flared and as a last resort, vented.

<u>Cap off pipeline and leave in place:</u>

Once the section of pipeline being disconnected from the system is isolated and purged, end caps are welded on either end, the pipeline will be decommissioned below-grade.

2.7.3.3 Removal of above-ground components

After dismantling the project, high value components will be removed for re-use or recycling. The remaining materials will be reduced to transportable size and removed from the site for disposal. Waste handling and disposal will be subject to conventional Manitoba Hydro codes of practice and relevant provincial and federal legislation.

2.7.3.4 Rehabilitation

Following removal above-ground components, the area will be restored to the surrounding land use. Disturbed areas will be graded to original contours and the soils will be restored to a condition consistent with the intended land use. Disturbed areas will be rehabilitated consistent with the rehabilitation and invasive species management plan developed for the project. This will include the restoration of access areas along the right-of-way.

2.7.3.5 Clean-up and demobilization

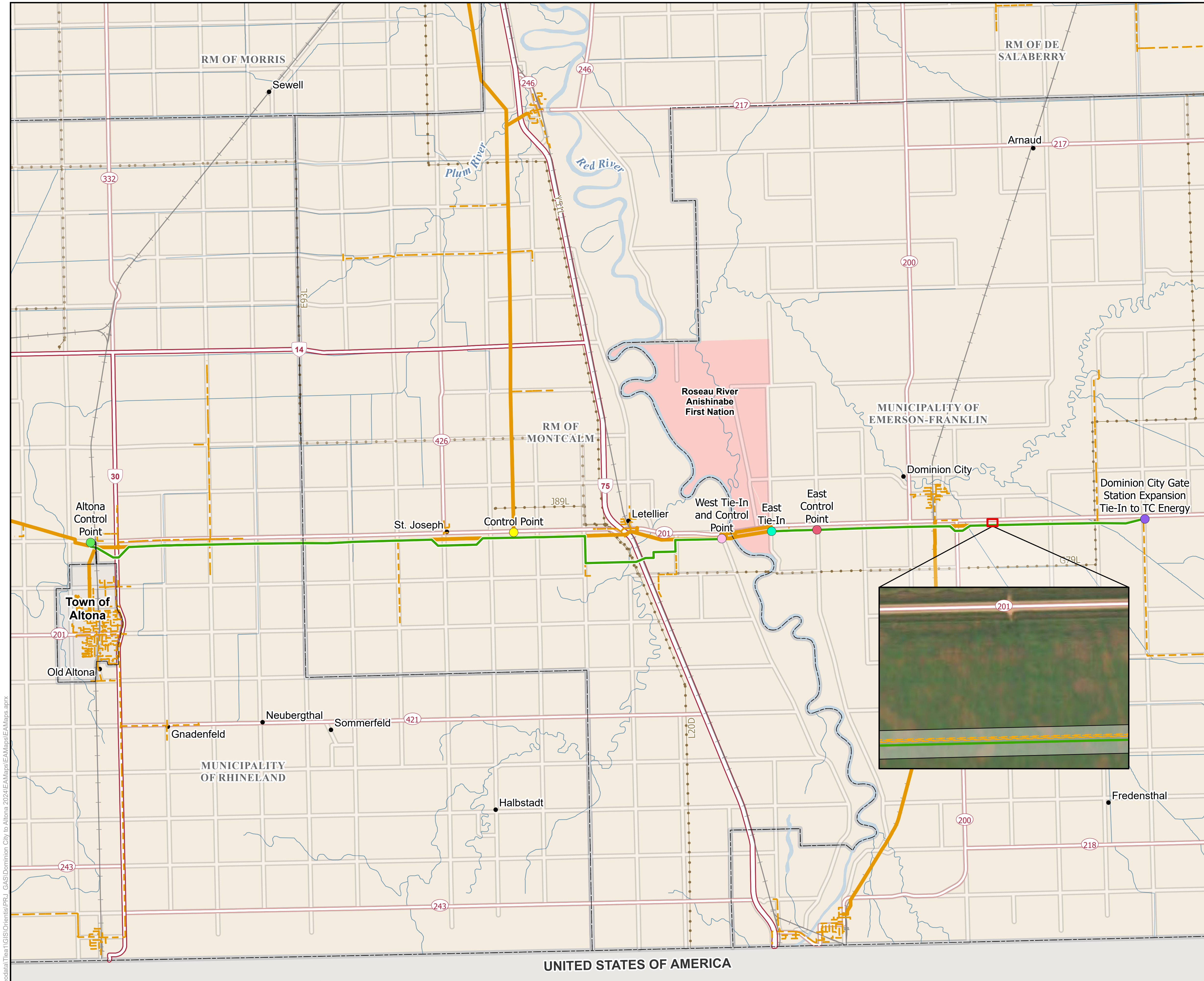
Refer to 2.7.1.13 (Clean-up and reclamation). Excess materials and equipment, other than what is capped and left in place, will be removed, and disposed of according to provincial and municipal regulations.

2.8 Funding

The project will be funded by Centra Gas Manitoba Inc.

Map 2-1 Dominion City to Altona gas transmission project

Map 2-2 Point of connection to TC Energy



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Components

- Altona Control Point
- Control Point
- Dominion City Gate Station Expansion Tie-In to TC Energy
- East Control Point
- East Tie-In
- West Tie-In and Control Point
- Preferred Route
- Project Development Area (PDA)

Infrastructure

- Transmission Pressure Gas Line
- Existing Gas Pipeline
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line

Landbase

- Community
- Provincial Highway
- Provincial Road
- Local Road
- First Nation Lands
- City/Town
- Rural Municipality

Imagery Source: Maxar

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 05, 2024

N

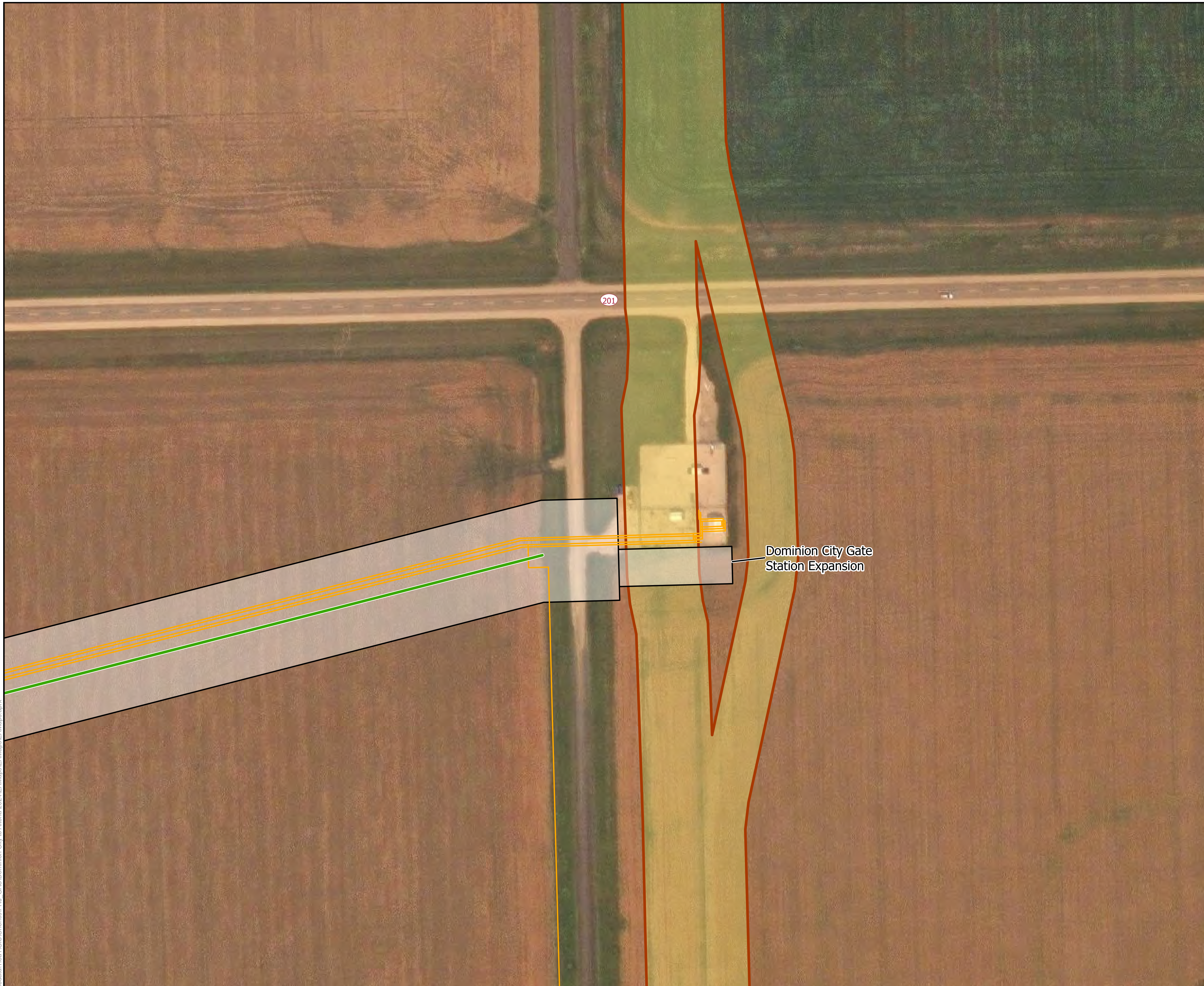
0 1.5 3 4.5 6 Kilometres
0 0.75 1.5 3 Miles

1:130,000

Dominion City to Altona Gas Transmission Project

Draft: For Discussion Purposes Only

Map 2-1



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Infrastructure
- Existing Pipeline
- Approximate Extents of TransCanada Pipeline

Landbase
- Provincial Road

Imagery: Maxar, Microsoft

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 05, 2024

N

0 10 20 30 40 Meters
0 55 110 220 Feet

1:1,500

Point of Connection to TC Energy at the Dominion City Gate Station

Draft: For Discussion Purposes Only

Map 2-2

3.0 Environmental assessment methods

This chapter describes the methods used for assessing the project's potential effects. Effects are changes to the environment or socio-economic conditions and the positive and negative consequences of these changes.

To determine the potential effects, the environmental assessment process progressed through the following steps:

- Scoping the project and the assessment (i.e., selecting valued components and defining spatial and temporal boundaries)
- Identifying project interactions with the environment
- Determining pathways of effects
- Developing mitigation
- Characterizing residual effects
- Assessing cumulative effects
- Determining significance
- Developing follow-up and monitoring programs

In addition to describing the methods employed during each step, this chapter explains how the environmental assessment process is documented within this report.

The methods described in this chapter were informed by past and ongoing Manitoba Hydro assessments and initiatives as well as regulatory requirements. The environmental assessment approach was structured to meet the requirements of the *Environment Act* (Manitoba)'s Licensing Procedures Regulation, M.R. 163/88 and considered feedback from project engagement.

3.1 Scope

Scoping involves focusing the environmental assessment of a proposal on relevant issues and concerns, types of effects, alternatives for consideration, methodology, and establishing the boundaries of the assessment.

Scoping includes defining the project, valued components to be considered in the environmental assessment, the geographic areas, and timescales over which potential effects will be studied, and the thresholds of change to be used to determine if predicted project effects would be significant.

Scoping is iterative and gets adjusted throughout the environmental assessment process as new information becomes available.

3.1.1 Project scope

The scope of the proposed project is described in Chapter 2.0 (Project description) and includes the following primary components:

- Installation of approximately 38.7 km of 8-inch steel gas transmission pipeline
- Expansion of, and connection to, an existing gate station east of Dominion City
- Installation of a new control point, expansion of two existing control points, and relocation of another existing control point

The project scope includes construction, operation, and decommissioning of the project components.

Primary project activities are described in Chapter 2.0 (Project description) and consist of:

- Construction of pipeline, gate station expansion, and valve sites
    - Mobilization and staff presence
    - Vehicle and equipment use
    - Access development
    - Marshalling yards (temporary work or stage areas)
    - Right-of-way preparation, including flagging, clearing of vegetation, topsoil stripping
    - Pipe stringing, including welding and coating
    - Pipe installation by trenching and lowering into place
    - Horizontal directional drilling
    - Testing (hydrostatic pressure testing of pipeline, x-ray)
    - Backfilling and contouring
    - Gate station and valve site connections, including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application
    - Clean-up and reclamation
- Operation and maintenance of pipeline, gate station, and value sites
    - Maintenance activities
    - Ground pipeline patrols – depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)
    - Annual valve operation checks
    - Vegetation management
- Decommissioning of pipeline, gate station, and valve sites
    - Pipeline disconnection (isolate, purge, and cap off below grade)
    - Removal of above-ground components (dismantling, removal from site, disposal)
    - Rehabilitation

- Cleanup and demobilization

3.1.2 Valued components

The assessment of effects presented in this report focuses on project-related environmental effects on valued components identified as relevant to this project.

Valued components (VCs) are biophysical, social, cultural, and economic elements that, if altered by the project, may be of concern to regulatory agencies, First Nations people, Métis citizens, resource managers, scientists, other interested parties and/or the public.

The following factors influenced the selection of VCs for this assessment:

- VCs adopted for previous environmental assessments and the feedback received about those assessments
- The professional judgment of the environmental assessment team in considering the project's anticipated components and activities, location, the surrounding environment, and regulatory requirements
- Engagement feedback from regulators, First Nations and their members, the Manitoba Métis Federation and Red River Métis citizens, landowners, interested parties, and the public on this project and past projects

Based on the above factors, seven VCs were selected for this assessment.

1. Important sites
2. Vegetation
3. Wildlife and wildlife habitat
4. Commercial agriculture
5. Health and well-being
6. Economic opportunities
7. Infrastructure and community services

3.2 Existing conditions

Before assessing project effects, it is necessary to understand the baseline conditions of the environment in which the project is proposed to take place.

The existing conditions relevant to the assessment of potential project effects are based on data collected during desktop analysis, field studies, and project engagement in relation to the spatial assessment boundaries.

In this assessment, existing conditions are described in two places:

- Existing conditions relevant for the assessment broadly and/or relating to more than one VC are included in Chapter 5.0 (Environmental setting).
- Existing conditions directly relevant to a specific VC, including their collection methods, are described in the individual VC assessment chapters.

In many cases, existing conditions expressly or implicitly include environmental effects that may be or may have been caused by other present or past projects or activities. In focusing the assessment on VCs, the description of existing conditions is at a level of detail and scope that supports the assessment of environmental effects attributable to the project.

3.3 Assessment of project effects

An assessment of project-related environmental effects and cumulative effects was undertaken for each VC using a standard framework, including consistent tables, matrices, and methods.

This report includes one chapter per VC (Chapters 6.0 to 12.0). Each VC chapter follows a standard format, covering each of the following topics:

Scope of the assessment
Existing conditions
Assessment of project effects
Assessment of cumulative effects
Determination of significance of project and cumulative effects
Prediction confidence
Follow-up and monitoring
Sensitivity to future climate change scenarios

The following sections describe the consistent methods, tools, and information applied to address each of the above topics in the assessments of project effects on the VCs.

3.3.1 Scope of each VC assessment

Each VC assessment chapter starts by defining the VC in the context of the assessment and explaining why it was chosen as a VC. The scope of each VC assessment chapter is further defined by describing the regulatory and policy setting, spatial and temporal boundaries, and VC-specific feedback from project engagement that informs the assessment.

3.3.1.1 Regulatory and policy setting

Each VC chapter includes a description of federal and provincial laws, regulations, policies, and guidelines relevant to consider in the assessment of project effects to the VC. Manitoba Hydro policies may also be included.

3.3.1.2 Engagement feedback

A summary of engagement feedback specific to each VC, as applicable, is included in each VC chapter. Each chapter also describes how the feedback from engagement influenced the scope of the assessment.

3.3.1.3 Spatial boundaries

Three spatial boundaries for the assessment of potential project effects are defined based on the geographic extent over which project activities and their effects on individual VC are anticipated to occur.

Project development area

The project development area (PDA) encompasses the anticipated area of physical disturbance associated with construction, operation, and decommissioning of the project components as described in the project description (Chapter 2.0). In other words, the PDA represents the project footprint.

The PDA is the same across all VCs.

Local assessment area

The local assessment area (LAA) encompasses the area where immediate or direct effects from a project's activities and components are predicted to occur.

The definition of the LAA may vary by VC and is provided in each VC chapter.

Regional assessment area

The regional assessment area (RAA) is the area where residual environmental effects from project activities and components may interact cumulatively with the residual environmental effects of other past, present, and known, certain, or reasonably near future projects/physical activities.

The definition of the RAA may vary by VC and is provided in each VC chapter.

Summary of VC-specific spatial boundaries

Table 3-1 presents the LAA and RAA boundaries defined for each VC assessed in this report.

Table 3-1: Summary of VC-specific spatial boundaries

Valued component	LAA	RAA
Important sites	1 km buffer around the PDA	5 km buffer around the PDA
Vegetation	1 km buffer around the PDA	15 km buffer around the PDA
Wildlife and wildlife habitat	1 km buffer around the PDA	15 km buffer around the final preferred route
Commercial agriculture	Quarter sections and river lots (i.e., surveyed parcels) of land traversed by the PDA	Administrative boundaries of the RMs of Emerson-Franklin, Montcalm and Rhineland, including the Town of Altona (*i.e.,* RMs traversed by the PDA)
Health & well-being	1.5 km buffer around the PDA	Administrative boundaries of the RMs of Emerson-Franklin, Montcalm and Rhineland, including the Town of Altona
Economic opportunities	Administrative boundaries of the RMs of Emerson-Franklin, Montcalm and Rhineland, including the Town of Altona	
Infrastructure and community services	Administrative boundaries of the RMs of Emerson-Franklin, Montcalm and Rhineland, including the Town of Altona	

3.3.1.4 Temporal boundaries

Three temporal boundaries were adopted to identify when environmental effects resulting from project activities may occur. The temporal boundaries are based on the timing and duration of project activities and the nature of the activities' interactions with each VC.

The temporal boundaries are the same across all VCs.

Construction

Project construction is anticipated to take approximately six to twelve months, commencing in summer 2026.

Operation

The project is anticipated to be in service in 2027.

Once operational, the project is anticipated to last at least 50 years based on the design standards.

Decommissioning

Decommissioning would occur at the end of the serviceable life of the project (50 years or more into the future).

3.3.2 Interactions between the project and valued components

Project components and activities with the potential to interact with components of the existing environment through the construction, operation, and decommissioning phases were identified. The environmental assessment team then considered potential interactions between project activities and each VC.

Table 3-2 is an interactions matrix identifying potential interactions between project activities and the VCs selected for the project. For each VC, the potential interactions identified in the interactions matrix (*i.e.,* marked with an 'X') are assessed.

Table 3-2: Project valued components and project activity interactions matrix

Project activity	Valued components						
	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Health and well-being	Economic opportunities	Infrastructure and community services
Construction of pipeline, gate station, and valve sites							
Mobilization and staff presence	X	-	X	-	X	X	X
Vehicle and equipment use	X	X	X	X	X	X	X
Access development	X	X	X	X	X	-	-
Marshalling yards (temporary work or storage areas)	X	X	X	X	X	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	X	X	X	X	X	-	-
Pipe stringing (including welding, coating)	X	-	X	X	X	-	X
Pipe installation – trenching and lowering	X	-	X	X	X	-	-
Horizontal directional drilling	X	-	X	X	X	-	X
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-	X	X	X	-	-
Backfilling and contouring	X	-	X	X	X	-	-
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	X	-	X	X	X	-	-
Clean-up and reclamation	X	X	X	X	X	-	X

Table 3-2: Project valued components and project activity interactions matrix

Project activity	Valued components						
	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Health and well-being	Economic opportunities	Infrastructure and community services
Operation and maintenance of pipeline, gate station, and valve sites							
Presence of pipeline, gate station, and valve sites	X	-	-	X	X	-	-
Vehicle and equipment use	X	X	X	X	X	X	X
Maintenance activities	X	X	X	X	X	X	X
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	X	X	X	X	-	-
Valve operation checks (annually)	-	X	X	-	X	-	-
Vegetation management	X	X	X	-	X	-	-
Decommissioning of pipeline, gate station, and valve sites							
Mobilization and staff presence	X	-	X	-	X	X	X
Vehicle and equipment use	X	X	X	X	X	X	X
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-	X	X	X	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	X	-	X	X	X	-	X
Rehabilitation	X	X	X	X	X	-	-
Clean-up and demobilization	X	X	X	X	X	-	X

Key: Interaction = X No interaction = -

3.3.3 Effects pathways

Once interactions between the project and VCs are determined, the assessment of each VC begins with a description of the mechanisms through which specific project activities could interact with the existing environment and result in an environmental effect (i.e., the effect pathways).

The project's potential effects are identified and assessed in the context of the VC's existing conditions, as well as its biophysical or socio-economic characteristics, regulatory context, and project engagement feedback.

Once effect pathways are identified, one or more parameter(s) are selected to facilitate quantitative and qualitative assessment of residual project effects and residual cumulative effects.

Where practical, these parameters are measurable and quantifiable (*e.g.,* direct habitat loss or the expected number of workers anticipated to move into the area for project construction). Measurable parameters provide defensible and acceptable means to characterize change in a VC attributable to the project and contribute to the determination of significance for those effects.

However, some effects lack defined parameters to measure effects and are therefore assessed qualitatively using scientific literature, professional judgement, engagement input, and past project experience. The amount of change in these parameters is used to help characterize the environmental effects and to assist in evaluating their significance.

3.3.4 Mitigation of project effects

Routing, placement of above-grade structures, and administrative aspects such as timing or duration of project activities are the primary means for mitigating project effects.

Beyond the above-mentioned primary mitigations, additional mitigation measures are identified to reduce or eliminate potential adverse effects and/or enhance potential positive effects of the project on each VC. These measures include site-specific and established general protection measures and practices, compliance with legislation, regulations, and guidelines, and planning considerations applicable to the project.

Mitigation measures are identified in each VC-specific effects assessment chapter.

3.3.5 Characterizing residual effects

A residual effect is the effect of a project predicted to remain following the implementation of mitigation measures.

Residual effects are characterized for each VC, considering how the proposed mitigation will avoid or reduce the effect. The residual effects are characterized using the following terms with specific criteria defined for each VC:

Direction: the long-term trend of the residual effect (i.e., positive, adverse, neutral).

Magnitude: the amount of change in a residual effect for a VC relative to its existing conditions (e.g., low, moderate, high).

Geographic Extent: the geographic area in which a residual effect occurs (i.e., PDA, LAA, RAA).

Duration: the time until the residual effect can no longer be measured or otherwise perceived (i.e., short-term, medium-term, long-term).

Frequency: how often the residual effect occurs and how often during the project or in a specific phase (i.e., single event, irregular events, multiple regular events, or continuous).

Reversibility: refers to whether the residual effect on a VC can be reversed once the physical work or activity causing it ceases (i.e., reversible, irreversible).

A summary of the characterization of residual environmental effects is provided in each VC chapter.

3.4 Assessment of cumulative effects

Provincial environmental assessment guidelines do not require cumulative effects assessments for Class 2 developments. However, an assessment of cumulative effects is included in the assessment for each identified VC, as applicable.

Cumulative effects are incremental effects resulting from residual project effects combined with effects from past, existing, and other reasonably near future projects and activities.

To conduct a cumulative effects assessment, past, present, and reasonably foreseeable projects that may overlap spatially and temporally with those of the project are identified. The project’s contribution to the cumulative effect is then evaluated. Within this process it is acknowledged that the effects of past and current projects inherently contribute to baseline conditions upon which project effects are assessed.

Two conditions must be met to initiate an assessment of cumulative effects on a VC:

- There are predicted adverse residual project effects on the VC.
- The adverse residual project effects on a VC could act cumulatively with the residual effects of other past, present, and reasonably near future projects or physical activities on the same VC.

If both conditions are met, then the assessment of cumulative effects is undertaken and documented within the effects assessment chapter of the VC, following the assessment of project residual effects.

Where a cumulative effects assessment is completed for a VC, the focus is on those other projects and physical activities that could result in similar residual effects to those being considered for the project.

3.4.1 Project/activity inclusion list

The project/activity inclusion list (Table 3-3) identifies known past, present and reasonably foreseeable future projects and physical activities with potential residual environmental effects that could overlap spatially and temporally with the project's residual environmental effects.

Reasonably near future projects are those that are publicly announced (with adequate descriptive detail), currently in a regulatory approval process, or under construction.

Manitoba Hydro reviewed the Manitoba Environment and Climate Change Public Registry and inquired about ongoing and future projects with the municipalities traversed by the project and the Town of Altona. No reasonably foreseeable future projects were identified that may interact cumulatively with the effects of this project.

As a result, the cumulative effects assessments carried out in each VC chapter only consider existing and ongoing projects and activities that may interact cumulatively with residual effects of the Dominion City to Altona gas transmission pipeline.

Map 3-1 shows those existing and ongoing projects and activities that have involved the placement of infrastructure across the landscape including roads, railways, electric and natural gas transmission and distribution lines.

Table 3-3 Project/activity inclusion list for cumulative effects assessment

Type of project/activity	Select specific activities/projects	Activity/project timeline	Timeline for construction, if applicable/ documented
The project			
Dominion City to Altona gas pipeline	The proposed project as described in Chapter 2.0	-	Approximately 12 months beginning in summer 2026, if licence received
Existing/ongoing projects and activities			
Domestic resource use	Includes hunting, fishing, trapping	Ongoing since before 1870	-
Recreational activities	Includes canoeing, snowmobiling, hiking	Ongoing since before 1870	-
Commercial resource use	Includes fishery and forestry	Ongoing since before 1870	-
Infrastructure	Includes existing rail lines, provincial trunk highways, provincial roads, pipelines, water treatment facilities, wastewater treatment facilities	Ongoing since before 1878	-
Hydroelectricity transmission and distribution lines	Transmission lines totalling 159.924 km	Around the early 1900s	-
	Distribution lines totalling 1,625.508 km		
Gas transmission and distribution lines	Transmission pressure gas lines totalling 151.166 km	Ongoing since before 1962	-
	Gas distribution line total length: unknown		
Potential future projects and activities			
No reasonably foreseeable future projects were identified that may interact cumulatively with the effects of the project.			

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

3.4.2 Pathways for cumulative effects

The assessment of each cumulative environmental effect begins with a description of the residual adverse project environmental effects and an analysis of the pathways through which such effects could interact with the residual effects from other projects and activities.

3.4.3 Mitigation of cumulative effects

Mitigation measures that can reduce the project cumulative environmental effects are described, with an emphasis on those measures that are under Manitoba Hydro's control and would help to reduce the interaction of the project effect with the effects from other projects and activities.

Manitoba Hydro will share information and knowledge with other proponents through its environmental assessment. In developing mitigation measures for adverse cumulative effects, it is typically not feasible (or appropriate) for one proponent to manage effects in an area developed by several other proponents. It is the primary responsibility of a given proponent to manage their own projects.

3.5 Determination of significance of project and cumulative effects

The determination of significance involves assessing the predicted residual and cumulative VC effects against established threshold criteria. Where residual and cumulative VC effects exceed threshold criteria, the associated effects are considered significant.

The thresholds are defined in consideration of regulatory requirements, standards, objectives, or guidelines as applicable to individual VCs. Where thresholds are not set by guidelines or regulations, a threshold is developed using the measurable parameters established for the VC, along with professional judgement and previous experience assessing project effects on the VC.

The significance determination focuses on residual and cumulative adverse effects; therefore, if positive or neutral residual or cumulative effects are identified, they are not assessed further.

The assessment also provides a determination of significance for the project's overall residual effects and cumulative effects after the implementation of mitigation measures.

3.6 Prediction confidence

The determination of significance of residual project environmental effects and residual cumulative environmental effects includes a discussion of the level of confidence in the prediction. Confidence in the prediction is based on certainty relative to:

- The quality and quantity of data used for the assessment, data limitations, and understanding of the effect pathways.
- The anticipated effectiveness of the proposed mitigation measures.

3.7 Follow up and monitoring

Manitoba Hydro's environmental protection program (Chapter 16.0) provides the framework for implementation, management, monitoring and follow-up of environmental protection measures.

Environmental protection and management plans will be prepared and implemented under the environmental protection framework to address environmental protection requirements in a responsible manner.

Follow-up and monitoring are intended to verify the accuracy of the environmental assessment, assess the implementation and effectiveness of mitigation and the nature of the residual effects, and to manage adaptively if required.

Follow-up and monitoring will be implemented through inspection, management, and auditing actions.

3.7.1 Inspection

Inspection is the organized and routine examination or evaluation, including observations, measurements and sometimes tests, of a construction project or activity. Inspection results are compared to pre-defined requirements or standards to determine whether an activity conforms to these requirements. Inspection provides an essential function in environmental protection and implementation of mitigation measures. Much of the success in environmental protection will be attributable to how well environmental inspections are conducted during the construction phase of the project.

Manitoba Hydro has established a comprehensive and integrated environmental inspection program to ensure effective implementation of environmental protection measures, compliance with regulatory approvals, and fulfillment of corporate environmental objectives.

Trained inspectors visit work sites and inspect for compliance with license terms and conditions, and adherence to environmental protection measures.

3.7.2 Monitoring

Monitoring refers to the continued observation, measurement, or assessment of environmental conditions at and surrounding a construction project or activity. Two main types of monitoring are typically undertaken for environmental assessments:

1) Environmental monitoring to verify the accuracy of the predictions made and the effectiveness of the mitigation measures implemented.

2) Compliance monitoring to verify whether a practice or procedure meets legislated requirements.

Monitoring determines if environmental effects occur as predicted, residual effects remain within acceptable limits, regulatory limits, criteria, or objectives are not exceeded, and mitigation measures are as effective as predicted. Monitoring also allows for adaptive management where monitoring results show there is a need for additional environmental protection or enhancement.

3.7.3 Management

Management is the control of pre-defined environmental effects, issues, and concerns through the implementation of reasoned and approved courses of action. Management plans will be prepared to address important management issues, regulatory requirements and corporate commitments identified in the environmental assessment report. Such management plans will describe the management actions, roles and responsibilities, evaluation mechanisms, updating requirements and reporting schedules. The following management plans will be prepared for the construction of the project (detailed in Chapter 16.0):

- Access
- Erosion and sediment control
- Rehabilitation and invasive species
- Waste and recycling

Manitoba Hydro will prepare the above plans. They will be adjusted based on continued engagement and regulatory feedback.

3.8 Greenhouse gases and climate change

The *Environment Act* proposal report guidelines (Government of Manitoba 2023) require discussion of climate change implications including a greenhouse gas inventory calculated according to guidelines developed by Environment Canada (Environment Canada 2021) and the United Nations (IPCC 2019). Chapter 13 provides details on climate change and the greenhouse gas inventory for the project.

3.9 Effects of the environment on the project

The assessment includes an evaluation of effects that may occur because of the environment acting on the project. Potential environmental changes and hazards may include wind, severe precipitation, ice storms, flooding, grass and forest fire, or tornados. The influence of such environmental changes and hazards on the project will be predicted and described as well as the measures taken to avoid potential adverse effects. The effects of the environment on the project are presented in Chapter 14.

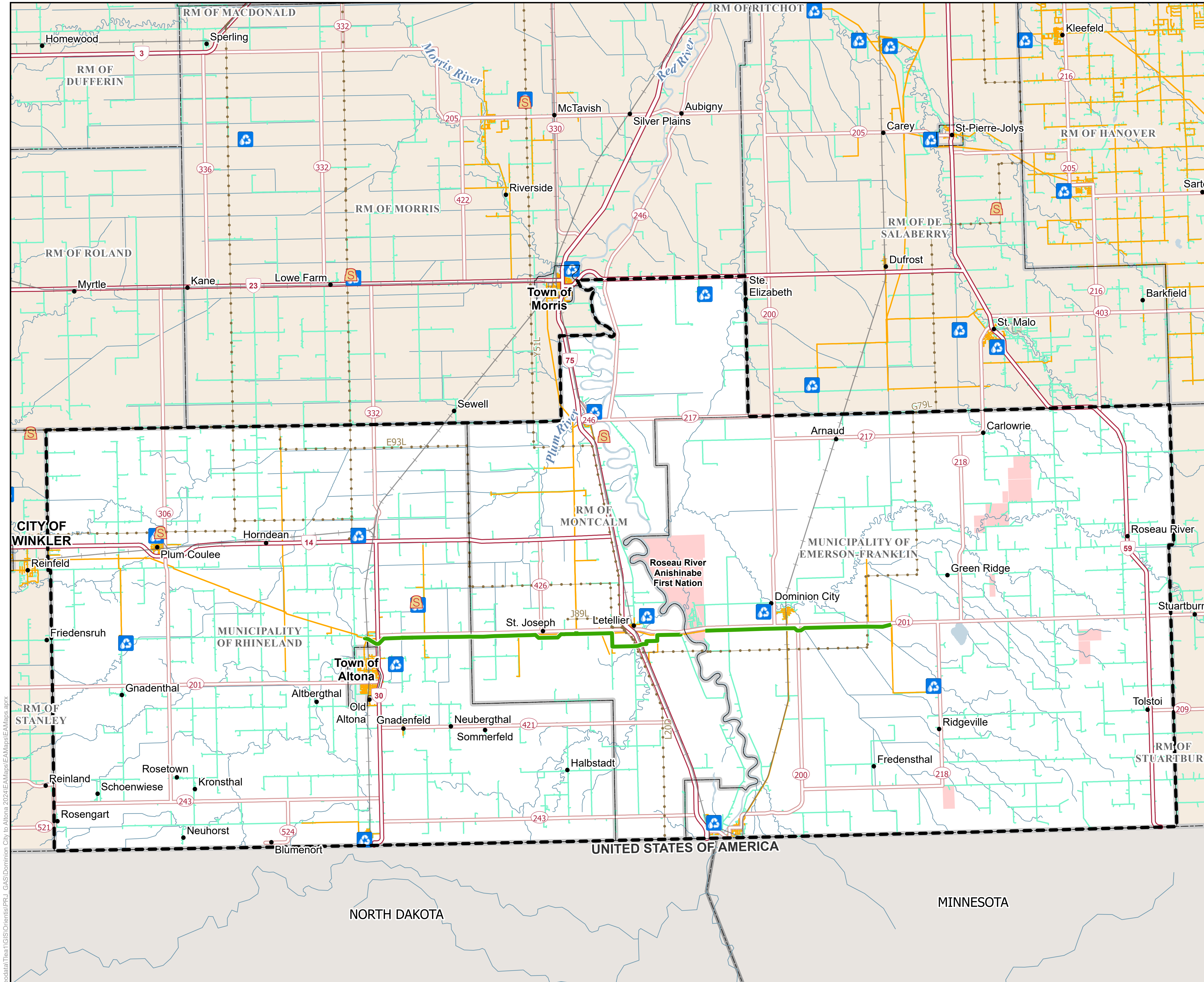
3.10 Accidents and malfunctions

As part of the assessment, potential accidents and malfunctions that might occur in connection with the project were identified and considered. This part of the assessment provides an initial basis for the development of emergency response planning.

For each accident or malfunction considered, a possible scenario relating how the event might occur during the life of the project was developed. Details on the types of accidents and malfunctions considered and the scenarios developed are discussed in Chapter 15.

Potential environmental effects on VCs resulting from accidents and malfunctions are assessed in a similar fashion to project environmental effects, including characterization using the same terms, prescribing mitigation measures, and determining significance of the effect using the same thresholds used for routine project environmental effects.

Map 3-1 Existing infrastructure considered in the cumulative effects assessment



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Existing Infrastructure
- Solid Water Site
- Wastewater Treatment Facility
- Provincial Highway
- Provincial Road
- Railway
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line
- Gas Transmission and Distribution Line
- Electrical Distribution Line

Assessment Area
- Regional Assessment Area

Landbase
- Community
- City/Town
- Rural Municipality
- First Nation Lands
- Provincial Park

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Existing Infrastructure Included in the Cumulative Effects Assessment

Draft: For Discussion Purposes Only

Map 3-1

4.0 Project engagement

This chapter provides an overview of the project engagement process Manitoba Hydro undertook for the Dominion City to Altona gas transmission pipeline and includes sections about the following topics:

- Goal and objectives of engagement
- Approach to engagement
- Engagement methods
- Engagement feedback
- Ongoing engagement

Participation, feedback, and perspectives shared have helped inform this environmental assessment report and have supported us in making project decisions.

4.1 Goal and objectives of engagement

Our goal with engagement is to work directly with First Nations, the Manitoba Métis Federation, Rural Municipalities, landowners, interested parties, and the public to understand and consider concerns and interests, inform project decisions and build positive relationships through the process.

To achieve our engagement goal for the project, our objectives included:

- Engaging early and continuing to engage throughout the project lifecycle.
- Sharing information about the need for the project.
- Working to resolve concerns about the project.
- Supporting participation in activities that will inform the environmental assessment process.
- Sharing how feedback and knowledge influences decision-making

In the context of engaging directly with First Nations and the Manitoba Métis Federation (MMF) we understand meaningful engagement to be the timely process of seeking, discussing, and carefully considering the views of others, in a manner that is cognizant of all parties' cultural values. We also recognize that what is considered meaningful may vary by audience.

Our engagement process is separate from any section 35 Crown consultation process that may be initiated by the Province of Manitoba about the project. We understand that the Crown may rely on the engagement activities and feedback generated through our engagement process to inform their consultation process. We sought to undertake a meaningful engagement process with the understanding that it may support the Province of Manitoba in fulfillment of their duty.

4.2 Approach to engagement

4.2.1 Overview

Through engagement, we worked to provide a variety of opportunities to share information and engage on the project. We recognized that different audiences have different preferences and levels of comfort with how and when they would like to be engaged.

Prior to initiating engagement, we developed an engagement plan that would remain adaptive and responsive to the feedback and preferences we learned from engaged audiences.

Our engagement approach was influenced by several legislative Acts, guidelines, principles, standards, and beneficial practices. Examples include but are not limited to: Manitoba’s Environment Act; Canada's Principles and Guidelines for Public Engagement; Canada’s Principles respecting the Government of Canada’s relationship with Indigenous peoples; Articles of the United Nations Declaration on the Rights of Indigenous Peoples; Manitoba’s Path to Reconciliation Act; as well as the International Association for Public Participation (IAP2)’s core values and public participation spectrum. Manitoba Hydro uses tools and techniques for engagement that are informed and guided by best practices, lessons learned from previous projects and input and feedback from those participating in our engagement processes.

We recognize that what is considered meaningful may vary by engagement audience. In the pursuit of meaningful engagement, we prioritized the following principles:

- **Respectful:** Acknowledge our work has impacts and enter conversations with an open mind, not a predetermined solution. Listen to understand. Be genuine in our intentions to engage and open to adjusting plans based on input. Be sensitive to historical issues and conscious of individual backgrounds, cultures, beliefs, and traditions.
- **Initiative-taking:** Identify engagement audiences and plan for engagement as early as possible at the outset of a decision or project. Start early to allow adequate time for meaningful engagement. Be informed, responsive, and timely in our communications.
- **Transparent:** Be open and honest. Help engaged audiences understand the scope of the decisions and potential impacts of the decisions, so they can decide how involved they want to be. Be upfront about what engaged audiences can and cannot influence, and why.

- **Inclusive:** Make it easy and convenient for those engaged to provide input. Be mindful of barriers to participation and find ways for the hard-to-reach or less represented to be included. Seek out and show value for diverse perspectives.
- **Accountable:** Report back to explain how input was considered and influenced the decision. Provide rationale if input did not influence the outcome. Provide regular updates as the decision is rolled out and a direct point of contact for inquiries. Follow through on commitments made.
- **Trust-Building:** Demonstrate genuine interest in and care for diverse perspectives. Be consistent and give those involved a reason to have confidence in the engagement and decision-making processes, even if they are not in favour of the outcome. Build relationships by creating opportunities for ongoing dialogue once specific engagement activities have ended.
- **Flexibility:** There is no one-size-fits-all approach for engagement. Consider how different audiences want to participate and be adaptable to unique circumstances, expectations, and preferences.
- **Continuous Evaluation:** Evaluate engagement activities and document successes and opportunities for improvement. Share internally with others who could benefit from it.

The following sections outline the engagement methods and activities we undertook to work towards the engagement objectives and achieving meaningful engagement on the Dominion City to Altona gas transmission pipeline.

4.3 Identification of engagement audiences

4.3.1 Project area considerations

Manitoba Hydro operates throughout Manitoba, on the original territories of the Anishinaabe, Cree, Anishininew, Dakota, and Dene peoples and the National Homeland of the Red River Métis. We acknowledge these lands and pay our respects to the ancestors of these territories. We also acknowledge the ancestral lands of the Inuit in northern Manitoba.

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives these nations share throughout the project.

The project area falls within the Rural Municipalities of Montcalm, Emerson-Franklin, and Rhineland. These RM's have relatively small populations (Section 5.8) but are undergoing steady growth. Employment has historically centred around agriculture, with recent expansions into the manufacturing, construction, service, and retail sectors.

We have heard through engagement on this project and past projects that treaty areas and other types of boundaries were imposed by government and do not acknowledge the breadth of the territories used traditionally and contemporarily by different nations nor do they show the overlapping nature of territories.

4.3.2 Identification

To achieve our engagement goal, it was important that our engagement efforts reach audiences that may be affected by or interested in the project. We developed criteria to help guide the identification of audiences that may be affected by or interested in the project.

Recognizing the enduring relationships between Indigenous peoples and the land and the fundamental Aboriginal and Treaty rights that set Indigenous nations and peoples apart from the broader public, we applied two sets of criteria to scope in engagement audiences.

To identify First Nation and Métis audiences we considered:

1. Known historical and/or contemporary use of the project area
2. Anticipated inclusion in Crown consultation
3. Interest in the project based on previous projects

To identify interested parties, we considered:

1. May be affected by the project
2. May have interest in the project

To determine how these criteria applied to potentially affected audiences, we reviewed and considered information from a variety of sources. Manitoba Hydro undertook a preliminary mapping exercise to determine the audiences for the engagement process. We examined the route planning area and land survey data and identified individuals, groups, governments, organizations, and businesses who may be impacted by or interested in the project.

Through this process, we identified three First Nations and Métis audiences to engage with, namely, Peguis First Nation, Roseau River Anishinabe First Nation, and the Manitoba Métis Federation. We also identified directly affected landowners, the

Rural Municipality (RM) of Emerson-Franklin, the RM of Rhineland, the RM of Montcalm, the Town of Altona, local businesses and individuals not directly affected by the project but that may have an interest in the project (i.e., the public).

Table 4-1 lists the audiences we have identified and engaged with under the FNMEP along with and the rationale for inclusion.

Table 4-1: Audiences engaged on the project and the rationale for their inclusion in project engagement

Audience	**Rationale for inclusion (criteria that apply):**
Peguis First Nation	• Known historical and/or contemporary use of the project area • Anticipated interest in the project based on previous projects • Anticipated inclusion in Crown consultation
Roseau River Anishinaabe First Nation	• Known historical and/or contemporary use of the project area • Anticipated interest in the project based on previous projects • Anticipated inclusion in Crown consultation
Manitoba Métis Federation, the recognized government of the Red River Métis	• Known historical and/or contemporary use of the project area • Anticipated interest in the project based on previous projects • Anticipated inclusion in Crown consultation
Directly affected landowners	• May be affected by the project • May have interest in the project
Rural Municipality of Emerson-Franklin	• May be affected by the project • May have interest in the project
RM of Rhineland	• May be affected by the project • May have interest in the project
RM of Montcalm	• May be affected by the project • May have interest in the project
Town of Altona	• May be affected by the project • May have interest in the project

Table 4-1: Audiences engaged on the project and the rationale for their inclusion in project engagement	
Local businesses	• May be affected by the project • May have interest in the project
Public	• May be affected by the project • May have interest in the project

The list of engaged audiences above was developed as a starting point, intended to remain adaptive if we learn of additional audiences that may be affected by or interested in the project.

4.4 Level of engagement

We determine the appropriate level of engagement based on the extent to which the project can be influenced though engagement and the anticipated severity of potential impacts that may result from the project.

Our approach to identifying public engagement audiences is partly guided by the IAP2. Public participation, as defined by IAP2, is "based on the belief that those who are affected by a decision have a right to be involved in the decision-making process". The IAP2 spectrum of public participation (Figure 4-1) helps to define the role and level of influence the public has on the overall decision-making process. This role is also to be communicated to the engagement audiences so that individuals and groups understand how their feedback and input is considered. We consider what opportunities there are for feedback to influence the decision-making process and determine which level of the spectrum is appropriate for which audiences.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 4-1: International Association of Public Participation's public participation spectrum

For this project, we are engaging with interested parties at the consult and involve levels. We engaged Rural Municipalities and directly affected landowners at the involve level of the spectrum by working to consistently understand and consider their concerns and demonstrate how their feedback influenced project decisions. Other audiences were engaged at the consult level of the spectrum. There were opportunities for participants to share feedback on routing options and considerations for the environmental assessment. The consult level of the IAP2 spectrum is not to be confused with Section 35 Crown consultation with rights-bearing nations.

It is our understanding that certain First Nation and Métis audiences have the potential to experience greater impacts, including impacts to constitutionally protected rights and associated activities. Based on this feedback and understanding, we identified two levels of engagement for First Nations and the Manitoba Métis Federation:

1. Deep engagement
2. Share and listen

Deeper engagement included more targeted engagement in a manner preferred by the community such as community specific open houses, the opportunity for funding to gather Indigenous Knowledge from the community in the form of interviews or an Indigenous Knowledge study, and other items or activities to reasonably support meaningful participation in the engagement process.

For this project, we are engaging with Peguis First Nation, Roseau River Anishinaabe First Nation, and the Manitoba Métis Federation at the deep engagement level, which included the opportunity to participate in a group engagement circle to share feedback about the preferred route and project.

This tiered approach to engagement aligns with the approach used by Canada and Manitoba in their section 35 Crown consultation processes. Canada and Manitoba tier their consultation so the depth of consultation is proportionate to the strength of claim a nation may have to the area and the seriousness of potential adverse effect to that claim.

As with the list of engaged audiences, the level of engagement was intended to remain adaptive. We anticipated that the level of engagement for a particular audience may change based on what we learn about the magnitude of potential project effects they may experience and based on engagement preferences.

4.5 Role of engagement in decision making

There were two main ways that engagement feedback had the ability to influence project decision-making:

1. Participant feedback helped inform the environmental assessment and routing adjustments.
2. Participant feedback helped identify mitigation measures for the project.

4.6 Communication methods

Communication methods for the project involved the following:

- Letters and emails
- Information sheets
- Project webpage, information line, and email address
- Poster advertisement for open house

Copies of project engagement materials can be found in Appendix A.

4.7 Engagement methods

Project engagement included pre-engagement activities, and one round of engagement to inform the environmental assessment and receive feedback on the route. We offered several different methods for participants to ask questions and provide feedback on the project, including:

- Interactive mapping & feedback portal
- 1 in-person public open house
- 1 in-person workshop
- 2 virtual information sessions
- Meetings with specific public, First Nation, and Métis audiences
- Project email address and hotline phone number

4.7.1 Pre-engagement

Pre-engagement began with Peguis First Nation, Roseau River Anishinabe First Nation, the Manitoba Métis Federation, Rural Municipality of Emerson-Franklin, Rural Municipality of Rhineland, Rural Municipality of Montcalm, and the Town of Altona on July 3, 2024, reaching out by email and letters.

The purpose of pre-engagement was to inform audiences about the upcoming project and begin discussions about engagement needs, preferences, and interest in participation. Pre-engagement notifications included a project overview map asking for initial feedback on the preferred route.

We contacted the Rural Municipalities of Emerson-Franklin, Rhineland, Montcalm, and the Town of Altona to solicit feedback on any proposed developments along the preferred route on October 22, 2024. The Town of Altona responded noting some approved developments that could see construction before the end of 2026, including a new business park and residential developments.

Table 4-2 includes the meeting held as part of pre-engagement for the project.

Table 4-2: Pre-engagement meetings

Date	Community	Location
July 15, 2024	Manitoba Métis Federation	Virtual
July 16, 2024	Roseau River Anishinabe First Nation	In-person

July 25, 2024	Peguis First Nation	In-person
July 16, 2024	Town of Altona	In-person

4.7.2 Engagement

We announced the start of engagement on July 3, 2024, by notifying First Nations, the Manitoba Métis Federation, landowners, RMs and interested parties via email, and launching the project webpage. We reached out to landowners along the preferred route via mailed letters to inform them about the project.

There was one round of engagement for this project since most of the preferred route follows the alignment of an existing gas pipeline, and no alternative route segments were presented. During engagement, we asked for feedback to understand if there were concerns with the preferred route, if there were any proposed adjustments or mitigations, as well as general interests and concerns in the project area.

We gave opportunity to provide feedback through email, phone calls, open houses, an engagement circle, and an interactive map and feedback portal.

We held the following information sessions as part of engagement:

Table 4-3: Information sessions

Date	Number of participants	Location
August 14, 2024	0	Virtual
August 15, 2024	0	Virtual
August 22, 2024	15	Open house
October 16, 2024	15	Community open house

4.8 Engagement feedback

The following sections summarize key themes and concerns we heard throughout project engagement. Many of these themes are interconnected, and many of the feedback topics discussed may fit in more than one of the key themes identified below.

4.8.1 Commercial agriculture

Participants shared concerns about the presence of the transmission pipeline negatively affecting existing or future tile drainage. They also shared concerns with depth of cover not being adequate as there are existing pipelines in the areas that are now exposed in-field. Concerns were also raised about the potential mixing of topsoil and subsoil during construction. They also expressed concerns about construction impacting natural drainage of the land. Concerns were raised about crop damage during construction. Concerns were also raised about issues with yield after an unrelated project, and concerns there will also be decreased yield after this project. We heard concerns about the potential for disruption to cattle operations, specifically breeding and calving seasons. Concerns were also raised about biosecurity.

4.8.2 Community well-being

Participants shared concerns that they have been told in the past they could not tap off the existing line because there was not enough available gas. A participant shared concerns that pipelines are typically capped off and left in place when decommissioned.

4.8.3 Economic activities

Participants shared concerns about the lack of community benefit associated with this project. They also expressed interest in employment opportunities that may be available on the project. We also heard concerns about how the presence of the transmission pipeline might affect future development opportunities.

4.8.4 GHG and climate

Participants shared concerns about potential gas leaks and contributing to greenhouse gas emissions.

4.8.5 Heritage sites/cemeteries

Participants shared interest in conducting a heritage study for the project. A participant shared the locations of unmarked cemeteries. Participants shared there is higher heritage potential north of the project area and along the Red River.

4.8.6 Human health

Participants shared concerns about the potential of leaks or explosions of the pipeline. A participant asked if Manitoba Hydro could ensure they would not be injured if the pipeline were to explode. A participant asked who would be responsible for compensation if the pipeline did explode.

4.8.7 Important sites and harvesting

Participants shared concerns about the presence of equipment during pipeline construction affecting foraging and hunting activities.

4.8.8 Land and resource use

Some participants expressed concern that this project would prevent them from installing tile drainage in future.

4.8.9 Property

A participant shared a concern that they were not compensated for an above-ground gas structure built on their property. A participant shared they were not compensated for a previous pipeline installation.

Routing Participants asked us to consider two route alternative options, which would both remain within the same quarter section. Manitoba Hydro investigated the feasibility of these options and is considering them further.

The following sections include brief profiles about each engaged First Nation and the Manitoba Métis Federation and summaries of the feedback they have shared during project engagement to date.

4.8.10 Peguis First Nation

We have had correspondence, discussions, and meetings with representatives from Peguis First Nation throughout the engagement process. We engaged with Peguis First Nation mainly via their Consultation and Special Projects Office, as well as with representatives from the Treaty Land Entitlement office. We understood from engagement that Peguis First Nation is interested in aiding the project archaeologist by monitoring fieldwork, taking notes, and supporting the Heritage Resource Impact Assessment fieldwork and report writing process for this project. Through feedback provided by Peguis First Nation during engagement, we understand Peguis First Nation’s key feedback about the project to include:

- Concerns that areas north of the project location and closer to a reservoir hold higher potential for the presence of heritage resources.
- The preference to have a ceremony before heritage work begins on the project

4.8.11 Roseau River Anishinabe First Nation

We have had correspondence, discussions, and meetings with representatives from Roseau River Anishinabe First Nation throughout the engagement process. From engagement, we understood interest in potential job opportunities in the community and are open to continue discussions on how to move forward. Our understanding of project feedback from Roseau River Anishinabe First Nation includes:

- Concerns about safety of the community and questions around safety measures in place with new pipelines.
- Interest in business and job opportunities from the project.
- Interest in tying into gas to supply the community or businesses.
- Concerns with existing pipeline easement and Roseau River Anishinabe First Nation's future plans to develop south of PR201

4.8.12 Manitoba Métis Federation

We have had correspondence, discussions, and meetings with the Manitoba Métis Federation throughout the engagement process. The Manitoba Métis Federation has expressed a desire to conduct their own desktop heritage study from a Métis perspective in the project area. To date, we have not received a proposal from the Manitoba Métis Federation to support a study and Red River Métis citizen engagement. We remain open to continuing to discuss development of a work plan with the Manitoba Métis Federation. Our understanding of feedback that the Manitoba Métis Federation has communicated about the project to date includes:

- Concerns that heritage work is being competed without a Métis specific lens incorporated, noting that the Manitoba Métis Federation are working on a Métis specific heritage protocol, which will be shared with proponents when complete
- Interest in potential interactions with practicing rights-based activities
- Interest in reviewing draft environmental protection plan
- Interest in identifying procurement values on employment for both Red River Métis and First Nations

4.9 Ongoing engagement

After filing this report with Manitoba Environment and Climate Change, we will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the RMs, and interested parties and provide a link to this report.

Following Manitoba Environment and Climate Change's decision regarding the Dominion City to Altona gas transmission pipeline, we will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the RMs and interested parties of the outcome of the decision. If we are granted a licence, we will keep our engagement audiences informed of construction schedules and activities.

We also plan to engage in further discussions about culture and heritage monitoring and other project monitoring opportunities.

Manitoba Hydro will also reach out to FNMEP participants to discuss interest in holding a ceremony or ceremonies at project milestones.

We will remain open and responsive to any questions or concerns that may arise from engaged audiences through the project's construction and operation. The project webpage will continue to be updated as the project progresses through the regulatory review process and project construction, and the toll-free phone number (1-877-343-1631) and project engagement email address (projects@hydro.mb.ca) will remain available. Any feedback about the engagement process will help support the continual improvement of Manitoba Hydro’s engagement efforts on future projects.

5.0 Environmental setting

Before assessing project effects, it is necessary to understand the baseline conditions of the environment in which the project is proposed to take place.

This chapter provides an overview of existing environmental conditions that are broadly relevant for the assessment and/or that relate to more than one VC, including the following:

- Historic and cultural setting
- Climate
- Ecological land classification
- Geology, soils, and terrain
- Groundwater and groundwater wells
- Aquatic environment
- Communities and population
- Land and resource use

The existing conditions were established based on data collected during desktop analysis, literature reviews, field reconnaissance, and project engagement.

Existing conditions directly relevant to a specific VC, including their collection methods, are described in each VC assessment chapter.

5.1 Historic and cultural setting

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives these nations share throughout the project.

The project region has changed substantially since colonialism. Past and ongoing projects and activities including the development of electrical and gas transmission and distribution lines, roads, settlements, and agricultural development have drastically altered the landscape and caused disruptions to the ways in which rights-based activities, practiced by First Nations peoples and Red River Métis citizens, occur in the area.

Although the project area is now predominantly composed of private land and used mainly for agriculture as well as residential, commercial, recreational, and other uses, Manitoba Hydro acknowledges that the land in the area is all Indigenous traditional land. Manitoba Hydro understands that First Nations people and Red River Métis citizens have enduring connections to these lands and may continue to visit the area to practice rights-based activities today, both on private land with landowner permission and on the small amount of Crown land that remains.

Treaty Land Entitlements (TLE) agreements, negotiated between certain First Nations and the federal government, aim to fulfill outstanding land-related treaty obligations. Engaged First Nations with active TLE agreements and outstanding TLE entitlements include Peguis First Nation and Roseau River Anishinabe First Nation (Indigenous Services Canada 2017). No part of the PDA (*i.e.,* proposed right-of-way) crosses reserve lands, a TLE selection, or Addition to Reserve selection.

The PDA is adjacent to Roseau River Anishinabe First Nation's (RRAFN) Reserve No.2 at Ginew, Manitoba. The project will tie into an existing pipeline segment installed in 2022/23. The pipeline runs within the right-of-way of Provincial Road 201 travelling through RRAFN's reserve, and crosses beneath the Red River.

During project engagement, Manitoba Hydro heard perspectives about past and ongoing harms, trauma, and alterations to traditional landscapes resulting from Manitoba Hydro projects and operations, including specific environmental, social, and cultural concerns related to the development of pipelines.

Figure 5-1 provides a non-exhaustive summary of major events or periods of change to the project area, which Manitoba Hydro understands have ultimately affected the landscape and the relationships First Nations peoples and Red River Métis citizens have with land in the project area.

While many of the events and activities described in Figure 5-1 have been immensely harmful and impactful to First Nations peoples, Red River Métis citizens, and their traditional lands, it is important to note that the land upon which the project is proposed is not singularly defined by the inflicted damage. The resilience of First Nations peoples the Red River Métis in the face of change persists and continues to grow with a renewal and resurgence of Indigenous identities, self-determination, and sovereignty.

Globally and within Canada there are increasing efforts to protect Indigenous rights (UNDRIP, calls for reconciliation nationally, and renewed interest in protecting language, culture, and constitutionally protected rights).

Figure 5-1: Timeline of events contributing to changes to the landscape

Figure 5-1: Timeline of events contributing to changes to the landscape and to the relationships that First Nations peoples and Métis citizens have with land in the project area

15thACenturyA

The Doctrine of Discovery is a historical legal concept originating from a series of Papal Bulls (formal statements from the Pope) during the 15th and 16th centuries. It provided direction for European explorers and colonizers to claim lands they "discovered" that were not inhabited by Christians, despite Indigenous peoples having lived on these lands since time immemorial. The principles of this doctrine made its way into Canadian law in the 1880s through various legal instruments, including royal charters and proclamations. The Doctrine of Discovery supported colonization and the dispossession of sovereign Indigenous nations to British and Canadian colonial governments.

Past and ongoing colonial and assimilative strategies that have served to disconnect, relocate, and displace First Nation and Métis people from the land can be traced back to this early doctrine

Pope Francis during a visit to Canada where the Vatican apologized for the Church's role in the residential school system, Maskwacis, Alberta, July 2022

19thACentury:AEradicationAofAtheAbuffaloA

Prior to settlement, the area was known for its rich buffalo resources. A number of trails developed by Indigenous peoples criss-crossed the project area, and this network was later used by European explorers and traders.

Political views at the time encouraged hunting for safer train passage and it was understood that if the buffalo were decimated, Indigenous peoples on the prairies would be more "submissive without their main source of subsistence." Eradication of the buffalo in the 19th century led to starvation and loss of culture, ultimately having "a profound influence on the lives of Indigenous peoples" (Phillips 2018). First Nations and Métis peoples engaged on other Manitoba Hydro projects in southern Manitoba have shared that buffalo were an important species within their respective traditional territories.

Men standing with pile of buffalo skulls, Michigan Carbon Works, Rougeville MI, 1892.Source: Burton Historical Collection, Detroit Public Library.

17AhA idA19AhA iA ThA fA dA

Beginning in the 1600s and extending for 250 years, the fur trade brought significant changes to the way of life of many First Nation peoples and communities as people adapted to new tools and a more commercially driven way of life (Glover 2020). Canada 1996).

Locations of North West Company posts in what is now southern Manitoba. Roseau River or "Reed River" was an important canoe route and is labeled "Indian Road from Lake of the Woods." It was used by the Sioux, Ojibwa, and by fur traders as an alternate route to the lower Red River valley. (1816. Source: PAM #: H3 614.2 gmd 1909 Sheet 1. HRB Map #0)

The fur trade era marked the earliest contact between Europeans and First Nations peoples in the project region. With the fur trade came small-pox, measles, influenza and other communicable diseases, trade goods, a money-based economy, and other factors that were disruptive to the culture and economies of the region's Indigenous peoples (Heagerty 1928). The intermingling of cultures eventually led to the emergence of a culturally distinct, diverse group of Métis people who later played a large role in the fur trade (Kloos 2016). A number of trails developed by Indigenous peoples criss-crossed the project area, and this network was later used by European explorers and traders. The major trails in the area were a small section of the cart trail from Fort Garry to Pembina along the west bank of the Red River near Letellier and the Crow Wing Trail along the east side of the Red River.

Using a route shown to them by local Indigenous peoples, early fur traders frequently travelled along the Roseau River, also known as the Reed River, to travel between the Red River and Fort St. Charles on the Lake of the Woods (Burpee 1927). French explorers likely used this river to continue their explorations in the West. In 1869, the Hudson's Bay Company founded a trading post along the Rivière aux Roseaux.

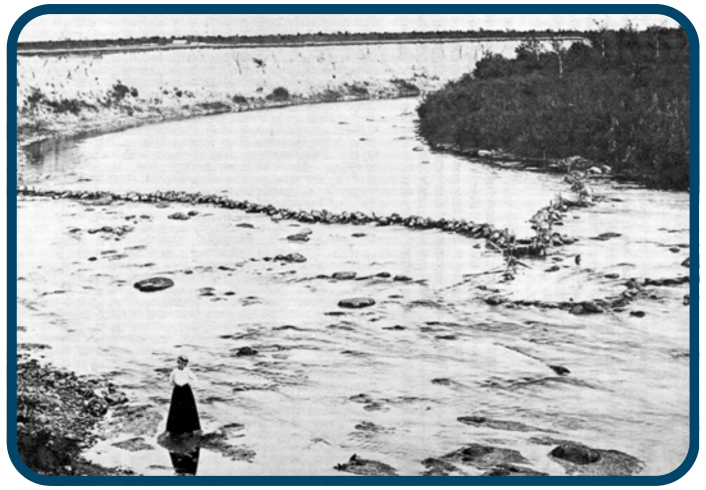
1872:ATheADominionALandsAActA

In 1872, the *Dominion Lands Act* was signed, which outlined specific policies to encourage homestead settlement throughout the west. This Act allocated "millions of prairie acres for homesteads, railway construction, and colonization companies" (Brglez 2021). As a result, settlers moved into the region. Canada intended to use natural resources and lands in the west to promote Western settlement and railway construction. The Act outlined a standard measure for surveying and subdividing land. The Dominion Land Survey divided the prairie lands into square townships. Each township comprised of 36 sections, where each section contained 640 acres (260 ha), which were further broken down into 160 acre (65 ha) quarter-sections. The Dominion Lands Act led the way for the development of infrastructure along a square grid system, including roads, drains, towns and sometimes, transmission lines. A different survey system was already present along the Red and Assiniboine Rivers, where French Métis and French settlers utilized the River Lot System, a historical subdivision technique used to allocate long narrow lots fronting the rivers. While many of the river lots across the prairies were eliminated to make way for development, several remain in the project area. In those areas, the township grid begins where the river lots end (Manitoba Historical Society 2008).

LateA19thACentury:ASettlementAalongAtheARivièreAauxARoseauxA

The Rivière aux Roseaux served as a major travel route for Indigenous peoples, especially the Sioux who called the river the "warriors' route" and travelled the river during their war expeditions or their hunting and fishing trips. Many French explorers also travelled along the river and numerous trails, which aided in their expansion westward. An influx of European settlers to the project region represents a significant leap in effects pathways that decreased Indigenous access to lands and resources available for harvesting and cultural activities.

The area was settled by a diversity of people. Altona was settled by Russian Mennonites in 1880, St Joseph and Letellier were settled by the Quebecois French in 1877 (although Métis may have settled here earlier), and Dominion City was settled by English settlers from Ontario in 1874.



Roseau Rapids Remains of ancient native fish trap at Roseau Rapids photographed in 1900. ((Source: Dominion City - Facts, Fiction and Hyperbole, by James M. Wadell, 1970.)

1870s:ATheARailwayAandAResourceA ExtractionA

The town of Dominion City was established in 1874 when the first settlers began to arrive from Ontario. The townsite had been known as Roseau Crossing because of an excellent ford over the Roseau River. That same year the Canadian Pacific Railway started construction on the Pembina Branch rail line. The Pembina Branch was a 67 mile stretch of track that ran north, along the east side of the Red River from St. Vincent, Minnesota to St. Boniface. The last spike in the railway was driven in at Dominion City in 1878. By 1879, the CPR built spur tracks from Roseau Crossing to what is known as Greenridge to mine gravel. The spur track on the south side of town had a camp of a thousand men to load the cars carrying gravel every half hour. The track operated until 1882 when it was pulled up, as the track was no longer needed since gravel was able to be mined elsewhere (Waddell 1970).

19thAcenturyAtoA1996:AResidentialAschoolAsystemA

Residential schools were created by the federal government in the 1800s under the Indian Act as a tool of assimilation. Indigenous children were forcefully sent to institutions, often far from their home communities, where they would "have their hair cut, their language killed, their relationships with family and community severed, their sense of belonging destroyed, and their physical, emotional, mental and spiritual health compromised" (Assembly of First Nations, 2021b). Many of these students never returned. Residential schools were characterized by the Truth and Reconciliation Commission as a cultural genocide and "a systematic, government- sponsored attempt to destroy Aboriginal cultures and languages and to assimilate Aboriginal peoples so that they no longer existed as distinct peoples," (Truth and Reconciliation Commission of Canada 2015).

Among the 14 residential schools across Manitoba, none were located near Roseau River Anishinabe First Nation. As a result, children from Roseau River were sent away to attend residential schools in Winnipeg, Portage La Prairie, Birtle, Brandon, Dauphin, and Sagkeeng (Ross 2021).

Postcard view of Brandon Indian Residential School (circa 1908) Source: Rob McInnes, BR0053

1871A- SigningAofATreatyAOneA

The signing of the numbered treaties is when the formal relationship between the Crown and Indigenous nations began, establishing a nation-to-nation relationship. Even though they are formal agreements, the parties to a treaty had different understanding of the meaning of treaties and different intentions when the treaties were negotiated. The Government of Canada has generally adopted a narrow view of treaty terms, originally considering the numbered treaties to be primarily a land conveyance agreement, intended to extinguish Indigenous title and open the region for settlement and development. The First Nation signatories to the numbered treaties, on the other hand, understood the treaties in the context of Indigenous peace and friendship treaties, which had long been used to mediate disputes and regulate external relations. From this perspective, the numbered treaties were an acknowledgement that First Nations peoples would share the land with the newcomers, and in return, would receive material support and assistance, a recognition of their primacy of occupation of the land, and an assurance that Indigenous economies and freedom of movement would not be affected (Daugherty 1983).

The interpretation and implementation of the numbered treaties remain a contested issue, but recent court decisions have supported the view that the honour of the Crown demands a liberal interpretation of the treaties.

The project area is on Treaty One lands. Treaty One was signed on August 3, 1871 by the federal government and the Anishinabek and Swampy Cree of southern Manitoba. Treaty One was the first of the numbered treaties and covers much of what is presently known as southern Manitoba. Treaty One established a formal relationship between the Crown and Indigenous peoples, and the conditions of Treaty One have had constant legal and socioeconomic effects on the signatory First Nations and Métis peoples.

6AtoApresent:ATheAIndianAActA

The Indian Act, first introduced in 1876, is a Canadian federal law that governs in matters pertaining to Indian status, bands, and Indian reserves. A new version of the Act was passed in 1951, and since then has been amended several times, with changes mainly focusing on the removal of discriminatory sections. The Indian Act still governs most First Nations today, and is an evolving, paradoxical document that has enabled trauma, human rights violations, and social and cultural disruption for generations of Indigenous people. *The Indian Act* has also enabled the government to determine the land base for nations in the form of reserves and defines who qualifies as 'Indian' in the form of Indian status. The Act outlawed traditional governance systems in favour of Band Chief and Councils with governing authority limited to Indian Reserve land. The Act also restricted Indigenous people from voting in federal elections until 1960, continued to take up and put laws on Indigenous land, and has the ability to enfranchise those First Nations (especially women) who the government deems to no longer have "status" (Assembly of First Nations, 2021a).

1930:ANaturalAResourcesATransferAActA

In 1930, the Natural Resources Transfer Act was passed by the federal government, transferring the jurisdiction of natural resources to the Province of Manitoba (Elias et al. 1997; Hall 2006). This provided provincial authority to exploit natural resources within the provincial boundary, including increased management over trapping, fishing, and hunting (Elias et al. 1997).

Sturgeon fishing, 1909. Source: Library and Archives Canada/PA-060742

1982:ATheAConstitutionAActA

The Constitution Act, 1982 enshrined the Charter of Rights and Freedoms into Canada's Constitution. Section 35 of the Act protects Aboriginal and Treaty rights and requires the Crown to act honourably in all its dealings with Indigenous peoples. Canadian courts, including the Supreme Court of Canada have made judgments clarifying the meaning of Section 35. One element of these judgments is the recognition that the Crown has a legal duty to consult with Aboriginal peoples about any decision or action that might adversely affect the exercise of an Aboriginal or Treaty righ b f ki h i ki that decision.

The duty to consult is generally triggered in relation to decisions or actions that have the potential to adversely affect lands and resources used to exercise Aboriginal or Treaty rights such as hunting, fishing and trapping for food.

1988:ATheAEnvironmentAActA

With the enactment of The Manitoba Environment Act in 1988, environmental assessment became a legislated requirement for certain types of development in Manitoba. The consideration of cumulative effects is central to environmental assessment as a tool for sustainability, particularly in areas where multiple large-scale projects operate or are planned. It is acknowledged as a best practice, but cumulative effects assessment is methodologically complex and there are challenges to its effective implementation. Manitoba's *Environment Act* and regulations do not include a requirement to include cumulative effects assessment at either the development or strategic level; however, it is not uncommon for proponents to address cumulative effects in their applications, such as this one.

1885:AMétisAScripAinAManitobaA

Beginning in 1885, as part of the Manitoba Act, the federal government offered Métis families 'scrip' in exchange for their land title (Robinson 2019). Scrip could be issued as land scrip (typically a quarter section of land), or it could also be issued as money scrip, valued at $160 or $240. Métis people were moved to create space for European settlers, and the federal government placed restrictions on which lands Métis people could homestead, with the vision of reaching Canada's 'manifest destiny', as noted in a letter from Sir John A. MacDonald (Augier 2021).

Métis scrip for purchase of dominion lands from 1905. Source: Library and Archives Canada / The Canadian Encyclopedia (https://www.thecanadianencyclopedia.ca/en/article/dominion-lands-policy)

1900sAtoApresent:AEnergyAdevelopmentA

Hydroelectricity generation in Manitoba began in the early 1900s with t construction of generating stations along the Winnipeg River. These ear generating stations were primarily to serve the growing City of Winnipe and industrial and agricultural operations in southern Manitoba. Due to increasing demands for electric power in Manitoba from the mid-1950s, interest grew in the hydroelectric generating capacity of the Nelson and Churchill river systems, with the first major project, the Kelsey Generati Station, completed in 1961. Manitoba Hydro now operates five generating stations on the Lower Nelson River and utilizes a High Volta Direct Current Transmission System to move power from northern Manitoba to the rest of the province. This system includes the Radisson Henday, Keewatinohk, Riel and Dorsey converter stations and Bipole transmission lines.

Construction of Limestone Generating Station,1987. Source: Government of Manitoba and Manitoba Hydro 2015

Natural gas in Manitoba is distributed primarily by Centra Gas Manitoba, a subsidiary wholly owned by Manitoba Hydro. Natural gas has been utilized in the province since the 1870's. As technology developed, natural gas pipelines have become an efficient way of improving access to gas for commercial and residential purposes. As energy demands increased, two natural gas pipelines were bult in the area in 1962 and 1989. These pipelines run from Dominion City to Altona and connect to the larger TC Energy system. While the pipeline runs through Roseau River Anishinabe First Nation's reservation, the community does not presently have access to natural gas services.

While energy development has greatly contributed to urban and rural development and advancements, it has also caused collective trauma and profound changes to ways of life for Indigenous peoples across Manitoba.

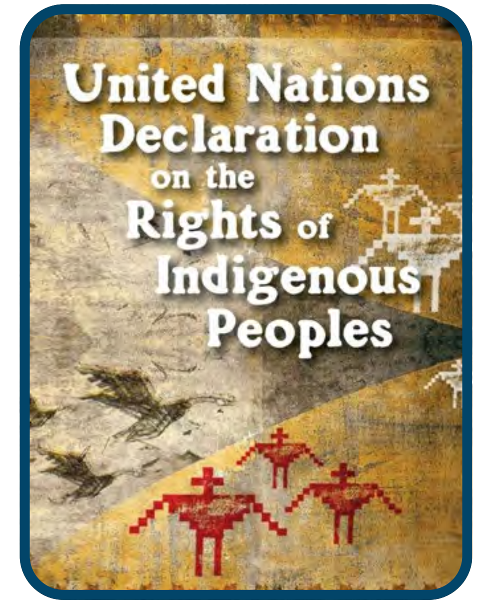
2016: The Path to Reconciliation Act

In 2016, the Government of Manitoba passed *The Path to Reconciliation Act,* which sets out the government's commitment to advancing reconciliation and is informed by, but not limited to the Truth and Reconciliation Commission Calls to Action. The Act recognizes that reconciliation of Indigenous and non-Indigenous peoples is to be guided by the principles of respect, engagement, understanding, and action.

The National Centre for Truth and Reconciliation (NCTR) held its grand opening in November, 2015. Photo by Carolyne Kroeker.

2021: UNDRIP Act

On June 21, 2021, the *United Nations Declaration on the Rights of Indigenous Peoples Act* received Royal Assent and came into force. This Act provides a roadmap for the Government of Canada and Indigenous peoples to work together to implement the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) based on lasting reconciliation, healing, and cooperative relations. Through 24 preambular provisions and 46 articles, UNDRIP affirms and sets out a broad range of collective and individual rights that constitute the minimum standards to protect the rights of Indigenous peoples and to contribute to their survival, dignity and well-being. Article 32 (2) of UNDRIP provides that *"states shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources,"* (United Nations General Assembly, 2007).



2023-2024: First modern Métis treaty

In 2023, members of the MMF voted in favor of developing a modern treaty with the federal government to affirm the MMF-Canada agreement.

On November 30, 2024 the first modern Métis treaty was signed between the MMF and the federal government. The agreement commits Canada to working with the MMF on a government-to-government basis, affirming the MMF's inherent rights to self-government and self- determination.

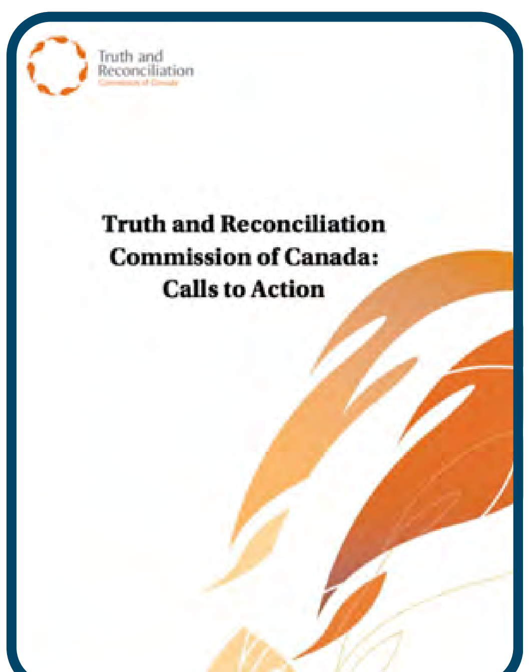
Manitoba Métis Federation President David Chartrand speaks to gathered attendees at the signing of the treaty in November, 2024. Photo by Brooke Jones for the Winnipeg Free Press.

2007 – 2015: Truth and Reconciliation Commission

Between 2007 and 2015, the Truth and Reconciliation Commission provided those directly or indirectly affected by the legacy of the Indian Residential School system with an opportunity to share their stories and experiences.

The Truth and Reconciliation Commission spent 6 years travelling to all parts of Canada and heard from more than 6,500 witnesses.

The Truth and Reconciliation Commission developed a guiding set of ten principles for truth and reconciliation and made 94 Calls to Action to advance the process of reconciliation in Canada.



2021: Unmarked graves

Since the Tk'emlups te Secwepemc announced in May of 2021 that the remains of as many as 215 children were found using ground-penetrating radar around the former Kamloops Indian Residential School in British Columbia, heritage concerns heard through engagement on Manitoba Hydro projects has increased dramatically. Manitoba Hydro is learning new ways to better include First Nation and Red River Métis input in heritage processes and developing understanding of heritage concerns and values, including at former residential schools sites and surrounding areas.

2021: MMF-Canada Agreement

On July 6, 2021 the Manitoba Métis Federation (MMF) signed the Manitoba Métis Self-Government Recognition and Implementation Agreement with Canada at Upper Fort Garry. The agreement provided immediate recognition of the MMF as the democratically elected Métis Government for the Red River Métis. Prior to this agreement, Métis citizens had been displaced across their homelands since the passing of the Manitoba Act established the Province of Manitoba in 1870.

Even though the physical landscape has changed over time, First Nations people and Red River Métis citizens have enduring relationships with the land and may continue to contemporary practice traditional and cultural activities in the area.

Chapter 6.0 (Important sites) includes a more detailed discussion about of the cultural history and importance of the project area, informed in part by conversations with engaged First Nations and the Manitoba Métis Federation.

5.2 Climate

The project is in the Grassland Transition Ecoclimatic Region in southern Manitoba. In the ecodistricts traversed by the project, historical climate is generally characterized by short, warm summers and long, cold winters with mean annual temperatures ranging from 2.4°C to 3.1°C and mean annual precipitation ranging from 515 to 540 mm of which one-quarter or less falls as snow (Smith et al. 1998).

To develop an understanding of historic climate normals and climate trends in the project area, data was reviewed from twelve stations including:

- Seven meteorological stations operated by Environment and Climate Change Canada (ECCC) within approximately 35 km of the projects proposed location
- Three complementary meteorological stations operated by Manitoba Agriculture
- Two hydrometric stations operated by Water Survey of Canada

Table 5-1 lists the stations reviewed and indicates which locations have reported climate normals and the availability of Adjusted and Homogenized Canadian Climate Data (AHCCD).

Table 5-1: Meteorological and hydrometric stations reviewed

Station	Operated by	Normals availability	AHCCD (Y/N)
Altona	ECCC	1981-2010: Temperature (A Code), Precipitation (C Code)	Y
Altona CFAM	ECCC	-	N
Altona South	ECCC	-	N
Emerson AUT	ECCC		Y

Emerson Auto	ECCC	1991-2020: Temperature (C Code), Precipitation (C Code), Wind (C Code)	Y
Morris 2	ECCC	1981-2010: Precipitation (C Code)	Y
Plum Coulee	ECCC	1981-2010: Temperature (C Code), Precipitation (C Code)	N
Altona	Manitoba Agriculture	-	-
Dominion City	Manitoba Agriculture	-	-
Letellier	Manitoba Agriculture	-	-
Red River at Emerson	Water Survey of Canada	-	-
Roseau River near Dominion City	Water Survey of Canada	-	--

The Red River at Emerson station represents hydrologic conditions relevant to the assessment, given the project's proximity to the Red River and in considering the project connects to a pipeline installed beneath the Red River on both sides of the river crossing.

The Roseau River near Dominion City station represents a smaller watershed in the region that drains into the Red River downstream from the project crossing, however, it is included as it is a natural (non-regulated) river that may provide meaningful information on more regional hydrologic conditions.

Although other gauges are present in the project area, these stations may have limited datasets (e.g., only water levels) or may not contain records with sufficient data for calculation of normals and trends.

5.2.1 Climate normals

Among the ECCC stations reviewed, the following climate normals are available (*i.e.,* reported):

- Altona

- Plum Coulee
- Emerson
- Morris

To supplement the available ECCC climate normal, climate data was also obtained from a gridded reanalysis dataset known as the European Reanalysis version 5 (ERA5; Hersbach et al., 2023) and normals were calculated at the grid nearest to Altona for the 1981-2020 period (40 years), which aligns with methods used to generate future projections.

Monthly climate normals for temperature, precipitation, and wind speed are illustrated in Figure 5-2. Note that period-of-record extremes at each ECCC station, which may extend beyond the 1981- 2010 (for Altona or Plum Coulee) period, are also shown.

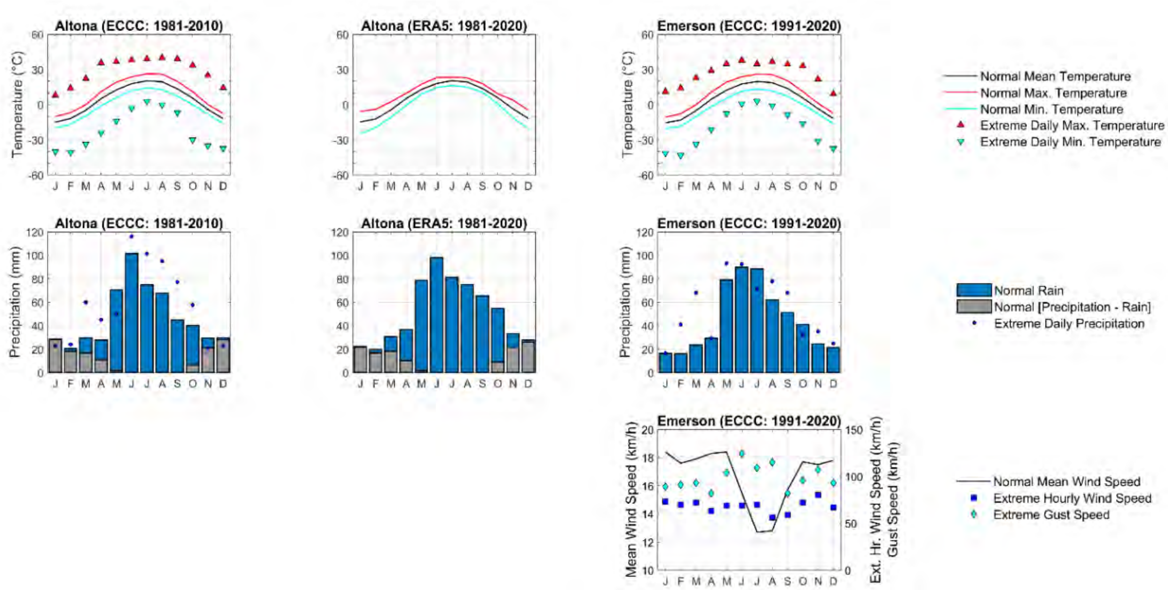


Figure 5-2: Monthly climate normals (Hersbach et al. 2023).

As shown in Figure 5-2, conditions and seasonal patterns are similar among the two datasets (ECCC and ERA5).

Monthly streamflow averages for the Water Survey of Canada stations were calculated for the 1981-2020 period to represent hydrological normals that complement climate normals and align with future projections.

The maximum streamflow shown for each month was based on the maximum of the mean daily streamflow for the entire period-of-record for the gauge.

Figure 5-3 shows monthly streamflow averages for the Red River at Emerson and Roseau River near Dominion City stations.

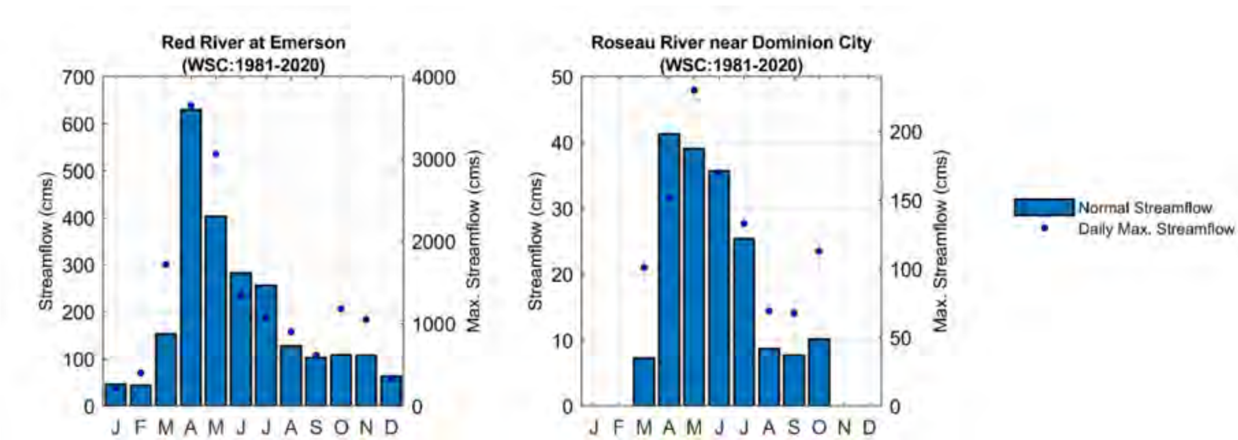


Figure 5-3: Monthly streamflow normal for the Red River at Emerson and Roseau River near Dominion City

Both sites exhibit a snowmelt dominated hydrologic regime, with April showing the highest monthly average flows with extension of higher flows into May and June for the Roseau gauge.

5.2.2 Trends

Adjusted and Homogenized Canadian Climate Data (AHCCD) from ECCC are developed specifically for purposes of understanding long-term trends in climate (Vincent et al., 2020; Mekis and Vincent, 2011; Wan et al., 2010). AHCCD includes:

- Minimum temperature (Tmin; mean of daily minimum temperature)
- Mean temperature (Tmean; mean of daily mean temperature)
- Maximum temperature (Tmax; mean of daily maximum temperature)
- Rain (total of daily rainfall)
- Snow (total of daily snowfall),
- Precipitation (total of daily precipitation)
- Wind speed (mean of hourly wind speed)

To understand climate trends in the vicinity of the project, AHCCD data was drawn from nearby stations (Altona, Morris, and Emerson) where available.

Due to limited data availability, AHCCD from stations at Winnipeg (for precipitation and wind) and Pilot Mound (for wind) was also included, even though these stations are approximately 80 km and 100 km away from the project.

Figure 5-4 depicts seasonal and annual time series from AHCCD at Altona, Morris, and Emerson for temperature. Figure 5-5 depicts the seasonal and annual AHCCD precipitation time series at Emerson and Winnipeg. Figure 5-6 depicts AHCCD the wind data time series at Pilot Mound and Winnipeg.

Since methods involved in generating AHCCD typically include the joining of multiple nearby stations (i.e., to reduce missing data and increase time series length), the sites presented in Figures 5-4, 5-5, and 5-6 may incorporate data from multiple stations (*e.g.*, those listed in Table 5-1).

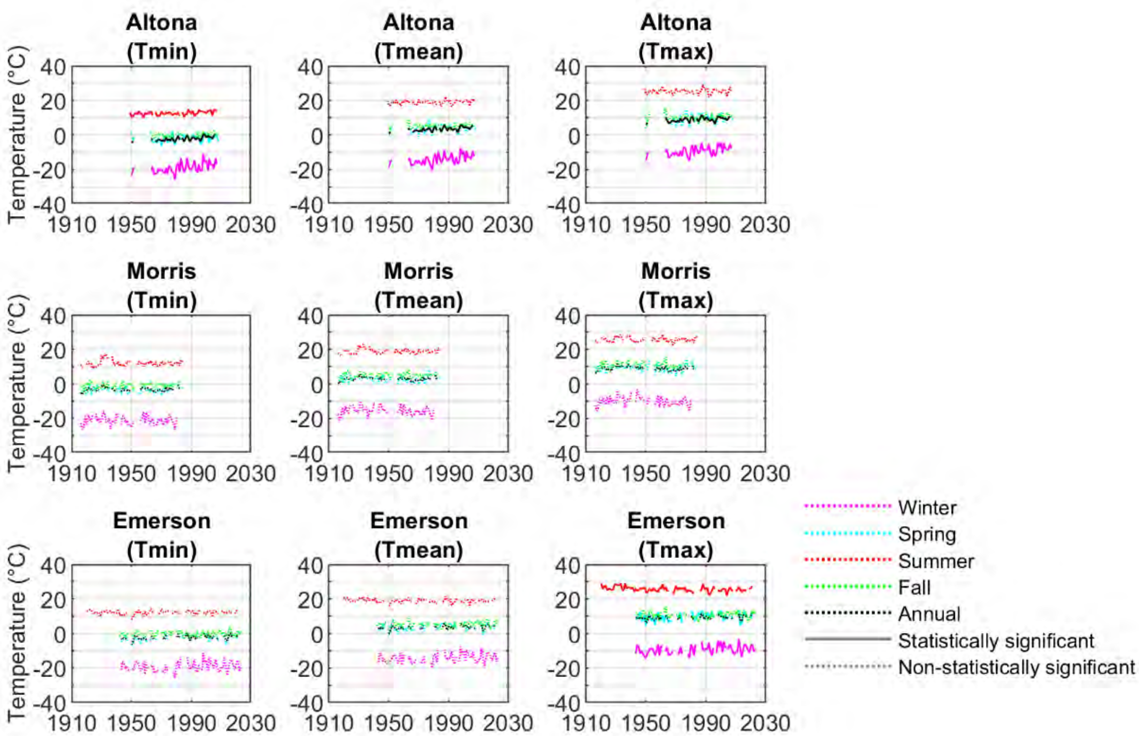


Figure 5-4: Time series of seasonal and annual temperature trends

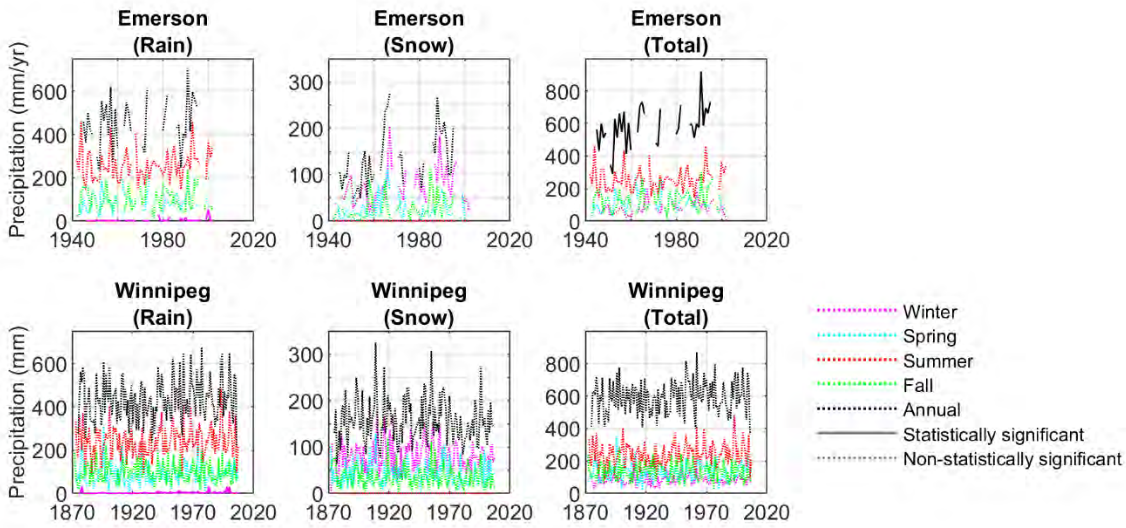


Figure 5-5: Time series of seasonal and annual precipitation trends

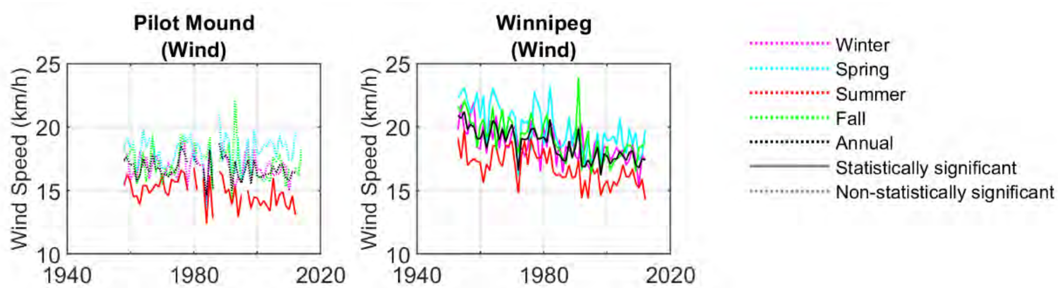


Figure 5-6: Time series of seasonal and annual wind trends

For streamflow trends, the raw Water Survey of Canada data was used with no adjustments or homogenization applied. However, any year with more than 10% missing data was omitted from the analysis for the purposes of quality control and assurance and show as a gap when the trend is plotted. Figure 5-7 depicts the annual flow trends for the Red River at Emerson and the Roseau River near Dominion City.

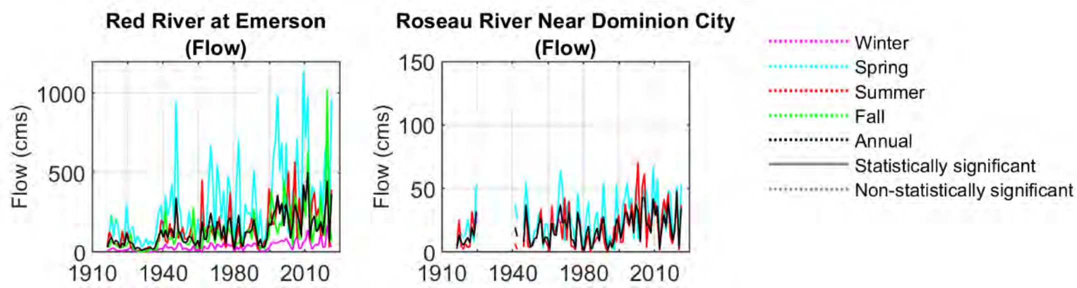


Figure 5-7: Time series of seasonal and annual flow trends for the Red River at Emerson and the Roseau River Near Dominion City.

For the flow trend analysis, hydrological years were considered when computing trends. Each hydrological year spans from October 1 of the year to September 30 of the following year. Note also that the Roseau River near Dominion City gauge is a seasonal gauge active only from March to October. Therefore, only seasonal trends for spring and summer were calculated and the annual value for this station considers only data from March to October of each year.

Statistically significant climate trends of note are outlined below:

For temperature:

- At Altona, annual minimum, mean, and maximum temperatures increased by 0.63°C/decade, 0.51°C/decade, and 0.49°C/decade respectively with the following seasonal trends:
    - Minimum temperature increased for winter, spring, and summer
    - Mean temperature increased the spring
    - Maximum temperature increased for winter
- At Emerson, maximum temperature increased in winter (0.35°C/decade) and spring (0.29°C/decade) but fall and annual increasing trends were not statistically significant. Maximum temperature decreased in the summer (-0.12°C/decade).
    - Note: This is the only location considered with a decreasing temperature trend. This statistically significant decreasing trend occurs when the entire time period of the dataset is considered. Exploration of different, shorter time periods (subsets of data) resulted in several samples with trends that were not statistically significant, including some trends being positive or flat. These results illustrate the sensitivity of trend analysis results to start and end dates.
- At Morris, no statistically significant annual or seasonal trends are present for minimum, mean, or maximum temperature.

For precipitation:

- At Emerson, annual total precipitation saw increases of 32.3 mm/decade.

- At Winnipeg, winter rain saw increases of 0.2 mm/decade.

For wind speed:

- At Winnipeg, wind speed saw decreases annually (-0.55 km/h/decade) and for all seasons.
- At Pilot Mound, wind speed saw decreases in summer by -0.3 km/h/decade.

For flow:

- At the Red River at Emerson, flow saw increases annually (17.7 m3/s/decade) and for all seasons as follows:
    - Winter: 4.7 m3/s/decade
    - Spring: 30.4 m3/s/decade
    - Summer: 20.5 m3/s/decade
    - Fall: 15.2 m3/s/decade
- At the Roseau River near Dominion City, flow saw increases annually (1.4 m3/s/decade) and for the spring and summer seasons as follows:
    - Spring: 1.7 m3/s/decade
    - Summer: m3/s/decade

Historic trends provide an indication of how the climate has changed in the past but may not be an accurate representation of continued longer-term changes in the climatic system (e.g., through extrapolation of trends). Projected changes to the climate system based on future greenhouse gas scenarios, developed using climate models, are presented in Chapter 13.0.

5.3 Ecological land classification

Ecological classification in Canada is a hierarchical designation describing ecologically distinct areas based on interrelationships of geology, landform, soil, water, vegetation, and human factors, with the ecozone at the coarsest level, followed by the ecoregion, and the ecodistrict.

The proposed project is in the Prairies Ecozone, the Lake Manitoba Plain Ecoregion, and overlaps three ecodistricts including the Winnipeg, Emerson, and Winkler Ecodistricts as shown in Map 5-1. Ecological land classification descriptions for each have been obtained from Smith et al. (1998) and are presented below.

5.3.1 Prairies Ecozone

The Prairies Ecozone extends north from the Canada-United States border and ranges from the western edge of Alberta to eastern Manitoba. This ecozone comprises the northern extension of the former open grasslands of the Great Plains of

North America. The ecozone has a landscape characterized by level to rolling or gently undulating terrain. Agricultural crops represent the dominant vegetation. Groves of trembling aspen (Populus tremuloides), balsam poplar (Populus balsamifera) and bur oak (Quercus macrocarpa) are also scattered across the prairies. Nearly all the tall grass and mixed grass prairie have been modified by human activity (Smith et al. 1998).

5.3.2 Lake Manitoba Plain Ecoregion

The Lake Manitoba Plain Ecoregion occurs within the Prairies Ecozone. Extending north from the international boundary, the Manitoba Escarpment marks its western extent. Historically, this ecoregion was comprised of prairie grasslands and stands of trembling aspen and bur oak, however domestic crops and pastureland have now replaced much of the natural vegetation. Trembling aspen and shrubs dominate moist sites, while bur oak and grassland communities dominate drier sites. Various deciduous herbs and shrubs contribute to the understory. Hydrophilic plant species including slough grasses, marsh reed grass, cattails, sedges, and willows can be found in poorly drained areas of this ecoregion (Smith et al. 1998).

5.3.3 Ecodistricts

Table 5-2 below shows the area and percentage of the PDA that falls within each of the three ecodistricts traversed by the proposed project.

Table 5-2: Area and percent coverage of ecodistricts in the PDA

Ecodistrict	PDA	
	Ha	%
Emerson	82.1	56.7
Winkler	32.3	22.3
Winnipeg	30.3	20.9
Total	144.7	100

Values might not sum to totals shown because of rounding.

Most of the PDA (approximately 56.7%) is in the Emerson Ecodistrict, with 22.3% and 20.9% falling within the Winkler and Winnipeg Ecodistricts respectively.

5.3.3.1 Winnipeg Ecodistrict

The Winnipeg Ecodistrict lies in the southeastern portion of the Lake Manitoba Plain Ecoregion. This ecodistrict encompasses the City of Winnipeg and subsequent development and drainage associated with the city and the surrounding agricultural land. Originally tall grass prairie, only small remnants of this native vegetation remain. Tree cover along the flood plains of the waterways contain Manitoba maple (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), cottonwood (*Populus deltoides*), basswood (*Tilia americana*), and American elm (*Ulmus americana*). A mixture of aspen and bur oak can be found on the upper terraces with an understory of hazelnut, red-osier dogwood, and snowberry (Smith et al. 1998).

5.3.3.2 Emerson Ecodistrict

The Emerson Ecodistrict is a small ecodistrict within the Lake Manitoba Plain Ecoregion that borders the United States at its south bound and extends northwards. Most land in this ecodistrict consists largely of cultivated fields used for spring wheat, other cereal grains and oil seeds through the use of dryland production. There are some areas with limited production of potatoes, corn, and garden crops under irrigation mostly from water supplied by the Red River. Areas of native forest can be found along waterways and are characterized by green ash, American elm and Manitoba maple with shrubs such as hazel and saskatoon. On riverbanks where flooding does not occur, bur oak can be found.

5.3.3.3 Winkler Ecodistrict

The Winkler Ecodistrict is bordered by the United States to the south and extends northwestward along the Manitoba Escarpment in the Lake Manitoba Plain Ecoregion. The land in this ecodistrict consists largely of cultivated fields used for spring wheat, other cereal grains, and oil seeds. There are some areas with limited production of potatoes. Corn and garden crops are grown under irrigation mostly from water supplied by the Red River. Areas of native forest can be found along waterways and are characterized by green ash, American elm, and Manitoba maple with shrubs such as hazel and saskatoon. On riverbanks where flooding does not occur, bur oak can be found (Smith et al. 1998).

5.4 Land cover

Natural Resources Canada uses remote sensing satellite data to spatially differentiate between the land cover classifications that make up Canada's land surface (Natural Resources Canada 2020). The distribution of land cover class types is illustrated in Map 5-2 with the area and percent covers in the PDA shown in Table 5-3. Specific valued component chapters include analysis of land cover classifications relative to their specific spatial boundaries as relevant.

Table 5-3: Land use / land cover class area (ha) and percent (%) coverage in the PDA

Land Use/ Land Cover Class	PDA	
	ha	%
Agri – Forage Field	2.0	1.4
Agricultural Field	136.5	94.3
Coniferous Forest	-	-
Cultural Features	-	-
Deciduous Forest	0.2	0.2
Forest Fire Burn Areas	-	-
Open Deciduous Forest	-	-
Range and Grassland	2.1	1.4
Roads, Trails and Rail Lines	3.7	2.5
Sand and Gravel	-	-
Water Body	0.2	0.1
Wetland Marsh	-	-
Total:	144.7	100

The dominant land cover class in the PDA is agricultural field, which account for greater than 94% (approximately 136.5 ha) of the PDA (Natural Resources Canada 2020).

5.5 Geology, soils, and terrain

5.5.1 Bedrock geology

Multiple bedrock types are found in the western portion of the project area, between Altona and the Red River. From Altona east to the Red River, formations include the Interlake Group, Stonewall Formation, Stony Mountain Formation and Red River Formation (Manitoba Energy and Mines 1990). These formations consist of dolostone, fossiliferous shale, and dolomitic limestone of the Silurian and Ordovician periods. Within the eastern portion of the project area, bedrock is characterized as the Amaranth, Melita, and Reston formations of the Jurassic Period (Manitoba Energy and Mines 1990). These formations contain shales, siltstone, sandstone, limestone, gypsum, anhydrite, and dolomite. A geologic cross section paralleling the project approximately 5 km to the south is presented in Figure 5-8.

Bedrock elevation in the project area ranges from approximately 596 to 643 metres above sea level (Little 1980a). Overlying surficial drift thickness in the project area ranges from 52 m to 61 m (Little 1980b).

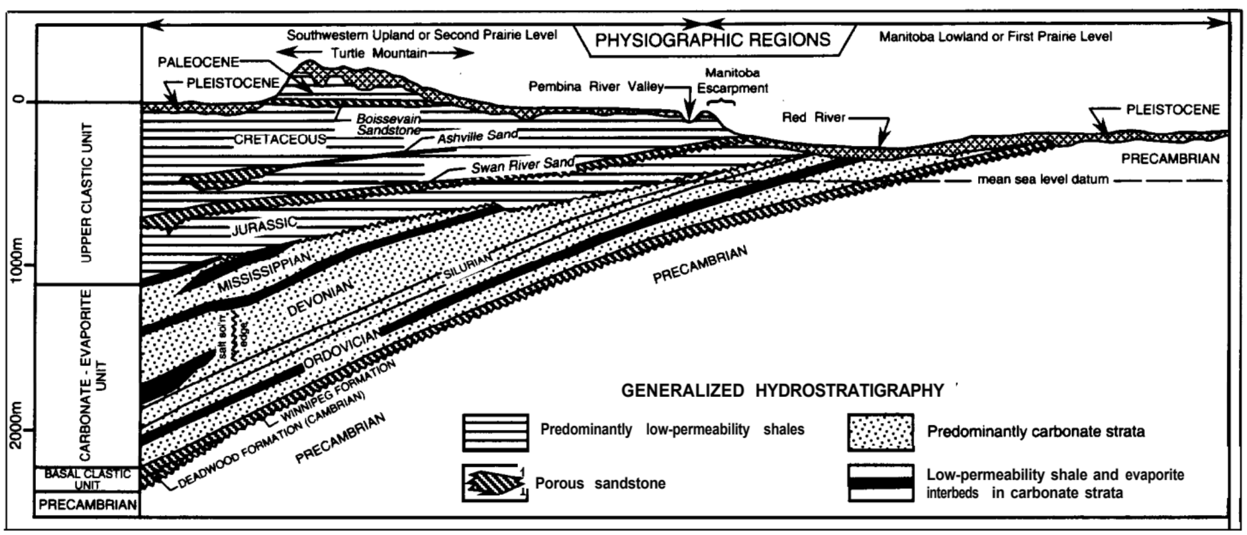


Figure 5-8: Geologic cross-section paralleling the project approximately 5 km to the south (Betcher et al. 1995)

5.5.2 Surficial geology

The predominant surficial material overlying the bedrock in the project area is characterized as offshore glaciolacustrine sediments comprised of clay, silt, and minor sand (Little 1980c). The glaciolacustrine sediments are approximately 33 m to 45 m deep in the project area, with variable till thicknesses between the glaciolacustrine sediments and the underlying bedrock (Figure 5-9).

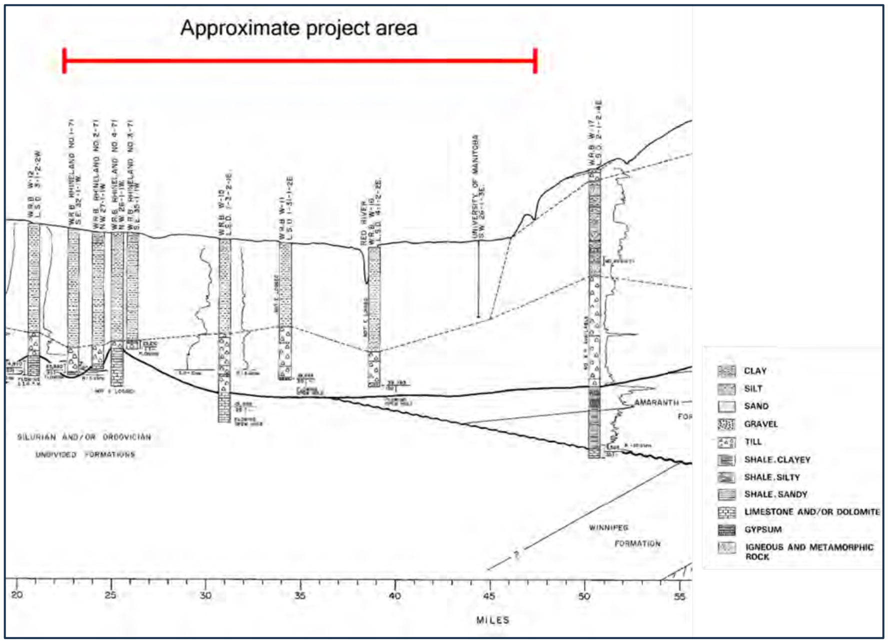


Figure 5-9: Borehole stratigraphy in the project area (Little 1980d)

5.5.3 Soils and terrain

The project is in the Red River Valley physiographic subsection of the Red River Plain physiographic section (Podolsky 1991). The landscape is described as a level to very gently sloping lacustrine plain characterized by deep lacustrine, deltaic, and fluvial deposits.

The elevation ranges from approximately 247.5 m at the western extent of the project and 242.5 m at the eastern extent of the project to approximately 238.5 m at the edges of the channel of the Red River. The bottom of the Red River channel is approximately 228 m. West of the Red River the land slopes from west to east at a regional gradient of 0.04% while east of the Red River the land slopes from east to west at a regional gradient of 0.03%.

Soils were previously mapped in the project area, with the RM of Rhineland having detail scale mapping (scale 1:20,000; Podolsky 1991) while the RMs of Montcalm and Emerson-Franklin are limited to broader-scale, reconnaissance mapping (scale 1:126,670; Ehrlich et al. 1953). The dominant soils are characterized as imperfectly drained Gleyed Rego Black Chernozems, Gleyed Black Chernozems, Gleyed Humic Vertisols and Gleyed Cumulic Regosols. The major soil associations within the project area include:

- Fort Garry association (Fort Garry, Hoddinott and Dencross series) – mainly imperfectly drained with some well drained soils developed on fine textured clayey over moderately fine (silty clay loam) to fine textured (silty clay) lacustrine sediments.

- Plum Coulee association (Plum Coulee and Deadhorse series) – imperfectly drained soils developed on fine textured clayey fluvio-lacustrine sediments.
- Red River association (Red River and Osborne series) – imperfectly to poorly drained soils developed on fine textured clay, silty clay, or heavy clay lacustrine sediments.
- Lakeland association (Lakeland series) – imperfectly drained soils developed on moderately fine textured fine loamy lacustrine sediments.

Soil texture is predominantly fine textured clays with minor inclusions of moderately fine textured clay loams in the St. Joseph to Letellier area. Soil drainage is almost completely characterized as imperfect. Salinity is not indicated to be an important issue in the immediate project area in existing soil resource information; however, there may be localized areas of salinity limitations.

Soils have a high capability for agriculture and as a result, the project area is mostly considered to be prime agricultural lands. However, due to the combination of level to very gentle slopes and fine textured soils, surface drainage in agricultural lands is a prominent practice within the project area. Surface drains are generally shallow (<30 cm) and are used to convey water from low-lying areas of fields to municipal drainage ditches at the field edges.

5.6 Groundwater and groundwater wells

The project area is underlain by a carbonate bedrock aquifer formed by thick and extensive carbonate rock beds with minor shale beds (Rutulis 1987a). Domestic wells are common in the extensive bedrock aquifer. However, the water quality in much of the project area is indicated as being salty, with total dissolved solids concentration of 5,000 mg/l to 100,000 mg/l.

East of the Red River the groundwater quality transitions to slightly saline, with total dissolved solids concentration of 2,500 mg/l to 5,000 mg/l. The poor water quality limits use of the water for domestic or agricultural purposes.

Sand and gravel aquifers within the project area are characterized as lenses of sand and gravel, occurring in the till and other surficial deposits (Rutulis 1987b). These aquifers are variable locally in depth, size, and water quality. Thin unconfined sand aquifers are known just south of the project and east of Altona. Like the bedrock water quality, the sand and gravel aquifers are impacted by salinity, with quality indicated to range from very poor to slightly saline (total dissolved solids ranging from 2,500 mg/L to 5,000 mg/L) to salty to very salty (5,000 mg/L to 25,000 mg/L).

A geological cross section close to the project (Figure 5-9) does not show the presence of sand and gravel deposits that could potentially be water bearing in surficial deposits above the underlying bedrock. However, the distance between boreholes from which the cross-section was developed and the scale of mapping of sand and gravel aquifers is limited in use for understanding the occurrence of these features at the local scale of the project.

Unconfined sand aquifers or coarse textured materials within channels resulting from glacial scours through the glaciolacustrine sediments may be present in the project area. These features, if present, may be small, localized, and discontinuous in nature or may be connected to unconfined aquifers or lenses of sand and gravel.

Artesian conditions occur when a confined aquifer contains water that is under pressure. When an artesian aquifer is intercepted, for example by a well or other disturbance, aquifer water will rise to a point where hydrostatic equilibrium is reached. There are flowing wells or artesian conditions located in the project area with numerous instances mapped within 10 km of the project (Hempe and Iqbal 2016; Figure 5-10). This includes wells with recorded water levels above the ground surface (e.g., east of the eastern extent of the project and south of the central portion of the project.

For example, a well approximately 10 km east of the eastern extent of the project is recorded as having a recorded water level more than three metres above ground surface (Figure 5-10).

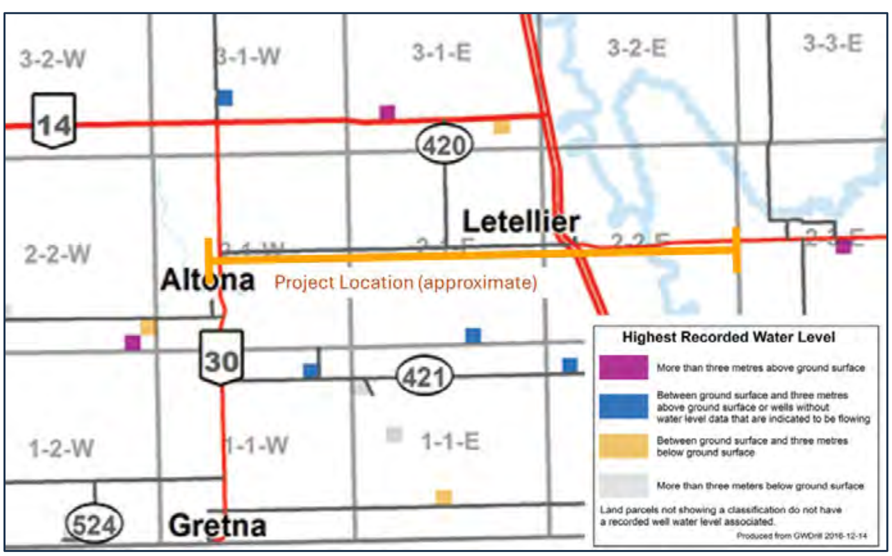


Figure 5-10: Flowing wells in the project area (modified from Hempel and Iqbal 2016)

In the Province of Manitoba's GWDrill 2018 groundwater records database, there are 55 groundwater well records within 5 km of the project (Table 5-4). Of these, only 6 are indicated as active, while the status of 33 are unknown, 15 are sealed, and 1 is inactive.

There are 5 recorded active wells located between 1 km and 5 km of the project. Two of these are indicated to be production wells, one of which is listed as domestic use. One well is listed as an observation well and the three remaining wells are test wells.

Within 1 km of the project, the single recorded active well is listed as an observation well.

Table 5-4: Summary of groundwater wells in the project area

Well Status	Number of wells		
	Within 1 m of project	Between 1 km and 5 km of project	Total
Active	1	5	6
Inactive	1	0	1
Sealed	5	10	15
Unknown	7	26	33

Source: GWDrill Database 2018 © Province of Manitoba

5.7 Aquatic environment

Map 5-3 illustrates watersheds, waterways, and fish habitat classifications (Milani 2013) in the project area. The project falls within the Red River watershed and the Rivière aux Marais/Plum River and Roseau River sub-watersheds.

5.7.1 Surface water hydrology

Surface water hydrology in the Prairie Ecozone is characterized by large, turbid rivers and streams along with many smaller rivers and creeks that drain the area in a north-easterly direction through the Nelson River drainage system, ultimately draining to Hudson Bay (Smith et al., 1998).

Many of the major watercourses in this ecozone have been modified or developed to some extent by hydropower, irrigation, flood protection or water management (Smith et. al, 1998). Perennial watercourses within the PDA that will be traversed by the proposed gas transmission project include the Red and Aux Marais Rivers and Harlow and Main drains (Map 5-3).

The proposed project will have three waterway crossings, the Rivière aux Marais and Harlow and Main Drains (Map 5-3).

5.7.2 Surface water quality

The Canadian Council for Ministers of the Environment (CCME) developed the water quality index (WQI) in 2001 and organizes long-term water quality data into categories: excellent, good, fair, marginal, and poor.

Rankings have been calculated for the Red River which is in the PDA. Based on monitoring from 2020-2022, water quality for the Red River, downstream of Winnipeg, was categorized as fair (CCME WQI value of 65-79), meaning the water quality is usually protected but occasionally threatened or impaired with conditions that sometimes depart from natural or desirable levels (CCME, 2024). More broadly, within the Prairies Ecozone, the waterbody average CCME WQI was 71 or fair quality (CCME 2024).

One long term water quality monitoring station for the Roseau River Watershed is located near Dominion City near PR 200 (Seine Rat Roseau Watershed District nd). This monitoring station has been operating since 1973 and water samples are collected four times during the year to be tested for several water quality parameters including water chemistry, nutrients, metals, pesticides, and bacteria. Results of water quality parameters from this testing location provide an overview of the quality of surface water from the Roseau River watershed prior to entering the Red River.

Recent analysis of the water (from 1992 to 2019) from the Roseau River monitoring station at Dominion City results in a water quality index from fair to good indicating some of the variables tested did not meet water quality guidelines.

Overall water quality findings determined that phosphorus levels in the Roseau River Watershed varied greatly from east to west. In the eastern portion of the watershed land cover consists or wetlands and forests with limited agricultural activities, while in the western portion of the watershed to the Red River, agricultural is the dominant land use resulting in higher phosphorus levels in waters such as the Main Drain.

Through water quality monitoring it was determined that there are notable differences in turbidity, phosphorus and dissolved solids in the Roseau River Watershed as the Roseau River enters the Red River Valley portion of the watershed likely resulting from changes in soil type and land use.

5.7.3 Fish and fish habitat

Sixty-four fish species have the potential to occur in the Red River.

Milani (2013) sampled several drains in southern Manitoba, two of which are traversed by the proposed project, the Harlow and Main drains. Fish species identified in the Harlow Drain included black bullhead (*Ameiurus melas*), brook stickleback (*Culaea inconstans*), central mudminnow (*Umbra limi*), fathead minnow (*Pimephales promelas*) and northern redbelly dace (*Chrosomus eos*). For the Main drain, species captured and identified included the central mudminnow, fathead minnow and finescale dace (*Chrosomus neogaeus*).

Within the project area, the banks of the Harlow and Main drain have been cleared of native vegetation cover because of agricultural activities, including cultivation, pastures, and haying, that occur to the waterline. Riparian areas are found along the Red River and Riviere Aux Marais River.

5.7.3.1 Aquatic species of conservation concern

Within the Lake Manitoba Plain Ecoregion, twelve species listed by the Manitoba Conservation Data Centre (MB CDC) can be found and include the following:

- Mussels: black sandshell (*Ligumia recta*), threeridge (*Amblema plicata*), wabash pigtoe (*Fusconaia flava*), wheel heelsplitter (*Lasmigona complanate*), Mapleleaf mussel (*Quadrula quadrula*), and creeper (*Strophitus undulatus*);
- Crayfish: - Calico crayfish (*Faxonius immunis*);
- Lamprey: chesnut lamprey (*Ichthyomyzon castaneus*) and Silver Lamprey (*Ichthymomyzon unicuspis*); and
- Fish: Bigmouth Buffalo (*Ictiobus cyprinellus*), Silver Chub (*Macrhybopsis storeriana*), northern pearl dace (*Margariscus nachtriebi*).

Three aquatic SOCC occur within 2 km of the project boundary and include the wabash pigtoe, white heelsplitter and the silver chub. Another five SOCC occur within 5 km of the project boundary and include the threeridge, calico crayfish, chestnut lamprey, black sandshell and mapleleaf mussel. Table 5-5 provides MB CDC rank information as well as any designations under Manitoba's Endangered Species and Ecosystems Act (ESEA), the federal Species at Risk Act (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Table 5-5. Aquatic species listed at risk within 5 km of the PDA

Scientific Name	Common Name	MBCDC Rank	ESEA	SARA	COSEWIC
Amblema plicata	Threeridge	S3	-	-	-
Faxonius immunis	Calico Crayfish	S3	-	-	-
Fusconaia flava	Wabash Pigtoe	S3	-	-	-
Ichthyomyzon castaneus	Chestnut Lamprey	SU	-	-	-
Lasmigona complanate	White Heelsplitter	S3	-	-	-
Ligumia recta	Black Sandshell	S3	-	-	-
Macrhybopsis storeriana	Silver Chub	S5	-	-	-
Quadrula quadrula	Mapleleaf Mussel	S1	Endangered	Threatened	Threatened

5.7.4 Conclusions related to groundwater and the aquatic environment

Since the project is not anticipated to interact with groundwater or groundwater wells, (i.e., no known locations within the PDA), surface water, or aquatic habitat, potential effects on hydrology and aquatics were not identified as areas requiring further assessment for this project.

5.8 Communities and population

The project is in the RMs of Emerson-Franklin, Montcalm, and Rhineland, from east to west. An overview of the communities within each of the three municipalities and the respective populations are provided below.

Chapter 11.0 discusses the economies of each of the RMs, while Chapter 12.0 discusses the infrastructure and community services available.

5.8.1 Rural Municipality of Emerson-Franklin

The RM of Emerson-Franklin became a municipality in 2015 when the Town of Emerson and the RM of Franklin decided to merge to create the rural municipality. The RM of Emerson Franklin is bordered by the RM of De Salaberry and RM of Montcalm to the north, the RM of Stuartburn to the east, the RM of Montcalm to the west, and the United States to the south. Communities located within the RM boundaries include Dominion City, Tolstoi, Ridgeville, Arnaud, Rosa, and Roseau River.

The unincorporated urban centre of Dominion City near the junction of PR 200 and PR 201 is located approximately 600 metres north of the PDA and approximately 7.5 km west of the Dominion City gate station, the termination point of the project.

According to Statistics Canada, in 2021, the population of the RM of Emerson-Franklin was 2,437 in 2021, which represents a 3.9% decrease when compared to the 2016 population of 2,537. The RM had a total of 1,134 private dwellings, 917 of which were occupied by permanent residents. The population density was 2.5 people per square kilometre (Statistics Canada 2021).

Dominion City, within the RM of Emerson-Franklin, had a 2021 population of 319, representing 9.6% decrease from the 2016 population of 353. In Dominion City, 148 of the 187 private dwellings are occupied by permanent residents and the population density is 124.4 people per square kilometre (Statistics Canada 2021).

5.8.2 RM of Montcalm

The RM of Montcalm is bordered by the RM of De Salaberry and RM of Emerson-Franklin on the east, RM of Morris to the north and west, and the RM of Rhineland to the west. Communities in the RM of Montcalm include the villages of St. Jean-Baptiste, St. Joseph, Letellier and Ste. Elizabeth. (RM of Montcalm 2023).

The community of Letellier is located at the junction of Provincial Trunk Highway 75 and PR 201 while the community of St. Joseph can be found adjacent to the proposed project along PR 201.

The 2021 population of the RM of Montcalm was 1,278, which represents a 1.4% increase when compared to the 2016 population of 1,260. There were a total of 524 private dwellings in the RM, 490 of which were occupied by permanent residents. The population density was 2.7 people per square kilometre (Statistics Canada 2021).

5.8.3 RM of Rhineland

The RM of Rhineland borders the state of North Dakota on the south, the RM of Montcalm on the east, the RMs of Morris and Roland on the north, and the RM of Stanley to the west. Communities within the RM of Rhineland include Altona, Blumenort, Gretna, Plum Coulee, and Rosenfeld.

The Town of Altona, an important agricultural centre for the RM of Rhineland, is the largest urban centre near to the proposed project. It is located at the junction of PTH

30 and PR 201, approximately 1.3 kilometres south of the PDA (Rhineland Municipality, 2024b; Town of Altona, 2024).

The 2021 population of the RM of Rhineland was 5,819, which represents an approximate 2.1% decrease in population when compared to the 2016 population of 5,945. 1,641 of the total 1,748 private dwellings were occupied by permanent residents and the population density was 6.1 people per square kilometre (Statistics Canada 2021).

The Town of Altona, had a 2021 population of 4,267, which represents an increase of 1.3% when compared to the 2016 population of 4,212. 1,700 of the total 1,760 private dwellings were occupied by permanent residents and there was a population density of 456.3 people per square kilometre (Statistics Canada 2021).

5.8.4 Roseau River Anishinabe First Nation

"Roseau River Anishinabe First Nation - Okweanashko-Ziibiing is a rural community located approximately one hour south of Winnipeg, Manitoba. Roseau River Anishinabe First Nation has three physical reserves:

- Roseau River No. 2 is the main reserve located 98 kilometers south of the city of Winnipeg (Highway 75 turn East onto Provincial Road 201). It is just 24 kilometers north of Emerson and within the catchment area of the Southern Regional Health Authority Incorporated. It is bordered by the communities of Dominion city and Letellier in Southern Manitoba (25 km's north of the Emerson-US international border crossing).
- Roseau Rapids No. 2A is considerably geographically smaller. It is located off Highway 218 north (80 kilometers south of Winnipeg).
- Roseau River No. 2B (Urban Reserve) even smaller, is located at the junctions of Highways 6 & 236 and the Perimeter Highway on the northwest side of Winnipeg, Manitoba." (Roseau River Anishinabe First Nation. 2024)

Two of RRAFN's three reserves are located within the spatial boundaries considered in this environmental assessment. Roseau River No. 2 is immediately adjacent to the PDA, while Roseau Rapids No. 2A is located approximately 9 km northeast of the project's termination point at the Dominion City gate station.

As of November 2024, Roseau River Anishinabe First Nation has a total registered population of 2,765 with 1,201 of those members living on RRAFN reserve land (Crown-Indigenous Relations and Northern Affairs Canada. 2024).

5.9 Land and resource use

Agriculture is the dominant land use and economic driver in the RMs traversed by the project with agricultural fields accounting for approximately 95% of the land cover within the PDA. Chapter 9 (Commercial agriculture) discusses the agricultural activities and practices occurring in the area and assesses project effects on this key type of land use in the area. This section discusses other types of land and resource use that take place within the spatial boundaries of the assessment, the types of land on which they occur, and the structures in place to manage land and resource use.

5.9.1 Property ownership

Land within the project area is predominantly private land, which accounts for approximately 97% of the PDA. The remaining areas of the PDA are comprised of roads (2.24%), Manitoba Hydro owned property (0.01%), and Crown land (2.24%).

Table 5-6: Property ownership status of land within the PDA

Land ownership category	PDA	
	Area (ha)	Percent
Private	140.265	96.92%
Crown	1.211	0.84%
Roads	3.235	2.24%
Manitoba Hydro owned	0.010	0.01%
Total:	144.721	100%

The portion of the PDA that is Crown land amounts to approximately 1.2 ha, which is comprised entirely of drains, including the Main Drain (0.32 ha), Drain–83, Drain 60605, WCW 7765, and WCW–678.

There are limitations in available geospatial data on Crown land. To develop approximations of Crown land areas overlapped by the PDA, where there were gaps in title ownership mapping, ReproMaps were referenced.

5.9.2 Designated and protected lands

Map 5-4 illustrates the locations of designated and protected lands in the broad area surrounding the project.

5.9.2.1 Provincial parks and ecological reserves

There are no provincial parks or ecological reserves within the spatial boundaries of the assessment (*i.e.,* within the RMs of Emerson-Franklin, Montcalm, and Rhineland). The closest provincial park to the project is St. Malo Provincial Park, approximately 22 kilometres northeast.

5.9.2.2 Provincial wildlife management areas and wildlife refuges

There is one wildlife management area (WMA) and six designated wildlife refuges within the spatial boundaries of the assessment (*i.e.,* within the RMs of Emerson-Franklin, Montcalm, and Rhineland).

The St. Malo WMA is in NE 35-3-4EPM in the RM of Emerson-Franklin, approximately 18.5 km northeast of the Dominion City gate station. St. Malo and the District Wildlife Association are responsible for acquiring land and management of lands within the St. Malo WMA, which protects habitat for deer, ruffed grouse, and neo-tropical birds. Other wildlife that may occur include black bears, raccoons, beaver, hares, and jackrabbits.

Amphibians include grey tree frogs, leopard frogs and wood frogs, while reptiles include the green licorice snake. Rare flora found in the WMA include western silvery aster, whorled milkwort, false spikenard, and Riddell's goldenrod. In addition, 82 species of birds have been inventoried in the WMA.

The wildlife refuges are all located in the RM of Rhineland and include: Rosenheim Coulee, H. Klassen, A. Enns, G.C. Froese, G. J Froese, and Hespeler Floodway.

None of the wildlife refuges are traversed by the PDA. The wildlife refuge closest to the project is the Rosenheim Coulee Wildlife Refuge located approximately 7.5 km northwest of project's tie-in point north of the Town of Altona.

5.9.3 Land use zoning

The RMs traversed by the project have their own municipal by-laws (laws, regulations, or rules of a local government), adopted under provisions of The Planning Act (Manitoba) and the Provincial Planning Regulation (M.R. 81/2011), that administer land use planning, zoning, and approvals for lands.

As a Crown corporation, Manitoba Hydro is generally exempt from The Planning Act and its regulations in terms of development planning. Manitoba Hydro is therefore not bound by municipal development plans but seeks to engage cooperatively with municipalities to limit conflicts between Manitoba Hydro projects and municipal development plans.

5.9.3.1 Planning districts

A portion of the RM of Rhineland is within the Rhineland, Plum Coulee, Gretna, and Altona (RPGA) Planning District.

The RPGA Planning District covers part of the RM of Rhineland as well as the Towns of Plum Coulee, Gretna and Altona and has the main goal of ensuring long term land use planning on an integrated and regional basis.

The RPGA's development plan categorizes three distinct ways in which people live: country living, village living and town living. Policies for each of these types of living are identified and include specific policies to be followed in relation to the following interests on the land: agriculture, commerce, housing, recreation, education, and health; culture and heritage; environment; transportation; water and wastewater, and waste management (Rhineland Municipality 2024).

Where the PDA traverses the RPGA Planning District, the land is predominantly designated as General Agriculture. There are four quarter sections north of Altona, where the land is designated as Restricted Agriculture, which limits the range of permitted agricultural uses to minimize land use conflicts near town and village living areas (Rhineland Municipality 2024).

The remainder of the RM of Rhineland and the RMs of Montcalm and Emerson-Franklin, are not part of a planning district.

5.9.3.2 Municipal zoning

Municipal zoning by-laws and development plans specific to the RMs traversed by the project include:

- RM of Rhineland Zoning By-Law No 2024-06, which recently amended By-Law 2021-06
- RM of Montcalm Zoning By-Law No. 809/19
- RM of Emerson-Franklin Development Plan 16M-02299-01 and Zoning By-law

Where the project traverses each of the RMs, the designations under the municipal zoning and planning instruments above are predominantly General Agriculture ("AG"), or Agriculture Zone 1/Agricultural Policy Area in the case of the RM of Emerson-Franklin's zoning by-law and development plan respectively (RM of Emerson-Franklin Development Plan, 2017). These designations generally identify that the land is to be used for agricultural purposes and limits certain non-agricultural that could create land use conflicts that by interfere with agricultural production.

In locations along the PDA near to settlements including the Town of Altona, Letellier, St. Joseph, and Dominion City, the project traverses parcels designated Agriculture Restricted Zone (“AR”), or Agriculture Zone 2 in the RM of Emerson-Franklin. These areas are also intended for agriculture but with restrictions on certain agricultural activities to limit potential land use conflicts and disruptions to more populated areas.

The PDA also crosses one location coded Agro Industrial Zone (“AI”) near the Town of Altona, which is intended for developments that have the potential to pose dangers to the health and safety of the public or may be offensive and disturbing to other adjacent properties (RM of Rhineland Zoning ByLaw 2021-06).

5.9.4 Recreation and tourism

The RMs traversed by the project support various local parks and recreation areas for residents and visitors.

There are several community/recreation clubs, municipal parks, campgrounds, and community halls located throughout various communities and towns, such as Emerson, Ridgeville, Roseau River, Rosa, Tolstoi, Dominion City and Woodmore in the RM of Emerson-Franklin.

Notable locations and events important to tourism and recreation in the area include:

- The Senkiw Suspension Bridge, a municipal historical site in the RM of Emerson-Franklin
- Portion of the Trans-Canada Trail, which traverses the RMs of Emerson-Franklin, Montcalm, and Rhineland
- Fort Dufferin, a National Historic Site three miles north of Emerson (Parks Canada, 2024)
- Musee Saint Joseph (museum) and the Montcalm Heritage Festival
- Altona Centennial Park and Aquatic Centre
- Buffalo Creek Nature Park in the Town of Altona
- Plum Coulee Elevator Museum

Snowmobiling is a popular recreational activity within the spatial boundaries of the assessment. In conjunction with local clubs, Snowmobilers of Manitoba Inc. (Snoman) develop and maintain a network of trails with the goal of promoting safe and environmentally responsible snowmobiling. According to the 2023-24 Snoman map, numerous club and provincial snowmobile trails traverse the project assessment area (Snoman Inc. 2024).

5.9.5 Resource use activities

Other resource use activities that occur in the assessment area (*i.e.,* within the RMs of Emerson-Franklin, Montcalm, and Rhineland) include woodlot management, hunting, trapping, and domestic resource uses.

No commercial forestry management licences exist in the assessment. The Government of Manitoba, Agriculture and Resource Development Branch, administers domestic forest utilization through the issuance of timber permits. Some private landowners may manage woodlots on their own properties under the direction of the Manitoba Woodlot Association's Private Land Resource Planning Initiative (Manitoba Forestry Association 2015).

The area provides hunters with hunting opportunities during specified seasons. Manitoba's big game hunting is administered by Manitoba Natural Resources and Northern Development within Game Hunting Area (GHA) zones. Most of the assessment area is in GHA zone 33 and species hunted within the RAA would include gray wolf, coyote, white-tailed deer, upland birds (grouse, wild turkey, gray partridge) and migratory birds such as ducks, coots, snipes, geese, sandhill crane and woodcock.

A very small portion of the assessment area is in GHA 35A, where species hunted include white-tailed deer, black bear, gray wolf, coyote, upland birds (wild turkey, grouse, and gray partridge) and migratory birds such as ducks, coots, snipe, geese, sandhill crane and woodcock.

Manitoba's Open Trapping Area Zone 1 where typical furbearer species harvested include beaver, badger, coyote, fox, marten, raccoon, red squirrel, wolf, and weasel, also overlaps the entire assessment area (Trapping Guide, 2023-24).

In some instances, aggregate resources have been identified by RMs in their Development Plans and associated by-laws. Within the RM of Emerson-Franklin, on the east side of the RM, south of Roseau River and east of PR 218, areas of low and medium potential aggregate deposits are scattered throughout. There are two smaller areas of high aggregate potential that contain known mineral resources just west of the village of Overstoneville and near the village of New Rosa. There are no areas of aggregate potential identified that overlap the PDA. There are also no aggregate deposits, gravel pits (private or crown) or bedrock quarries overlapping the PDA based on a review of the aggregate resources compilation map series (MAP AR99-1-2 Winnipeg NTS 62H) (Manitoba Energy and Mines. 1988).

The St. Joseph Windfarm is near St. Joseph, MB west of PTH 75, south of PTH 14 and north of PR 421, in the RM of Montcalm. This windfarm consists of 60 - 2.3MW turbines with a total rating of 138 megawatts. The St. Joseph Windfarm is situated in an agricultural dominated landscape where most turbines have been placed on annual cropland. The project will be directionally drilled to cross potential HV cables associated with the windfarm.

5.9.6 Traditional land and resource use

As illustrated in Figure 5-1, past and ongoing projects and activities including the development of electrical and gas transmission and distribution lines, roads, settlements, and agricultural development have drastically altered the landscape and caused disruptions to the ways in which rights-based activities, including harvesting and other cultural activities, occurs in the area.

Although the project area is now predominantly composed of private land and used mainly for agriculture as well as other residential, commercial, and recreational uses, Manitoba Hydro acknowledges that the land in the area is all Indigenous traditional land and that First Nations people and Red River Métis citizens continue to practice rights-based activities across the landscape today, including on both private land with landowner permission and on the small amount of Crown land that remains.

Chapter 6.0 (Important sites) considers potential project effects to culturally important sites and practices, which has been informed through project engagement (Chapter 4.0) on this project and past Manitoba Hydro projects.

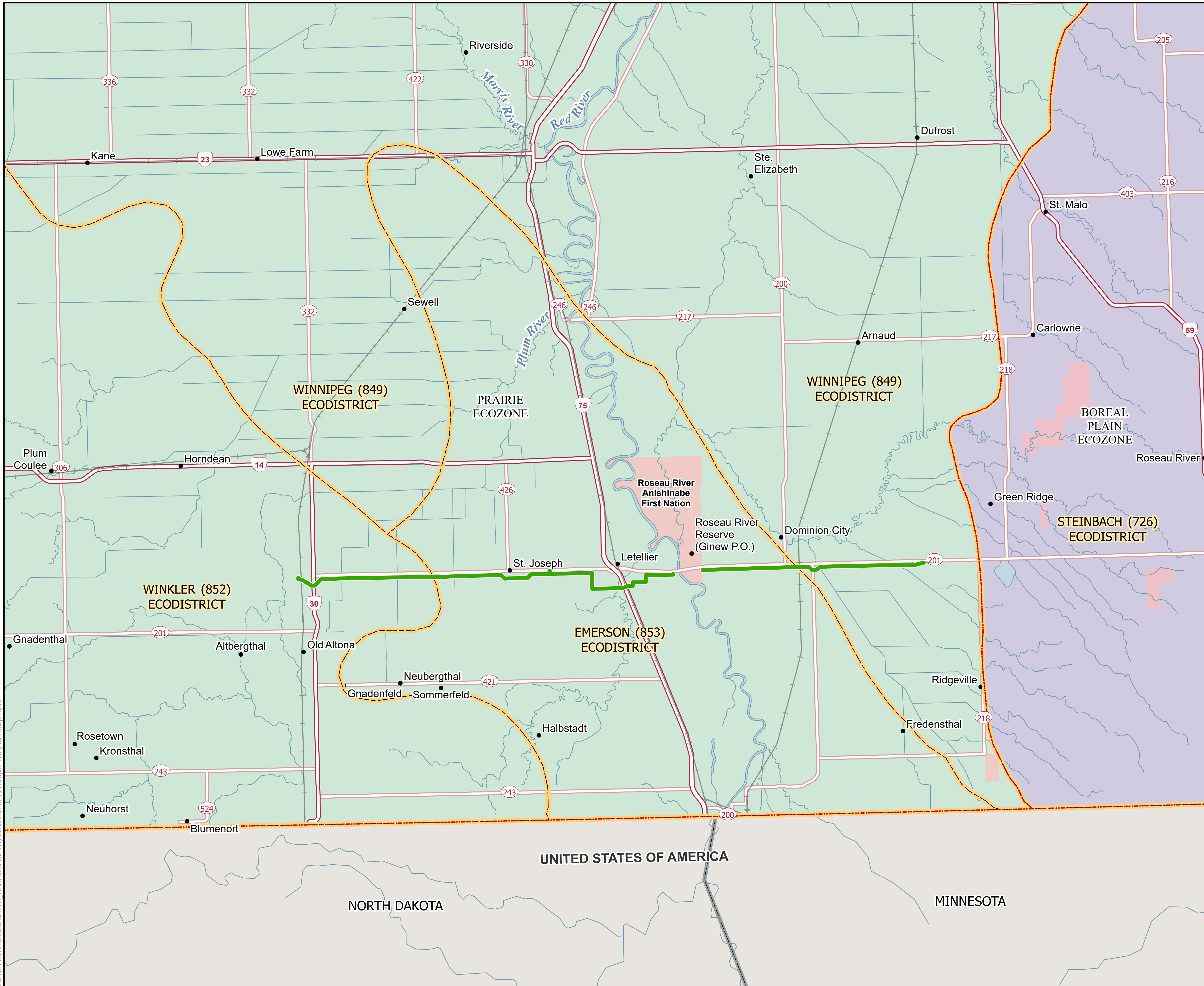
Manitoba Hydro recognises that a lack of information regarding specific cultural activities and locations they may occur does not necessarily represent a lack of cultural use or importance of the area. Even if not specifically identified through project engagement, Manitoba Hydro assumes that harvesting and other cultural practices are potentially occurring within the assessment area.

Map 5-1 Ecozones, ecoregions, and ecodistricts

Map 5-2 Land cover classification

Map 5-3 Waterways and watersheds

Map 5-4 Designated lands and land use zoning



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Ecoregions and Ecodistricts
- Interlake Plain Ecoregion
- Lake Manitoba Plain Ecoregion
- Ecozone
- Ecodistrict

Landbase
- Community
- Provincial Highway
- Provincial Road
- Railway
- First Nation Lands

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 02, 2024

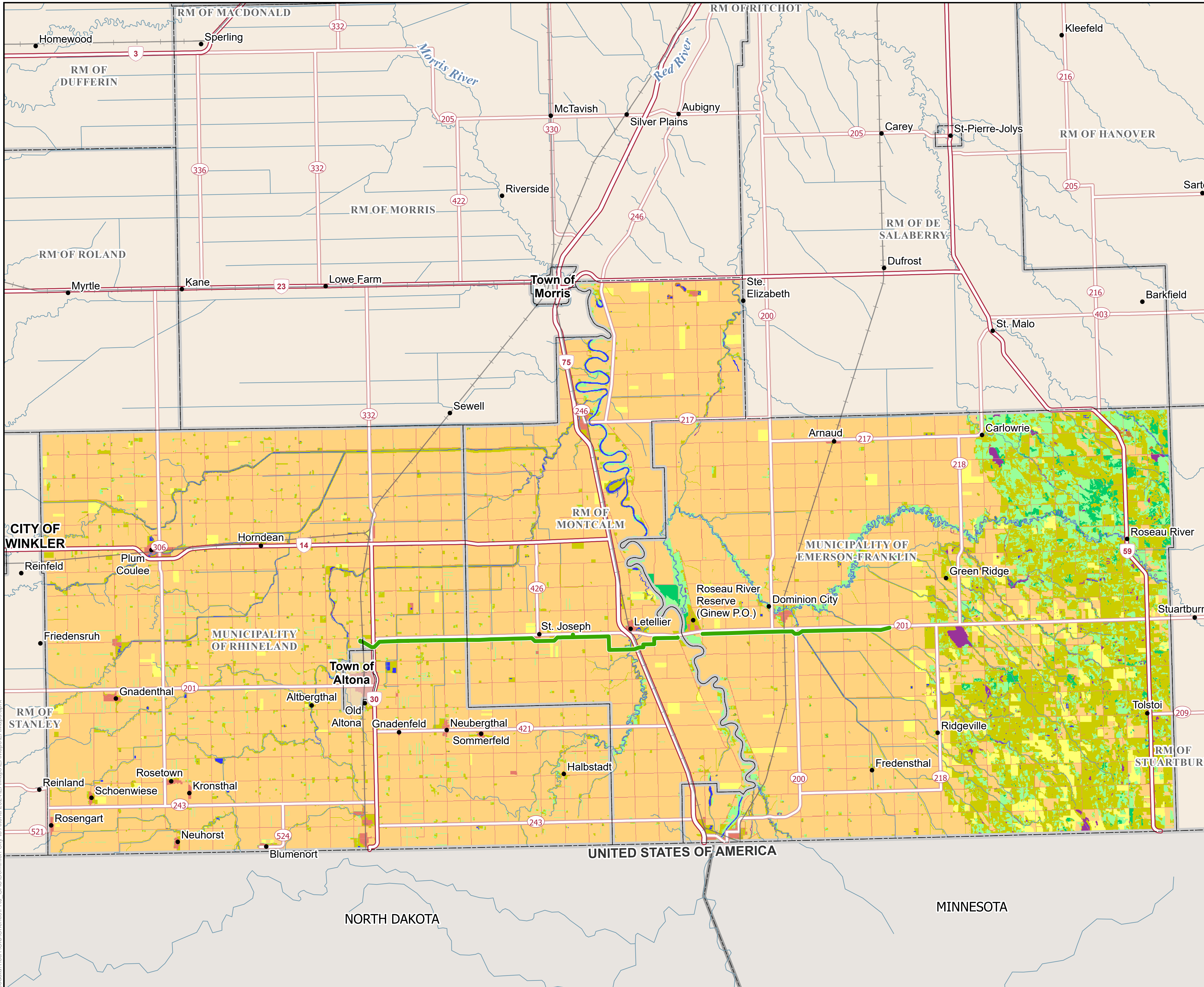
N

0 2.5 5 7.5 10 Kilometres
0 1.5 3 6 Miles
1:220,000

Ecozones, Ecoregions, and Ecodistricts

Draft: For Discussion Purposes Only

Map 5-1



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Land Cover Classification
- Agricultural Cropland
- Bare Rock, Gravel and Sand
- Coniferous Forest
- Cultural Features
- Deciduous Forest
- Forage Crops
- Forest Cutover
- Marsh and Fens
- Mixedwood Forest
- Open Decidious Forest
- Range and Grassland
- Treed and Open Bogs
- Water

Landbase
- Community
- Provincial Highway
- Provincial Road
- City/Town
- Rural Municipality

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 02, 2024

N

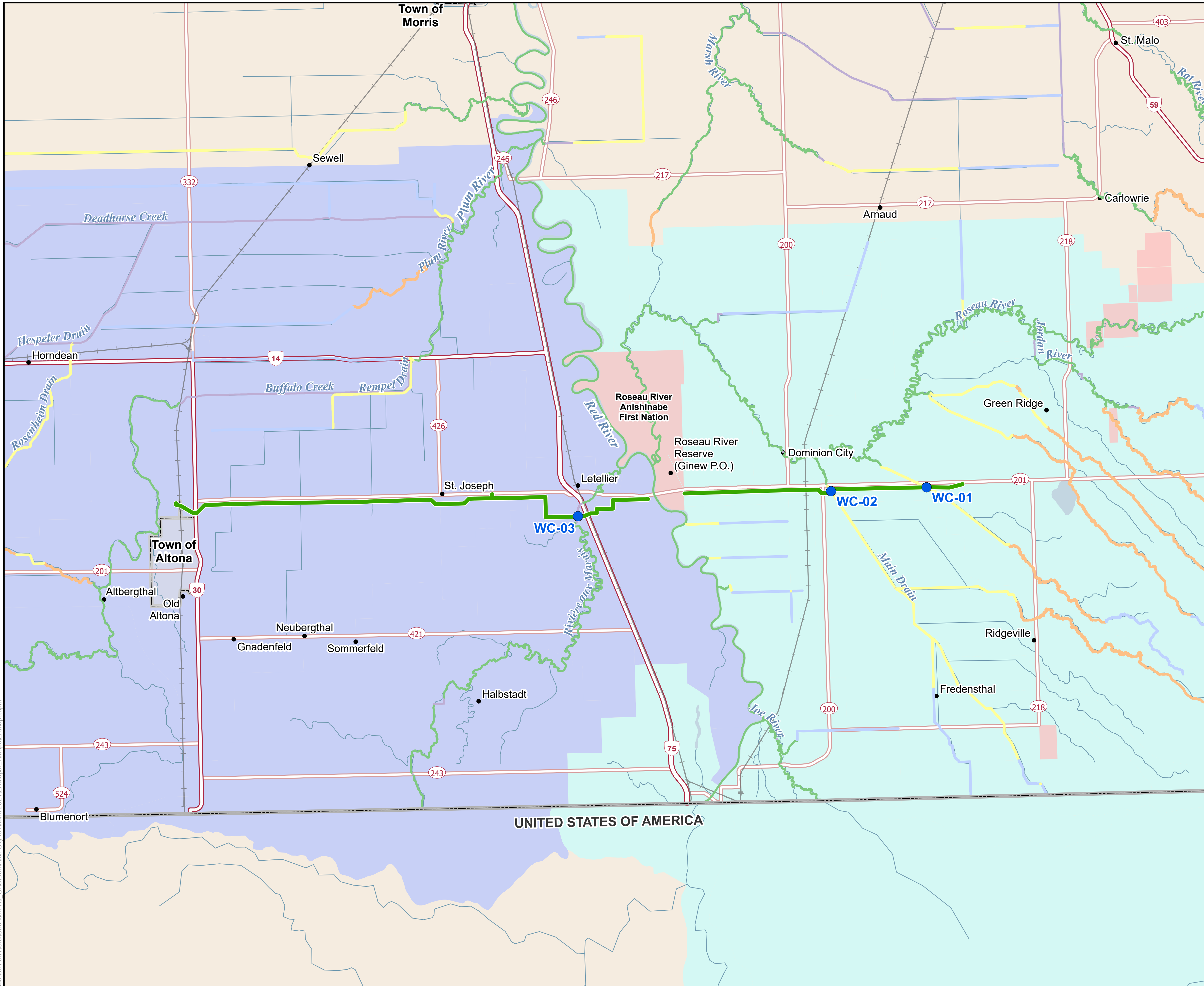
0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Land Cover Classification

Draft: For Discussion Purposes Only

Map 5-2



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Water Crossings
- Water Crossing

Milani Habitat Classification
- Type A
- Type B
- Type C
- Type D
- Type E

Gross Sub-Watersheds
- Rivière aux Marais/Plum River
- Roseau River

Landbase
- Community
- Provincial Highway
- Provincial Road
- First Nation Lands
- City/Town

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 02, 2024

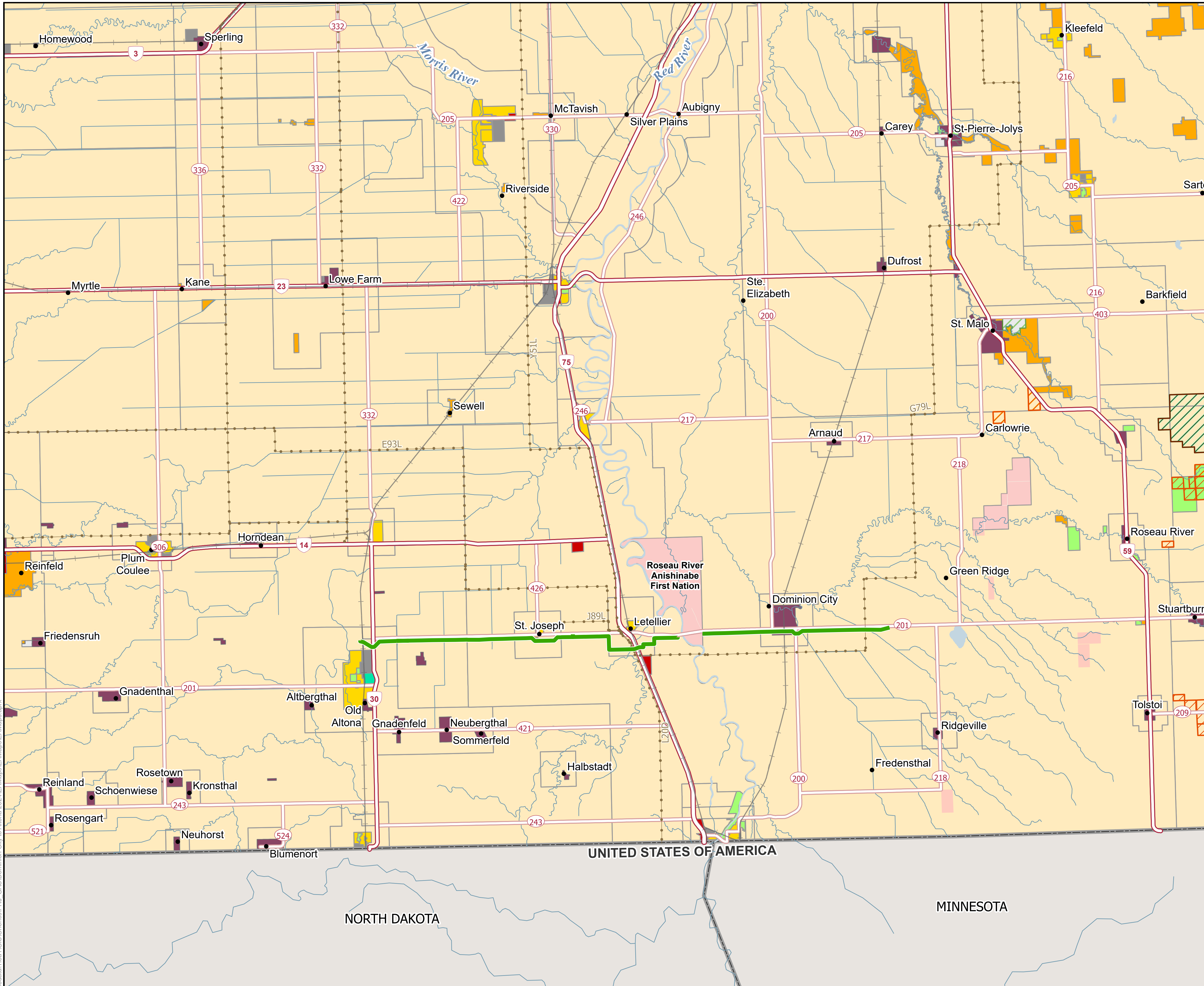
N

0 2 4 6 8 Kilometres
0 1.25 2.5 5 Miles
1:175,000

Waterways and Watersheds

Draft: For Discussion Purposes Only

Map 5-3



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure

- Preferred Route

Designated and Protected Lands

- Community Pasture
- Provincial Park
- Area of Special Interest
- Protected Area
- Wildlife Management Area

Land Use Zoning[1]

- Commercial
- Industrial
- Mixed Use
- Parks, Recreation, and Open Space
- Residential
- Rural/Agricultural
- Rural Residential
- Settlement Centre
- Other

Existing Infrastructure

- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line

Landbase

- Community
- Railway
- Provincial Highway
- Provincial Road
- First Nation Lands

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Source:
1. Manitoba Development Plan Designations, 2024, Province of Manitoba

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Designated Lands and Land Use Zoning

Draft: For Discussion Purposes Only

Map 5-4

6.0 Important sites

For this assessment, important sites include heritage resources as defined and protected by Manitoba's Heritage Resources Act (1986) as well as a broad range of cultural sites and features understood to be important to First Nations peoples and Red River Métis citizens in the area.

Manitoba Hydro chose to use important sites as a valued component (VC) because it can broadly capture the diverse ways by which locations and features of the land are of heritage or cultural value and because the project has the potential to interact with important sites.

Heritage resources refer to physical, cultural, and natural elements considered valuable and preserved for their historical, cultural, scientific, or aesthetic significance. Heritage resources include tangible remains of human endeavour that have survived through time and provide evidence of past activity. These are non-renewable resources that may be disturbed or damaged by development activities.

Cultural sites and features important to First Nations peoples and Red River Métis citizens include both tangible sites and intangible cultural heritage.

Tangible important sites include sites or objects of cultural, historical, spiritual, or sacred importance. Certain land types and interests such as unoccupied Crown land and land available for Treaty Land Entitlement opportunities are also considered.

Intangible cultural heritage is defined by UNESCO to include traditions and living expressions transmitted from one generation to the next (UNESCO 2023).

This assessment, therefore, also considers the practice of ceremony, the places ceremony may occur, as well as the experiences and cultural knowledge transmission that occur through undertaking cultural practices, including rights-based activities.

Taking a broad approach to assessing project effects on heritage and culture aligns with the Manitoba Clean Environment Commission's comment related to culture and heritage in the Bipole III Transmission Project Report on Public Hearing (2013), which stated the following:

"With regard to heritage resources, it is important to keep in mind that these are by no means limited to those resources, such as archaeological sites, that have already been identified. In many cases, heritage resources are only identified because there has previously been some disturbance, such as building of roads, that has turned up artifacts. It is also important to remember that the landscape itself is a heritage resource, providing visual cues for storytelling and memory. Alteration of the landscape can, by itself, have an impact on heritage." (Manitoba Clean Environment Commission 2013)

6.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on important sites from project activities. An assessment of cumulative effects on important sites is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other recent transmission projects in southern Manitoba (e.g., the Pointe du Bois to Whiteshell (PW75) Transmission Project, Dorsey to Wash'ake Mayzoon Transmission (D83W) Project, and Manitoba-Minnesota Transmission Project (MMTP)). The assessment considers the following:

- Disturbance of heritage resources from their in-situ[2] context
- Disturbance of cultural sites or features important to First Nations peoples and Red River Métis citizens

6.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

6.1.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to important sites.

- *The Heritage Resources Act (Manitoba)*
- *The Constitution Act (Canada)*

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[2] In situ' – in the natural or original place of deposition

- Manitoba Hydro's Indigenous Relations Commitment Statement

6.1.2.1 The Heritage Resources Act (1986)

Heritage resources are non-renewable resources that provide a tangible cultural link between the past and present. Heritage resources are protected under Manitoba's The Heritage Resources Act (1986) and are "…a heritage site, a heritage object, and any work or assembly of works of nature or of human endeavor that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural scientific or aesthetic features, and may be in the form of sites or objects or a combination thereof". Heritage sites are recorded in a provincial registry and are managed by the Historic Resources Branch (HRB) of the Department of Sport, Culture and Heritage. This registry includes the following categories:

- Archaeological sites
- Provincial sites
- Municipal sites
- Commemorative plaques
- Cemeteries

The provincial registry does not specifically recognize cultural sites and therefore does not offer protection for cultural sites understood to be important to First Nations peoples and Red River Métis citizens unless they can be captured and registered as an archaeological site. Examples of cultural sites that may be registered as an archaeological site include culturally modified trees or trees with prayer flags. If it is in the opinion of the Minister that heritage resources may be affected by development, the Minister can order an archaeological study or other protection measures.

6.1.2.2 The Constitution Act section 35, Part II (1982)

Section 35 of The Constitution Act, 1982, recognizes and affirms the existing Aboriginal and treaty rights of the Indigenous peoples of Canada. These affirmed rights include rights relevant to important sites including rights to practice one's culture and spiritual traditions as well as rights to lands, territories, and resources recognized as inherent Aboriginal rights by Canadian courts (Government of Canada 2021).

Traditional activities and practices included within this chapter reflect traditional activities and practices that the courts have expressly recognized would potentially be constitutionally protected under section 35 of the Canadian Constitution Act, 1982. The authors of this chapter did not try to distinguish whether activities, customs and practices shared through project engagement met the test to be constitutionally protected. If an activity, practice, or custom was shared with Manitoba Hydro and understood to be important to a potentially affected First Nation or the Manitoba Métis Federation, it was considered relevant to this assessment.

6.1.2.3 Manitoba Hydro's Indigenous Relations Commitment Statement

In 2023, Manitoba Hydro released an Indigenous Relations Commitment Statement. Commitments within the statement that are relevant to the assessment of project effects on important sites include the following:

- We will work collaboratively with Indigenous communities to address the adverse impacts of our projects and operations.
- We will collaborate with Indigenous communities to understand and be guided by their Indigenous Knowledge as it relates to our projects (Manitoba Hydro 2023).

6.1.3 Consideration of engagement feedback

Project engagement (Chapter 4) actively sought to provide opportunities for concerned and engaged audiences to provide feedback about the project. Feedback related to important sites included the following:

- During a meeting with Peguis First Nation, representatives requested that a ceremony take place prior to heritage work commencing. Representatives also shared that they welcome Roseau River Anishinabe First Nation, and the Manitoba Métis Federation to participate in the ceremony.
- The Manitoba Métis Federation shared the potential for adverse heritage effects, at sub-river crossings and anywhere near water construction.
- Peguis First Nation noted that other projects they have been involved in within the area have identified heritage resources, especially along the Red River. Representatives noted concern for heritage resources to be present in this project.
- During an open house in Roseau River Anishinabe First Nation, participants identified three important sites. These sites are known to the Nation and are located within the LAA and RAA.

6.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on important sites, along with effects pathways and measurable parameters are outlined in Table 6-1.

Table 6-1: Potential effects, effects pathways, and measurable parameters for Important sites

Potential effect	Effect pathway	Measurable parameter(s) and units of measurement
Changes to important sites, including disturbance of heritage resources from their *in-situ* context and/or disturbance of tangible cultural sites or features important to First Nations peoples and Red River Métis citizens	Project activities involving ground disturbance resulting in physical interaction with known or unknown important sites, including features and objects located beneath or upon the surface	Number of heritage resources altered/lost because of project activities Instances of encountering heritage resources and/or cultural sites, features, or objects during pre-construction field work or construction activities Qualitative assessment of feedback related to potential physical impacts to important sites shared through project engagement

Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites	Project induced changes to sense of place, aesthetics, and stress resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices due to the presence of the pipeline Increased noise or changes in the types of noise during construction Periodic changes to noise during operations and maintenance activities Project activities that restrict access to important sites resulting in loss of opportunities for cultural experiences, practices, and knowledge transfer	Qualitative assessment of feedback related to potential project impacts to cultural experiences Qualitative assessment of the project's predicted residual effects on noise and psychological stress presented in Chapter 10 (Health and well-being) Qualitative assessment of changes to access

6.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on important sites:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA, which is deemed inclusive of important sites that could be encountered during project activities.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 5 km buffer around the PDA. The RAA area is crucial for understanding the broader

environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

Map 6-1 displays the spatial boundaries for important sites, which are consistent with the boundaries discussed in the heritage resources technical memo prepared for the project (Appendix B).

6.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on important sites are based on the timing and duration of project activities as follows:

- Construction – If a licence is received, it is anticipated to start in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

To understand existing conditions related to important sites, the assessment also considers information from the existing database of previously recorded sites, general cultural chronologies, and the living memories of knowledge holders who have shared feedback about important sites through project engagement and on past projects.

6.1.7 Residual effects characterization

Table 6-2 provides the definitions used to characterize the residual effects on VC name.

Table 6-2: Characterization of residual effects on important sites

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to important sites relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to important sites relative to baseline.

Table 6-2: Characterization of residual effects on important sites

Characterization	Description	Quantitative measure or definition of qualitative categories
		Neutral – no net change in measurable parameters for important sites relative to baseline.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**No measurable change –** no disturbance of important sites is predicted. **Low –** a measurable or perceived change is predicted, but the disruption to the ability or preference to visit important sites or the ability to undertake cultural activities is not expected to be diminished and/or there is no anticipated loss to heritage resources. **Moderate –** a measurable or perceived change is predicted in which there will be short-term implications to the ability to undertake cultural activities and/or limited damage to heritage resources and/or cultural sites. Any encounters with undiscovered sites during construction would have at least a moderate magnitude of effect on the site; an assessment by a professional archaeologist would be required to evaluate the magnitude. **High –** an objectively clear change is predicted, resulting in long-term implications including long-term diminishment in the ability to undertake cultural activities and the loss/damage of heritage

Table 6-2: Characterization of residual effects on important sites

Characterization	Description	Quantitative measure or definition of qualitative categories
		resources, and the knowledge they provide.
Geographic Extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	Not applicable for heritage resources or other tangible important sites for which impacts cannot be undone. For other effects (e.g., to intangible cultural heritage, cultural experiences): **Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation

Table 6-2: Characterization of residual effects on important sites

Characterization	Description	Quantitative measure or definition of qualitative categories
	existing condition after the project activity ceases	**Irreversible –** the residual effect is unlikely to be reversed

6.1.8 Significance definition

For this assessment, adverse residual effects on important sites are considered significant if the proposed project results in:

- the destruction of a heritage resource
- a long term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated

The destruction of the object is considered the extreme end of the potential effect. Once a heritage object is destroyed, no further information can be learnt about that heritage resource and the knowledge and historical understanding that could have been gained from the object is lost.

The severity of the project's residual effects on important sites will vary between cultural groups and between individuals in cultural groups. Affected First Nation peoples and Red River Métis citizens will perceive the significance of these effects differently as each is different, uses the land differently, has different connections to different places, and views future use of the area differently. Recognizing the variation, significant adverse effects for important sites will be considered as a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated.

It is important to note that even if effects to individual components of the environment are deemed not significant, there could still be effects to important sites overall because of the presence of the project and due to perceived effects or stress caused by the project.

6.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of engagement feedback and windshield surveys. Heritage screening was informed by three pieces of information: documented history, known archaeological sites and detailed landscape analysis. LiDAR imagery was overlaid onto the study area to allow for visual examination of relict channels. The land use primarily consists of agricultural fields. The existing conditions described in this section focus on:

- The natural environment
- Land-based attributes
- Cultural history
- Registered heritage sites
- Cultural sites and features

6.2.1 The natural environment

The physical environment is composed of climate, landscape, soils, hydrology, local and regional topographic relief, and the geological processes that created the landscape. These factors not only assist with contextualizing heritage resources within an area, but also in determining areas within the PDA that have moderate to high heritage potential.

The RAA is located within the Rural Municipalities (RMs) of Rhineland, Montcalm, and Emerson-Franklin, on NTS 1:50,000 topographic map sheet 62H/03.

The RAA is situated in the Prairies Ecozone, the northern extension of the former open grasslands of the Great Plains of North America. Topographic relief is generally subdued. Originally, a large part of this ecozone consisted of tall-grass prairie. Almost all of this region has been converted to cropland or has been strongly modified by drainage, grazing and haying (Smith et al. 1990).

Soil materials in the Red River Basin were deposited during the time of glacial Lake Agassiz and primarily consist of deep, clayey lacustrine sediments. Soil drainage of these fine-textured sediments is dominantly poor and imperfect, given the general level to gently sloping landscape.

The major drainages are the Red and to a much lesser extent, the Roseau [Reed], rivers. Other drainages include Buffalo Creek and Riviere aux Marais [Marsh]. Both the Red and the Roseau rivers played an important role in the early exploration and settlement of the region.

6.2.2 Land-based attributes

The cultural history for Manitoba is complex and covers a period of approximately 8,000 years from the receding of the glaciers to present day (Klassen 1983). The area was deglaciated some 12,000 years ago but was largely inundated by glacial lake Agassiz until 8000 years ago (Figure 6-1). The significance of this is that the area was largely uninhabitable until some 8000 years ago.

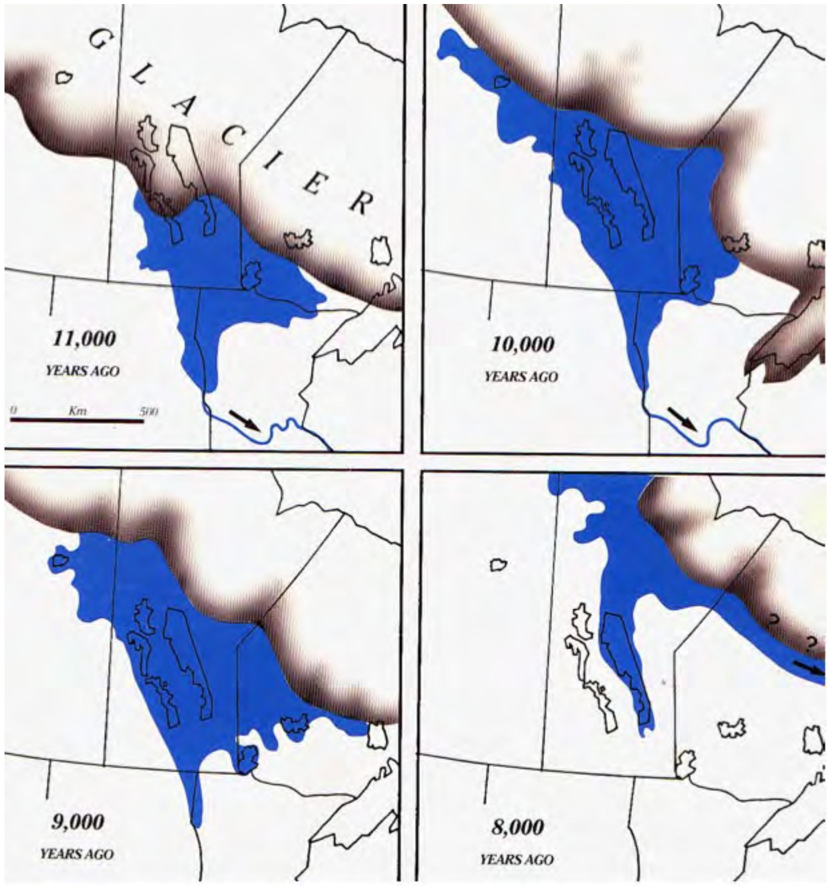


Figure 6-1: Deglaciation of the RAA

6.2.3 Cultural history

The following is a summary of cultural history in the project area The chronology comprises two major periods: the Indigenous Period and the Indigenous European Period.

6.2.3.1 The Indigenous Period

Early Indigenous Period (ca. 12,000 – 8,000 B.P[3])

The earliest period, known as the Palaeo (or Early) Period, begins around ca. 12,000 years Before Present (B.P.) to ca. 8,000 B.P. As mentioned above, the RAA was not

[3] B.P. "Before Present" – a dating technique based on the number of years before 1950 A.D., the date that is used as the base for radio-carbon dating

habitable during this time period due to either being covered by glaciers or by glacial lake Agassiz.

The Intensive Diversification (or Middle) Period (8,000 to 2,000 B.P.)

The Intensive Diversification (or Middle) Period represents a time of technological shift reflected by the introduction of atlatl darts and side-notched projectile points, and a shift of subsistence strategies from megafauna to small-scale hunting. The major cultural complex occupying central Manitoba during the Middle Period is the Shield Archaic, which may have developed out of the Plano complex of southern Keewatin District and eastern Manitoba (Wright 1995). Shield Archaic technology is characterized by bifacially flaked stone knives, side-notched and lanceolate projectile points, and large end scrapers. Another characteristic of the Shield Archaic is the manufacturing of tools and ornaments from native copper. Most of this copper was obtained from sources in the upper Great Lakes region around the shores of Lake Superior. However, there are sources in the Northwest Territories that may have also been used. (Wright 1995). Subsistence hunting focused on bison, supplemented with other resources.

The Woodland (or Late) Period (2,000 to 300 B.P.)

The Intensive Diversification Period was followed in the south portion of the province by the Woodland (or Late) Period (2,000 to 300 B.P), which is characterized by the introduction of pottery and the use of the bow and arrow. Rock art, in the form of petroforms, pictographs, and petroglyphs, also becomes prominent throughout the landscape.

It is likely that Plains pottery traditions made their way into the area with a continued focus on bison hunting. The stone tools consist of side-notched and triangular projectile points, a variety of scrapers, modified cobbles, and hammer stones.

Another important characteristic of Woodland culture in southern Manitoba was the practice of burying the deceased beneath earthen mounds. This custom of burying the dead beneath mounds is largely confined in Western Canada to southern Manitoba (Northern Lights Heritage Services Inc 2008) Registered burials within the RAA can be found in Table 6-4.

6.2.3.2 Indigenous European Period (c.a. 300 B.P. to present)

Prior to its establishment as a settlement the area was known for its rich bison resources. Several Indigenous trails criss-crossed the study area and this network was later used by European explorers and traders. The first European explorer to arrive in southern Manitoba was Christophe Dufrost de la Jermerais, nephew of Pierre Gaultier de La Vérendrye and his “second in command” in the venture to discover the “Western Sea” (Champagne 2003). In 1731, Dufrost’s first expedition was with his uncle where they constructed Fort Saint-Pierre at the western end of Lac La Pluie (Rainy Lake). The following year he accompanied the explorer to Lac des Bois (Lake of the Woods) and helped build Fort Saint-Charles. In 1733, with his cousin Jean-Baptiste Gaultier de La Vérendrye, he travelled within a few kilometers of Lac Ouinipigon (Lake Winnipeg). A small post was constructed at the junction of the Roseau and Red rivers, known as Fort Roseau and this was the location where Dufrost fell ill and died on May 10, 1736 while travelling between Fort Maurepas and Fort Saint-Charles. He was buried “at the Fourche des Roseaux” near the present village of Letellier, Manitoba (Champagne 2003). His is the first recorded burial site of a European on the Canadian prairies (Ledohowski 2003). It was not until 1737 that Pierre Gaultier de La Vérendrye, the Explorer, reached the Prairies and the two forts on the Red River.

'The explorer, Alexander Henry, is known to have established his major post at nearby Park River in 1800, sending small detachments to winter at Riviere aux Marais (near St Joseph) and Hair Hills’ (Manitoba Culture Heritage and Tourism 1994).

The Rivière aux Roseaux, which flows nearby, served as a river route for the Indigenous peoples who travelled there. The Sioux had named it the “warriors’ route” and travelled the river during their war expeditions or their hunting and fishing trips. It was on this route that the Indigenous guides led the explorer Pierre Gaultier de La Vérendrye and his companions during their expeditions from Lac des Bois, near which the Rivière aux Roseaux originates. The French explorers likely used this river to continue their explorations in the West. Then, in 1869, the Hudson’s Bay Company founded a trading post along the Rivière aux Roseaux.

The major trails in the project area were a small section of the cart trail from Fort Garry to Pembina along the west bank of the Red River near Letellier and the Crow Wing Trail along the east side of the Red River. The Boundary Commission Trail extended west from the Red River at the town of Emerson (Fort Dufferin) and was originally used by traders and hunters until the 1870s and 1880s when it was adopted as a route for the North-West Mounted Police.

For a relatively small section of Manitoba, the area has a diverse ethnic population. Altona was settled by Russian Mennonites in 1880, St Joseph and Letellier were settled by the Quebecois French in 1877 (although Métis may have settled here earlier), and Dominion City was settled by English settlers from Ontario in 1876. Each of these settlements is briefly described.

Altona is in the West Mennonite Block, which was granted in 1876. Old Altona was laid out in traditional Mennonite style with a main road and farms on either side. New Altona, or Altona, was essentially a railway town.

The community of St. Joseph is situated northwest of Emerson. St. Joseph was first known as Mission de la Riviere aux Marais, after the river flowing past Letellier. Archbishop Tache established a parish here in 1877 and named it St. Joseph, after the patron saint of Canada. The area was largely settled by French Canadians from Quebec (Manitoba Conservation 2000).

Letellier was originally known as Catherine and the name was changed to Letellier in 1881, after the lieutenant-governor of Quebec. The first to come and settle permanently in the region were Métis who came mainly from Saint-Norbert. Most of the Métis did not keep their land after 1870 and left the region to settle in the Northwest. Starting in 1866, English-speaking settlers came to settle in the region served by Presbyterian ministers from Emerson. French-Canadian settlers, mainly from the United States, also arrived in large numbers between 1876 and 1877 at the site of Letellier.

The town of Dominion City dates to 1874 when the first settlers began to arrive from Ontario. The townsite had been known as Roseau Crossing because of an excellent ford over the Roseau River. That same year the Canadian Pacific Railway (CPR) started construction on the Pembina Branch rail line. The Pembina Branch was a 67 mile stretch of track that ran north, along the east side of the Red River from St. Vincent, Minnesota to St. Boniface. The last spike was driven in at Dominion City in 1878. By 1879, the CPR built spur tracks from Roseau Crossing to what is known as Greenridge to mine gravel. The spur track on the south side of town had a camp of a thousand men to load the cars carrying gravel every half hour. The track operated until 1882 when it was pulled up when commercial gravel was obtained from Birds Hill (Waddell 1970).

6.2.4 Registered heritage sites

A review of the Provincial and Municipal designated sites and commemorative plaques indicated a total of 20 Provincial sites, 6 Municipal sites and 2 plaques are in the RAA.

The provincial site registry listed 20 registered archaeological sites within the RAA. These sites are listed in Table 6-3. Few of the sites have evidence of cultural affiliation and it is not clear how much subsurface testing took place. With such a small data set, any observations on this data set should be treated as speculation. Plotted on a map, these sites are clustered along the Buffalo Creek, Red River, and Rivière aux

Marais. This clustering of sites reflects settlement pattern but may also represent ease of site discovery (sites are exposed in eroding riverbanks).

Table 6-3: Provincially registered archaeological sites located within the RAA

Site	Site Type	Description	Within LAA or RAA
DgLh-010	Precontact	Lithic scatter on the east side of the Red River	RAA
DgLh-013	Historic	Farm implements & household debris embedded in the riverbank	RAA
DgLh-004	Late Middle	Site located along Riviere aux Marais	RAA
DgLh-006	Besant	Scatter of cultural material	LAA
DgLh-009	Woodland	Isolated find, 2 artifacts	LAA
DgLi-001	Probably late woodland	Campsite	LAA
DgLj-003	Archaic; Woodland	Isolated find, poorly recorded	RAA
DgLj-004	Archaic; Woodland	Campsite	RAA
DgLj-005	Historic	Settlement was not inspected	RAA
DgLh-014	Precontact	Isolated find; single biface	RAA

DgLh-016	Precontact	Ancestral remains, 14 bison bone fragments	RAA
DgLh-018	Precontact	Isolated find, scatter of lithic flakes	RAA
DgLh-019	Laurel complex, mid and late Woodland	Campsite; site has been disturbed or destroyed by agricultural practices	RAA
DgLj-009Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA
DgLj-011Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA
DgLj-012Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA
DgLj-013Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA
DgLj-014Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA
DgLj-015Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	LAA
DgLj-016Y	Unknown	Site was archaeologically assessed and marked, but no form was submitted	RAA

One of the sites was a historic campsite, the rest can be considered early or pre-European contact. The earliest sites are a possible Pelican Lake and a Besant projectile point, and two sites noted as Archaic-Woodland. The rest of the identified sites fall within the last 2000 years. Three of the sites were identified as bison kill sites and those with artifacts contain elements of Plains bison hunting cultures. Two of these have associated campsites.

There is one site with Laurel/Blackduck ceramics and five listed as Woodland suggesting the presence of Woodland subsistence patterns, which are more diversified than the Plains bison hunting. This suggests that Woodland cultures were moving into the area and the importance of traditional plains bison hunting was diminishing. Métis bison hunting, which represented a new bison hunting tradition, is not represented in these sites.

Of the 20 sites, four are in the LAA: DgLj-015Y, DgLi-001, DgLh-006 and DgLh-009. DgLi-001 is an artifact scatter, DgLh-006 produced a Besant point, and DgLh–009 is recorded as an isolated find. DgLj-015Y is uninterpreted. The location of all four sites may require additional assessment.

In addition to the above, there are five burial sites registered by the HRB within the RAA (Table 6-4). Four of the sites are likely pre-European contact. Two of them are burial mounds. The Roseau River Mound is reported to be destroyed. The importance of the mounds and burials lend to the cultural significance of this area.

One burial, DgLh-015Y, would be the burial of La Verendrye’s nephew la Jereraye. This burial location is estimated from historical documents.

Table 6-4: Burials Registered by the HRB within the RAA

Borden No.	Name	Location
DgJh-001	Roseau River Mound	Roseau River
DgLh-003	Letellier Mound	Riviere aux Marais
DgLh-015Y	La Jemeraye Burial	Location estimated
DgLj-002	Buffalo Creek Site	Buffalo Creek

DgLj-003	Braun Site 1	Buffalo Creek

There are six municipally designated sites located just outside the LAA. These consist of three historic sites in Altona and three historic sites in Dominion City. These sites are listed in Table 6-5.

Table 6-5: Designated provincial and municipal sites located within the RAA

Name	Site type
Bergthaler Church Waisenamt	Municipal
Klippenstein House	Municipal
Schwartz House	Municipal
All Saints Anglican Church	Municipal
Dominion City Cemetery	Municipal
Timber Truss Bridge	Municipal

There are only two plaques registered within the RAA, although this does not count steel markers and monuments for early schools. The existing plaques are located outside of the LAA.

These sites are listed in Table 6-6. The First Railway plaque documents the completion of the Pembina Branch of the Canadian Pacific Railway in 1878. The Pembina Branch ran some 100 kilometres from St. Boniface to the international boundary at Emerson, connecting Manitoba to eastern Canada by rail through the United States (Manitoba Historical Society 2019). This plaque is located beside the Manitoba Biggest Sturgeon, which was caught in the Roseau River in 1903.

Table 6-6: Plaques

Dominion City	First Railway in Western Canada
Dominion City	Manitoba’s Biggest Sturgeon

Finally, there are two centennial farms registered in the area, one in 1894 and one is 1884 (Table 6-7). Homesteading began in Canada in 1872. The farmers in the RAA were likely Mennonites, who received their block of land in 1874.

Table 6-7: Centennial farms

Region	Farm location	Year established
Altona	NW 21-1-1 W	1894
Dominion City	SE 22-3-2 E NE 22-3-2 E	1890

To summarize:

- In the RAA, there are 20 Provincial sites, 6 Municipal sites, 2 plaques and 2 Centennial farms.
- In the LAA, there are 4 provincially designated sites, and no municipally designated sites or plaques

6.2.5 Areas of elevated concern

Based on the review of documented history, known archaeological sites, landscape analysis, and professional judgement of the project archaeologist, five areas of concern (AOC) with elevated archaeological potential were identified.

A windshield survey on June 12, 2024 allowed for visual assessment of the landscape and confirmed there are no observable historic structures or plaques along the PDA.

All five areas are within the LAA and were identified based on proximity to known archaeological sites, the Riviere aux Marais, Buffalo Creek, and the Red River.

AOCs linearly traverse approximately 6.6 kms of the PDA at the following general locations:

- AOC one was to the west-southwest of Buffalo Creek.
- AOC two was near a known archaeological site east of Altona.
- AOC three was near the Riviere aux Marais and numerous archaeological sites.
- AOC four was flagged as it is near both the Riviere aux Marais and the Red River.
- AOC five was flagged as it is near both the Riviere aux Marais and the Red River.

Pedestrian surveys and shovel testing prior to construction will be focused in these areas.

The AOCs are further detailed in Appendix B.

6.2.6 Cultural sites and features

Manitoba Hydro hosted a project Open House on October 16th, 2024 in Roseau River Anishinabe First Nation, in which participants identified three important sites. These sites are known to the Nation, and rest within the LAA and RAA. These sites are further detailed below in Table-6-8.

Table 6-8: Important sites located within the RAA and LAA

Two burials south of Provincial Road-201	LAA
Cemetery South of Provincial Road-201	LAA
Pow-wow grounds and surrounding area, north of Provincial Road-201.	RAA

Through engagement on this project and past projects, Manitoba Hydro understands that both Crown and private lands are used for practicing rights-based activities. Crown land is highly valued as it is available for First Nations peoples and Red River Métis citizens to use for rights-based activities without permission. In the Manitoba Métis Federation's Manitoba-Minnesota Transmission Project (MMTP) Métis Interests Report (2016), the Manitoba Métis Federation explains the importance of unoccupied Crown land as "…areas where they can exercise their Métis rights without permission. On all other land types, the exercise of Métis rights can be restricted from time to time under certain circumstances." (Manitoba Métis Federation 2016)

The PDA traverses approximately 1.2 ha of Crown land, which is comprised entirely of drains and amounts to 0.84% of the PDA (Table 5-6).

With landowner permission, private lands also provide areas for First Nations peoples and Red River Métis citizens to undertake rights-based activities.

Based on past engagement on projects in southern Manitoba, Manitoba Hydro also understands that both Crown and private land can contribute to the fulfillment of Treaty Land Entitlement (TLE) agreements. TLE agreements have been negotiated between certain First Nations and the federal government to fulfill outstanding land-related treaty obligations (Indigenous Services Canada 2017).

Although there are currently not any TLE selections in the RAA, Peguis First Nation and Roseau River Anishinabe First Nation, who are being engaged about the project, have TLE settlement agreements that are not yet entirely fulfilled. Both nations' TLE agreements include an amount of provincial Crown land to be selected as well as an amount of land to be acquired from private landowners who are willing to sell (Indigenous Services Canada 2017).

Manitoba Hydro recognises that a lack of information regarding important sites does not necessarily represent a lack of cultural use or importance of the area. Even where specific important sites were not shared through project engagement, Manitoba Hydro assumes that they are potentially present within the project area. Further, Manitoba Hydro understands that the area is of broad cultural importance to engaged First Nations and the Manitoba Métis Federation who have maintained enduring relationships with the land in the area for generations.

6.3 Project interactions with important sites

Table 6-9 identifies, for each potential effect, the physical activities that might interact with important sites and result in the identified effect.

Table 6-9: Project interactions with important sites		
Project activities/components	Changes to important sites, including heritage resources in their in-situ context and tangible cultural sites or features	Changes to cultural experience, including intangible culture, cultural practices, knowledge transmission, and access to important sites
Construction of pipeline, gate station, and valve sites		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	-	✓
Pipe installation – trenching and lowering	✓	✓
Horizontal directional drilling	✓	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-
Backfilling and contouring	✓	✓
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline, gate station, and valve sites		
Presence of pipeline, gate station, and valve sites	-	✓
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-
Valve operation checks (annually)	-	-
Vegetation management	✓	✓
Decommissioning of pipeline, gate station, and valve sites		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓

Table 6-9: Project interactions with important sites		
Project activities/components	Changes to important sites, including heritage resources in their in-situ context and tangible cultural sites or features	Changes to cultural experience, including intangible culture, cultural practices, knowledge transmission, and access to important sites
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	✓	✓
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction
– = No interaction

6.4 Assessment of project effects

While effects to important sites could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction and include the following:

- Changes to important sites
- Changes to cultural experience

The following sections assess the pathways for each effect, describe mitigation measures to reduce potential effects, and characterize residual effects following the application of mitigation measures.

The assessment draws on information shared by rights-bearing nations and individuals during project engagement on this project and past projects.

6.4.1 Effects pathways

6.4.1.1 Changes to important sites

Important sites, including heritage resources and cultural sites or features important to First Nations peoples and Red River Métis citizens, may be changed by the project during construction, operations, and decommissioning. The pathways through which important sites may be affected by the project include:

- Project activities that may cause disturbance of heritage resources, features and objects located beneath or upon the surface from their in-situ context, mainly those project activities involving ground disturbance
- Project activities that may cause disturbance of tangible cultural sites or features important to First Nations peoples and Red River Métis citizens, including project activities involving ground disturbance, increased noise, and/or restricted access to important sites

<u>Analytical assessment techniques</u>

Changes to important sites are assessed by predicting the project's potential to encounter heritage sites and/or resources and other culturally important sites and features.

In relation to heritage resources, the likelihood of an area to contain heritage resources is known as the archaeological potential. Archaeological potential within the project area was assessed by reviewing archival maps, photos, LiDAR, information gathered during project engagement, input from the HRB, and mapping potential locations (e.g., types of landforms, nearness to documented heritage resources, proximity to water) in relation to the project footprint.

Because registered archaeological sites or heritage resources are protected under *The Heritage Resources Act*, maps of these locations cannot be made public and are not provided in this assessment.

The assessment of possible effects on cultural sites, features, and practices qualitatively draws on information shared through project engagement with engaged First Nations and the MMF, and experience in the protection of these sites on past projects with the involvement of the archaeological community and Indigenous nations.

Construction

Sites, including heritage resources and other tangible cultural sites or features present in the soil or on the landscape in the project area, are primarily vulnerable to project activities involving ground disturbance. Less common is disturbance of sites or features located on the surface because they are easier to detect prior to project activities. This would include spaces used for ceremony or other cultural purposes, such as trees with prayer flags.

Much of the LAA is cultivated, which indicates that any cultural materials to a depth of approximately 30 cm are likely disturbed. Cultivation can move or damage artifacts, and small features such as hearths. However, there is some residual information in cultivated field sites.

There can also be some damage from overbank flooding, which can also erode features and move artifacts. Depending on the distance to the river, overbank flooding can also preserve archaeological deposits through the deposit of sediments during periods of flooding. The analysis of sediments can help determine whether sites would be preserved or damaged by the flooding. Given the project's proximity to the Red River, which is within the LAA, there is the potential to encounter artifacts during construction that have been moved further inland from the riverbank as the result of past overland flooding events.

During construction, the primary project activities that may result in disruption of heritage resources and tangible cultural sites or features are those that involve ground disturbance. The primary area of concern is the PDA, and within the PDA, the pipeline trench. During construction, trenching is the project activity involving the largest amount of ground disturbance. Pipeline trenches are narrow linear disturbances, and they are more likely to damage than destroy buried archaeological sites.

Other project activities during construction that may involve ground disturbance include the use of vehicles and equipment, right-of-way clearing, and access routes.

Review of available heritage resources information determined that there is only one recorded heritage site near the PDA. Five areas of concern (AOC) with elevated heritage potential were identified by the project archaeologist for investigation through pedestrian surveys and shovel tests prior to construction. These AOCs are described in Section 6.2.6 and in greater detail in the technical memo included in Appendix B.

During project engagement, Roseau River Anishinabe First Nation shared a few cemetery and ceremonial locations on a map, all within the RAA. Peguis First Nation shared that an area to the north of the gas pipeline may hold higher potential for the presence of heritage resources. Peguis First Nation noted that other projects they have been engaged in within the area have identified heritage resources, especially along the Red River. They noted concerns for heritage resources to be present in this project.

Peguis First Nation identified previous heritage work undertaken in the region by the Manitoba Métis Federation and noted this work to be challenging due to environmental factors including weather. They were also made aware that there were heritage resources found in the surrounding region.

The Manitoba Métis Federation shared the potential for adverse heritage effects at sub-river crossings and anywhere with near-water construction. A representative of the Manitoba Métis Federation shared concerns about the archaeology/heritage approach overall within Manitoba and the approach taken to incorporate Métis heritage in their work, as much of the focus is from a First Nations lens and forget that the Métis are a post-contact Indigenous nation.

Operations

During operations, the potential for the project to disturb important sites is substantially diminished because ground disturbance is anticipated to be low. Potential effects during operations are generally related to maintenance activities, including vehicle and equipment use for repairs and vegetation management.

New information that may be learned about important sites in the area during pre-construction field work or during construction may highlight information relevant to operations (i.e., new locations to be aware of).

Decommissioning

During decommissioning, important sites may be affected through pathways like the construction phase. Decommissioning activities such as vehicle and equipment use, disassembly and removal of pipeline infrastructure, and rehabilitation require ground disturbances.

Effects would primarily be limited to previously undisturbed areas. However, it is possible that new important sites for rights-based activities could be established between the time of construction and decommissioning of the project, which is anticipated to take place in at least 50 years.

6.4.1.2 Changes to cultural experience

The project has the potential to affect cultural experience, during construction, operation, and decommissioning. The pathways through which cultural experience may be affected by the project include:

- Project activities that may alter sense of place, aesthetics, and/or cause stress, resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices
- Project activities that include increased noise or changes in the type of noise
- Project activities that restrict access to important sites resulting in loss of opportunities for cultural experiences, practices, and knowledge transfer

Access, in this context, refers to whether and how people can physically visit an area.

Analytical assessment techniques

Changes in cultural experience are assessed through a qualitative assessment of feedback related to potential project impacts to cultural experiences, residual effects on noise and psychological stress and changes to access.

Construction

During construction, the primary project activities that may result in changes to cultural experience by affecting the sense of place include the use of vehicles and equipment, access development, marshalling yards, right-of-way preparation, pipe installation, horizontal directional drilling, backfilling and contouring, gate stations and valve site connections, and clean-up and reclamation. The project may also affect cultural experience through project activities that cause noise and changes to access.

Throughout construction, there will be an increase in noise or change in the types of noise in localized to the areas under active construction.

For the duration of active construction, access to the PDA (right-of-way) is prohibited. Physical barriers (*i.e.,* gates, fences) may be in place during this time to deter access to the area. These access restrictions are intended to protect health and safety while construction activities are underway. However, the restrictions also prevent access to important sites and access points that may be located along the PDA.

Although there is only a small amount of Crown land traversed by the PDA (1.2 ha, or 0.84% of the PDA), all of it being drains, Manitoba Hydro understands based on engagement feedback shared for this project and past projects, that First Nations peoples and Red River Métis citizens may also use private land to practice cultural activities with landowner permission. The Manitoba Métis Federation shared that there are interests related to constitutionally protected rights on private lands that may be used for harvesting with landowner permission and that there may be Métis owned private lands in the area on which Red River Métis citizens undertake cultural activities. In areas of private land along the PDA, where landowners may currently grant permission for individuals to use their property to undertake rights-based activities, those areas would be inaccessible during construction.

Limiting access has the potential to affect cultural experiences by affecting cultural continuity and knowledge transfer. A loss or diminishment of experience of important sites, through the pathways described, may have long-term implications on cultural vitality of Indigenous peoples due to diminished opportunity for the intergenerational transmission of cultural and Indigenous Knowledge that occurs through participating in cultural practices (i.e., intangible cultural heritage).

Operations

During operations, the potential for the project to result in changes to cultural experience are generally related to the presence of pipeline, gate station and valve sites, maintenance activities, vehicle and equipment use, and vegetation management.

Changes to aesthetic conditions resulting from project activities during operations, may affect Indigenous peoples' sense of place, defined as peaceful enjoyment of lands and waters without sensory disturbances, stress, or harassment, and their emotional and spiritual attachment to culturally important places. Effects to sense of place would primarily occur during scheduled inspections and maintenance activities described in Chapter 2 (Project description).

During operations, access to the PDA (right-of-way) may be prohibited on occasion to allow for inspections and maintenance activities to proceed in a safe manner. Aside from these localized and isolated periods of access restriction during specific activities, access to the PDA will return to the same state as it exists prior to the project.

Decommissioning

During decommissioning, potential effects are generally related the removal of above-ground components (dismantling, removal from site, disposal), rehabilitation and clean up, vehicle and equipment use, and mobilization and staff presence. The pathways to the effects are like those during the construction phase.

6.4.2 Mitigation measures

Potential effects can be reduced through implementation of effective mitigation measures including general environmental protection measures, beneficial management practices, standard operating procedures, environmental protection plans, and environmental restoration plans. This section describes mitigation measures that have been identified to reduce effects on important sites.

6.4.2.1 Mitigation for changes to important sites

The primary methods for protecting archaeological sites are discovery and mitigation. The purpose of undertaking a Heritage Resources Impact Assessment is to facilitate site discovery. Within the areas of concern (AOCs), Manitoba Hydro plans to conduct pedestrian surveys by walking the cultivated fields and excavating shovel tests. If archaeological sites are discovered prior to any potential effects from the development, there is potential to move some activities related to the development, which would remove the effect or capture the information contained within the archaeological site before it is damaged or destroyed (mitigation).

A Heritage Resources Impact Assessment (HRIA) study will be conducted prior to construction activities to identify heritage resources within the PDA and then mitigate the potential effects. The implementation of the Cultural and Heritage Resources Protection Plan (CHRPP) during the construction phase within areas of high archaeological potential is meant to mitigate any heritage resources disturbed during that phase of the project. These are standard measures applied to other Manitoba Hydro projects and have been successful in avoiding the significance threshold.

Project-specific mitigation measures to avoid or reduce the potential effects of the project on important sites are described below.

- Pre-construction survey of areas with heritage potential. A total of five areas of heritage concern have been identified, including relict channels and archaeological sites. These features may have the potential for heritage resources on or along their margins. Areas to be surveyed prior to or during construction have been determined by:
    - reviewing archival maps, photos, LiDAR, mapping potential locations (e.g., types of landforms, nearness to documented heritage resources, proximity to water),
    - reviewing information gathered during project engagement; and examining input from the HRB,
    - Windshield surveys.
- Mitigation for the protection of heritage sites or objects is outlined in the CHRPP. The CHRPP will provide clear instructions on how to proceed should Manitoba Hydro, its contractors and/or consultants, discover or disturb a cultural or heritage site or object and will determine the ongoing protection measures for the resources through processes outlined in this document.
- If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only if approval is received from the archaeologist or the Historic Resources Branch.
- Manitoba Hydro will work to notify engaged First Nations and the Manitoba Métis Federation about archaeological finds.
- Manitoba Hydro remains open to engaged First Nations and the Manitoba Métis Federation in identifying sensitive sites to help inform the environmental protection program for the project.
- Identified cultural and heritage sites will be marked for protection prior to construction.

- Existing access roads, trails or cut lines will be used to the extent possible.

6.4.2.2 Mitigation for changes to cultural experience

Through engagement on past projects, Manitoba Hydro has learned about the importance of providing people working on projects, particularly those who are non-local, with Indigenous cultural awareness training prior to work taking place. First Nations have also shared perspectives about the importance of incorporating ceremony into projects to show respect for the spirits and peoples that may be affected by a project. During project engagement, Peguis First Nation requested that a ceremony, inviting participation by other engaged nations, take place prior to heritage work commencing as well.

These recommendations provide opportunities for cultural continuity and knowledge transfer.

Project-specific mitigation measures to avoid or reduce the potential effects of the project on cultural experience are described below.

- Manitoba Hydro will provide notification to engaged First Nations and the Manitoba Métis Federation and relevant interested parties prior to the start of construction.
- Indigenous Cultural Awareness Training will be required for project workers (i.e., both Manitoba Hydro staff and contractors) before their participation in project work.
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies at times that would work for those interested in participating.
- Contractors will be restricted to established roads and trails and cleared construction areas in accordance with the Access Management Plan.

6.4.3 Characterization of residual effects

This section describes the residual project effects to important sites that are predicted to remain after the application of mitigation measures. Table 6-2 provides the definitions used to characterize the residual effects.

6.4.3.1 Residual effect on important sites

Heritage resources and objects are non-renewable and once disturbed or destroyed can never be returned to their original context, losing key information. A potential adverse effect on heritage sites is disturbing them from their in-situ[2] condition. Disturbance may range from displacement from the original context to complete destruction. If a disturbed heritage resource gets displaced from its in-situ context, some to all information about the heritage object can be lost. A heritage resource disturbed to a minor extent can retain information such as typology and association with a complex or culture. However, detailed information such as association with other heritage objects from the area and stratigraphic deposition can be lost. At the extreme, disturbing a heritage object can result in the destruction of the object. When a heritage resource is destroyed, the knowledge and historical understanding that could have been gained from the resource is lost.

For intangible cultural sites and features important to First Nations peoples and Red River Métis citizens, the potential range of adverse effects is aligned with the range identified for heritage resources, from loss of integrity and/or information about the site or object to complete destruction. Where intangible cultural heritage or cultural experiences may be disrupted, the potential adverse effects are expected to vary broadly based on the unique relationships that different Indigenous nations and individuals have with the area in terms of cultural practices, experiences, and perspectives.

Following mitigation, there is still potential for the project to encounter important sites throughout the PDA and potentially decrease the number or quality of heritage resources and other important sites and features.

Residual effects for changes to important sites are characterized by the following:

- Direction: Adverse
- Magnitude: Moderate during construction and decommissioning, low during operation
- Geographic extent: PDA
- Duration: Long-term
- Frequency: Multiple irregular events for most effects to important sites, but effects to intangible cultural heritage may be continuous through operations due to the ongoing presence of the project
- Change: Irreversible

6.4.3.2 Residual effect on cultural experience

Following the implementation of mitigation measures, predicted residual effects on cultural experience include:

- alterations to sense of place, aesthetics, and/or stress, resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices
- increased noise or changes in the type of noise
- Access restrictions to the PDA during construction
- Intermittent localized access restrictions to the PDA during maintenance activities

Although First Nations peoples and Red River Métis citizens may access private land for right-based activities with permission, project effects to access to important sites will affect only those who are landowners or who specifically obtain permission to use private land within the LAA.

Following the implementation of mitigation measures described above, residual effects for changes in cultural experience are characterized by the following:

- Direction: Adverse
- Magnitude: Moderate during construction, decommissioning, and low during isolated periods of maintenance activities
- Geographic extent: LAA
- Duration: Long-term throughout construction, operation and decommissioning; as it relates to the presence of the pipeline, noise and access restrictions
- Frequency: Continuous (during construction, decommissioning, and during operations due to presence of the line) and irregular events when maintenance activities take place
- Change: Irreversible

6.4.3.3 Summary of residual effects

Table 6-10 characterizes the residual effects on important sites.

Table 6-10: Project residual effects on important sites

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Changes to important sites						
Construction	A	M	PDA	LT	IR	I
Operation	A	L	PDA	LT	C	I
Decommissioning	A	M	PDA	LT	IR	I
Changes in cultural experience						
Construction	A	M	LAA	LT	C	I
Operation	A	L	LAA	LT	C	I
Decommissioning	A	M	LAA	LT	C	I

6.4.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the important sites and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For important sites, both conditions are present.

Past and ongoing project and activities including the development of transmission lines, roads, railway, and resource development in the RAA have drastically altered important sites since European contact first occurred. A more detailed history of activities that have altered the cultural landscape and Indigenous connections to land in the project area is included in Chapter 5 (Environmental setting).

6.4.4.1 Project residual effects likely to interact cumulatively

Table 6-11 shows the project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the project to impact important sites. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 6-11: Potential cumulative effects on important sites name

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Changes to important sites	Changes to cultural experience
Existing/ongoing projects and activities		
Domestic resource use (e.g., hunting, trapping, fishing)	-	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓	✓
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	✓	✓
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	✓	✓
Manitoba Hydro gas and electricity transmission and distribution	✓	✓

Table 6-11: Potential cumulative effects on important sites name

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Changes to important sites	Changes to cultural experience

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

6.4.4.2 Cumulative effects on important sites

6.4.4.3 Pathways for cumulative effect

Ongoing/existing projects and activities in the RAA have the potential to interact cumulatively with the project's residual effects on important sites if they involve activities involving ground disturbance, clearing of forested areas, or create noise and/or access disruptions. Effects related to noise and access will only be additive if the activities causing noise or disruptions in access to important sites occur concurrently and close to one another.

Cumulative effects can affect both important sites and the resolution and fidelity of archaeological knowledge. Small impacts may degrade and potentially destroy the integrity of important sites over time, even though the effect of each individual impact is limited. As archaeological sites provide only a small sample of past cultural activity, losing one or more archaeological sites in a region can significantly reduce the archaeological knowledge of a region. Ongoing activities that have the potential to disturb the ground have the potential to damage or destroy important sites.

6.4.4.4 Mitigation measures

Project mitigation measures will help reduce project residual effects to important sites. Manitoba Hydro will continue to consider feedback related to mitigation for how the project contributes cumulatively to effects to important sites in the RAA.

Other proponents maintaining existing projects and activities in the project area are responsible for reporting relevant activities to the Historic Resources Branch and may adopt mitigation measures to mitigate their own potential effects. The regulators can inform Manitoba Hydro if it appears that there are unanticipated adverse cumulative effects occurring. The Historic Resources Branch also reviews land-based developments through the heritage resource impact assessment program as mandated by *The Heritage Resources Act*. Therefore, additional mitigation for cumulative effects related to heritage resources are addressed by the provincial regulators as they determine whether future projects will require heritage investigations.

6.4.4.5 Residual cumulative effect

Residual cumulative effects on important sites, and the experience of visiting important sites are predicted to be adverse in direction. Magnitude is predicted to be low based on experience with transmission pipelines, consideration of the identified mitigation measures, the residual and cumulative effects characterizations for feedback heard during project engagement. Geographic extent of predicted cumulative effects would be the RAA.

Cumulative effects resulting from noise and changes in access are likely to be more temporary in nature and only interact cumulatively during periods of overlapping activity. On the other hand, effects related to the ongoing presence of the project in conjunction with ongoing and existing projects and activities, are considered long-term until individual projects no longer contribute effects on important sites (*i.e.,* until the activity stops or the project is rehabilitated). While some cumulative effects on important sites may be reversible following decommissioning of the projects contributing to effects, Manitoba Hydro understands that effects resulting in the interruption of opportunities for Indigenous Knowledge transfer and cultural continuity that occurs through visiting important sites are not reversible.

6.4.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on important sites are predicted to be not significant.

Manitoba Hydro acknowledges that individuals and communities may experience effects to important sites in unique ways. Therefore, effects may be felt to different magnitudes depending on the individual, and some individuals may deem effects as substantive. With this variation in mind, the project is not anticipated to affect important sites to a point where long-term cultural experiences are critically reduced or eliminated based on qualitative assessments of indicators of the potential effects, literature review, engagement feedback, and professional judgment. With mitigation and environmental protection measures, the cumulative effects on important sites are predicted to be not significant.

With mitigation and environmental protection measures, the cumulative effects on VC name are predicted to be not significant.

6.4.6 Prediction confidence

Prediction confidence in the assessment of effects on important sites is moderate.

This prediction confidence assignment reflects the available information regarding heritage sites mentioned during engagement with First Nations people and Red River Métis citizens, a review of publicly available literature on important sites in the project area, experience with applying and monitoring mitigation measures on past Manitoba Hydro projects, and the assessments of other VCs of relevance throughout this assessment.

In relation to heritage resources, this prediction confidence reflects the limited number of land-based features of interest and low potential terrain, but also recognizes the limited number of archaeological studies in the area. The prediction confidence of smaller, ephemeral sites and burials is lower. The location decisions for these heritage resources are more specific and thus harder to predict. Chance find policies, as described in the CHRPP, are built around this understanding and outline reporting procedures if heritage resources are encountered in the study area.

Manitoba Hydro is aware that there may be important cultural sites and features present in the RAA that we are not aware of and have considered this assumption in this assessment. Given the qualitative and subjective nature of assessing potential effects to important sites, specifically to the experience of visiting important sites and enjoyment of place, the views of First Nations people and Red River Métis citizens may differ from the findings of this assessment.

6.4.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16).

Manitoba Hydro will continue to work with interested First Nations and the MMF to mitigate the above noted effects. The environmental protection program (EPP) is a framework for implementation, management, monitoring and evaluation of protection activities in keeping with environmental effects identified in environmental assessments, regulatory requirements, and public expectations. The EPP prescribes measures and practices to avoid and reduce adverse environmental effects (e.g., wildlife reduced risk timing windows, setbacks, and buffers for sensitive habitat).

Manitoba Hydro will provide opportunities for First Nations and the Manitoba Métis Federation to identify additional sensitive sites to help inform the EPP.

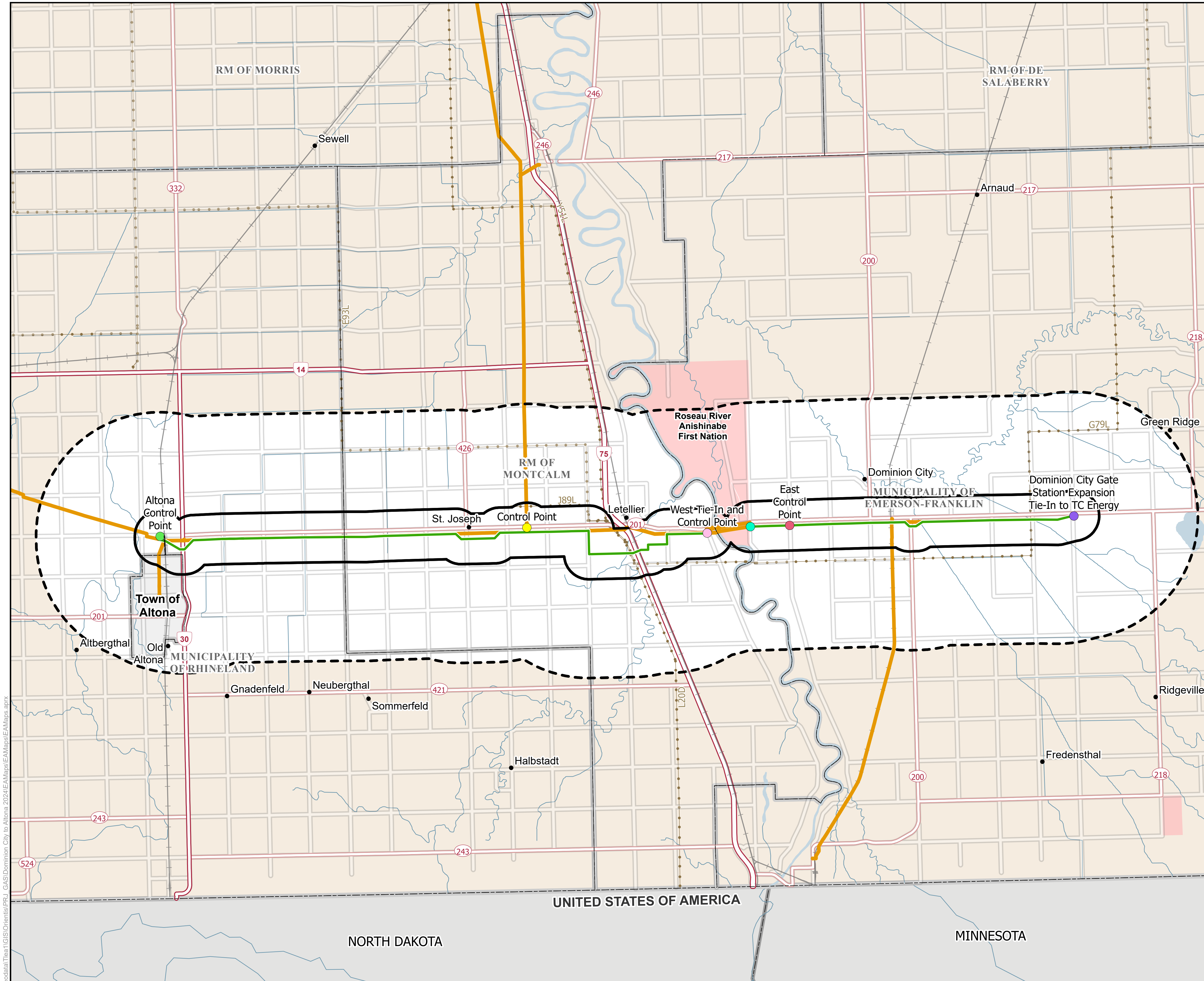
Manitoba Hydro will reach out to First Nations and the Manitoba Métis Federation to determine interest in a field visit to observe construction activities and to discuss ceremonies for those interested.

6.4.8 Sensitivity to future climate change scenarios

Effects of climate change on important sites are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

If heritage resources or cultural sites and features are located on the surface, the major risk with climate change is forest fires. Hotter and drier spring and summer weather will contribute to this. Subsurface heritage resources are less effected by fires. However, since charcoal from fires can diffuse into soil, fires may contaminate soil and make dating of subsurface heritage resources difficult. Droughts could expose previously underwater heritage resources, cultural sites, or features, while flooding could result in the disappearance of previously exposed heritage resources, cultural sites, or features.

Map 6-1: Spatial boundaries for important sites



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Components
- Altona Control Point
- Control Point
- Dominion City Gate Station Expansion Tie-In to TC Energy
- East Control Point
- East Tie-In
- West Tie-In and Control Point
- Preferred Route

Assessment Areas
- Local Assessment Area (1 km buffer around PDA)
- Regional Assessment Area (5 km buffer around PDA)

Infrastructure
- Transmission Pressure Gas Line
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line

Landbase
- Community
- Provincial Highway
- Provincial Road
- Local Road
- First Nation Lands
- City/Town
- Rural Municipality

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 1.5 3 4.5 6 Kilometres
0 1 2 4 Miles
1:150,000

Spatial Boundaries for Important Sites

Draft: For Discussion Purposes Only

Map 6-1

7.0 Vegetation

Vegetation for this environmental assessment refers to the diversity and characteristics of an area's plant cover. Vegetation provides ecological, aesthetic, recreational, and economic value, supports wildlife, and is important to traditional and cultural practices of Indigenous nations. Vegetation was chosen as a valued component for the following reasons:

- There is potential for the project to interact with species of conservation concern (SOCC).
- There is potential for the project to contribute to an increase in non-native, invasive or noxious weeds.
- Knowledge shared through project engagement included the potential harvesting of vegetation for traditional purposes in the project area.
- Through project engagement, the potential for interaction between the project and shelterbelts was identified as an area of concern.

7.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on vegetation. An assessment of cumulative effects on vegetation is also presented.

This assessment has been influenced by engagement feedback, information provided from a field reconnaissance survey, and Manitoba Hydro's experience with other transmission projects (both gas and hydroelectric) in southern Manitoba (e.g., Northwest Gas Transmission Project, the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, St. Vital Transmission Complex and Manitoba-Minnesota Transmission Project. The assessment considers the following:

- Memorandum from the vegetation field reconnaissance undertaken in June 2024 by Szwaluk Environmental Consulting Ltd (Appendix C)
- Desktop review of provincial and federal databases including the land cover classification, Manitoba Conservation Data Centre (MBCDC) (Appendix D), Species at Risk Act (SARA), Endangered Species and Ecosystems Act (Manitoba) (MBESEA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
- Feedback heard through project engagement (Chapter 4.0)
- Northwest Gas Transmission Project Environmental Assessment (2015)

- St. Vital Transmission Complex Environmental Assessment (2014)
- Dorsey to Wash'ake Mayzoon Transmission Project Environmental Assessment (2022)

7.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

7.1.2 Regulatory and policy setting

Effects to vegetation are provincially and federally regulated. The following laws, and associated regulations, policies, and guideline were considered for assessing project effects to vegetation.

7.1.2.1 Federal guidance

Species at Risk Act (SARA)

The federal *Species at Risk Act* (2002) (SARA) protects species at risk and their critical habitat in Canada. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated and to prevent species listed as special concern from becoming threatened or endangered.

Species at risk and their habitats are protected under SARA which prohibits:

- The killing, harming, or harassing of endangered or threatened species at risk (Sections 32 and 26)
- The destruction of critical habitat of endangered or threatened species at risk (Sections 58, 60, and 61)

Under SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the status of species at risk[4]. COSEWIC designates species at risk by listing them under Schedule 1 of SARA under the following classifications:

- Extirpated – a species that no longer exists in the wild in Canada, but exists elsewhere in the wild
- Endangered – a species that is facing imminent extirpation or extinction
- Threatened – a species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- Special Concern – a species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (Government of Canada 2021)

7.1.2.2 Provincial guidance

The Endangered Species and Ecosystems Act (Manitoba)

Provincially, at risk plant and animal species native to Manitoba are designated as endangered, threatened, extinct, extirpated (no longer present in Manitoba), or special concern and are protected under *The Endangered Species and Ecosystems Act* (2018) and its regulations (Province of Manitoba n.d.). In addition to designating the status of a species at the provincial level, the purposes of *The Endangered Species and Ecosystems Act* (ESEA) are to ensure protection and enhance the survival of endangered and threatened species in the province and to enable the reintroduction of extirpated species into the province.

Activities that would kill, disturb, or interfere with any listed species, or damage, destroy, or remove habitat and natural resources on which a listed species depends, are prohibited by Manitoba's ESEA.

At risk ecosystems can also be designated as threatened or endangered, and protected, under the MESEA. Two ecosystems are currently designated as

4 Under SARA and in relation to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), wildlife species include both animal and plant species, defining wildlife species as "a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years (Government of Canada 2002).

endangered: alvars and native grass prairie (Province of Manitoba 2023). Neither of these endangered ecosystem types intersect the project area.

Manitoba Conservation Data Centre

The Manitoba Conservation Data Centre (MB CDC) assigns conservation status ranks to plant and animal species in Manitoba based on their rarity along a five-point scale (Manitoba Conservation Data Center 2023). MB CDC ranks range from S1 to S5 as defined below:

- S1: Critically imperiled – at a very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors
- S2: Imperiled – at a high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors
- S3: Vulnerable – at moderate risk of extirpation in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors
- S4: Apparently secure – at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors
- S5: Secure – at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations, or occurrences, with little to no concern from declines or threats (NaturServe Explorer 2023)

The Noxious Weed Act (Manitoba)

The Noxious Weeds Act of Manitoba requires that municipalities inspect, monitor and control (or destroy) noxious weeds within their borders. Noxious weeds pose a threat to the economy (i.e., agriculture), the environment (e.g., invasive species) and human and animal health (e.g., poisonous weeds) (Rural Municipality of St. Andrews 2024).

Non-native and invasive plants regulated by *The Noxious Weed Act*, are categorized into three tiers as follows:

- Tier 1: Species considered to have the most potential for negative effects though they may not yet be present in Manitoba
- Tier 2: Species that already have already established in Manitoba and are observed to spread easily

- Tier 3: All other designated species

7.1.2.3 Other legislation

Other pieces of legislation that may be relevant to the project's interactions with vegetation include:

- *The Environment Act* (Manitoba) as it relates to the requirement for a pesticide use permit prior to implementation of a herbicide program for vegetation management.

7.1.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide feedback about the project.

Feedback from public engagement generally related to the value of shelterbelts. Knowledge gained from Indigenous engagement included the potential harvesting of vegetation for traditional purposes in the project area.

Through experience engaging on past gas transmission projects, Manitoba Hydro understands that general concerns related to the potential effects of gas transmission lines on vegetation include the potential loss or disruption to shelterbelts, the potential change or loss of species of conservation concern, loss or disturbance of existing wooded areas (i.e., private woodlots), development through wetlands, loss or disturbance of plants, and the spread of invasive plants.

7.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on vegetation, along with effects pathways and measurable parameters are outlined in Table 7-1.

Table 7-1: Potential effects, effects pathways, and measurable parameters for vegetation

Potential effect	Effect pathway	Measurable parameter(s) and units of measurement
Change in species of conservation concern and abundance and distribution.	Direct loss of plant species of conservation concern from construction activities. Indirect loss of species of conservation concern from the establishment of regulated weeds and non-native invasive species during construction and operation and maintenance activities.	Number, abundance, and spatial distribution of species of conservation concern Qualitative assessment of potential for regulated weeds and non-native invasive species to alter the abundance and distribution of species of conservation concern.
Change in invasive and non-native species abundance and distribution	Increase in abundance of invasive and non-native plants.	Number, abundance, and spatial distribution of invasive and non-native plants.

7.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on vegetation:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The total area of the PDA is 145 ha and is described in detail in Chapter 2.0 (Project Description).
- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA which is used to evaluate measurable effects on vegetation. The total area of the LAA is approximately 8,174 ha.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 15 km buffer around the PDA. This area is where there is the potential for cumulative

and socio-economic effects, and that will be relevant to the assessment of any wider-spread effects of the project. The total area of the RAA is approximately 183,561 ha.

The LAA and RAA used for the assessment of project effects on vegetation are consistent with the LAA and RAA boundaries being used to assess effects on wildlife and wildlife habitat. The LAA and RAA boundaries are also consistent with those that have been used to assess effects on vegetation on recent hydroelectric transmission projects in Manitoba.

Map 7-1 illustrates the spatial boundaries for the assessment of project effects on vegetation.

7.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on VC name are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

7.1.7 Residual effects characterization

Table 7-2 provides the definitions used to characterize the residual effects on vegetation.

Table 7-2: Characterization of residual effects on vegetation

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to vegetation relative to baseline **Adverse –** a residual effect that moves measurable parameters in a

Table 7-2: Characterization of residual effects on vegetation		
Characterization	Description	Quantitative measure or definition of qualitative categories
		direction detrimental to vegetation relative to baseline **Neutral –** no net change in measurable parameters for vegetation relative to baseline
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**No measurable change –** no measurable change is predicted **Low** – A measurable change in species is predicted but it is unlikely to affect sustainability in the LAA and there is no predicted effects **Moderate –** a measurable change affecting the sustainability of species of conservation in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of species of conservation concern in the RAA is predicted
Geographic extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA

Table 7-2: Characterization of residual effects on vegetation

Characterization	Description	Quantitative measure or definition of qualitative categories
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

7.1.8 Significance definition

For this assessment, adverse residual effects on vegetation are considered significant if, following the application of mitigation measures, the proposed project threatens the long-term persistence or viability of native vegetation communities or species of conservation concern in the RAA.

7.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data, including pertinent reports, published literature, provincial and federal databases, and other data sources. Information was also gathered during the reconnaissance survey conducted for vegetation and land use in June 2024.

The existing conditions described in this section focus on:

- Ecological land classification
- Land cover classification
- Botanical resources including species of conservation concern, non-native, and invasive or noxious weeds

7.2.1 Ecological land classification

Canada has a hierarchal framework to classify ecologically distinct areas of land based on interrelationships of geology, landform, soil, water, vegetation, and human factors. The ecozone is the most generalized level of classification. Each ecozone is broken down into ecoregions and then into smaller ecodistricts. The ecodistrict is the most detailed level of ecological land classification (Smith et al. 1998).

The PDA is in one ecozone, one ecoregion and three ecodistricts. Map 5-1 and Table 7-3 below illustrate how the PDA, LAA and RAA intersect the Canada land classification ecozones, ecoregions and ecodistricts.

The PDA is 100% located in the prairies ecozone and Lake Manitoba Plain Ecoregion. Approximately 56.6% of the PDA is located in the Emerson ecodistrict, 22.5% in the Winkler ecodistrict and 20.9% in the Winnipeg ecodistrict.

Table 7-3: Ecodistrict area (ha) and percent (%) coverage in the PDA, LAA and RAA.

Ecodistrict	RAA		LAA		PDA	
	ha	%	ha	%	ha	%
Emerson	60,433	33	4,622	57	82	57
Winkler	49,569	27	1,845	23	32	22
Winnipeg	45,408	25	1,707	20	30	21

Steinbach	25,0428	14	0	0	0	0
Null[1]	3,102	1	0	0	0	0
Total	183,561	100	8,174	100	144	100

[1]Null category refers to data that is not available for the small portion of the RAA that extends into United States.

The Emerson Ecodistrict is a small ecodistrict that consists largely of cultivated fields used for spring wheat, other cereal grains, and oil seeds using dryland production. There are some areas with limited production of potatoes, corn, and garden crops under irrigation mostly from water supplied by the Red River. Areas of native forest can be found along waterways and are characterized by green ash (*Fraxinus pennsylvannica*), American elm (*Ulmus Americana*) and Manitoba maple *(Acer negundo*) with shrubs such as hazel (*Corylus spp.)* and saskatoon (*Amelanchier alnifolia*). On riverbanks where flooding does not occur, bur oak (*Quercus macropcarpa*) can be found.

The Winkler Ecodistrict consists largely of cultivated fields used for spring wheat, other cereal grains and oil seeds that use dryland production methods. Native vegetation in this ecodistrict which used to consist of tall grass prairie and herbs has disappeared due to cultivation. Native forests can still be found along watercourses consisting of green ash, American elm and Manitoba maple with shrubs of hazel and saskatoon. On riverbanks where flooding does not occur, bur oak can be found.

The Winnipeg Ecodistrict encompasses the City of Winnipeg and subsequent development, and drainage associated with the city and the surrounding agricultural land. Originally this ecodistrict consisted of tall grass prairie, meadow prairie grass and meadow grass communities however because of cultivation and development, only small remnants of the original types of vegetation remain. Tree cover along the floodplains of waterways contain Manitoba maple, green ash, cottonwood (*Populus deltoides*), basswood (*Tillia americana*) and American elm. A mixture of aspen (*Populus tremuloides*) and bur oak can be found on upper terraces with and understory of hazelnut, red-osier dogwood (*Cornus sericea*) and snowberry (*Symphoricarpos albus*).

7.2.2 Land cover classification

Natural Resources Canada uses remote sensing satellite data to spatially differentiate between the land cover classifications that make up Canada's land surface (Natural

Resources Canada 2020). Native vegetation classes include range and grassland, deciduous forest, coniferous forest, and marsh wetland. The water class includes rivers and streams. Agricultural includes forage crops and fields. Cultural features, and roads and rail lines are also identified.

The distribution of land cover class types is illustrated in Map 5-2 with the area and percent covers in the PDA, LAA, and RAA shown below in Table 7-4.

Table 7-4: Land use / land cover class area (ha) and percent (%) coverage in the PDA, LAA and RAA

Land Use/ Land Cover Class	RAA		LAA		PDA	
	ha	%	ha	%	ha	%
Agri – Forage Field	3,867	2	17	2	2	1
Agricultural Field	141,422	77	6,965	85	136	94
Coniferous Forest	2	0	-	-	-	-
Cultural Features	898	0	59	0.7	-	-
Deciduous Forest	8,060	4	194	2	0.2	0.1
Forest Fire Burn Areas	3	0	-	-	-	-
Open Deciduous Forest	573	2	6	0.1	-	-
Range and Grassland	17,055	9	408	5.0	2	1
Roads, Trails and Rail Lines	6,612	4	308	4	4	2
Sand and Gravel	42	0	-	-	-	-
Water Body	1421	1	56	0.7	0.2	0.1
Wetland Marsh	541	0	2	0	-	-
Null[1]	3066	2	-	-	-	-

[1]Null category refers to data that is not available for the small portion of the RAA that extends into United States.

The dominant land cover type throughout the assessment area for vegetation is agriculture, which accounts for 96% of the PDA, 87% of the LAA, and 79% of the RAA. Less than five percent of the RAA and LAA consists of forested land, with only 0.2 % of forested land (deciduous forests) making up the land cover classes in the PDA. The forested lands found in the LAA and PDA are found mainly as shelterbelts or small wooded areas on private land or along natural waterways such as the Red and Marais Rivers. Wetlands and waterbodies make up 0.6% of the LAA and 0.1% in the PDA. The waterbody class in the PDA includes the Red River, Riviere Aux Marais and the Harlow and Main drains.

7.2.3 Vegetation in the project development area

A botanical survey was conducted on June 20, 2024, to qualitatively document the vegetation in the ditches at several road crossings in the PDA. The ditch nearest to Provincial Road 201 was also surveyed to gain a better understanding of local vegetation community. Cultivated land supporting field crops of corn and cereal grains typically occurred adjacent to the roadside ditches.

7.2.3.1 Roadside vegetation

The roadside vegetation in the project area consisted dominantly of grasses with a mixture of forb species, with varying presence. Smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*) and quack-grass (*Elymys repens*) were common grasses throughout the ditches. Frequent forb species included northern bedstraw (*Galium boreale*), Canada goldenrod (*Solidago canadensis*), bastard toadflax (*Comandra umbellata*) and Canada anemone (*Anemonastrum canadensis*). Also common, but less abundant, were smooth aster (*Symphyotrichum laeve*), prairie sage (*Artemisia ludoviciana*) and wild licorice (*Glycyrrhiza lepidota*). Prickly rose (*Rosa acicularis*) was a common low shrub (<1 m) in the ditches.

7.2.3.2 Drain and riparian vegetation

Two water drains were surveyed along the proposed pipeline route, both located east of Provincial Trunk Highway (PTH) 75. The municipal drains were vegetated with shrubs of sandbar willow (*Salix interior*), red-osier dogwood (*Cornus sericea*), western snowberry (*Symphoricarpos occidentalis*) and prickly rose along the banks. Common reedgrass (*Phragmites australis*), orchard grass (*Dactylis glomerata*), sedges (*Carex* spp.) and common cattail (*Typha latifolia*) were frequent species.

The Red River crossing was not surveyed as tie-in locations were beyond the riparian area. However, species observed at nearby road crossings of the Red River included trees of cottonwood (*Populus deltoides*) and bur oak, while tall shubs (>1m) were chokecherry (*Prunus virginiana*), fireberry hawthorn (*Crataegus chrysocarpa*) and beaked hazelnut (*Corylus cornuta*).

According to Smith et al. (1998), typical riparian species that occur in this area include American elm, green ash, Manitoba maple and bur oak with associated shrubs such as hazel and Saskatoon.

West of PTH 75, the proposed pipeline crosses the Marais River. The river was surveyed approximately 500 m south of the crossing. The riparian vegetation along the river's edge included abundant cover of broad-fruited bur-reed (*Sparganium eurycarpum*). Other species recorded included Manitoba maple, bluejoint reedgrass (*Calamagrostis canadensis*), water smartweed (*Persicaria amphibia*), stinging nettle (*Urtica dioica*) and greater burdock (*Arctium lappa*).

7.2.3.3 Shelterbelt vegetation

Shelterbelts are aesthetically important as noise, wind, and visual barriers. In addition to aesthetic benefits, shelterbelts also have the potential to reduce soil erosion from wind and water as well as provide important wildlife habitat for areas used for nesting, feeding, and breeding by many bird species, other wildlife, and species at risk.

Three wind breaks or shelterbelts were observed west of PTH 75, along the proposed pipeline route. These shelterbelts supported deciduous trees of green ash and Siberian peashrub (*Caragana arborescens*).

7.2.4 Species of conservation concern

Species of conservation concern already exist in low numbers and are listed either by the Manitoba Conservation Data Centre (MBCDC) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or are protected provincially or federally through *The Endangered Species and Ecosystem Act* (MBESEA) and/or the *Species at Risk Act* (SARA).

Plant species of conservation concern include all provincially (MBESEA) and federally (SARA) listed species, as well as species ranked as Critically Imperiled to Vulnerable, by the (MB CDC) (i.e., those ranked S1 through S3). Species of conservation concern ranked S1, S2, or S3 (or any combination) by the MB CDC but not listed under the MBESEA are not protected by legislation, but they are important contributors to biodiversity in Manitoba and considered rare or uncommon in the province.

According to the MBCDC there are 129 plant SOCC that can be expected to range within the Lake Manitoba Plain Ecoregion. Currently there are 11 species listed at risk in the ecoregion, with either ESEA, SARA or COSEWIC (see Table 7-5).

Table 7-5 - Plant species listed at risk in the Lake Manitoba Plain Ecoregion

Scientific name	Common name	ESEA	SARA	COSEWIC
Agalinis aspera	Rough Agalinis	Endangered	Endangered	Endangered
Agalinis gattingeri	Gattinger's Agalinis	Endangered	Endangered	Endangered
Celtis occidentalis	Hackberry	Threatened	-	-
Cypripedium candidum	Small White Lady's-slipper	Endangered	Threatened	Threatened
Dalea villosa	Hairy Prairie-clover	Threatened	Special Concern	Special Concern
Fraxinus nigra	Black Ash	-	-	Threatened
Solidago riddellii	Riddell's Goldenrod	Threatened	Special Concern	Special Concern
Symphyotrichum sericeum	Western Silvery Aster	Threatened	Threatened	Threatened
Teloschistes chrysophthalmus	Golden-eyed Lichen	-	Special Concern	Special Concern
Vernonia fasciculata	Fascicled Ironweed	Endangered	Endangered	Endangered
Veronicastrum virginicum	Culver's-root	Threatened	-	-

Based on MBCDC records, two SOCC occur within the RAA, with no species occurrence in the LAA. The small white lady's-slipper is ranked as S2 (Imperiled), and

Culver's Root is ranked as S1S2 Critically Imperiled to Imperiled. The small white lady's-slipper is also designated as endangered under MESEA and threatened under SARA and COSEWIC, while Culver's root is designated as threatened under MESEA only.

Three species of conservation concern ranked Vulnerable by the MBCDC were recorded during the survey and included narrow-leaved puccoon (*Lithospermum incisum*, S3), common milkweed (S3S4) and possibly cottonwood (S3S5). At the location where cottonwood was recorded, identification was made roadside, approximately 15 m away due to high water levels. No plant species at risk listed with either *The Endangered Species and Ecosystems Act* (MESEA), *Species at Risk Act* (SARA) or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were encountered during the survey.

7.2.5 Non-native, invasive species or noxious species

Invasive plant species are a subset of weedy plant species that require control or eradication based on provincial or federal legislation. These species are of concern because they can cause economic losses, damage to native plant communities, or human illness or injury (Royer and Dickinson 1999).

Information on invasive and noxious plant species was collected by reviewing relevant legislation and sources identifying these species including *The Noxious Weeds Act* and the Invasive Species Council of Manitoba website. These species often follow human activities and are introduced along roads, rivers and right of ways.

Where established, invasive, and non-native plants can impact ecosystem diversity, structure, and function. Invasive species compete with native species and can form dense patches that may spread to other areas. Displacement of native species changes ecosystem composition in ways that may make the habitat unsuitable for native species. Therefore, invasive species are risk factors for species of concern (Canadian Food Inspection Agency 2008).

Several non-native, invasive, and noxious species occur in the project area. Twenty non-native species were recorded during the field reconnaissance survey in June 2024 (Appendix C).

Of these plants, 11 species are considered invasive (Canadian Food Inspection Agency 2008; Invasive Species Council of Manitoba 2024) due to their tendency to outcompete native species and dominate habitats once introduced, and included smooth brome (*Bromus inermis*), quack-grass (*Elymus repens*), field sow-thistle (*Sonchus arvensis*), tufted vetch (*Vicia cracca*), alfalfa (*Medicago sativa*), Canada thistle

(*Cirsium arvense*), lamb's-quarters (*Chenopodium album*), field bindweed, (*Convolvulus arvensis*), orchard grass (*Dactylis glomerata*), field pennycress (*Thlaspi arvense*) and redroot pigweed (*Amaranthus retroflexus*).

Nine species recorded are listed as Tier 3 noxious plants according to *The Noxious Weeds Act* (Manitoba Government 2024) and included field sow-thistle (*Sonchus arvensis*), common milkweed (*Asclepias syriaca*), Canada thistle (*Cirsium arvense*), lamb's-quarters (*Chenopodium album*), field pennycress (*Thlaspi arvense*), common dandelion (*Taraxacum officinale*), giant ragweed (*Ambrosia trifida*), common ragweed (*Ambrosia artemisifolia*) and greater burdock (*Arctium lappa*).

7.3 Project interactions with vegetation

Table 7-6 identifies, for each potential effect, the physical activities that might interact with the vegetation and result in the identified effect.

Table 7-6: Project interactions with vegetation

Project activities/components	Change in SOCC abundance and distribution	Change in abundance and distribution of invasive and non-native species
Construction of pipeline, gate station, and valve sites		
Mobilization and staff presence	-	-
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	-	-
Pipe installation – trenching and lowering	-	-
Horizontal directional drilling	-	-
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-
Backfilling and contouring	-	-
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	-
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline, gate station, and valve sites		
Presence of pipeline, gate station, and valve sites	-	-
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	✓
Valve operation checks (annually)	-	✓
Vegetation management	✓	✓
Decommissioning of pipeline, gate station, and valve sites		
Mobilization and staff presence	-	-
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	-
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction
– = No interaction

7.4 Assessment of project effects

While effects to vegetation could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction due to vehicle and equipment use, access development, right-of-way preparation (topsoil stripping) and marshalling yards (temporary work or storage areas) and include the following:

- Change in SOCC abundance and distribution
- Change in the abundance and distribution of invasive and non-native species

As illustrated in the project interactions table (Table 7-5), no effects to vegetation are anticipated to result from certain project activities including mobilization and staff presence, pipe stringing, pipe installation testing, backfilling and contouring, gate station and valve site connections, presence of the pipeline, ground pipeline patrols, valve operation, and pipeline disconnections as these project activities will be contained on the proposed pipeline right-of-way.

Horizontal directional drilling will be used to cross waterbodies (e.g., rivers and drains), shelterbelts, and road allowances. Equipment (work area) for drilling under shelterbelts, drains and road allowances will be set up on agricultural land in PDA. As a result, vegetation will not be impacted by horizontal directional drilling.

Depth cover surveys, cathodic protection monitoring tests, and leak surveys will be confined to the PDA (both work and access) and as a result there will be no impacts to vegetation.

Finally, the operation of the valve sites as well as the future abandonment of the pipeline and any valve or gate station dismantling will not affect vegetation as these areas occur within existing developed footprints.

All other project activities have potential pathways of effect that may result in changes in vegetation diversity including the potential changes in the abundance of species of conservation concern and the change in distribution of invasive and non-native species. The follow sections assess these pathways of effect, set out mitigation, and characterize residual effects.

7.4.1 Change in species of conservation concern

Even though the dominant land use in the PDA is agriculture, the project has potential to alter or disturb vegetation.

The effect pathways through which the project has the potential to change SOCC abundance includes:

- Direct loss of alteration of plant species of conservation concern from ground disturbance during construction activities and decommissioning
- Indirect loss of plant species of conservation concern from the introduction or establishment of regulated weeds and non-native invasive species

7.4.1.1 Construction

During construction, plant species diversity can be affected through vehicle and equipment use, right-of way and valve site preparation on non-agricultural lands (i.e., along road allowances), topsoil stripping and salvage (along road allowances), temporary workspace and access development (if required), and the modification to the existing GS146 Dominion City Primary gas site.

Right-of way preparation and valve and gas station site preparation/expansion in non-agricultural areas (i.e., road allowances) can result in the removal or disturbance to existing vegetation that can alter or result in the loss of species of conservation concern present within the PDA. Heavy equipment and vehicle use on temporary workspaces could remove or crush SOCC or affect them through soil compaction and rutting. However, since the PDA mostly traverses previously developed lands, the potential for adverse effects to SOCC is limited.

Three species of conservation concerns were observed in the PDA during the field reconnaissance conducted in June 2024. Narrow-leave puccoon (S3) and common milkweed (S3S4) were found in road ditches or along the water drains. Cottonwood (S3S5) occurred in a shelterbelt in the PDA. There is the potential for narrow-leaved puccoon and milkweed to be affected by development of the ROW along road allowances or at sites to be prepared for new project components (i.e., valve sites). Both narrow-leaved puccoon and common milkweed are known to occur in disturbed areas. It is anticipated that no impacts will occur to cottonwood as shelterbelts traversed by the PDA will be crossed beneath through horizontal directional drilling.

No protected species, listed under MESEA, SARA or COSEWIC were encountered during the field reconnaissance survey, however two species, culver's-root (*Veronicastrum virginicum*) and small white lady's-slipper (*Cypripedium candidum*) are both species at risk known to occur within 5 km of the project boundary (Manitoba Conservation Data Centre 2024).

Species of conservation concern in the PDA as well as other SOCC in the surrounding LAA and RAA could experience indirect effects from construction if there is an introduction or establishment of regulated weeds and non-native invasive species.

Ground disturbance because of right-of-way and valve site preparation, vehicle and equipment use and topsoil stripping and salvage has the potential to increase opportunities for weed and non-native invasive species to establish and spread in the PDA and LAA. Competition from weeds and non-native invasive species may change the abundance and distribution of plant species of conservation concern effects extending up to 1 km from the area of disturbance (Manitoba Hydro 2023).

7.4.1.2 Operations, maintenance, and decommissioning

Right-of-way maintenance has the potential to impact SOCC through using vehicle equipment and vegetation management. Vegetation management activities such as herbicide application or mowing could kill or remove SOCC while using heavy equipment and vehicles during clean-up and reclamation can impact SOCC through crushing and soil disturbance.

The use of vehicles and equipment for inspection, maintenance, and vegetation management through operations and decommissioning will continue to introduce potential pathways for indirect effects on species diversity through the potential introduction and spread of regulated weeds and non-native invasive species.

7.4.2 Change in the abundance and distribution of invasive and non-native species

The effect pathway through which the project has the potential to change the distribution of invasive and non-native species include:

- Introduction and spread of invasive and non-native plant species from ground disturbance and materials and equipment used during construction, maintenance and decommissioning

7.4.2.1 Construction

During construction, the use of materials and equipment has the potential to spread non-native and invasive plants within the PDA. ROW and valve site preparation as well as development of temporary work areas onto undisturbed land can create soil disturbance, which can lead to colonization of areas by invasive or non-native weedy species that can outcompete native plant species and cause changes in vegetation distribution.

Heavy equipment used during right-of way preparation and valve and gas station site preparation/expansion can result in the introduction and/or spread of invasive and non-native species in the PDA and beyond.

In addition, construction materials (i.e., gravel and fill) used for the preparation of sites or for temporary work areas also creates a pathway for the introduction and spread of invasive and non-native species if contaminated with seed or fragments of invasive plants (Nature Conservancy, n.d.).

7.4.2.2 Operations, maintenance, and decommissioning

The use of vehicles and equipment for inspection, maintenance, and abandonment of the pipeline through operations, maintenance and decommissioning will continue to create a potential pathway for the introduction and spread of regulated weeds and non-native invasive species in the PDA. Ongoing weed management along the portions of the ROW under agricultural production is expected to continue throughout operations.

7.4.3 Mitigation measures

This section describes the mitigation measures identified to minimize effects on the change in SOCC abundance and change in the distribution of invasive and non-native species.

7.4.3.1 Mitigation measures related to change in SOCC abundance and distribution

In addition to the gas transmission line being routed primarily on agricultural land, mitigation measures to reduce project-related changes to include:

- SAR will be protected in accordance with provincial and federal legislation and provincial and federal guidelines. A 30 m setback distance will be applied to known SAR. Setbacks and buffers along the ROW will be clearly identified by signage or flagging prior to construction, and signage or flagging will be maintained during construction to alert crews to the presence of the setback.
- If previously unidentified plant SAR are found on the ROW prior to or during construction, the occurrences will be flagged for avoidance.
- Access shall be restricted to established roads and trails and cleared construction areas.

- If avoidance of listed SAR is not possible, the regulators will be contacted to determine the most appropriate mitigation action. This could include harvesting seed from the PDA, salvaging and transplanting portions of sod, collecting cuttings or transplanting whole plants.

7.4.3.2 Mitigation measures related to change in abundance and distribution of invasive and non-native species

The following outlines the proposed mitigation measures to reduce the changes in abundance and distribution of invasive and non-native species:

- All equipment must arrive at the ROW or project site clean and free of soil or vegetation debris.
- Weed control along access roads and trails will be conducted in accordance with the Rehabilitation and Weed Management Plan.
- Equipment will be cleaned before moving from locations with identified invasive weed infestation.

7.4.4 Characterization of residual effects

This section describes the residual project effects to vegetation predicted to remain after the application of mitigation measures. Table 7-7 describes the factors used to characterize the residual effects on vegetation.

7.4.4.1 Residual effect on change in SOCC abundance and distribution

After mitigation, predicted residual effects on change in SOCC abundance and distribution include:

- Potential loss of plant SOCC from right-of-way preparation, and topsoil stripping and salvage
- Potential loss of plant species of conservation concern on right-of-way from vegetation management or other maintenance activities during operations

No species at risk listed with either the MBESEA or SARA were observed during the field reconnaissance and as such, the project is not anticipated to effect protected species. However, three SOCC have been identified in the PDA and have the potential to interact with project.

Additional undocumented species of conservation concern may also be present in the PDA and may be impacted by the proposed project. No land cover categories will be lost or changed because of the project (i.e., agriculture, deciduous, range and grassland).

Following the implementation of mitigation measures described above, residual effects for change in SOCC abundance and distribution are characterized as follows:

- Direction: adverse
- Magnitude: low, project effects are not predicted to affect sustainability in the PDA or LAA and there are no predicted effects on listed species.
- Geographic extent: PDA; if temporary workspaces cannot be entirely confined to pre-developed area, residual effects may extend to the LAA
- Duration: long-term
- Frequency: single event during construction and decommissioning and irregular events throughout operations
- Reversibility: reversible

7.4.4.2 Residual effect on change in abundance and distribution of invasive and non-native species

As discussed in Section 5.2.4 most of the project occurs on agricultural land (more than 95%) with a small portion of the proposed ROW paralleling road allowances. Even though invasive and non-native species were observed in the PDA during the field reconnaissance conducted in June 2024, it is anticipated that following implementation of the mitigation identified above for the change in abundance and distribution of invasive and non-native species that the project will result in no residual effects.

7.4.4.3 Summary of residual effects on vegetation

Table 7-7 characterizes the residual effects on vegetation.

Table 7-7:Project residual effects on vegetation

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Residual effect on change in SOCC abundance and distribution						

Construction	Adverse	Low	PDA	Long-term	Single event	Reversible
Operation	Adverse	Low	PDA	Long-term	Irregular	Reversible
Decommissioning	Adverse	Low	PDA	Long-term	Single Event	Reversible
Residual effect on change in abundance and distribution of invasive and non-native specie						
Construction	No residual effects anticipated					
Operation						
Decommissioning						

7.4.5 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

Both conditions have been met with respect to the change to SOCC abundance and distribution. The project is anticipated to have adverse residual effects on the change in SOCC abundance and distribution. Each residual effect could interact with residual effects of other past, present or foreseeable future physical activities.

Both conditions were not met for change to abundance and distribution of invasive and non-native species.

7.4.5.1 Project residual effects likely to interact cumulatively

Table 7-8 shows the project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the project to impact vegetation. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 7-8: Potential cumulative effects on vegetation

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects
	Change in SOCC abundance and distribution
Existing/ongoing projects and activities	
Domestic resource use (e.g., hunting, trapping, fishing)	✓
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	✓
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	✓
Manitoba Hydro gas and electricity transmission and distribution	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

Note: No future projects or activities were identified for this project.

7.4.5.2 Cumulative effect for change in SOCC abundance and distribution

The assessment of the cumulative effects to vegetation, specifically the change in SOCC abundance and distribution, likely to result from the project in combination with other projects and physical activities, including the pathways to effect and mitigations, are discussed in subsequent sections.

Pathways for cumulative effect

Ongoing projects and physical activities in the RAA (Table 7-8) have the potential to interact cumulatively with the project if their plans include development or activities in areas of SOCC occurrences as these activities would contribute to changes in SOCC abundance and distribution.

The ongoing activities identified as likely to interact with the residual effects of the project on vegetation have similar effects pathways as those identified for this project. Physical activities that involve ground disturbance and the use of vehicles and equipment are likely to cause residual effects resulting in the direct and indirect loss of plant species of conservation concern.

Since all projects identified, are anticipated to involve these types of physical activities (i.e., effects pathways), the project is anticipated to interact cumulatively with all projects in relation to effects to vegetation, specifically, the change in SOCC abundance and distribution.

Mitigation measures

Project mitigation measures, including restricting access to established roads will help reduce project residual effects to SOCC. Other future projects are expected to implement similar standard mitigation measures and avoid or minimize effects to vegetation as appropriate.

Residual cumulative effect

Many of the ongoing projects that may interact cumulatively with residual project effects on vegetation are in or alongside previously disturbed, modified habitats. The RAA is extensively developed, primarily for agriculture which currently covers approximately 145,289 ha or 79.1%. A much smaller area of 8,634 ha (<5%) is covered by coniferous and deciduous forest. Within the PDA, as per the land cover classification, only 0.2 ha (less than 1%) is forested. Some of the existing projects, specifically infrastructure which are permanent structures, have potentially caused a loss or alteration of SOCC in the RAA.

With the implementation of mitigation measures identified for vegetation, this project, in combination with other ongoing and future projects, is predicted to have small contributions to cumulative effects on SOCC.

While the project will have a cumulative environmental effect, with the implementation of mitigation measures, cumulative effects are anticipated to be of low magnitude and are anticipated to potentially occur throughout the RAA. Cumulative effects will be long-term (during the project's lifespan) occurring on a continuous basis but reversible after decommissioning.

7.4.6 Determination of significance

With mitigation and environmental protection measures, the residual effects on vegetation are predicted to be not significant.

The project is not anticipated to threaten the long-term persistence or viability of species of conservation concern in the PDA, LAA, or RAA.

7.4.7 Prediction confidence

Prediction confidence in the assessment of effects on vegetation is moderate-high.

The land cover classification was used to predetermine percentages of cover classes, revealing that most of the land traversed by the proposed project PDA is used for agriculture (>95%), which was consistent with the land use documented during reconnaissance surveys. The percent of native vegetation class (i.e., forests) in the PDA is minimal and suggests a smaller potential for SOCC to be present in the PDA.

Areas that have the potential to support SOCC in the PDA include shelterbelts, wooded areas, riparian areas along the river and drains, and road allowance ditches. The potential for interactions between the project and SOCC is higher in areas where the PDA parallels road allowances than where the pipeline will cross beneath shelterbelts, drains, and riparian areas using horizontal directional drilling, reducing the likelihood of interaction with SOCC.

Although minimal and not anticipated to result in a change in the characterization of vegetation effects, some potential limitations for the effects on vegetation include the imperfect detection of SOCC, survey timing (spring only) and seasonal changes experienced by different species. There is also some uncertainty related to un-surveyed areas (i.e., drains, shelterbelts etc.) where additional SOCC may be present.

In summary, consideration of other projects with similar disturbance to vegetation, found that monitored effects of those projects were aligned with the predicted effects anticipated for this environmental assessment.

7.4.8 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the environmental protection plan (Chapter 16).

7.4.9 Sensitivity to future climate change scenarios

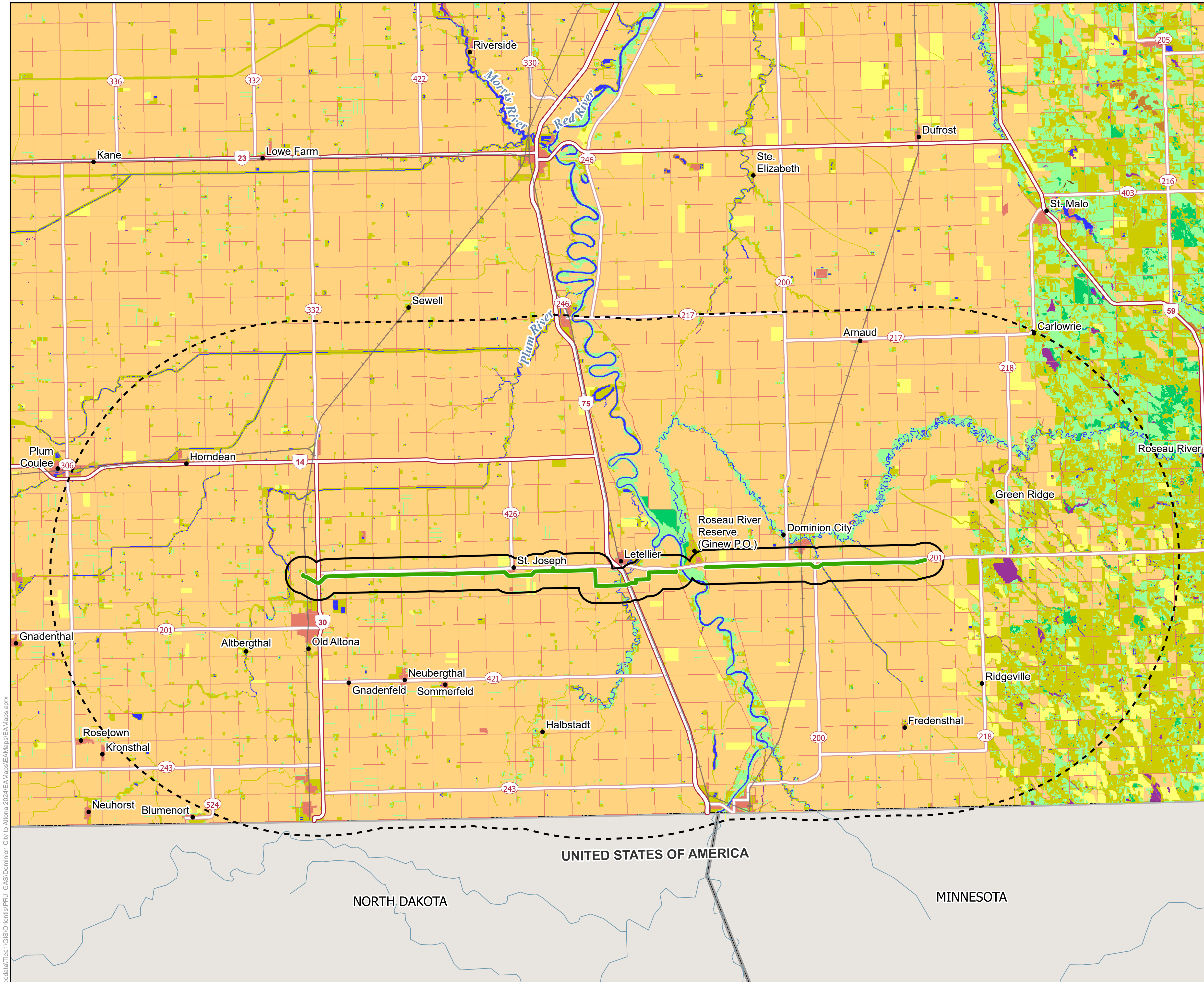
Effects of climate change on vegetation are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding). Climate change could lead to more frequent and severe flooding events, which can damage roads, utilities, and other critical infrastructure.

A portion of the RM of Emerson-Franklin in the western half of the rural municipality is in an area identified as a Designated Flood Area. This designated flood area extends the entire length of the Red River and encompasses the area around Dominion City and the Town of Emerson (WSP 2017). In previous years the municipality has experienced floods of varying degrees within the Red River valley, which have resulted in severe damage.

As a result of climate change, there is the potential for continued floods because of increased precipitation in both winter and spring and rapid spring melt (Government of Manitoba 2011). An increase in flooding from climate change will impact native vegetation including SOCC.

The presence of flood barriers in the RM of Emerson-Franklin such as ring dykes around the Town of Emerson and Dominion City have helped to reduce potential impacts to these areas from flooding. In addition, flood and erosion prone area policies have been drafted and implemented to reduce impacts to future developments. These protection measures along with implementation of mitigation for proposed projects will help to mitigate the potential effects of flooding on native vegetation, including SOCC.

Map 7-1 Spatial boundaries for vegetation, and wildlife and wildlife habitat



Manitoba Hydro

Dominion to Altona
Gas Transmission Pipeline

Project Infrastructure
- Preferred Route

Assessment Area
- Local Assessment Area (1 km buffer around PDA)
- Regional Assessment Area (15 km buffer around PDA)

Land Cover Classification
- Agricultural Cropland
- Bare Rock, Gravel and Sand
- Coniferous Forest
- Cultural Features
- Deciduous Forest
- Forage Crops
- Forest Cutover
- Marsh and Fens
- Mixedwood Forest
- Open Decidious Forest
- Range and Grassland
- Treed and Open Bogs
- Water

Landbase
- Community
- Provincial Highway
- Provincial Road
- Railway

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 02, 2024

N

0 2.5 5 7.5 10 Kilometres
0 1.5 3 6 Miles
1:220,000

Spatial Boundaries for Vegetation, and Wildlife and Wildlife Habitat

Draft: For Discussion Purposes Only

Map 7-1

8.0 Wildlife and wildlife habitat

Wildlife for this environmental assessment includes birds, mammals, terrestrial invertebrates, amphibians, and reptiles.

Wildlife are components of ecological cycles, provide economic benefits from hunting, guiding, and trapping, and provide a source of food and materials. Over 100 wildlife species could range into the regional assessment area (RAA) and include small mammals, aquatic and terrestrial furbearers, large carnivores, ungulates, birds, terrestrial invertebrates, reptiles, and amphibians.

Wildlife and wildlife habitat was selected as a valued component as they provide ecological, aesthetic, recreational, economic, and cultural value to Indigenous communities, stakeholders, the public, local businesses, and government agencies. In addition, wildlife and wildlife habitat was selected as a VC for the following reasons:

- There is potential for the project to interact with species of conservation concern (SOCC) that may be found in the project development area (PDA), during construction. Species of conservation concern already exist in low numbers and are listed either by the Manitoba Conservation Data Centre (MBCDC) or Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or are protected provincially or federally through *The Endangered Species and Ecosystem Act* (Manitoba) (MBESEA) and/or the *Species at Risk Act* (SARA).
- Presence of important wildlife habitat in the PDA, local assessment area (LAA) and RAA (Regional Assessment Area) along rivers and drains as well as shelterbelts and wooded areas.

8.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on wildlife and wildlife habitat from project activities. An assessment of cumulative effects on wildlife and wildlife habitat is also presented.

This assessment has been influenced by engagement feedback, information provided from a field reconnaissance survey, and Manitoba Hydro’s experience with other transmission projects (both gas and hydroelectric) in southern Manitoba (e.g., Northwest Gas Transmission Project, the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash’ake Mayzoon Transmission Project, St. Vital Transmission Complex and Manitoba-Minnesota Transmission Project. The assessment considers the following:

- Wildlife observations recorded during the vegetation and land use field reconnaissance undertaken in June 2024 by Szwaluk Environmental Consulting Ltd (Appendix C and D)
- Desktop review of provincial and federal databases including the land cover classification, MBCDC (Appendix D), SARA, MBESEA and COSEWIC
- Feedback heard through project engagement (Chapter 4.0)
- The Northwest Gas Transmission Project environmental assessment (2015)
- St. Vital Transmission Complex environmental assessment (2014)
- Dorsey to Wash'ake Mayzoon Transmission Project environmental assessment (2022)

8.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

8.1.2 Regulatory and policy setting

The following federal and provincial laws, and associated regulations, policies, and guidelines, were considered for assessing project effects to wildlife and wildlife habitat.

8.1.2.1 Federal guidance

Species at Risk Act (SARA)

The federal *Species at Risk Act* (2002) protects species at risk and their critical habitat in Canada. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated and to prevent species listed as special concern from becoming threatened or endangered. Species at risk and their habitats are protected under SARA which prohibits:

- The killing, harming or harassing of endangered or threatened species at risk (Sections 32 and 26)

- The destruction of critical habitat of endangered or threatened species at risk (Sections 58, 60, and 61)

Under SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the status of species at risk[5]. COSEWIC designates species at risk by listing them under Schedule 1 of SARA under the following classifications:

- Extirpated – a species that no longer exists in the wild in Canada, but exists elsewhere in the wild
- Endangered – a species that is facing imminent extirpation or extinction
- Threatened – a species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- Special Concern – a species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (Government of Canada 2021)

Migratory Birds Convention Act (MBCA)

The Migratory Birds Convention Act (1994) and associated regulations (Migratory Birds Regulations [MBR], 2022) provide for the protection of migratory birds, their eggs, and their nests. It applies to most native bird species.

8.1.2.2 Provincial guidance

The Endangered Species and Ecosystems Act (Manitoba)

Provincially, at risk plant and animal species native to Manitoba are designated as endangered, threatened, extinct, extirpated (no longer present in Manitoba), or special concern and are protected under *The Endangered Species and Ecosystems Act* (2018) and its regulations (Province of Manitoba n.d.). In addition to designating the status of a species at the provincial level, the purposes of *The Endangered Species and Ecosystems Act* (ESEA) are to ensure protection and enhance the survival

[5] Under SARA and in relation to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), wildlife species include both animal and plant species, defining wildlife species as "a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years (Government of Canada 2002).

of endangered and threatened species in the province and to enable the reintroduction of extirpated species into the province.

Activities that would kill, disturb, or interfere with any listed species, or damage, destroy, or remove habitat and natural resources on which a listed species depends, are prohibited by Manitoba's ESEA.

At risk ecosystems can also be designated as threatened or endangered, and protected, under the ESEA. Two ecosystems are currently designated as endangered: alvars and native grass prairie (Province of Manitoba 2023). Neither of these endangered ecosystem types intersect the project area.

The Wildlife Act

The Wildlife Act provides general provisions for regulating the activities relating to the take and trade of wild animals in Manitoba. A "wild animal" is defined as "an animal or bird of a species or type listed in Schedule A or declared by the regulations to be a wild animal", and includes select amphibian, reptile and mammal species and most bird species (including those not protected under the MBCA) known to exist in Manitoba.

Manitoba Conservation Data Centre

The Manitoba Conservation Data Centre (MB CDC) assigns conservation status ranks to plant and animal species in Manitoba based on their rarity along a five-point scale (Manitoba Conservation Data Center 2023). MB CDC ranks range from S1 to S5 as defined below:

- S1: Critically imperilled – at a very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors
- S2: Imperilled – at a high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors
- S3: Vulnerable – at moderate risk of extirpation in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors
- S4: Apparently secure – at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors

- S5: Secure – at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations, or occurrences, with little to no concern from declines or threats (NaturServe Explorer 2023)

8.1.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for Indigenous communities and concerned and interested parties to provide wildlife and wildlife habitat related feedback about the project.

To date, no concerns related to wildlife and wildlife habitat were raised during project engagement.

Through experience engaging on past gas transmission projects, Manitoba Hydro understands that general concerns related to the potential effects on wildlife and wildlife habitat include the potential loss or disruption to shelterbelts, the potential change or loss of species of conservation concern, and the loss or disturbance of existing wooded areas (i.e., private woodlots).

8.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on wildlife and wildlife habitat, along with effects pathways and measurable parameters are outlined in Table 8-1.

Table 8-1: Potential effects, effects pathways, and measurable parameters for wildlife and wildlife habitat

Potential effect	Effect pathway	Measurable parameter(s) and units of measurement
Change in wildlife habitat	Direct effects from the temporary disturbance and displacement of SOCC due to ground disturbance Indirect effects to wildlife from sensory disturbance	Amount of wildlife habitat in the PDA (ha) that may be altered because of the project.
Change in mortality risk	Direct change in mortality risk due to vehicle collisions because of increased traffic	Total areas (ha) of PDA that intersects wildlife habitat within the LAA.

8.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on wildlife and wildlife habitat:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The total area of the PDA is 145 ha and is described in detail in Chapter 2.0 (Project Description).
- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA which is used to evaluate measurable effects on wildlife. The total area of the LAA is 8,174 ha.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 15 km buffer around the PDA. This area is where there is the potential for cumulative and socio-economic effects, and that will be relevant to the assessment of any wider-spread effects of the project. The total area of the RAA is approximately 183,561 ha.

The LAA and RAA used for the assessment of project effects on wildlife and wildlife habitat are consistent with the LAA and RAA boundaries being used to assess effects on vegetation and are shown on Map 7-1. The LAA and RAA boundaries are also consistent with those that have been used to assess effects on wildlife and wildlife habitat on other recent transmission projects in Manitoba.

8.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on wildlife and wildlife habitat are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

8.1.7 Residual effects characterization

Table 8-2 provides the definitions used to characterize the residual effects on VC name.

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to wildlife and wildlife habitat relative to baseline **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to wildlife and wildlife habitat relative to baseline **Neutral –** no net change in measurable parameters for wildlife and wildlife habitat relative to baseline

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat		
Characterization	Description	Quantitative measure or definition of qualitative categories
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**Change in habitat:** **Negligible –** no measurable change in wildlife species of conservation concern **Low –** a measurable change in species is predicted but it is unlikely to affect sustainability in the LAA and there are no predicted effects on listed species. **Moderate –** a measurable change affecting the sustainability of species of conservation concern in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of species of conservation concern in the RAA is predicted **Change in mortality risk:** **Negligible –** a measurable change in the abundance of wildlife in the LAA is not anticipated **Low –** a measurable change in the abundance of wildlife in the LAA is not anticipated, although temporary local shifts in distributions in the LAA might occur **Moderate –** a measurable change in the abundance and/or distribution of wildlife in the LAA

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat		
Characterization	Description	Quantitative measure or definition of qualitative categories
		might occur, but a measurable change on the abundance of wildlife in the RAA is not anticipated **High –** a measurable change in the abundance and/or distribution of wildlife in the RAA might occur
Geographic extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	Description	Quantitative measure or definition of qualitative categories
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

8.1.8 Significance definition

For this assessment, adverse residual effects on wildlife and wildlife habitat are considered significant if the proposed project:

- results in a threat to the long-term persistence or viability of a wildlife species in the RAA

8.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data, including pertinent reports, published literature, provincial and federal databases and other data sources. Information was also gathered during the reconnaissance survey conducted for vegetation and land use in June 2024.

The existing conditions described in this section focus on:

- Occurrence and distribution of wildlife
- Species of conservation concern

8.2.1 Overview

The proposed project is in the Prairies Ecozone, Lake Manitoba Plain Ecoregion and Emerson, Winkler and Winnipeg ecodistricts. It is also located in the Aspen-Oak Section of the Boreal Forest Region (Rowe 1959), which is a transition zone between forest and prairie vegetation of west-central Canada. A description of the ecozone, ecoregion, ecodistricts can be found in Chapter 5.0.

Twelve land cover classes occur within the RAA. These classes include native vegetation of range and grassland, deciduous forest, open deciduous forest, coniferous forest and marsh wetland. Agricultural cover classes include forage crops and field crops while the waterbody class includes rivers and streams. Cultural features, sand and gravel, roads and rail lines are also identified.

More than 79% of the land in the RAA is used for agriculture, (more than 87% in the LAA) with the majority consisting of cropland. Less than five percent of the RAA and LAA consists of forested habitat found along natural waterways, shelterbelts, or wooded areas on private land. Range and grassland make up 9.3% of the RAA and 5.0% of the LAA. Wetlands and waterbodies make up less than 1% percent of the RAA and LAA.

The dominant land use in the PDA is agricultural (>95%), with most of the land under cultivation. Only 0.2% of the PDA consists of deciduous forest and 1.4% as range and grassland. Waterbodies make up less than 1% of the PDA.

8.2.2 Birds

Up to 100 breeding bird species potentially occur in the regional assessment area (Bird Studies Canada, 2021). Although most of the RAA is comprised of land under agricultural use, some forested areas remain, including riparian forest along the Red River, and deciduous stands and shelterbelts that are interspersed within the agricultural areas. In addition, pastures, hay lands, and even no-till agricultural lands can support many grassland bird species. Woodlands, riparian edges, and shelterbelts within the project study area, provide suitable habitat for many bird species, including least flycatcher (*Empidonax minimus*), red-headed woodpecker (*Melanerpes erythrocephalus*), the eastern wood-pewee (*Contopus virens*), common yellowthroat (*Geothylypis trichas*), and Tennessee warbler (*Leiothlypis peregrina*) (Manitoba Hydro, 2022; Manitoba Hydro, 2015; Canadian Wildlife Federation (CWF), 2024).

Within the PDA, most land traversed by the proposed transmission line is agricultural land (>95%). According to the land cover classification (Table 7-4) approximately 2.0 hectares (1%) of range and grassland, 0.2 hectares (0.2%) of deciduous forested land and no wetlands are traversed by the proposed project.

During the field reconnaissance for vegetation and landuse conducted on June 20, 2024, bird species that were observed adjacent to the proposed project ROW included: common grackle (*Quiscalus quiscula*), killdeer (*Charadrius vociferus*), American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceus*), and barn swallows (*Hirundo rustica*).

8.2.3 Mammals

The prairie ecozone supports a wide variety of mammals including rodents, furbearers, and ungulates. Most mammal species in the RAA are common and widespread across southern Manitoba, particularly in natural habitats such as forests, grasslands, or wetlands. Some common species include eastern cottontail (*Sylvilagus floridanus*), eastern grey squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), beaver (*Castor canadensis*), and woodchuck (*Marmota monax*) (Manitoba Hydro, 2022; Manitoba Hydro, 2014; Tetratech, 2012).

This proposed project is located on agricultural land with limited overlap with natural habitats. During the vegetation and land use field reconnaissance surveys conducted in June 2024, coyote and deer tracks were observed. No other incidental observations of mammals were recorded.

8.2.4 Amphibians and reptiles

Amphibians and reptiles are not typically found in intensively developed agricultural areas, and generally prefer natural habitats such wetlands, forests, and grasslands. Other than the few watercourses traversed by the project in the ditches adjacent to the municipal roads there is only marginal habitat for amphibians or reptiles in the LAA. During winter months, reptiles and amphibians are dormant and concentrated primarily in moist sites, specifically those located near or adjacent to watercourses and drainage ditches (Manitoba Hydro 2022 and 2024).

Amphibians with a reported distribution area which overlaps with the RAA include the mudpuppy (*Necturus maculosus*), western tiger salamander (*Ambystoma mavortium*), Canadian toad (*Anaxyrus hemiophrys*), American toad (*Anaxyrus hemiophrys*), gray treefrog (*Hyla versicolor*), Cope's gray treefrog (*Hyla chrysoscelis*), boreal chorus frog (*Pseudacris maculata*), wood frog (*Lithobates sylvaticus*), and northern leopard frog (*Lithobates pipiens*). Six reptiles expected to occur within the RAA are the snapping turtle (*Chelydra serpentina*), western painted turtle (*Chrysemys picta bellii*), red-bellied snake (*Storeria occipitomaculata*), plains garter snake (*Thamnophis radix*), red-sided garter snake (*Thamnophis sirtalis parietalis*), and smooth green snake (*Opheodrys vernalis*) (Preston, 1998; Manitoba Herp Atlas, 2024).

Amphibian calls were detected at three locations during the field reconnaissance conducted on June 20, 2024. The boreal chorus frog was heard at one location and the American toad was heard at two locations.

8.2.5 Terrestrial invertebrates

Terrestrial invertebrates include species living in the soil (e.g., nematodes, earthworms), on the ground (i.e., beetles, spiders), in the air (i.e., butterflies, moths, flies, bees), and within the vegetation canopy (i.e., spiders, aphids, beetles). Terrestrial invertebrates are ecologically important for their role as nutrient cyclers and decomposers (e.g., earthworms), as predators of pest species, as pollinators of flowering plants (e.g., bees) and as food for other animals (e.g., birds) (Manitoba Hydro 2012).

During the reconnaissance survey conducted in June 2024, a monarch butterfly (*Danus plexippus*) was observed in the LAA.

8.2.6 Species of conservation concern

Based on a review of provincial and federal databases and existing literature, a list of SOCC that may be found in the RAA are presented in Appendix D.

8.2.6.1 Birds

Five bird SOCC have the potential to occur in the PDA, LAA and RAA (Manitoba Conservation Data Centre, 2024). They include the chimney swift (*Chaeture pelagica*) which is ranked as S2B (breeding population is imperiled) and is also designated as Threatened by MBESEA, SARA, and COSEWIC; the bobolink (*Dolichonyx oryzivorus*), ranked as S3S4B (breeding population is vulnerable to apparently secure) and is designated as threatened by SARA and Special Concern by COSEWIC; the eastern wood-pewee (*Contopus virens)* and red-headed woodpecker (*Melanerpes erythrocephallus)* which are ranked as S3B *(breeding population is vulnerable)*. The eastern wood-peewee is also designated as special concern by SARA and COSEWIC, while the red headed woodpecker is designated as threatened by MBESEA and endangered under SARA and COSEWIC. The barn swallow, which can also be found in the RAA, LAA and PDA is provincially ranked as Apparently Secure (S4B) but is designated as Special Concern under SARA and COSEWIC.

During the field reconnaissance conducted in June 2024, one bird species of conservation concern, the barn swallow, was identified at the bridge crossing the Main Drain in Section 16-2-3EPM.

8.2.6.2 Mammals

Three mammal SOCC can be found within the project RAA and include the plains pocket gopher (*Geomys bursarius)*, mule or blacktailed deer (*Odocoileus hemionus*;

MBESEA – threatened) and the American badger (*Taxidea taxus taxus)*; SARA and COSEWIC – Special Concern) (Manitoba Conservation Data Centre, 2024). Riparian areas along the Red River, Riviere Aux Marais, and other forested areas, have the potential to support these SOCC, however, suitable habitat for these mammals is limited due to the predominance of crop land in the project study area.

During the field reconnaissance, deer tracks were observed but were not able to be identified as to what deer species they were (i.e., mule, white-tailed). No mammal species of conservation concern were observed during the field reconnaissance.

8.2.6.3 Invertebrates

In the Lake Manitoba Plain Ecoregion, thirty-one invertebrate species of conservation concern can be found. Three invertebrate SOCC are known to occur in the RAA. The MBCDC Provincial database records include the Ashton cuckoo bumble bee (Bombus bohemicus), yellow-banded bumble bee (Bombus terricola) and the monarch (Danus plexippus). The Ashton cuckoo bumblee bee is listed as S1 (critically imperiled) under the MBCDC and Endangered under SARA and COSEWIC, while the yellow-banded bumble bee is listed as S3S5 (vulnerable to secure) under the MBCDC and designated special concern under SARA and COSEWIC.

The monarch butterfly is ranked as S3S4B (vulnerable to apparently secure for the breeding population) under the MBCDC and is designated as Endangered under SARA and endangered under COSEWIC. In 2022, the monarch butterfly was added to the International Union for the Conservation of Nature's "Red List" of Threatened species and categorized as endangered — two steps from extinct. In 2023, the migratory monarch status changed from endangered to vulnerable, highlighting the imperative need for continuous data collection and evaluation (Monarch Joint Venture 2024).

During the field reconnaissance conducted in June 2024, a monarch butterfly was observed on alfalfa (Medicago sativa), near the bridge crossing the Main Drain, which is located approximately 320 metres north of the proposed gas transmission line crossing.

8.2.6.4 Amphibians and reptiles

Based on MBCDC's provincial records, two amphibian and one reptile SOCC are known to occur in the PDA, LAA and RAA. The northern leopard frog (*Lithobates pipiens*) and western tiger salamander (*Ambystoma mavortium*) are provincially ranked as Apparently Secure (S4 to S4S5) but are both designated as Special

Concern under SARA and COSEWIC. The only reptile species, the snapping turtle (*Chelydra serpentina*), is provincially ranked as S3 and is listed as special concern by SARA and COSEWIC.

No amphibian or reptile species, listed under MBCDC, MBESEA, SARA or COSEWIC were encountered during the field reconnaissance survey conducted in June 2024.

8.3 Project interactions with wildlife

Table 8-3 identifies, for each potential effect, the physical activities that might interact with the VC and result in the identified effect.

Table 8-3: Project interactions with wildlife and wildlife habitat

Project activities/components	Change in wildlife habitat	Change in mortality risk
Construction of pipeline, gate station, and valve sites		
Mobilization and staff presence	✓	-
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	-	✓
Pipe installation – trenching and lowering	✓	✓
Horizontal directional drilling	✓	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	✓	✓
Backfilling and contouring	✓	-
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	✓	-
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline, gate station, and valve sites		
Presence of pipeline, gate station, and valve sites	-	-
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓
Valve operation checks (annually)	✓	✓
Vegetation management	✓	✓
Decommissioning of pipeline, gate station, and valve sites		
Mobilization and staff presence	✓	-
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	-
Removal of above-ground components (dismantling, removal from site, disposal)	✓	-
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction
– = No interaction

8.4 Assessment of project effects

Much of the historical wildlife habitat and natural vegetation in the PDA, LAA and RAA has been converted for agricultural use. Through the project routing process wildlife habitat was largely avoided. Where wildlife habitat does persist, such as near waterbodies, shelterbelts and drainage ditches mitigation measures will be implemented.

While effects to wildlife and wildlife habitat could occur during construction, and operation they are anticipated to be most pronounced during construction and include the following:

- Change in wildlife habitat
- Change in mortality

As illustrated in the project interactions table (Table 8-3), effects to wildlife and wildlife habitat are anticipated to result from certain project activities including vehicle and equipment use, ROW preparation, pipeline stringing and installation, backfilling and contouring and horizontal directional drilling.

The actions of stringing, bending, joining, and coating of the proposed pipeline in place will not impact wildlife and wildlife habitat. Horizontal directional drilling (HDD) will occur for crossing of sensitive areas (e.g., rivers and drains, shelterbelts, and road allowances). The set-up of the equipment (work area) for drilling of the shelterbelts, drains and road allowances, will be on agricultural land located in PDA and as a result will minimize the effect to wildlife and wildlife habitat. In addition, the proposed pipeline will tie into the existing pipelines already installed under the Red River. As a result, wildlife and wildlife habitat will not be impacted by HDD of the proposed gas transmission line.

Depth cover surveys, cathodic protection monitoring tests, and leak surveys will be contained to the proposed gas transmission line ROW (both work and access) and as a result there will be no impacts to wildlife and wildlife habitat. Finally, the operation of the valve sites as well as the future abandonment of the pipeline and any valve or gate station dismantling will not affect wildlife or wildlife habitat as these areas occur within existing developed footprints.

The follow sections assess these pathways of effect for wildlife and wildlife habitat, set out mitigation, and characterize residual effects.

8.4.1 Change in wildlife habitat

Even though the dominant land use in the PDA is agriculture, there is still the potential for the interaction of wildlife and their habitat during project development in areas where the proposed gas transmission line is adjacent to existing road allowances. Past environmental assessments on other pipeline projects have found that construction, and maintenance activities can result in potential effects on species of conservation concern (Kelly WM Scott & Associates 2011; Stantec Consulting Ltd 2014a), including the loss of habitat, disruption of breeding activity, and the temporary displacement of species of concern because of noise.

The effect pathways through which the project has the potential to interact with wildlife and wildlife habitat include:

- Ground disturbance to wildlife habitat during construction activities and decommissioning
- Indirect effects on wildlife and wildlife habitat from project related sensory disturbance

8.4.1.1 Ground disturbance

<u>Construction</u>

During construction, right-of-way preparation and pipeline installation (i.e., trenching) of the proposed pipeline has the potential to cause disturbance to wildlife habitat, specifically in areas where the proposed pipeline is located adjacent to road allowance ditches. Ditches can provide suitable habitat for amphibian species, including SOCC. Amphibians are particularly vulnerable to disturbance due to their life history requirements requiring access to water, upland habitats, and minimal ground disturbance during spring and summer. However, proposed construction activities will not result in any land use cover class being lost, altered or converted (i.e., no trees or natural habitats will be lost as a result of project development). Similar effects will occur during decommissioning.

8.4.1.2 Sensory disturbance

<u>Construction</u>

Indirect effects on habitat are those that reduce the effectiveness of existing or remaining habitat for wildlife. Indirect effects to wildlife and wildlife habitat from construction related activities include project-related temporary sensory disturbance and displacement of wildlife from mobilization and vehicle/equipment use, right-of way preparation, creation of temporary work and storage areas, topsoil salvage and stripping, stringing and welding, trenching, horizontal directionally drilling, hydrostatic pressure testing and clean-up and reclamation which may result in the temporary displacement of mammals and birds. These activities could disrupt and displace some wildlife within the LAA.

During the field reconnaissance conducted in June 2024, one bird species of conservation concern, the barn swallow, was identified at the bridge crossing the Main Drain in Section 16-2-3EPM. Approximately 20 barns swallows were observed exiting and entering underneath the bridge crossing and therefore it is assumed that nests are in this area. The bridge crossing of the Main Drain is located approximately 320 metres northwest of the proposed pipeline crossing.

Operations, maintenance, and decommissioning

Although changes to habitat availability will be most pronounced during construction, operation and maintenance will continue to have an influence on wildlife and wildlife habitat through periodic disturbances associated with vegetation maintenance and inspection activities as well as clean-up and reclamation activities associated with decommissioning (i.e., noise).

8.4.2 Change in mortality

During construction the primary pathways for direct changes in wildlife mortality risk are associated with collision with project-related transportation in the LAA.

The effect pathway through which the project has the potential to result in a change in mortality include:

- Increase in construction vehicles and traffic collisions and indirect effect of sensory disturbance from construction activities

8.4.2.1 Change in direct (collisions) and indirect (sensory disturbance) mortality risk

Construction

Wildlife mortality could increase due to collisions of mammals, birds, or amphibians, including SOCC, with construction vehicles. During construction, some roads will experience increased volumes, particularly during peak periods of workforce movement (e.g., between shifts) and during peak periods of materials delivery.

Behavioural changes related to increased activity, noise and nighttime illumination from construction may cause an indirect increase in mortality risk due to disturbance to wildlife, resulting in behavioural changes that may increase chances of predation. Small mammals or birds may move from cover (i.e., behavioural change) because of disturbance from noise and vibration, putting them at greater risk of predation and mortality from exposure (Habib, Bayne and Boutin 2007).

8.4.3 Mitigation measures

This section describes the mitigation measures identified to minimize effects on the change in habitat and change in mortality to wildlife.

8.4.3.1 Mitigation measures related to change in habitat

Mitigation measures to reduce project-related changes to wildlife habitat include the following:

- Construction activities will not be carried out during the reduced risk timing windows for wildlife species without additional mitigation measures such as pre-construction nest searches.
- Wildlife features (i.e., stick nests) will be identified in the Construction Environmental Protection Plan (CEnvPP) and mitigation applied such as buffers.
- Construction activities will be restricted to established roads, trails and cleared construction areas in accordance with the Access Management Plan
- Access shall be restricted to established roads and trails and cleared construction areas.
- Environmentally sensitive sites, features and areas will be identified and mapped before construction.

8.4.3.2 Mitigation measures related to change in mortality

Mitigation measures to reduce project-related changes to wildlife mortality include the following:

- Construction activities will be restricted to established roads, trails and cleared construction areas in accordance with the Access Management Plan.
- Project-related vehicles will observe all traffic rules, including speed limits and provincial and federal highway regulations.
- Construction activities will not be carried out during reduced risk timing windows for wildlife species without additional mitigation.
- Inspecting the trench before backfilling to prevent amphibians or other wildlife from being inadvertently buried.

- Hunting and harvesting of wildlife, or possession of firearms by Project staff will not be permitted while working on the project sites.

8.4.4 Characterization of residual effects

This section describes the residual project effects to wildlife and wildlife habitat predicted to remain after the application of mitigation measures.

8.4.4.1 Residual effect on change in wildlife habitat

After mitigation, predicted residual effects on the change in wildlife habitat include:

- Indirect effect of sensory disturbance during operations and maintenance.

Sensory disturbances and annoyance (e.g., noise) can occur during operations because of the use of equipment during right-of-way maintenance (i.e., vegetation management) and ground pipeline patrols which can temporarily displace wildlife along the proposed pipeline route. However, vegetation management will only occur periodically throughout the life of the project and as a result is anticipated to be small in magnitude, contained to the ROW and reversible once the project is decommissioned. Since the residual effect of sensory disturbance will only cause potential temporary displacement of wildlife, long-term effects on wildlife are not anticipated.

Following the implementation of mitigation measures described above, residual effects for change in wildlife habitat are characterized as follows:

- Direction: adverse
- Magnitude: low, indirect effects of sensory disturbance on wildlife are unlikely to have a measurable effect on the abundance of wildlife in the LAA, however temporary local shifts in wildlife distributions might occur in the PDA.
- Geographic extent: LAA
- Duration: short-term wildlife using these areas will return once sensory disturbance ceases.
- Frequency: is at multiple, irregular intervals: Sensory disturbance from right of way maintenance and vegetation management will occur multiple times at irregular intervals throughout operations.
- Reversibility: reversible

8.4.4.2 Residual effect on change in mortality

After mitigation, predicted residual effects on the change in mortality include:

- Increase in construction vehicles and traffic collisions and indirect effect of sensory disturbance from construction activities.

Wildlife mortality can increase due to collisions of mammals, birds, or amphibians, including SOCC, with construction vehicles. Small mammals or birds may move from cover and be at increased risk of predation. However, disturbance activities will be restricted to the ROW and designated roads and trails. The project location in areas developed for agriculture lowered the risk of affecting most wildlife species. Maintenance activities will occur periodically throughout the life of the project and as a result is anticipated to be small in magnitude, contained to the ROW and reversible once the project is decommissioned. Since the residual effect of mortality will only create a limited risk to wildlife, long-term effects on wildlife are not anticipated.

Following the implementation of mitigation measures described above, residual effects for change in wildlife mortality are characterized as follows:

- Direction: adverse
- Magnitude: low, effects of mortality on wildlife are unlikely to have a measurable effect on the abundance of wildlife in the LAA, however temporary local shifts in wildlife distributions might occur in the PDA.
- Geographic extent: LAA
- Duration: short-term, wildlife mortality will cease once disturbance ends.
- Frequency: is at multiple, irregular intervals: Mortality risk from right of way maintenance will occur multiple times at irregular intervals throughout operations.
- Reversibility: reversible

8.4.4.3 Summary of residual effects on wildlife and wildlife habitat

Table 8-4 characterizes the residual effects on wildlife and wildlife habitat.

Table 8-4: Project residual effects on wildlife and wildlife habitat

Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Residual effect on change in wildlife habitat						
Construction	Adverse	Low	LAA	Short-term	Irregular	Reversible
Operation	Adverse	Low	LAA	Short-term	Irregular	Reversible
Decommissioning	Adverse	Low	LAA	Short-term	Irregular	Reversible
Residual effect on change in wildlife mortality						
Construction	Adverse	Low	LAA	Short-term	Irregular	Reversible
Operation	Adverse	Low	LAA	Short-term	Irregular	Reversible
Decommissioning	Adverse	Low	LAA	Short-term	Irregular	Reversible

Residual Effects Characterization

8.4.5 Cumulative effects on wildlife and wildlife habitat

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For wildlife and wildlife habitat both conditions have been met. The project is anticipated to have adverse residual effects on the change in wildlife habitat, specifically indirect effects on wildlife and wildlife habitat from project related sensory disturbance. This residual effect could interact with residual effects of other present or foreseeable future physical activities.

8.4.5.1 Project residual effects likely to interact cumulatively

Table 8-5 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project. Where residual effect from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 8-5: Potential cumulative effects on wildlife and wildlife habitat

Other Projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects
	Indirect effects on wildlife and wildlife habitat from project related sensory disturbance
Existing/ongoing projects and activities	
Domestic resource use (e.g., hunting, trapping, fishing)	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	✓
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	✓
Manitoba Hydro gas and electricity transmission and distribution	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

Note: No future projects or activities were identified for this project.

8.4.6 Cumulative effect for change in wildlife and wildlife habitat

The assessment of the cumulative effects to wildlife and wildlife habitat, specifically the change in wildlife habitat because of sensory disturbance likely to result from the project in combination with other projects and physical activities, including the pathways to effect and mitigations, are discussed in subsequent sections.

8.4.6.1 Pathways for cumulative effect

All existing and ongoing projects and activities including existing infrastructure, transmission lines, infrastructure, commercial resource use and recreational activities have contributed to a change in wildlife and wildlife habitat and indirect changes specifically to sensory disturbance. The primary pathways of these effects are through land clearing and/or operation-related disturbances (e.g., noise).

The primary pathway of effect for ongoing activities and projects (Table 8-5) in conjunction with the proposed project is through operation-related sensory disturbances (i.e., noise).

8.4.6.2 Mitigation measures

The implementation of the mitigation measures identified above in Section 8.4.3.2 will reduce the proposed project's adverse effects on wildlife and wildlife habitat, including sensory disturbance. Application of similar mitigation for existing projects/activities by other proponents would help to mitigate similar project effects that may result, lessening the potential for cumulative effects.

8.4.6.3 Residual cumulative effect

Many of the ongoing projects and activities that may interact cumulatively with the residual project effect on wildlife and wildlife habitat are in or alongside previously disturbed, modified habitats. The RAA is extensively developed, primarily for agriculture which currently covers approximately 145 ha or 79% while a much smaller area of 8,000 ha (<5%) is covered by coniferous and deciduous forest. Within the PDA, as per the land cover classification, 137 ha (>95%) is agriculture. Some of the existing projects, specifically infrastructure, commercial resource use and recreational use have potentially contributed to a change in wildlife habitat because of sensory disturbance.

With the implementation of mitigation measures identified for wildlife and wildlife habitat, this project, in combination with other ongoing projects, is predicted to have a small contribution to cumulative effects on sensory disturbance to wildlife.

While the project will have a cumulative environmental effect, with the implementation of mitigation measures, cumulative effects are anticipated to be limited to the LAA and are anticipated to be of low magnitude. Cumulative effects will be short-term occurring on a multiple, irregular basis and reversible after decommissioning.

8.4.7 Determination of significance

With mitigation and environmental protection measures, the cumulative effects on wildlife and wildlife habitat are predicted to be not significant.

Although the project will have indirect effects to wildlife because of sensory disturbance from construction and operations activities, the project is not anticipated to affect the long-term persistence or viability of wildlife. With mitigation and environmental protection measures, the cumulative effects on wildlife and wildlife habitat are predicted to be not significant.

8.4.8 Prediction confidence

Prediction confidence in the assessment of effects on wildlife is high. The level of confidence is based on:

- The quantity and quality of data available
- Professional judgement and experience with similar projects
- Effectiveness of mitigation measures, which reflect best industry practices

Mitigation measures during construction and operation will be implemented to reduce adverse effects on wildlife. The level of confidence in the effectiveness of the mitigation measures is high based on past project experience.

8.4.9 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the environmental protection plan (Chapter 16).

8.4.10 Sensitivity to future climate change scenarios

Effects of climate change on wildlife and wildlife habitat are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding). Climate change could lead to more frequent and severe flooding events, which can damage roads, utilities, and other critical infrastructure.

A portion of the RM of Emerson-Franklin in the western half of the rural municipality is in an area identified as a Designated Flood Area (WSP 2017). This designated flood area extends the entire length of the Red River and encompasses the area around Dominion City and the Town of Emerson (WSP 2017). In previous years the municipality has experienced floods of varying degrees within the Red River valley, which have resulted in severe damage.

As a result of climate change, there is the potential for continued floods because of increased precipitation in both winter and spring and rapid spring melt (Government of Manitoba 2011). As a result, an increased frequency in flooding from climate change will impact wildlife and wildlife habitat that currently is present in the RAA.

The presence of flood barriers in the RM of Emerson-Franklin such as ring dykes around the Town of Emerson and Dominion City have helped to reduce potential impacts to these areas from flooding. In addition, flood and erosion prone area policies have been drafted and implemented to reduce impacts to future developments. These protection measures along with implementation of mitigation for proposed projects will help to mitigate the potential effects of flooding on wildlife and wildlife habitat.

9.0 Commercial agriculture

Commercial agriculture refers to the for-profit production of crops and livestock and is the dominant agricultural practice in the project area. Given the location of the project in a prime agricultural region, project components and activities could affect commercial agriculture.

Concerns were raised about the potential for effects on commercial agriculture due to the project during project engagement (e.g., during discussions with landowners and through feedback provided by provincial government staff and producer representative organizations).

Commercial agriculture was selected as a valued component because unmitigated effects from project activities during construction and from the presence of the project and maintenance activities, could reduce the amount of land available for agriculture, degrade the quality of land used to support agriculture, and interfere with agricultural activities.

Commercial agriculture is a key driver of productivity and prosperity in Manitoba and plays an important role in maintaining economic strength and generating socio-economic stability within the region of the project. Within the project area commercial agriculture includes:

- production of annual and perennial crops (i.e., row crops, other specialty crops, grains, oil seeds, hay, and forages)
- application of fertilizers, manure, soil amendments and pesticides
- raising of livestock and livestock grazing

This section presents baseline conditions for commercial agriculture and assesses the potential effects of project construction, operation and maintenance, and decommissioning activities on commercial agriculture. An assessment of cumulative effects on commercial agriculture is also presented.

9.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on commercial agriculture from project activities. An assessment of cumulative effects on commercial agriculture is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other recent transmission projects in Southern Manitoba (e.g., the Pointe du Bois to Whiteshell (PW75) Transmission Project, Dorsey to

Wash'ake Mayzoon Transmission (D83W) Project, and Manitoba-Minnesota Transmission Project (MMTP)).

9.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

9.1.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to commercial agriculture.

9.1.2.1 Provincial regulation and policies

The Noxious Weeds Act

The Noxious Weeds Act defines noxious weeds in Manitoba and outlines responsibilities to control and destroy noxious weeds. The Act defines a noxious weed as a plant that is designated as a tier 1, tier 2 or tier 3 noxious weed in the regulations, and the definition includes the seed of a noxious weed, whether it is still attached to the noxious weed or separated from it. Specific noxious weeds are designated within the Noxious Weeds Regulation 42/2007. The Act is relevant to this assessment of project effects because noxious weeds could be introduced to previously unaffected agricultural lands because of project activities. The listed weeds are designated into one of the three tiers based on prevalence, distribution, and invasiveness:

- Tier 1 species are those that are considered to have the most potential for negative effects though they may not yet be present in Manitoba. Under the Act, all Tier 1 species must be destroyed on land that a person owns or occupies.
- Tier 2 includes those species that are already established in Manitoba and have been observed to spread easily. Tier 2 species infestations less than 20 acres must be destroyed on land that a person owns or occupies, while infestations

occupying 20 acres or more must be controlled and kept from spreading on land that a person owns or occupies.

- Tier 3 species on land a person owns or occupies must be controlled if the weed's uncontrolled spread is likely to negatively affect an aspect of Manitoba's economy or environment, or the well-being of residents in proximity to the land.

Section 5(1) of the Act requires the cleaning of equipment following the use of that equipment in an area where a noxious weed is present.

Beyond *The Noxious Weeds Act*, there is no legislation directly governing biosecurity on agricultural land or with respect to agricultural operations. For example, there is no legislation addressing the potential spread of soil-borne pathogens (e.g., clubroot, soybean cyst nematode) or livestock diseases.

Biosecurity Protocols

In pursuit of reducing the movement of diseases and weeds in agricultural production areas, Manitoba Agriculture has developed biosecurity protocols for different end users, including landowners, agricultural service providers, utility companies, and researchers (Manitoba Agriculture 2024[a]). Biosecurity Management on Agricultural Land for the Energy and Transportation Industries is the protocol that applies to pipeline projects. This protocol's objective is to prevent the spread of soil-borne pests such as weeds, protists, and nematodes in agricultural soils by limiting soil movement between fields and across right of ways (Manitoba Agriculture 2024[b]).

The biosecurity protocols are relevant to this assessment of project effects because they show the importance of biosecurity for agricultural operations and provide strategies for maintaining and enhancing biosecurity.

9.1.2.2 Municipal guidance

Land use planning in the rural municipalities traversed by the project is guided under provincial land use policies and governed under *The Planning Act*. Each of the rural municipalities traversed by the project has a zoning by-law that regulates the development and use of the land, buildings, and structures (including agricultural uses).

Under *The Planning Act's* Provincial Planning Regulation (81/2011), the project is within an agriculture policy area with a rural/agriculture designation. The goals stated for the agricultural policy area include:

- Protecting agricultural land for present and future food production and agricultural diversification opportunities.

- Protecting agricultural operations from encroachment by other land uses.
- Maintaining the ability of a producer to efficiently manage, expand or diversify an operation.

Under the municipal zoning by-laws, the project is within land zoned for agriculture. This zoning is intended to preserve these areas for agricultural land uses. Lands are predominantly zoned for general agricultural uses (i.e., Agricultural General Zone in the RM of Rhineland and RM of Montcalm; Agricultural 1 Zone in the RM of Emerson-Franklin). Near the Altona, St. Joseph, Letellier and Dominion City town sites, agricultural uses are restricted (i.e., Agricultural Restricted Zone in the RM of Rhineland and RM of Montcalm, Agricultural 2 Zone in the RM of Emerson-Franklin), generally with respect to livestock operations. The project traverses a designated Agro-Industrial Zone north of Altona between PTH 30 and the CPKC rail line. These agricultural zonings allow for public utilities as permitted and/or conditional uses.

9.1.2.3 Manitoba Hydro policies

Manitoba Hydro’s agricultural biosecurity policy and procedure

Manitoba Hydro understands that biosecurity is of concern to agricultural producers across the province and recognizes that Manitoba Hydro staff and contractors have the potential to affect agricultural biosecurity through construction and maintenance activities that require access to agricultural land. Manitoba Hydro’s agricultural biosecurity policy addresses the need to prevent the introduction and spread of diseases, pests and invasive plant species on agricultural land and livestock operations (Manitoba Hydro 2023a).

Manitoba Hydro’s agricultural biosecurity standard operating procedure (SOP) (Manitoba Hydro 2023b) includes the following:

- Guidance for working in livestock settings and crop settings including assessing biosecurity risks, where a landowner or producer does not have an established protocol
- The requirement for all employees, subsidiaries and contractors who are required to perform work in livestock and agricultural settings to be trained in Manitoba Hydro’s agricultural biosecurity policy and the biosecurity SOP every three years

Like the provincial Biosecurity Management on Agricultural Land for the Energy and Transportation Industries protocol (Manitoba Agriculture 2024[b]), Manitoba Hydro’s agricultural biosecurity SOP seeks to prevent the spread of soil-borne in agricultural soils by limiting soil movement between fields and across rights of way, and provides mitigation measures that are focused on cleaning techniques and reducing exposure to biosecurity risk (*e.g.,* not working under very wet conditions).

While the provincial protocol (Manitoba Agriculture 2024[b]) presents multisector biosecurity guidance, the Manitoba Hydro SOP is specifically developed to address biosecurity concerns and issues related to how Manitoba Hydro project activities may interact with agricultural lands and operations.

Landowner compensation

Where property easements need to be acquired, Manitoba Hydro seeks to identify, contact, and communicate with landowners in a timely manner. Manitoba Hydro will mitigate project effects on agriculture to the extent practical. However, residual project effects may result from construction and operation activities. Effects may include temporary and permanent loss of land due to the presence of above-ground structures, damage to crops and property, ongoing nuisance to farmers, and direct and indirect effects on property use. Landowners and producers are compensated for these residual effects.

Four types of compensation are available to affected landowners:

1. Land compensation

Land compensation is a one-time payment to landowners who grant an easement for a transmission pipeline right-of-way. It is based on the following:

- total land area (acres) of easement required
- current market value of the land (per acre)

- Easement compensation factor for underground gas transmission lines, Manitoba Hydro's compensation factor is 100% of current market value.

2. Construction damage compensation

Construction damage compensation is provided to landowners who experience damage to their property due to construction, operation, and maintenance of a Manitoba Hydro project. A one-time payment for construction damage is negotiated on a case-by-case basis. Manitoba Hydro will:

- compensate or be responsible for repairing, to the satisfaction of the landowner, any damage to a landowner's property related to the construction and operation and maintenance of the gas transmission line, and

- compensate a landowner for damages such as the reapplication of topsoil or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the landowner's expertise.

If crops are in place prior to construction, the crop owner is compensated for financial loss due to damage. This compensation generally considers the most recent average value of the harvested crop reported by Manitoba Agricultural Services Corporation [MASC].

3. Structure impact compensation

Structure impact compensation is a one-time payment to landowners if an above-ground structure is constructed on land classified as agricultural. Structure impact compensation considers the following:

- lands permanently removed from production, determined by the type of structure constructed on the land
- reduced productivity in an area of overlap around each above-ground structure
- additional time required to manoeuvre farm machinery around each above-ground structure
- double application of seed, fertilizer and weed control in the area of overlap around each above-ground structure

4. Ancillary damage compensation

Ancillary damage compensation is a one-time payment that applies where Manitoba Hydro's use of the right-of-way directly or indirectly affects property use. Ancillary damage compensation is negotiated. Landowners may be compensated for:

- agricultural effects (*e.g.,* effects on irrigation and aerial spraying activities)
- constraint effects, such as restricted access to adjacent lands

9.1.3 Consideration of engagement feedback

Project engagement (Chapter 4) actively sought to provide opportunities for concerned and interested parties to provide feedback about the project.

Questions and concerns regarding commercial agriculture raised by agricultural landowners related to reduced productivity due to land disturbance, damage to crops during construction, compensation for disruption in operations and impacts to current and future drainage management.

9.1.4 Potential effects, pathways, and measurable parameters

The selection of effects included in the assessment of environmental effects on commercial agriculture was based on regulatory guidance, namely Manitoba Environment and Climate Change's Information Bulletin – Environment Act Proposal Report Guidelines, key issues and concerns identified during engagement, and Manitoba Hydro experience and learnings from past assessments.

The potential project effects on commercial agriculture, along with effects pathways and measurable parameters are outlined in Table 9-1.

Table 9-1: Potential effects, effects pathways, and measurable parameters for commercial agriculture

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Loss of agricultural land	Clearing of the right-of-way, creation of access routes, and set-up of marshalling yards may result in temporary agricultural land loss. The presence of above-ground structures remaining through operation (e.g., valve sites) will result in permanent agricultural land loss.	Extent of temporary agricultural land loss (ha) Extent of permanent agricultural land loss (ha)
Degradation of agricultural land	Construction activities may result in losses of agricultural production due to degradation of soil capability through soil disturbance, compaction, and alteration of drainage paths. Traffic movement during project maintenance activities might cause soil degradation through compaction.	Land capability class for agriculture

Conflict with agricultural activities	Construction and operation and maintenance activities might cause conflict with agricultural activities (e.g., disrupted field operations or access, tile drainage installation) and increased potential for crop and livestock biosecurity risk.	Interference with agricultural activities (e.g., increased field access distances, relocation of agricultural buildings or structures, modified tile drainage installation requirements)

9.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on commercial agriculture:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.

- **Local assessment area (LAA):** includes all components of the PDA and the quarter sections and river lots (*i.e.,* surveyed parcels) of land traversed by the PDA. The quarter section was selected to define the LAA as these land survey/ownership units generally encompass the basic field management unit most used in the project region. A portion of the land between Letellier and the Red River is surveyed in river lots – long and narrow land parcels adjacent to the Red River. In this area, four river lots have been included as part of the LAA to be consistent with the remainder of the LAA in relation to the project. The LAA represents the area where direct and indirect effects on agriculture are likely to be most pronounced or identifiable and encompasses the locally affected agricultural land uses or activities. Therefore, project effects that are experienced across the entire field management unit will generally be considered within the boundary of the LAA.

  Regional assessment area (RAA): includes the PDA and LAA and is defined by the boundaries of the RMs that are traversed by the PDA. From east to west, the RMs that make up the RAA for assessment of effects to commercial agriculture are Emerson-Franklin, Montcalm, and Rhineland. In addition, the Town of Altona, south of the western terminus of the Project, is included in the

RAA. While the Town of Altona is not traversed by the PDA, it is fully contained within the RM of Rhineland and includes agricultural land use. The area defined by these RMs was chosen as the RAA because it represents the region that encompasses the communities within which changes in socio-economic parameters attributable to project effects on agriculture might occur. The RAA is the area used for assessing cumulative environmental and socio-economic effects.

Map 9-1 illustrates the spatial boundaries for the assessment of project effects on commercial agriculture.

9.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on commercial agriculture are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

9.1.7 Residual effects characterization

Table 9-2 provides the definitions used to characterize the residual effects on commercial agriculture.

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to commercial agriculture relative to baseline conditions. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
		commercial agriculture relative to baseline conditions. **Neutral –** no net change in measurable parameters for commercial agriculture relative to baseline conditions.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**No Measurable Change –** no measurable change in the capacity for agriculture. **Low –** small but measurable change in the capacity for agriculture. Land loss, land degradation or conflict with activities has a measurable effect on production levels, however production can continue at or near pre-disturbance levels. **Moderate –** a change that is greater than low but will not result in an impairment of agricultural capacity. Land loss, land degradation or conflict with activities has a measurable effect on production levels that may influence production at the field management unit level. **High –** a change that can result in an impairment of agricultural capacity. Land loss, land degradation or conflict with activities influences production such that production cannot continue at or near pre-disturbance levels.

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA. **LAA –** residual effects extend into the LAA. **RAA –** residual effects extend into the RAA.
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase. **Medium-term –** the residual effect extends for up to 3 years following completion of construction (*i.e.*, through post-construction reclamation) **Long-term -** the residual effect extends beyond 3 years post-construction and may extend up to the life of the project.
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event -** residual effect occurs once **Multiple irregular event –** residual effect occurs multiple times at no set schedule **Multiple regular event –** residual effect occurs multiple times at regular intervals **Continuous –** residual effect occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

9.1.8 Significance definition

A determination of significance is made for the project residual effects on commercial agriculture after the implementation of mitigation measures has been considered. There are no specific provincial regulations or guidelines that set thresholds for determining the significance of environmental effects on commercial agriculture. As such, the study team developed thresholds to evaluate the capacity for agriculture to continue for extended periods of time following construction of the project.

It is acknowledged that effects on commercial agriculture may differ depending on the scale at which, and the perspective from which, they are evaluated. The significance of project effects from the perspective of an individual landowner or producer, considered at a local scale of an individual agricultural operation or agricultural field, can differ from the perspective of the agricultural industry considered at a broader, regional scale.

For this assessment, adverse residual effects on commercial agriculture are considered significant if the proposed use of the land for the project results in either of the following:

- a loss of commercial agricultural land or degradation of soil quality such that existing agricultural production cannot continue at current levels for extended periods of time (i.e., beyond the post-construction reclamation phase, or beyond 3 years post-construction) or cannot be adequately compensated
- interference with or disruption that restricts agricultural operations and activities such that existing agricultural operations and activities cannot continue at current levels for extended periods of time (beyond construction phase) or cannot be adequately compensated

9.2 Existing conditions

Within the project region, a broad-based conversion to commercial agricultural land use began in the 1870's with the arrival of European settlers (Deveson 2007). With respect to commercial agriculture in present day, the area within the RAA can generally be characterized as being predominantly under annual crop production with some livestock.

Baseline information for existing conditions to support this assessment was gathered through a detailed review of the following information sources:

- Available desktop information (*e.g.,* existing soil resource information, land cover, crop types, landowner maps, Statistics Canada)

- Orthoimagery (*i.e.,* corrected aerial/satellite imagery) review
- Windshield survey completed within the LAA
- Feedback from project engagement

The existing conditions described in this section focus on:

- Agricultural land cover and land use
- Existing commercial agriculture operation types and farm sizes
- Agricultural capability
- Soil compaction risk
- Agricultural cropping, including risk to crop biosecurity
- Livestock operations, including risk to livestock biosecurity

9.2.1 Agricultural land cover and land use

The RAA is comprised largely of land under agricultural crop production, with approximately 73% characterized as land under annual crop production and 3% under forage crop production (Table 9-3; Map 5-2). Approximately 12% of the RAA is characterized as grassland land cover, which in some cases may be used for grazing livestock or cut for hay for livestock feed (e.g., road rights-of-way, drainage channel side slopes).

Within the LAA and PDA agricultural land use is even more dominant with 87.3% and 94.3%, respectively, under agricultural production. The dominance of annual cropping is consistent within the RAA. Grasslands occupy minor portions of the LAA (4.1%) and PDA (1.2%).

Table 9-3: Land cover types in the RAA, LAA and PDA

Crop Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Agriculture – annual cropping	179,291	73.3%	2,815	87.5%	136.5	94.3%
Agriculture – forage crops	6,207	2.5%	55	1.7%	2.0	1.4%
Conifer Forest	2	0.0%	0	0%	0	0%
Cultural	1,309	0.5%	12	0.4%	0	0%
Deciduous Forest	14,378	5.9%	97	3.0%	0.2	0.2%
Grassland	30,203	12.3%	133	4.1%	2.1	1.2%
Marsh/Fens	789	0.3%	0	0%	0	0%
Mixedwood Forest	3	0.0%	0	0%	0	0%
Open Deciduous Forest	1,947	0.8%	0	0%	0	0%
Roads/Trails/Rail Lines	8,488	3.5%	87	2.7%	3.7	2.1%
Sand and Gravel	116	0.0%	0	0%	0	0%
Water	1,901	0.8%	17	0.5%	0.2	0.1%
Null[1]	47	0.0%				
Totals	244,683	100.0%	3,218	100.0%	144.7	100.0%

NOTES:
[1]Null category refers to data that is not available for the small portion of the RAA that extends into United States.

9.2.2 Existing commercial agriculture operation types and farm sizes

Farm types within the RMs of the RAA reporting agricultural activities (i.e., Rhineland, Montcalm and Emerson-Franklin) predominantly reported as oilseed and grain farming (62% of farms), with an additional 7% reporting as other crop farming, including hay production and other miscellaneous crop farming (Table 9-4; Statistics Canada 2021[a]). Cattle ranching and farming comprised 18% of farms, with fewer farms reporting as hog and pig farming (3%), sheep and goat farming (2%), and poultry and egg farming (2%).

When compared to Manitoba overall, farming in the RMs of the RAA is more heavily weighted to oilseed and grain farming, owing to the agricultural capability of the soil for cropping (see Section 9.2.3). More information on agricultural cropping and livestock within the LAA and PDA is presented in Section 9.2.5 and Section 9.2.6, respectively.

There were three farms reporting as having organic products for sale and three farms reporting as having certified organic products for sale in 2021 (Statistics Canada, 2021[b]). It is unknown if any of the farming operations within the LAA are considered organic production systems.

With respect to manure management, manure was reported to be applied by 139 farms within the RMs of the RAA, with 120 farms reporting solid or composted manure application and 36 reporting liquid manure application (Statistics Canada, 2021[c]). Manure management within the LAA is discussed further in Section 9.2.6.

There were nine farms within the RMs of the RAA reporting as having irrigation as a practice; however, no acres were included in this reporting due to data being deemed too unreliable to be published (Statistics Canada, 2021[c]). Irrigation does not appear to be a practice within the LAA based on the windshield survey and orthoimagery review.

Table 9-4: Farm types reported in the RMs of the RAA

Farm Type	RMs of the RAA		Manitoba	
	Number of farms	%	Number of farms	%
Oilseed and grain farming	351	62	6,749	46
Cattle ranching and farming	105	18	3,812	26
Other crop farming	38	7	1,898	13
Other animal production	23	4	1,015	7
Hog and pig farming	15	3	245	2
Sheep and goat farming	14	2	174	1
Poultry and egg production	10	2	263	2
Greenhouse, nursery and floriculture production	3	1	137	1

Fruit and tree nut farming	2	0	66	0
Total number of farms	570	100	14,543	100

Source: Statistics Canada. 2021. Table 32-10-0231-01 Farms classified by farm type, Census of Agriculture, 2021

RMs of the RAA include Montcalm, Rhineland and Emerson-Franklin.

With respect to farm size, farms under 180 acres in size were the most reported, with 32% of farms within RMs of the RAA in this size class (Table 9-5; Statistics Canada, 2021[d]). These farms are likely comprised of a combination of "hobby farms" and/or landowners with relatively small land holdings and potentially leasing or renting out land to operators.

In other size classes, the most common farm size is the 1,120 to 3,520 acres class, with 24% of farms reporting in this class. Farm size classes are similar between RMs of the RAA and those reported for Manitoba overall.

Table 9-5: Farms sizes reported in the RMs of the RAA

Farm Size	RMs of the RAA		Manitoba	
	Number of farms	%	Number of farms	%
Under 180.00 acres	180	32	3,996	27
180.00 to 559.99 acres	121	21	3,315	23
560.00 to 1119.99 acres	100	18	2,485	17
1120.00 to 3519.99 acres	139	24	3,675	25
3520.00 acres and over	30	5	1,072	7
Total number of farms	570	100	14,543	100

Source: Statistics Canada. 2021. Table 32-10-0232-01 Farms classified by total farm area, Census of Agriculture, 2021.

RMs of the RAA include Montcalm, Rhineland and Emerson-Franklin.

9.2.3 Agricultural capability

Agricultural land capability is a function of climatic, topographic and soil conditions for a given parcel of land. Agricultural capability classes provide insight into the ability of the soils to support cropping and describe the degree of limitation in use for cropping. Where specific limitations exist, subclasses are assigned and describe the type of limitation.

The agricultural capability classification system is a seven-class system, with Class 1 having no significant limitations in use for crops and Class 7 having no capability for arable culture or permanent pasture. The definitions of agricultural capability classes are given in Table 9-6.

Table 9-6: Agricultural Capability Classification

Agricultural Capability Class	Degree of Limitation
1	Soils in this class have no significant limitations in use for crops
2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices
3	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices
4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices or both
5	Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible
6	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible
7	Soils in this class have no capability for arable culture or permanent pasture
O	Organic soils, which are not rated for agricultural capability

SOURCE: Canada Land Inventory 1969

The agricultural capability classes within the RAA are predominantly Class 2 (52.0%), Class 3 (29.7%) and Class 1 (12.6%) (Table 9-7). Class 1, 2 and 3 lands are considered prime agricultural land for the purposes of land use planning in Manitoba if the land unit occupies one quarter section or more or 60% of more of a river lot (Manitoba Agriculture 2008; Manitoba Government n.d.). Class 1, 2 and 3 lands are considered to have no significant limitations, moderate, and moderately severe limitations for dryland crop production, respectively, and typically consist of grain, oilseed, specialty and row crop production. The distribution of agricultural capability classes across the RAA is shown in Map 9-2.

Within the LAA, 99.4% of the land is characterized as Class 1, 2 and 3 with Class 2 (83.0%) being the most common (Table 9-7). The main limitation to agricultural capability in the LAA is excess water (subclass W, 93.8%) due to the combination of inherent drainage limitations and soil texture. A minor portion of the LAA (2%) is limited due to inundation (subclass I, 2.3%) due to overland flooding.

The PDA has a very similar characterization with 99.7% of the area within Class 1, 2 and 3 (Table 9-7). The excess water limitation applies to 99.3% of the PDA while the inundation limitation affects less than 1% of the PDA.

Table 9-7: Agricultural Capability in the RAA, LAA and PDA

Agricultural Capability	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
1	30,756.3	12.6	140.4	4.4	1.0	0.7
2	127,283.4	52.0	2,672	83.0	126.3	87.3
3	72,746.5	29.7	387.8	12.0	16.9	11.7
4	195.1	0.1	0	0	0	0
5	9,568.8	3.9	16.2	0.5	0.4	0.3
6	1,321.5	0.5	0	0	0	0
7	0	0	0	0	0	0
Organic	0	0	0	0	0	0
Urban, Modified or Unclassified[1] and Open Water[2]	2,809	1.2	1.7	0.1	0	0
Total[3]	244,683	100	3,218	100	144.7	100

[1] Urban, modified or unclassed lands are not assigned an agricultural capability class.

[2] Open water = surface water features such as rivers, lakes and smaller open water bodies.

[3] Values might not sum to totals shown because of rounding.

9.2.4 Soil compaction risk

Soil compaction is an important process which can result in degradation of soil capability and productivity. Compaction can reduce the rate of infiltration of water into the soil, soil water holding capacity, soil air movement, seedling emergence, crop growth and crop yield. Soil compaction can occur because of vehicle and heavy equipment traffic.

Soils have degrees of risk of soil compaction which vary based on factors including soil texture and moisture status. A generalized compaction risk rating system was developed using professional judgment and review of two compaction systems that had been designed for forestry applications; specifically, the Soil Compaction and Puddling Hazard Key (British Columbia Ministry of Forests 1999) and the table of Compaction and Rutting Hazard for Soils in Ontario (Archibald *et al.* 1997).

The compaction risk rating matrix determined based on the combination soil texture and drainage properties is provided in (Table 9-8). Resultant compaction risk ratings within the RAA, LAA and PDA are presented in Table 9-9.

The analysis is mostly pertinent to the PDA as this is the area subject to disturbance through project activities. Within the PDA, soils are almost completely rated as having a high compaction risk, owing to the combination of moderately fine to very fine soil textures and imperfect to poor drainage.

A map of compaction risk ratings is presented in Map 9-3.

Table 9-8: Compaction Risk Matrix

Drainage	Textural Class					
	Very Coarse (S, LS, LFS)	Moderately Coarse (SL, FSL)	Medium (VFSL, L, SiL)	Moderately Fine (SCL, CL, SiCL, Si)	Fine/Very Fine (SC, SiC, C, HC)	Organic
Rapid	Low	Low	-	-	-	-
Well	Low	Low	Low	Moderate	Moderate	-
Imperfect	Low	Low	Moderate	High	High	-
Poor	Moderate	Moderate	High	High	High	-
Very Poor	-	-	-	-	-	High

NOTES:
S = sand LS = loamy sand LFS = loamy fine sand

SL = sandy loamy	FSL = fine sandy loam	VFSL = very fine sandy loam
L = loam	SiL = silt loam	SCL = sandy clay loam
CL = clay loam	SiCL = silty clay loam	Si = silt
SC = sandy clay	SiC = silty clay	C = clay
HC = heavy clay		

SOURCE: Matrix developed using professional judgment and review of two compaction systems (Archibald *et al.* 1997; British Columbia Ministry of Forests 1999)

Table 9-9: Compaction risk in the RAA, LAA and PDA

Compaction risk	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Low	39,384	16	0	0	0	0
Moderate	43,052	18	190	6	1.0	0.7
High	159,433	65	2,978	94	142.9	99.3
Unclassified	0	0	0	0	0	0
Open water	0	0	0	0	0	0
Total[3]	244,591	100	3,169	100	144	100

NOTES:

1 Developed lands (disturbed, urban, etc.) are not assigned an agricultural capability class.

2 Open water = surface water features such as rivers and lakes.

3 Values might not sum to totals shown because of rounding.

9.2.5 Agricultural cropping

Agricultural cropping within the project region is dominated by cereal, oilseed, and row crop production. The following breakdown of cropping within the RAA is from spatial distribution of crop type data for 2023 based on Agriculture and Agri-Food Canada's annual crop inventory (Government of Canada 2024) (Table 9-10):

- cereal/oilseed cropland covers 40% of the area under agriculture.
- row cropland covers 39% of the area under agriculture.
- natural hayland (grassland) covers 3% of the area under agriculture.
- seeded hayland (pasture and forages) covers 2% of the area under agriculture.

Within the LAA, cropping agriculture is even more dominant (Table 9-10):

- cereal/oilseed cropland covers 44% of the area under agriculture
- row cropland covers 50% of the area under agriculture
- natural hayland covers 1% of the area under agriculture
- seeded hayland covers 2% of the area under agriculture

The relatively high portion of the agricultural area being used for annual crops (row crops, cereals, and oilseeds) reflects the high agricultural capability in the LAA. Cereal/oilseed cropland is predominantly under canola and spring wheat production, while row cropland is predominantly corn and soybeans (Figure 9-1).

Table 9-10: Crop Types Grown (2023) in the RAA, LAA and PDA

Crop Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Row Crops[1]	96,327	39.4	1,591.2	49.4	76.7	53.0
Cereal/ Oilseed Crops[2]	98,484	40.2	1,389.7	43.2	65.0	44.9
Other Crop Types[3]	1	0	0	0.0	0	0
Seeded Hayland[4]	4,988	2.0	0	0.0	0	0
Natural Hayland[5]	8,371	3.4	19.7	0.6	0.3	0.2
Non-agricultural	35,390	14.5	209	6.5	2.7	1.9
Water	1,104	0.5	8.5	0.3	0	0
Null[6]	21	0	0	0	0	0
Totals	244,683	100	3,172	100	144	100

NOTES:

1 Row crop – includes corn, potatoes, soybeans, sunflower

2 Cereal/oilseeds – include cereals, canola, flaxseed, peas, fallow buckwheat, canary seed, millet

3 Other crop types – include beans, hemp, lentils, mustard, safflower and vegetables, and are included in this category due to low reported acreages

4 Seed hayland – includes forage crops and greenfeed

Crop Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)

5 Natural hayland – includes grasslands
6 Null refers to the small area of the RAA across the US Border where data is not available
Source: Government of Canada. 2024. Annual Crop Inventory. Agriculture Canada. Accessed July 2024 at: https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9

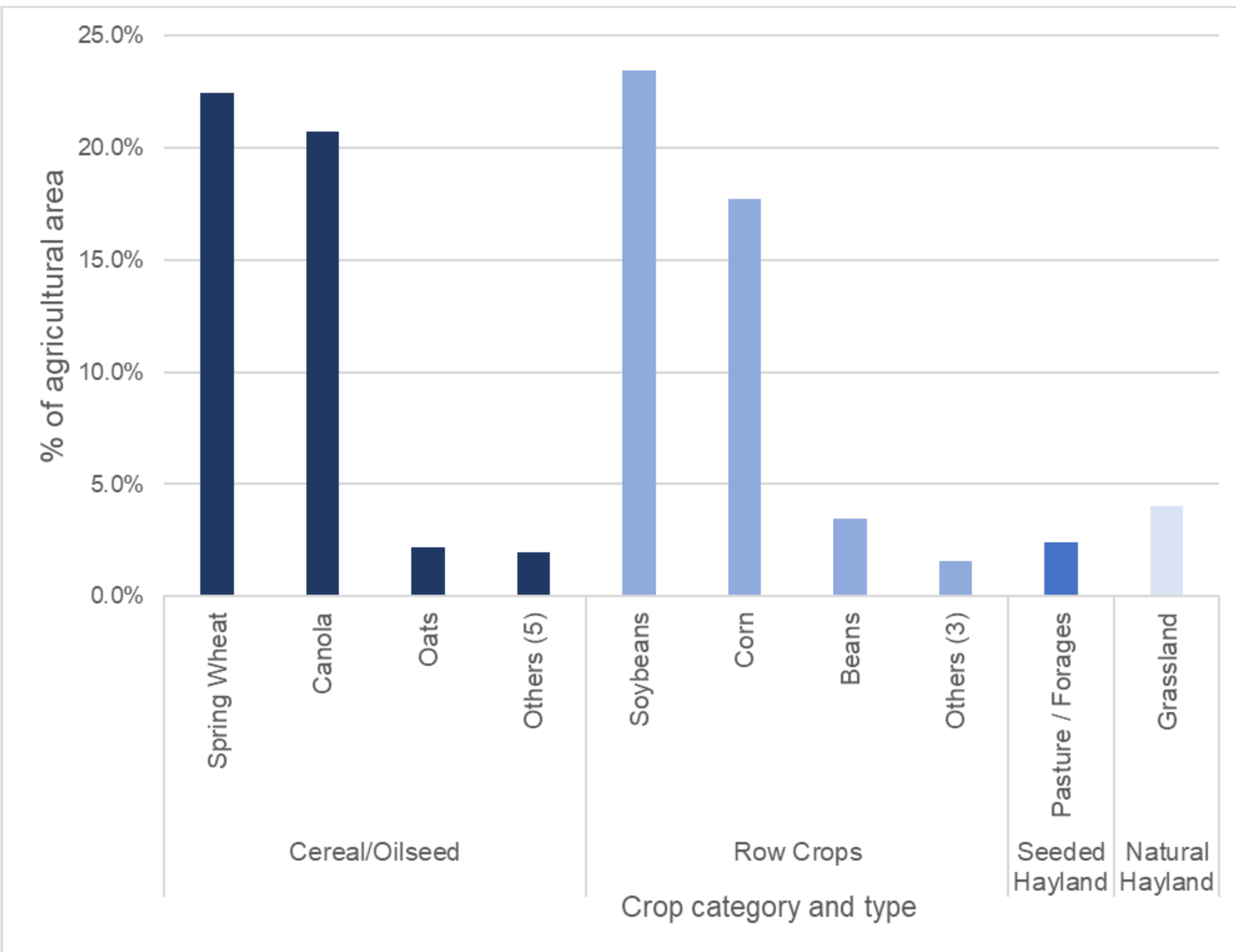


Figure 9-1: Crop types within the LAA (Source: modified from Government of Canada 2024.)

9.2.5.1 Irrigation

There was no irrigation observed within the LAA through the windshield survey or orthoimagery evaluation.

9.2.5.2 Drainage

Drainage is an important land improvement practice in the region of the project historically and in present day. Large, regional drainage projects allowed for development of agriculture in the region and producers use local, field-scale drainage improvements to remove excess water limitations and improve crop productivity.

Large, regional drains are maintained by municipalities, are in the order of metres wide and deep and typically collect water across regional areas and convey that water long distances.

Local surface drains are developed and maintained by producers, are generally shallow (<30 cm) and are used to convey water from low-lying areas of fields to municipal drainage ditches at the field edges.

An example of regional and local surface drainage improvements within the LAA is shown in Figure 9-2. Maintenance of the effectiveness of these local and regional drains is of critical importance to producers within the LAA and across the RAA, respectively.

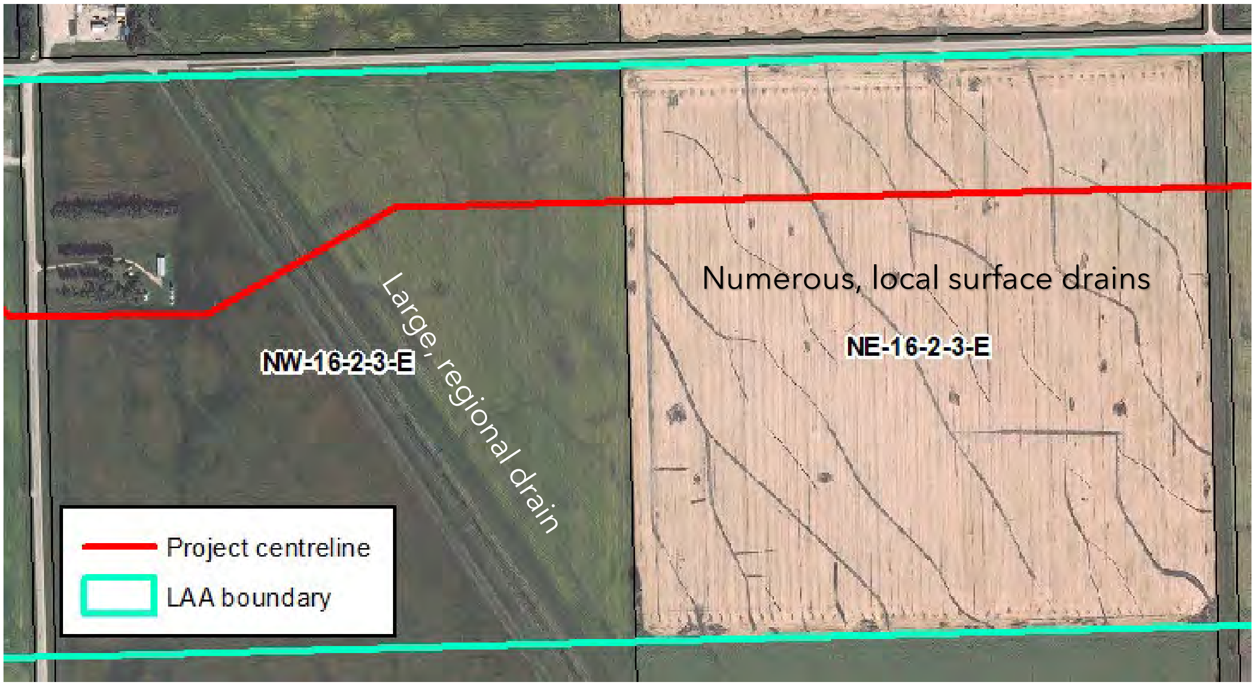


Figure 9-2: Large, regional drain and field-scale surface drains within the LAA

Two large, regional drains are found within the LAA. The Main Drain crosses the LAA in a southeast to northwest direction in NW-16-2-3-E1 (Photo 9-1) and the Harlow Drain crosses the LAA in the same direction through, SE, NE and NW-13-2-3-E1 and NE-14-2-3-E1 (Photo 9-2).

Photo 9-1: Main Drain at NW-16-2-3-E1 looking south-southeast (Source: Google Maps)

Photo 9-2: Harlow Drain at NE-14-2-3-E1 looking southeast (Source: Google Maps)

Local, field-scale surface drains are variable in nature (i.e., path, width, and depth) but are typically 10s of metres wide and shallow (i.e., 20-30 cm). Numerous, shallow surface drains within a field is common within the LAA. The surface drains have a very subtle appearance on the field surface (Photo 9-3).

Photo 9-3: A local, field-scale shallow surface drain in NE-16-2-3-E entering the municipal ditch (Source: Google Maps)

Tile drainage has emerged in recent years as a prominent practice in southern Manitoba as a means for producers to manage excess water for annual crop production. Tile drainage consists of perforated plastic pipes buried below the crop rooting zone, typically at 0.9 to 1.2 m (3 to 4 ft) below ground surface, and oriented in parallel lines with a typical spacing of 15 m (50 ft) between each drain line. These pipes convey excess water to the field edge where water outlets, typically into a ditch.

Tile drainage was visually confirmed in one field immediately adjacent to the LAA (SE-15-2-1W1) during the windshield survey but visual evidence of tile drainage was not noted within the LAA. Through project engagement to date, Manitoba Hydro has not heard about the presence of any fields within the LAA that are tile drained. However, engaged producers shared concern that the project may impact their ability to install tile drainage in the future.

The installation of tile draining following the project would still be an option. However, the presence of the project, and other buried utilities within fields traversed by the project, may influence tile drainage system design (e.g., tile depth, layout) and would require a safety watch during installation.

9.2.5.3 Cropland biosecurity

Cropland biosecurity refers to the management practices that can help minimize and/or control the introduction, transfer, or multiplication of pests in crops. Crop pests such as weeds, insects, diseases, and nematodes, can do irreversible damage to cropland productivity and can cause economic harm to crop producers' operations.

Diseases of concern for prominent crops in the project area include clubroot and verticillium wilt, both of which impact canola, and soybean cyst nematode. These are considered soil-borne pathogens, so biosecurity practices which minimize, control, or prevent soil movement to and from other regions and the project area, and between fields affected by the project, can help mitigate the spread of these diseases related to project activities.

The disease of primary concern for field crops within the RAA is clubroot, which affects canola and is caused by *Plasmodiophora brassicae,* a soil-borne pathogen (Manitoba Agriculture 2024[d]). Resting spore numbers will decline over time when non-host crops are grown, but a proportion of the spores can survive in the soil for up to 20 years. Clubroot was confirmed at very low levels in soil samples in Manitoba in

2011 and 2012, and the pathogen has been detected in more fields including symptomatic plants since then (Canola Council of Canada 2024).

Currently, there are no economical control measures that can remove the disease from a canola field once it has been infested. However, it is possible to curtail the spread and reduce the incidence and severity of infection (Canola Council of Canada 2024).

Movement of infested soil on machinery is the most important mechanism for the spread of clubroot. Of the three RMs traversed by the Project, the RM of Emerson-Franklin has the highest concentration of *Plasmodiophora brassicae* spores per gram of soil (Table 9-11; Figure 9-3; Manitoba Agriculture 2024[c]). The RM of Rhineland also has confirmed clubroot spores, while the RM of Montcalm has not had spores detected or they have been detected at very low levels. No RMs within the RAA have had fields with reported symptoms (i.e., swollen tissues or galls on canola roots) from clubroot.

Table 9-11 Clubroot Distribution in the RAA

Rural Municipality	Spores per gram of Soil
Emerson-Franklin	10,001–80,000
Montcalm	<1,000
Rhineland	1,000–10,000

NOTES:
Clubroot symptoms are typically observe d in canola growing in soil with >80,000 spores per gram of soil.
The tabulated data are based on soil and canola plant tissue analysis from 2009 to 2014.
Altona not reported here.
SOURCE: Manitoba Agriculture. 2024. Clubroot Distribution in Manitoba, 2022. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/plant-diseases/clubroot-distribution-in-manitoba.html

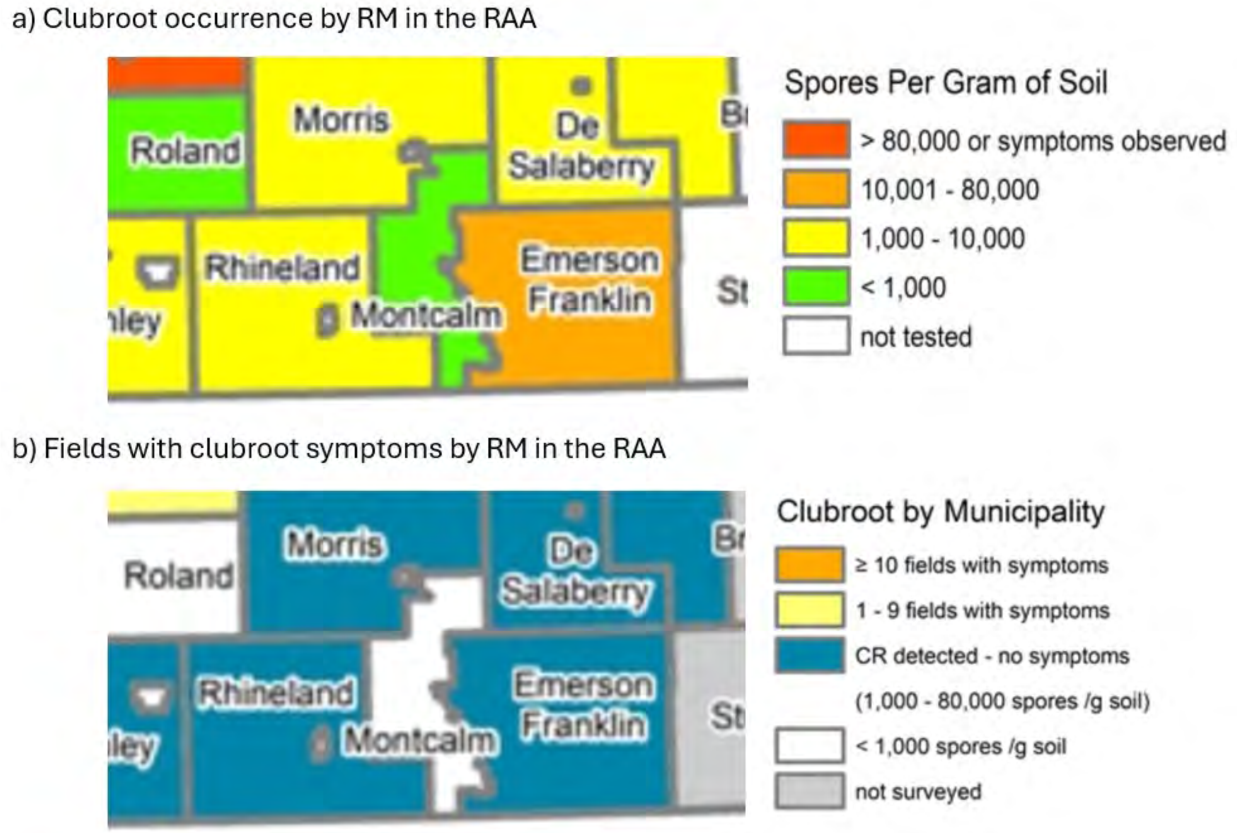


Figure 9-3: Clubroot occurrence within the RAA (modified from Manitoba Agriculture 2024[c])

In 2014, Verticillium wilt in canola caused by *Verticillium longisporum* was detected in Manitoba and this was the first case of this disease on an oilseed crop in North America (Manitoba Agriculture 2024[d]). The complete host range of *Verticillium longisporum* is still unknown, but many other brassica crops like broccoli, cabbage, mustard, and cauliflower are also hosts (Manitoba Agriculture 2024[d]).).

Soybean cyst nematode (SCN) is a parasitic roundworm harmful to soybean crops. Preventative action, early detection and timely management are key to avoiding significant yield loss from SCN (Manitoba Pulse & Soybean Growers 2021). Testing for SCN confirmed its presence for the first time in 2019 and in at least one field in five RMs as of 2021. The three main RMs within the RAA all have confirmed cases of SCN (Figure 9-4).

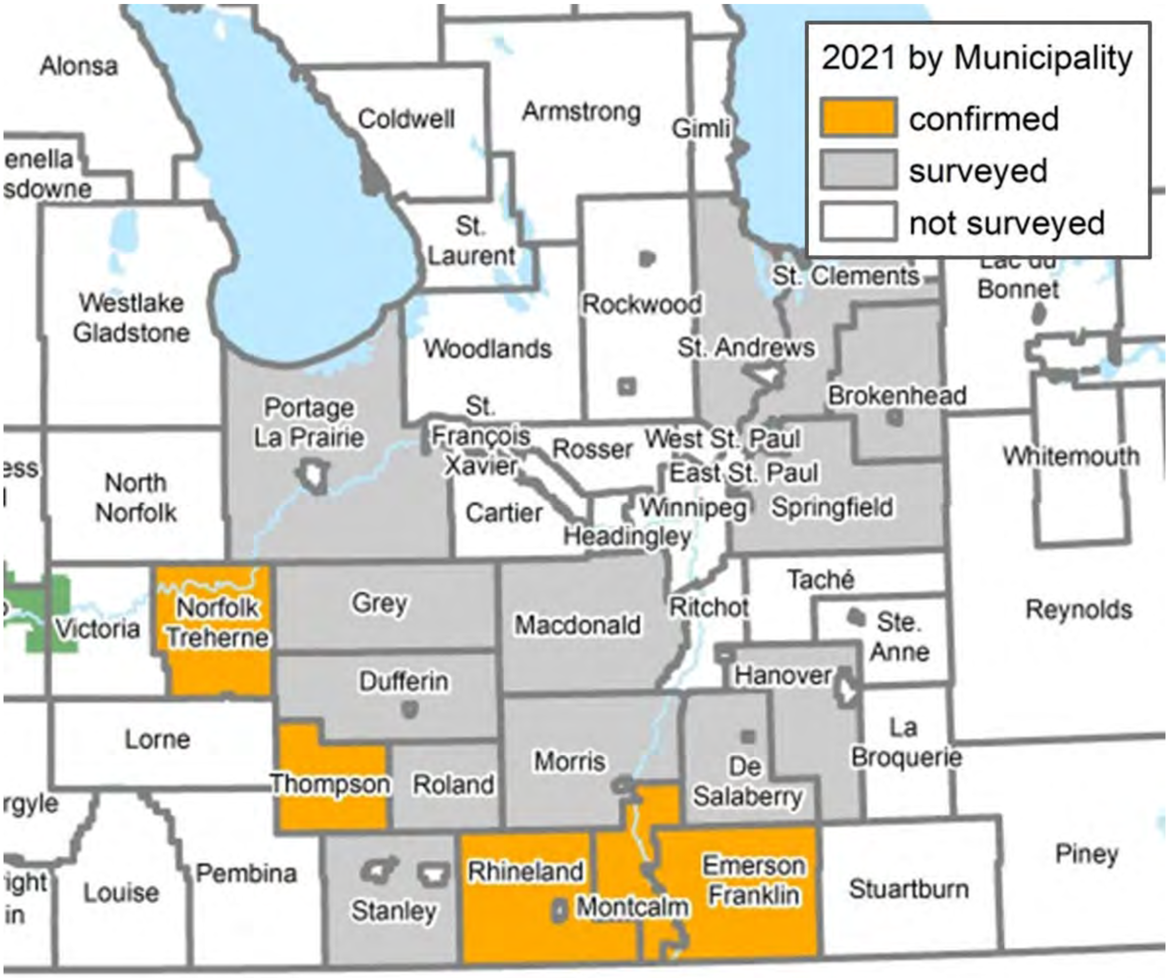


Figure 9-4 Soybean cyst nematode (modified from Manitoba Pulse & Soybean Growers 2021)

9.2.6 Livestock and other value-added operations

As discussed in Section 9.2.2, livestock production is a practice within the RAA. A windshield survey and orthoimagery review confirmed the presence of livestock operations within the LAA. Livestock and grain operations with an apparent active yard site being used for agricultural production activities within the LAA are summarized in Table 9-12. A swine and two dairy operations (one apparent mixed dairy – grain operation) were observed within the LAA, along with three other grain operations.

No other agricultural value-added operations were found within the LAA, except for a couple of agri-retail operations (i.e., AGT Foods – pulse product processor and exporter, The Tractor People - machinery dealer,). Beyond having a base of operations within the LAA, other livestock related practices within the LAA likely include manure application either in the form of solid manure or liquid manure or both.

Table 9-12 Livestock, grain and other value-added operations within the LAA

Legal Location	Type of Operation	Comment
NW 16-2-1-W	Swine	Yard site with livestock pens and small open air hog barns
NE 15-2-1-W	Grain	Yard site with several grain bins and shed
NW 14-2-1-W	Dairy	Yard site with two large barns and silage storage
NW 15-2-1-E	Grain	Large grain/seed operation
NE 15-2-1-E	Grain & Dairy	Delorvale Holsteins and Grain
SW 18-2-2-E	Grain	Yard site with several grain bins and sheds

Hutterite Colony farming operations are found within the RAA. Three such operations are found within 5 km of the LAA, all in the eastern portion of the RAA – Glenway Hutterite Colony (SE-2-3-3E), Avonlea Hutterite Colony (NE-28-2-4-E) and Ridgeville Hutterite Colony (SE-5-2-4E). Of the three colonies, only one has agricultural fields within the LAA (NE and NW-14-2-3-E, NE and NW-15-2-3-E). Hutterite farming operations are typically mixed grain-livestock operations.

9.2.6.1 Livestock biosecurity

The introduction or spread of diseases can be very devastating for livestock operations. This is especially the case for livestock operations with large numbers of animals contained within common spaces (e.g., cattle feedlots, dairy operations, intensive hog operations).

Livestock disease can be spread via close contact with livestock, contaminated feed and through soil.

Anthrax is a disease that quickly kills cattle, sheep, and other grazing livestock (Canadian Food Inspection Agency 2024). It appears regularly in Manitoba, and it is important to vaccinate for the disease every year (Manitoba Agriculture 2024[e]).

Conditions such as flooding, drought and recent digging can bring spores into close contact with grazing animals (Manitoba Agriculture 2024[e]). So, activities resulting in soil disturbance, such as soil stripping and excavation, have the potential to disturb anthrax spores. Anthrax is a concern specifically raised by raised by Manitoba Beef Producers through project engagement.

9.3 Project interactions with commercial agriculture

Table 9-13 identifies, for each potential effect, the physical activities that might interact with the VC and result in the identified effect.

Project activities have the potential to result in temporary and permanent loss of commercial agricultural land during construction and operation and maintenance, respectively. Degradation of soil quality could occur during construction and operation and maintenance, which could lead to a reduction in land capability for agriculture.

Project activities also have the potential to conflict with commercial agricultural activities during the construction and operation and maintenance phases of the project. Conflict with commercial agricultural activities could occur due to multiple pathways (e.g., effects on farm equipment operation and manure application, effects on livestock and animal health and compromised biosecurity for crops and livestock).

Temporary land loss is anticipated to occur during construction, after which most of the affected land will be returned to the previous agricultural land use. Permanent land loss will occur for the lifetime of the project under and immediately around the limited permanent surface structures.

Table 9-13: Project interactions with commercial agriculture		
Project activities/components	Loss or Degradation of Agricultural Land	Conflict with Agricultural Activities
Construction of pipeline, gate station, and valve sites		
Mobilization and staff presence	–	–
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	–	✓
Pipe installation – trenching and lowering	–	✓
Horizontal directional drilling	–	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	–	✓
Backfilling and contouring	✓	✓
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	–	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline, gate station, and valve sites		
Presence of pipeline, gate station, and valve sites	✓	–
Vehicle and equipment use	✓	✓

Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓
Valve operation checks (annually)	–	–
Vegetation management	–	–
Decommissioning of pipeline, gate station, and valve sites		
Mobilization and staff presence	–	–
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	✓
Removal of above-ground components (dismantling, removal from site, disposal)	✓	✓
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction

– = No interaction

9.4 Assessment of project effects

While effects to commercial agriculture could occur during construction, operation, and decommissioning, they will be most pronounced during construction. Potential project effects to commercial agriculture include:

- Loss and/or degradation of agricultural land due to disturbance to land during construction, operation and decommissioning, and the presence of project structures through operation
- Conflict with agricultural activities, which can take many forms including inconvenience and nuisance associated with carrying out farming operations, and increased biosecurity risk to cropping and livestock operations

Pathways of potential effects, mitigation measures to minimize potential effects, and residual effects characterization are presented in the following sections.

9.4.1 Effects pathways

9.4.1.1 Loss and/or degradation of agricultural land

There are two types of land loss associated with the project:

- Temporary land loss is associated with the construction phase of the project. Temporary land loss refers to lands currently under production which are not available for production activities for all or a portion of the production season during construction (*i.e.*, generally during May to October each year).
- Permanent land loss pertains to the operational phase of the project. Permanent land loss refers to lands currently under production which are not available for production activities following construction through to decommissioning of the project.

Degradation of land may include decreased land capability for agriculture (*e.g.*, loss of topsoil) and/or reduced soil productivity (e.g., compaction, change in nutrient or moisture status).

<u>Analytical assessment techniques</u>

<u>Temporary land loss estimation</u>

Estimates for areas of temporary land loss during the construction phase assume that the entire portion of the PDA (i.e., right-of-way) under agricultural land use will be unavailable for agricultural use and activities during the construction period.

<u>Permanent land loss estimation</u>

Permanent land loss refers to the area that will be occupied by project structures or permanently disturbed footprints (*e.g.,* gate station expansion footprint) and that will be unavailable for continued agricultural land use through the operation and maintenance phase of the project. Permanent land loss is estimated by determining the sum of the area under above-ground project structures and permanently disturbed footprints as given in the project description (Chapter 2).

Construction

During construction of the pipeline, gate station and valve sites, activities such as vehicle and equipment use, access development, establishment of marshalling yards, right-of-way preparation, backfilling and contouring, and clean-up and reclamation activities can result in the loss and or degradation of agricultural land.

It is assumed that temporary loss of commercial agricultural land will affect the entire agricultural portion of the PDA for the duration of construction. Of the whole PDA area of 145 ha, 141.7 ha (approximately 98%) is under annual crop production (Table 9-14). As shown in Table 9-15, the area of PDA under agricultural land use predominantly falls under Class 2 agricultural capability (87%), and with an appreciable portion under Class 3 agricultural capability (12%).

Table 9-14: Crop Types Grown (2023) in the PDA

Crop Type	Area	% of PDA
Row Crops[1]	76.7	53
Cereal/ Oilseed Crops[2]	65.0	45
Other Crop Types[3]	0	0
Seeded Hayland[4]	0	0
Natural Hayland[5]	0.3	0
Non-agricultural	2.7	2
Totals	144	100

Table 9-15: Agricultural land use area in the PDA

Agricultural Capability	Area	% of PDA
Class 1	1.1	1
Class 2	126.3	87
Class 3	16.9	12
Class 4	0	0
Class 5	0.4	0
Class 6	0	0
Class 7	0	0
Totals	145	100

Potential effects from construction activities that could result in the degradation of agricultural land would be primarily limited to the PDA and include soil compaction, rutting, admixing, and erosion. These effects can result in changes to land capability, soil productivity, decreased crop growth, and reduced crop yields (Manitoba Agriculture, Food and Rural Initiatives 2008).

The potential for soil compaction is greatest in areas of poorly drained fine textured soils or when soils are under high moisture conditions. Wheel use from heavy equipment on saturated soils increases the potential for compaction as well (Wolkowyski and Lowry, 2008). Soil that becomes exposed due construction activities can be susceptible to erosion by water and wind, leading to a change in soil thickness and crop productivity.

Alteration to surface drainage could result if existing surface drains are temporarily impaired or blocked. Alteration to local *(i.e.,* in-field), drainage paths would be likely to effect land areas beyond the PDA and up to the extent of the LAA boundaries within an affected field. Alteration to large, regional surface drains would affect areas beyond the LAA.

Operation and maintenance

As most of the project is underground with agricultural land being returned to agricultural land use following construction, the presence of project structures is anticipated to have a minimal effect on land loss. The project will result in approximately 0.01 ha (100 m^2) of agricultural land being lost at the location of the expansion of the existing gate station at NW-18-2-4-E.

This land loss is considered permanent because the expanded structure footprint will exist through the operational life of the project and will be unavailable for agricultural use. The area of agricultural land lost due to aboveground structure presence comprises approximately 0.12% (0.17 ha) of the PDA.

There is also the potential for soil disturbance / degradation to occur during operations and maintenance, albeit to a lesser extent and degree than during the construction phase. Degradation may occur during vehicle and equipment use, maintenance activities and ground pipeline patrols.

9.4.1.2 Conflict with agricultural activities

The project has the potential to result in conflict with agricultural activities during both construction and operation and maintenance. During project engagement, landowners, representative producer/commodity organizations, and provincial staff provided comments and raised concerns on how the project could cause conflict with commercial agriculture operations.

Conflict with agricultural activities could occur due to:

- interference with or damage to agricultural infrastructure (*e.g.,* buildings, barns, grain bins, manure application and water-supply systems)
- interference with the use of field equipment including reduced ability to conduct operations within the right-of-way or over the pipeline (*e.g.,* crossing, deep tillage)
- disruption to livestock operations including interference with haying, calving, breeding, grazing and manure application activities
- increased biosecurity risk for crops and livestock including the spread of disease (crop and livestock) and noxious weeds
- increased management effort due to:
    - additional operational costs and inconveniences associated with increased management effort due to presence of project structures, including:
        - overlap of farm input application (*e.g.,* seed, fertilizer, pesticides) in proximity to project structures resulting in inefficiencies and excess input usage

        - inefficiencies of field operations due to working around project structures resulting in excess fuel usage and equipment depreciation
    - changes in access routes to farm properties and to areas of agricultural activities (*e.g.,* rotational paddocks, watering facilities, wintering sites, cropping fields)

Most interactions between the project and commercial agriculture are similar between construction and operation and maintenance phases. However, the nature, degree and extent of interactions differ between the phases in some cases.

Analytical assessment techniques

The potential for conflict with agricultural activities applies to both project construction and operations. The employment of standardized analytical assessment techniques is a challenge for assessing the potential for conflict with agricultural activities due to the numerous potential pathways and specific operational conditions at an individual farm and field level. Therefore, the assessment of potential for conflict with agricultural activities is inherently more qualitative in nature.

Construction

During construction, any project activities that involve workers, equipment, or materials within agricultural fields could interfere with agricultural operations and activities. For example, project activities such as vehicle and equipment use, access development and right-of-way preparation, and the presence of marshalling yards or other temporary obstructions, within fields that are in use for agricultural production, have the potential to disrupt or interfere with commercial agriculture activities. Such disruption or interference might result in inconvenience, increased time and increased monetary costs to farming.

The degree and extent of construction interactions will depend highly on timing of construction, with less interaction resulting if work occurs outside of the growing season (typically May through October), and particularly during the winter, than would result during the growing season. Construction activities may be a concern in terms of biosecurity of crop and livestock operations, and may result in interference with, or damage to, infrastructure.

Interference with or damage to agricultural infrastructure

Right-of-way preparation, including clearing for the project, has the potential to affect agricultural buildings and structures (*e.g.,* grain bins, fencing, storage sheds, barns, and livestock corrals). Interactions would be limited to the ROW, and buildings and structures within the PDA would have to be removed or relocated. However, there are no identified agricultural buildings or other infrastructure within the PDA. Therefore, there are no anticipated effects to agricultural infrastructure.

Interference with the use of field equipment

Construction activities, if being undertaken during the growing season (i.e., typically May through October), have the potential to interfere with the use of field equipment including reduced ability to conduct field operations within the right-of-way during the construction phase. Numerous field operations are completed throughout the growing season in the undertaking of crop production within the LAA. This includes seeded preparation, fertilization, seeding/planting, pesticide application, harvesting and tillage.

Disruption to livestock operations

Construction activities might also interfere with livestock operations within the LAA. While livestock production is not a prominent practice in the LAA, the PDA traverses through and near lands that are potentially used for livestock grazing, manure application, and hay production.

Such livestock related activities can be disturbed by the establishment of a ROW and any construction activities taking place within the agricultural portions of the PDA and coinciding with agricultural operations. While not anticipated based on the agricultural land use within the LAA, temporary infrastructure associated with livestock production (e.g., watering stations) may be present within the PDA. If construction activities are determined to potentially interfere with temporary infrastructure associated with livestock production, this infrastructure may have to be re-located.

Increased biosecurity risk

During project engagement, a producer representative organization (Manitoba Beef Producers) and Manitoba Agriculture raised concerns regarding how the proposed pipeline may affect biosecurity risk for commercial agricultural lands in the project area. Concerns raised were primarily related to the transfer of noxious weeds and spread of disease (i.e., soil-borne pathogens).

Soil transport is an important mechanism for the spread of weeds and soil-borne diseases from one field or region to another. There is potential for soil to be transferred from field to field or from another region to the project site during the construction and operations and maintenance phase because of construction equipment, other vehicles and people moving between fields. However, increased biosecurity risk would be more pronounced during construction than operations.

The introduction of pests to previously non-affected agricultural lands can have lasting reductions in crop yields and increased input and management costs.

Operation and maintenance

Effects associated with the operation and maintenance phase of the project are related to vehicle and equipment use, maintenance activities and ground patrols. These activities can primarily cause nuisance and inconvenience, but may also result in increased production costs, if timing overlaps production operations and activities. In addition, there will be increased risk to biosecurity primarily due to vehicles and equipment traversing fields.

Interference with agricultural operations and activities

Farmers will face challenges related to nuisance and inconvenience if the timing of operation and maintenance activities overlaps the growing season (*i.e.,* typically May to October). The presence of vehicles and equipment and project staff working within agricultural portions of the PDA at the same time as agricultural operations being undertaken may prevent portions of the field from being accessed. This interference could require additional visits to the field by the producer, which could also incur additional costs to the producer. In addition, there are risks inherent in completing field operations while other machinery and workers are in the field.

While the presence of new aboveground infrastructure is limited, aboveground structures in cropping fields may create extra management effort for producers to work around structures. In addition, there are risks inherent with operating farm machinery in proximity to the structures. Since the responsibility is on farmers and operators to avoid structures while operating wide equipment, working around structures requires more attention.

Regarding the potential for future sub-surface or tile drainage improvements, there is potential for conflict with the proposed gas pipeline. The proposed pipe trench depth is approximately 1.3 meters, with 1 meter depth of cover above the pipe. The typical depth of tile drainage lateral pipes (i.e., those installed throughout the field that convey excess soil water) is 0.9 to 1.2 m. Therefore, the depth of the gas pipeline and the likely depth of potential, future tile drainage pipes are in conflict. The installation of tile draining following the project would still be an option to producers. However, the presence of the project may influence tile drainage system design.

Specifically, the tile drainage design would have to consider the buried gas pipeline and the optimal tile depth and/or layout in absence of the pipeline may have to be altered to accommodate the gas pipeline. For example, the depth of tile drainage lateral pipes and associated header pipes (i.e., collector pipes at the end of lateral pipe runs and typically at the edge of the field) may need to be adjusted to shallower or deeper depths to avoid the gas pipeline. The drainage tile depth would have to adhere to a minimum clearance or separation distance from the gas pipeline – this clearance or separation distance would have to be confirmed with Manitoba Hydro prior to installation of the tile drainage system. Similarly, the optimal tile drainage layout may need to be altered to avoid the gas pipeline if the tile drainage design cannot feasibly or reasonably accommodate the presence of a gas pipeline.

Alterations to layout may require additional header pipes. Finally, if the presence of the gas pipeline necessitates a deeper tile drainage pipe depth, the increased depth may require the addition of a pump station to the drainage system. A combination of change in layout, drainage pipe depth and a pump station may be required. These changes may increase the cost of the tile drainage system. In addition to changes in drainage system design, the presence of the gas pipeline would require a safety watch during installation.

<u>Increased biosecurity risk</u>

During the operation and maintenance phase of the project, there will be potential for soil to be transferred from field to field when maintenance vehicles and people are moving between fields. Through these situations, pests could be introduced and spread in previously non-affected areas.

The introduction and spread of pests would largely be of concern during spring, summer, and fall, which are associated with the growing season and cropping activities. However, because routine pipeline maintenance in agricultural areas is typically completed during winter periods and under frozen soil conditions the potential for compromised biosecurity will be reduced.

The growth of weeds around structures is a concern to agricultural producers. Weeds may grow around structure perimeters that are not accessible for weed control by producers, allowing weed seeds to disperse into adjacent field areas and creating a nuisance for producers.

For livestock operations, especially on pasture/grazing lands, there is potential for the introduction of disease during operation and maintenance activities. Pests and diseases have lasting adverse production value (reductions in yield and livestock health) and production cost (increased input and management costs) effects. Disease transfer may occur through disturbance and/or movement of soil or close contact with animals. However, the likelihood of the former is low due to the dominance of annual cropping in the LAA. The potential for biosecurity risk to livestock would be greater where pipeline maintenance activities intersect areas of multiple operations with different livestock types. Again, this scenario has a low likelihood as there is a lack of intensity and diversity in livestock production within the LAA.

9.4.2 Mitigation measures

9.4.2.1 Mitigation for loss and/or degradation of agricultural land

Mitigation for permanent loss of agricultural land primarily involves compensation for land permanently removed from agriculture due to above-ground infrastructure presence. Manitoba Hydro's compensation policy (*i.e.,* the structure impact portion) takes into consideration land permanently removed from production on agricultural land for directly affected landowners.

Mitigation for temporary loss of agricultural land includes the following:

- Manitoba Hydro will pay compensation for damage to infrastructure/crops from construction or maintenance activities. Where possible, construction schedules will take into consideration the timing of agricultural activities.
- Compensation will be provided to landowners and agricultural Crown land lessees for:
    - damage to property, any relocation of incompatible agricultural buildings
    - temporary loss of agricultural land
- Areas of temporary soil disturbance on agricultural lands will be rehabilitated in accordance with the Rehabilitation and Weed Management Plan. This plan will be developed before construction and would be part of the overall Environmental Protection Program, as described in Chapter 16.
- Manitoba Hydro will contact directly affected landowners to discuss how to reduce effects on their agriculture activities.

Mitigation for degradation of agricultural land includes the following:

- Effects of soil compaction and rutting will be mitigated by managing equipment traffic routes and activities for access development, marshalling yard setup, ROW preparation, pipeline stringing and installation, and station and valve site preparation. In accordance with the Access Management Plan, the Contractor will be restricted to established roads and trails and cleared construction areas

- The pipeline will be constructed in agricultural areas when soils are not saturated to limit compaction, rutting and admixing. If this is not possible, other mitigation or rehabilitation measures will be conducted to reverse effects
- If working on saturated soils during non-frozen ground conditions, equipment and techniques that distribute ground pressure (e.g., construction mats, geofabric and padding and corduroy) will be used to avoid compaction and admixing
- Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing an erosion protection and sediment control plan to limit adverse environmental effects of sediment releases on the aquatic environment in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines Mitigation for conflict with agricultural activities Routing the project to parallel existing gas pipeline easement for much of the PDA assists in reducing overall project conflicts with agricultural activities.

Mitigation for interference with farm operations or damage to infrastructure includes the following:

- Manitoba Hydro will pay compensation to landowners and agricultural Crown land lessees for damage to infrastructure/crops from construction or operation and maintenance activities. Where possible, construction schedules will take into consideration the timing of agricultural activities.

Ancillary damage compensation could be provided for:

- Damage to infrastructure
- Prior to construction, if producers indicate a specific activity or practice that will be affected by the project, Manitoba Hydro will make reasonable efforts to implement specific mitigation, where possible, to reduce local effects. Manitoba Hydro understands that even though overall project effects will affect a small proportion of the RAA, local effects (i.e., field scale) can have a meaningful effect on individual operations.

Mitigation for conflict/interference with agricultural activities includes the following:

- Where conflict, interference can't be avoided, Manitoba Hydro will pay compensation as described above

Mitigation for increased biosecurity risk includes the following:

- Manitoba Hydro staff and contractors will follow the Manitoba Hydro corporate policy on biosecurity and develop a biosecurity management plan for the project (Section 16.7.5.2)

- Where construction or maintenance activities have the potential to interfere with field activities, discussions with the landowner or producers will be held to identify ways to minimize effects to agricultural operations.
- Asking producers or landowners to avoid spreading manure or pasturing livestock, if applicable, in the pipeline ROW prior to construction.
- All equipment will arrive at the ROW or project site clean and free of soil or vegetative debris (including weed seeds).

9.4.3 Characterization of residual effects

9.4.3.1 Residual effect for loss and/or degradation of agricultural land

With the implementation of mitigation measures, including compensation, residual effects from the project due to temporary loss and degradation of land are anticipated to be adverse and confined to the PDA (i.e., site of construction or operation and maintenance activities). Within the PDA, the temporary loss of agricultural land during construction would result in a small but measurable change in the capacity for agriculture (*i.e*., low magnitude). The change in land capability class for agriculture and extent of lands affected by compaction could result in a change that is greater than that for temporary land loss but one that will not affect the sustainability of the capacity for agriculture (*i.e.,* moderate magnitude) within the PDA. Residual effects due to degradation of land will be highly sensitive to timing – construction during the growing season will result in more pronounced effects while construction under frozen conditions will reduce the potential for soil degradation.

Residual effects from temporary land loss will be limited to the construction phase (short-term) while those for degradation of land due to compaction will extend beyond the construction phase (medium term) because if compaction effects occur, effects could persist for a few years following remedial action. Temporary land loss will occur once during construction.

In contrast, the frequency of events leading to degradation of soil is considered irregular because there could be multiple construction activities occurring at irregular intervals during construction and operation that could trigger a compaction effect. Because land removed from agricultural use within the ROW and temporary footprints during construction will be returned to agricultural use after construction, the residual effects due to temporary land loss and degradation of land are considered reversible.

With the implementation of mitigation measures (primarily through design mitigation and landowner compensation), the residual effects from the project due to permanent loss of land during operation and maintenance are anticipated to be adverse and confined to the PDA (*i.e.,* gate station and valve station footprints). Residual effects from soil degradation are not anticipated during normal operation and maintenance. Within the PDA, the permanent loss of agricultural land will result in a small but measurable change in the capacity for agriculture (*i.e.,* low magnitude). The land area affected by the presence of the project will be small compared to that currently used for agriculture in the PDA and LAA. Residual effects due to permanent land loss are a one-time event and permanent because the loss will persist for the lifetime of the project. Permanent loss of agricultural land is deemed reversible because the affected land can be returned to agricultural use following decommissioning, at which point the residual effect would be considered neutral in direction.

9.4.3.2 Residual effect for conflict with agricultural activities

Following the application of mitigation, while the potential for conflict with agricultural activities remain, the magnitude of these effects and the extent over which they are experienced will be reduced. Communications with landowners prior to land access for project activities may result in additional site-specific mitigation, further reducing potential for conflict with agricultural activities. Compensation will be provided to address the residual potential conflict with agricultural activities and damages that may be caused by project activities.

Post-mitigation, the magnitude of the residual effects related to conflict with agricultural activities is anticipated to be low, except for future, potential tile drainage installations, and the extent over which they are experienced are anticipated to be limited to the LAA. The potential project effect on future tile drainage installations could be characterized as having a moderate magnitude, as the project may influence the design and layout of tile drainage systems at the field management unit level.

Residual effects due to conflicts with agricultural activities will be highly sensitive to timing for those conflicts that are associated with crop growing season activities (e.g., tillage, harvesting).

9.4.3.3 Summary of residual effects characterizations for commercial agriculture

The characterization of residual effects for loss and/or degradation of agricultural land and for conflict with agricultural activities is presented below. A summary of residual environmental effects that are likely to occur on commercial agriculture because of the project is provided in Table 9-16.

Table 9-16: Project residual effects on commercial agriculture

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Loss and/or degradation of agricultural land						
Construction	Adverse	Low-Moderate	PDA	Medium-term	Single event	Reversible
Operation	Adverse	Low	PDA	Medium-term	Irregular	Reversible
Decommissioning	Adverse / Neutral	Low	PDA	Medium-term	Single event	Reversible
Conflict with agricultural activities						
Construction	Adverse	Low	LAA	Short-term	Single event	Reversible
Operation	Adverse	Low-Moderate	LAA	Short-term	Irregular	Reversible
Decommissioning	Adverse	Low	LAA	Short-term	Single event	Reversible

9.4.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

9.4.4.1 Project residual effects likely to interact cumulatively

Table 9-17 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact infrastructure and services. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Potential cumulative effects were identified for loss and/or degradation of agricultural land and conflict with agricultural activities as, in both cases, residual project effects have the potential to act cumulatively with effects of other projects on the inclusion list, namely existing infrastructure including Manitoba Hydro projects.

Table 9-17: Potential cumulative effects on commercial agriculture

Other Projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Loss and/or degradation of agricultural land	Conflict with agricultural activities
Existing/ongoing projects and activities		
Domestic resource use (e.g., hunting, trapping, fishing)	–	–
Recreational activities (e.g., canoeing, snowmobiling, hiking)	–	–
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	–	–
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, pipelines, water treatment facilities, wastewater treatment facilities)	✓	–
Gas and electricity transmission and distribution	✓	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

9.4.4.2 Cumulative effect for loss and/or degradation of agricultural land

9.4.4.2.1 Pathways for cumulative effect

Past and present projects that were identified as having potential cumulative effects with the effects of this project on commercial agriculture are primarily existing infrastructure projects and Manitoba Hydro gas and electricity transmission projects (see Table 9-17). These developments have contributed to agricultural land loss throughout the RAA. Other existing linear developments that include above-ground infrastructure that preclude all or portions of the development footprints to be returned to agricultural production following construction, such highways, have also contributed to land losses from commercial agriculture in the RAA.

9.4.4.2.2 Mitigation measures

The implementation of mitigation measures described in Section 9.4.2.1 will reduce the effects on agriculture from the project and the project's contribution to cumulative effects on agriculture.

Additional mitigation measures proposed to reduce the cumulative environmental effects on loss or degradation of agricultural land include the following:

- Manitoba Hydro will continue to work with agricultural producers affected by the project and representative producer/commodity organizations to determine site and operation-specific mitigation to lessen the potential for cumulative effects to commercial agriculture.
- Manitoba Hydro will continue to support studies to understand the effects of its projects on commercial agricultural land use and use study outcomes to reduce effects of existing and future projects on conflict with agricultural activities.

9.4.4.2.3 Residual cumulative effect

A portion of land capable of supporting commercial agriculture in the RAA has already been disturbed due to previously constructed and operational projects, including numerous linear projects, such as Provincial Trunk Highway 75, provincial roads, buried pipelines and overhead transmission lines, and other non-linear infrastructure. These existing projects have not substantially reduced the land available for commercial agriculture, which is the dominant land use in the RAA.

With the addition of the proposed project's effects and those of other projects, cumulative effects on loss of agricultural land are anticipated to be low in magnitude. The project will result in minimal land loss that is considered permanent, and this land loss will be reversible upon the decommissioning of the project at some future date. The project's contribution to land loss will be small relative to losses from past projects and is not expected to measurably affect the capacity for commercial agriculture in the RAA.

Similarly, while the project will contribute to degradation of land capability for agriculture, but these effects will be small relative to degradation from past projects and these effects are anticipated to be reversible and not to persist over the long-term. With the addition of the proposed project's effects and those of other projects, cumulative effects on degradation of land are anticipated to be low in magnitude.

The combined cumulative environmental effect on loss and/or degradation of land will be measurable but is not anticipated to result in an impairment to the capacity of agriculture in the RAA and agriculture is anticipated to continue at or near pre-disturbance levels.

9.4.4.3 Cumulative effect for conflict with agricultural activities

9.4.4.4 Pathways for cumulative effect

Past and present projects that were identified as having potential cumulative effects with the effects of this project on commercial agriculture are primarily existing infrastructure projects and Manitoba Hydro gas and electricity transmission projects (see Table 9-17). These developments have contributed to conflict with agricultural activities throughout the RAA.

9.4.4.5 Mitigation measures

The implementation of mitigation measures described in Section 9.4.2.2 will reduce the effects on agriculture from the project and the project's contribution to cumulative effects on commercial agriculture.

Additional mitigation measures proposed to reduce the cumulative environmental effects on conflict with agricultural activities include the following:

- Manitoba Hydro will continue to work with agricultural producers affected by the project and representative producer/commodity organizations to determine site and operation-specific mitigation to lessen the potential for cumulative effects to commercial agriculture.
- Manitoba Hydro will continue to support studies to understand the effects of its projects on commercial agricultural land use and use study outcomes to reduce effects of existing and future projects on conflict with agricultural activities.

9.4.4.6 Residual cumulative effect

With the addition of project effects and those of other projects, cumulative effects on conflict with agricultural activities will be moderate in magnitude and will not result in an impairment of the capacity of agriculture in the RAA. Agricultural production within the RAA is anticipated to continue at near pre-disturbance levels. It is anticipated that much of the project's contribution to this cumulative effect will be short term in nature (i.e., during construction and operation and maintenance activities which overlap with agricultural field operations), and reversible upon the decommissioning of the project at some future date. Agriculture is considered to have a moderate capacity to accommodate or recover from changes anticipated from the cumulative effects of past and current projects. While these projects will act cumulatively and increase the level of conflict with agricultural activities, agricultural production is anticipated to return and continue near pre-disturbance levels. The project's contribution to cumulative environmental effects is not expected to measurably affect the capacity for commercial agriculture within the RAA.

Within the LAA and at the individual field scale, the project's presence will affect the potential for future sub-surface or tile drainage improvements, an effect that will act cumulatively with other existing buried facilities. This cumulative effect may be most impactful in fields where the proposed project parallels existing gas pipelines or in fields where existing pipelines cross. This cumulative effect is anticipated to increase the tile drainage design (depth and layout) complexity and may result in increased tile drainage system costs to producers. Specific design elements which may be influenced by consideration of existing pipelines are discussed in Section 9.4.1.2.3.

While this cumulative effect is not anticipated to impair the capacity of commercial agriculture at the scale of the RAA, the effect to an individual producer at the scale of an agricultural field management unit (i.e., quarter section field) would be measurable and meaningful.

9.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on commercial agriculture are predicted to be not significant. With the implementation of mitigation measures, adverse residual effects are expected to be low to moderate (for the potential degradation of land capability for agriculture within the PDA) in magnitude, are reversible and are not anticipated to persist beyond the medium term (i.e., 3 years post-construction).

With mitigation and environmental protection measures, the cumulative effects on commercial agriculture are also predicted to be not significant.

9.6 Prediction confidence

Prediction confidence in the assessment of effects on commercial agriculture is moderate to high.

The prediction confidence is based on the information compiled during desktop-based data compilation, data analyses, understanding project activities, location, and schedule as well as information gathered from KPIs and other public engagement. A windshield surveys was conducted to provide additional information on agricultural land use and buildings within the LAA. There is a high degree of confidence in assessment predictions. While some of the available desktop data are limited in scale (e.g., reliability (e.g., AAFC crop inventory data are based on remote sensing and are not field validated), and completeness (e.g., agricultural operation type and location information was not provided by most industry association groups), the environmental effects mechanisms are well understood.

The mitigation measures identified in Section 7.12.4 are standard practice and have been implemented on previously completed transmission projects. Finally, the significance conclusion is based upon a well-founded understanding of the commercial agriculture context within the project RAA.

The prediction confidence with respect to cumulative effects is moderate given the lack of spatial context available for the assessment of cumulative effects.

9.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (Chapter 16).

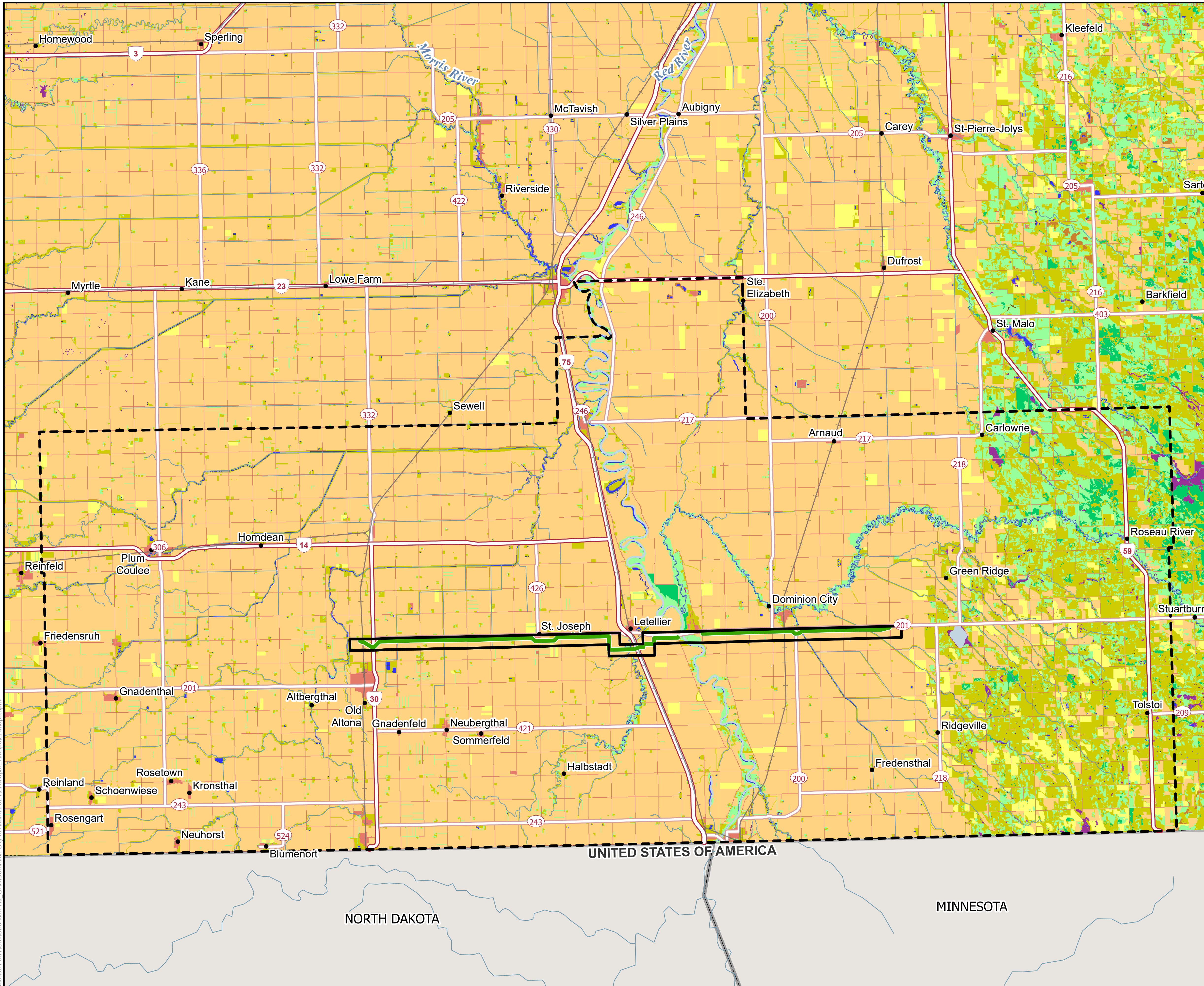
9.8 Sensitivity to future climate change scenarios

Effects of climate change on commercial agriculture are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding). These changes could affect commercial agriculture activities such as crop types grown and intensity of drainage practices, but specifics on these changes (i.e., nature, degree, timing, location) are difficult to predict with certainty.

Map 9-1: Spatial boundaries for commercial agriculture

Map 9-2: Agricultural capability in the commercial agriculture assessment areas

Map 9-3: Soil compaction risk ratings



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure

Preferred Route

Assessment Areas

Commercial Agriculture Local Assessment Area

Commercial Agriculture Regional Assessment Area

Land Cover Classification

Agricultural Cropland

Bare Rock, Gravel and Sand

Coniferous Forest

Cultural Features

Deciduous Forest

Forage Crops

Forest Cutover

Marsh and Fens

Mixedwood Forest

Open Decidious Forest

Range and Grassland

Water

Landbase

Community

Provincial Highway

Provincial Road

Railway

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 3 6 9 12 Kilometres

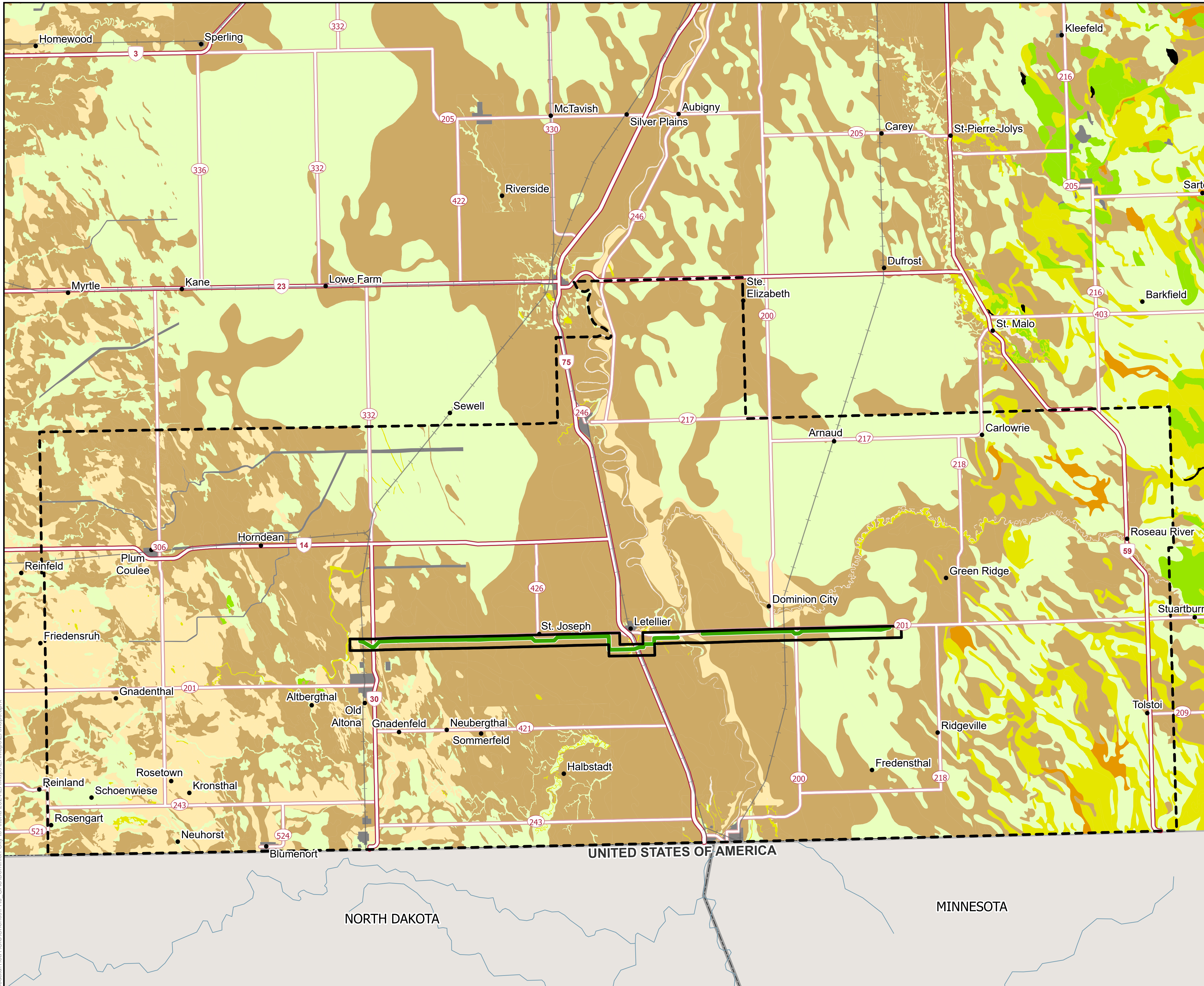
0 1.75 3.5 7 Miles

1:260,000

Spatial Boundaries for Commercial Agriculture

Draft: For Discussion Purposes Only

Map 9-1



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure

- Preferred Route

Assessment Areas

- Commercial Agriculture Local Assessment Area
- Commercial Agriculture Regional Assessment Area

Agricultural Capability

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic
- Unclassified

Landbase

- Community
- Provincial Highway
- Provincial Road
- Railway

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

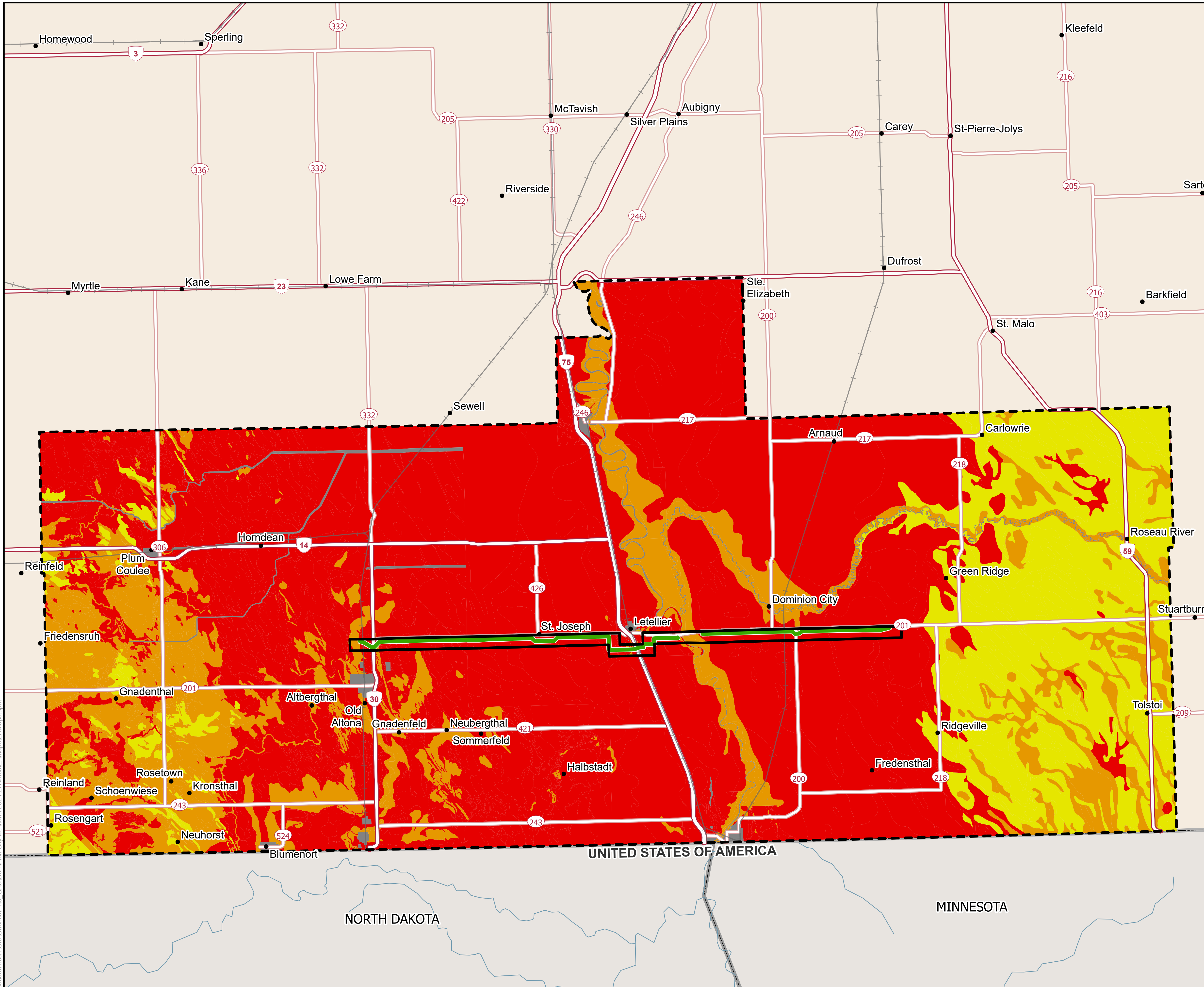
0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Agricultural Capability in the Commercial Agriculture Assessment Areas

Draft: For Discussion Purposes Only

Map 9-2



Manitoba Hydro

Dominion to Altona
Gas Transmission Pipeline

Project Infrastructure

Preferred Route

Assessment Areas

Commercial Agriculture Local Assessment Area
Commercial Agriculture Regional Assessment Area

Compaction Risk

H - High
L - Low
M - Moderate
Unclassified

Landbase

Community
Provincial Highway
Provincial Road
Railway

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 05, 2024

N

0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles
1:260,000

Soil Compaction
Risk Ratings

Draft: For Discussion Purposes Only

Map 9-3

10.0Health and well-being

For the purposes of this assessment, health and well-being refers to the measures and conditions in place to protect and promote the well-being of individuals and communities.

This chapter is focused on potential changes to environmental conditions attributable to the project that can influence the health risk of individuals and communities as well as psychological stress caused by perceived and realized potential effects on health and well-being. Health and well-being were included as a valued component (VC) because it was identified as an issue during project engagement and has been assessed as part of other effects assessments for projects in the region.

There is no single definition of well-being that is universally accepted, and perceptions of well-being vary across geographies, languages, and cultures (Indigenous Services Canada 2024). Indigenous Services Canada notes that well-being generally includes social, economic, health and political conditions essential to fulfilling enjoyable lives.

The Canadian Index of Well-being defines well-being as "the presence of the highest possible quality of life in its full breadth of expression focused on but not necessarily exclusive to good living standards, robust health, a sustainable environment, vital communities, an educated populace, balanced time use, high levels of democratic participation, and access to and participation in leisure and culture." (Canadian Index of Well-Being n.d.). Well-being can include mental and physical health, social, cultural, spiritual, economic, and environmental dimensions (Betley et al. 2023). For the purposes of this EA, well-being refers to social and economic influences on human health that may be affected because of the Dominion City to Altona gas transmission project.

10.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on health and well-being. An assessment of cumulative effects on health and well-being is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other recent projects including the Northwest Gas Transmission Project, the Dorsey to Wash'ake Mayzoon Transmission Project, and the Silver to Rosser Tap Transmission Project. The assessment considers the following:

- Change in air quality
- Change in noise
- Stress resulting from the presence and operation of the pipeline, including perceived effects and from safety concerns

10.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

10.1.2 Regulatory and policy setting

The following provincial laws, and associated regulations, and guidelines were considered for assessing project effects to health and well-being.

- Canadian Ambient Air Quality Standards
- Manitoba Ambient Air Quality Guidelines and Objectives
- Health Canada noise guidance
- Manitoba guidelines for sound pollution

10.1.2.1 Canadian Ambient Air Quality Standards

The Canadian Council for Ministers of the Environment has developed the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter, ozone, nitrogen dioxide and sulfur dioxide. The CAAQS have four management levels (green, yellow, orange, red) for the four pollutants and set out recommended management actions to control pollutant levels (Canadian Council of Ministers of the Environment 2019).

The CAAQS are established as air quality objectives under the *Canadian Environmental Protection Act, 1999*.

10.1.2.2 Manitoba Ambient Air Quality Guidelines and Objectives

Regulatory requirements are in place for assessing potential project-related change to air quality. Air quality is regulated by Manitoba Environment and Climate Change based on the Manitoba Ambient Air Quality Guidelines and Objectives (Government of Manitoba 2005).

10.1.2.3 Health Canada noise guidance

Although Health Canada does not have noise guidelines or enforceable noise thresholds or standards, they do consider noise-induced endpoints as health effects. These include noise-induced hearing loss, sleep disturbance, interference with speech comprehension, complaints, and change in the percentage of the population at a specific receptor location who become highly annoyed (Health Canada 2017).

Health Canada advises different assessment approaches depending on the project phase, duration of noise-producing activities, and range of noise levels. Health Canada has also produced a guidance document for evaluating the human health impacts of noise through the environmental assessment process (Health Canada 2017).

10.1.2.4 Manitoba guidelines for sound pollution

Manitoba's guidelines for sound pollution specify outdoor environmental sound level objectives for residential, commercial, and industrial areas and include maximum acceptable noise levels for the protection of human health (Province of Manitoba 1992). These guidelines are not used for enforcement but is a reference document for noise monitoring.

These guidelines are applied in the assessment of potential impacts to health and well-being to determine whether predicted levels of noise due to the project are above the acceptable thresholds and to determine whether additional mitigation measures may be needed to reduce or control noise levels.

10.1.3 Consideration of engagement feedback

Project engagement (Chapter 4) actively sought to provide opportunities for concerned and interested parties to provide health and well-being related feedback about the project.

Concerns raised during project engagement primarily related to safety concerns, specifically, increased traffic during construction, safety procedures in place in the event of a pipeline leak or explosion and impacts to Roseau River Anishinabe First Nation (RRAFN) community and residents.

10.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on health and well-being, along with effects pathways and measurable parameters are outlined in Table 10-1.

Table 10-1: Potential effects, effects pathways, and measurable parameters for health and well-being

Potential effect	Effect pathway	Measurable parameter(s) and units of measurement
Decrease in air quality	Emission of dust and exhaust from vehicles and equipment particularly during construction, posing a potential increased human health risk via inhalation of criteria air contaminants.	CAAQS levels for criteria air contaminants Qualitative assessment of whether exposure to criteria air contaminants represents potential human health risk
Increase in noise levels	Increased noise or changes in the types of noise during construction, operations, and decommissioning activities.	Assessment of noise risk based on Province of Manitoba guidelines
Increase in stress	Stress related to potential safety issues (e.g., leaks, explosions) with the presence of the pipeline	Qualitative assessment of stress related to safe operation of the pipeline

10.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on health and well-being:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA and consists of a 1.5 km buffer. This area represents properties that will be traversed and

immediately adjacent to the project and are most likely to experience human health risks and stress from the construction and operation of the pipeline.
- **Regional assessment area (RAA):** includes the PDA and LAA and includes the administrative boundaries of the RM of Emerson-Franklin, Montcalm and Rhineland. This assessment area is sufficiently broad to encompass cumulative effects, including the incremental effects of the project. In addition, the Town of Altona, located south of the western terminus of the project, is included in the RAA. The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

10.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on health and safety are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

10.1.7 Residual effects characterization

Table 10-2 provides the definitions used to characterize the residual effects on health and well-being.

Table 10-2: Characterization of residual effects on health and well-being

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters or qualitative categories in a direction beneficial to health and well-being relative to baseline **Adverse –** a residual effect that moves measurable parameters or qualitative categories in a direction detrimental to health and well-being relative to baseline

Table 10-2: Characterization of residual effects on health and well-being		
Characterization	Description	Quantitative measure or definition of qualitative categories
		Neutral – no net change in measurable parameters or qualitative categories for health and well-being relative to baseline.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**Negligible** – no discernible change to health and well-being **Low** – a discernable change in health and well-being risks or outcomes, below regulatory benchmarks and not affecting daily activities **Moderate** – a measurable change in health and well-being risks or outcomes that is at or around regulatory benchmarks and may moderately affect an individual's daily life and activities **High** – a measurable change in health and well-being risks or outcomes above regulatory benchmarks that has a severe effect on an individual's daily life or activities or could result in hospitalization or death
Geographic Extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the	**Short-term –** the residual effect is restricted to the construction phase

Table 10-2: Characterization of residual effects on health and well-being

Characterization	Description	Quantitative measure or definition of qualitative categories
	residual effect can no longer be measured or otherwise perceived	**Medium-term –** the residual effect extends beyond the construction phase **Long-term -** the residual effect extends for the life of the project (including operation and decommissioning)
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular events –** occurs at no set schedule **Multiple regular events –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

10.1.8 Significance definition

For this assessment, adverse residual effects on health and well-being are considered significant if the proposed project has the potential to adversely change mental and physical health outcomes so that they exceed the specific regulatory benchmarks referenced below and cannot be mitigated or reduced with current or anticipated programs, policies, or mitigation measures.

- For changes in air quality, adverse residual effects on air quality are considered significant if the project contributes to an increase in air quality parameter concentrations to levels that are above ambient air quality guidelines.
- For changes in noise levels, adverse residual effects on noise are considered significant when estimated audible noise exceeds Manitoba's provincial noise guidelines for residential and commercial areas for both daytime and nighttime conditions and results in greater than five noise complaints to the province. Manitoba Environment and Climate Change does not enforce specific noise limits

for regulation of ambient daytime and nighttime noise levels, but instead will review nuisance noise if residents have reported five complaints.

- For changes in stress, adverse residual effects are considered significant if the proposed project has the potential to adversely change well-being in a manner that has an irreversible, severe negative effect on individual's daily lives or activities and cannot be mitigated or reduced with current or anticipated programs, policies, or mitigation measures.

10.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data. The existing conditions described in this section focus on:

- Air quality
- Noise
- Regional population health
- Self-rated health and well-being

10.2.1 Air quality

Manitoba generally has good air quality, with poorer air quality being attributable to aspects such as wildfire smoke and transboundary pollutants from the United States or other Canadian provinces. As the RAA is primarily in an agricultural setting, air quality in the area may also be affected by dust and other particulate emanating from agricultural activities like aerial spraying of pesticides, application of fertilizers and manure, harvesting, and from smoke generated by local crop burning programs (Government of Manitoba 2021). Air quality in the province in previous years was also affected by smoke from forest fires (CBC News 2021) and there is the potential for diminished air quality if forest fires occur this year. The primary chemicals of concern to human health from crop burning and forest fire smoke include asphyxiant and irritant gases, and particulate matter of less than 2.5 μm or 2.5 parts per million ($PM_{2.5}$) (USEPA 2021).

In 2012, the Canadian Council of Ministers of the Environment committed to implementing a national Air Quality Management System (AQMS) to help protect the health of the public and the environment. Comparison of $PM_{2.5}$ (fine particulate matter) and ozone for the three-year period from 2013 to 2015, as part of the national AQMS, indicated that these parameters complied with the CAAQS at the five air monitoring stations located across the province of Manitoba (Manitoba Environment and Climate Change 2024). Two of these stations are in Winnipeg and are the closest monitoring stations to the RAA.

$PM_{2.5}$ levels from the most recently publicly available air quality report for Manitoba (2017-2019 period) indicated that although $PM_{2.5}$ levels were impacted by the severity of wildfires from year to year, the $PM_{2.5}$ levels in Winnipeg consistently achieved the CAAQS standards (Manitoba Environment and Climate Change 2023). Ozone levels in Winnipeg also achieved the CAAQS ozone standard during the same reference period (Manitoba Environment and Climate Change 2023).

10.2.2 Noise

Existing noise levels in the assessment areas for health and well-being will be typical of urban and rural settings. Noise levels within the urban areas in the Town of Altona, and communities of Letellier and Dominion City, may be higher than noise levels in rural areas. Noise in rural areas may be due to highway traffic, agricultural activities, airplanes, and recreational activities. Based on a noise assessment conducted for the Selkirk Generating Station, typical baseline noise levels for an urban-rural mixed setting are between 40.4 and 44.5 dBA in the daytime (Stantec Consulting Ltd. 2015). Health Canada (2017) considers day-night noise levels to vary from less than 45 dBA for a typical quiet rural area to 53 to 57 dBA for a typical suburban residential area.

10.2.3 Regional population health

The project is in the Southern Health–Santé Sud Regional Health Authority (RHA) within Zone 2 and Zone 3 of the RHA. This RHA region extends from the Manitoba/Ontario border east along the United States border to the RM of Louis and then heads north to the RM of Alonsa. The area also extends from the RM of Alonsa south along the shore of Lake Manitoba where it then heads southeast back to the Manitoba Ontario/border. It covers an area of approximately 27,000 square kilometres and serves over 226,000 residents including 28 municipalities and rural municipalities, four cities, four towns, one village, one unorganized territory, seven First Nation communities and many other cultural communities including Métis, Mennonite, Hutterite, and Francophone (Southern Health-Santé Sud 2024).

The Southern Health-Santé Sud RHA has rates of many chronic diseases that have increased significantly over time because of the growth in population and ages (Southern Health-Santé Sud 2024). Chronic conditions, such as diabetes, total respiratory morbidity and childhood asthma have seen significant increases and in 2023, this RHA was projected to have the highest increase of patients needing renal therapies for end-stage kidney disease in 2024.

10.2.4 Self-rated health and well-being

Although Manitoba Hydro undertakes an environmental assessment to quantify the impacts of the project on the environment and communities, we recognize that individuals and communities may perceive the impacts of our projects differently. Perceived environmental conditions can be a strong predictor of mental health, and in some cases may be more useful for predicting mental health than objective environmental conditions (Gomm and Bernauer 2023).

In some cases, even environmental conditions that do not cause adverse biophysical human health effects may contribute to negative mental health outcomes, since the perception of the severity of impacts is often subjective (Gomm and Bernauer 2023). Moreover, subjective exposure and concern about environmental hazards may be at least as important a predictor of poor health outcomes as objective exposure to hazards (Peek et al. 2009).

Stress from perceived risk and environmental annoyance are key determinants for mental health and well-being in the context of development projects (Baldwin and Rawstorne 2019). Both stress and annoyance are factors that can erode mental well-being and affect physical health. The links between stress, mental health and physical health are well-documented. Research shows that:

- Unmanaged stress has physical health consequences that include weakened immune systems, weakened functioning of the circulatory and metabolic systems, and increased incidence of cardiovascular disease and Type 2 diabetes (Brunner and Marmot 2006).
- Stress can lead to the adoption of health-threatening coping behaviours such as tobacco use and alcohol consumption (Mikkonen and Raphael 2010).
- Impaired mental health has a worsening effect on other conditions such as cardiovascular disease, diabetes, and addictions; as well it can influence the onset and transmission of infectious disease due to its lowering of the immune system and significantly reduce life expectancy (Wilson and Wilkerson 2011).

For these reasons, understanding the current perceived health status of individuals and communities in the RAA is helpful when considering potential project impacts on perceived health. Self-rated health, also known as perceived health, is a metric collected by Statistics Canada as an indicator of overall health status. Self-rated health includes components of mental, physical, and social well-being.

Statistics Canada uses multiple surveys to measure self-rated health in Canada, one of which being the Canadian Community Health Survey. The Canadian Community Health Survey is an annual survey to track and monitor the health status and health determinants for the Canadian population at the national, provincial, and health region levels.

Table 10-3 displays the health characteristics for self-rated health from the Southern Health-Santé Sud RHA alongside provincial and national rates for both males and females from the most recently available two-year data set from 2019-2020. As summarized in the table, the self-rated health and self-rated mental health for people in the Southern Health-Santé Sud RHA was comparable to the provincial and national rates.

Table 10.3: Indicators for community well-being for the Southern Health-Santé Sud Regional Health Authority and provincial and national rates, 2019-2020

Geography	Canada		Manitoba				Southern Health-Santé Sud RHA, Manitoba					
Sex	Males	Females	Males		Females		Males			Females		
Characteristics	Percent	Percent	Percent	Statistically different from the Canada rate	Percent	Statistically different from the Canada rate	Percent	Statistically different from the Canada rate	Statistically different from the provincial rate	Percent	Statistically different from the Canada rate	Statistically different from the provincial rate
Perceived health, very good or excellent	62.6	61.0	62.4	0	58.0	-1	57.6	0	0	59.4	0	0
Perceived health, fair or poor	10.4	11.2	11.2	0	12.1	0	11.6[E]	0[E]	0[E]	10.1[E]	0[E]	0[E]
Perceived mental health, very good or excellent	69.4	62.8	67.9	0	59.1	-1	67.2	0	0[E]	66.2	0	1
Perceived mental health, fair or poor	8.0	9.7	7.1	0	10.2	0	7.6[E]	0[E]	0[E]	9.5[E]	0[E]	0[E]
Perceived life stress, most days quite a bit or extremely stressful	19.4	22.2	17.6	0	22.4	0	17.6[E]	0[E]	0[E]	18.7	0	0
Sense of belonging to local community somewhat strong or very strong	68.7	71.2	72.1	1	74.2	1	74.5	0	0	78.4	1	0

All data is total population 12 years and older, for the 2019-2020 reference period (most recent available data) from the Canadian Community Health Survey

E: use with caution

Source: Statistics Canada 2022.

10.3 Project interactions with health and well-being

Table 10-4 identifies, for each potential effect, the physical activities that might interact with health and well-being and result in the identified effect.

Table 10-10-3: Project interactions with health and well-being			
Project activities/components	Reduction in air quality	Increase in noise levels	Increased stress
Construction of pipeline, gate station, and valve sites			
Mobilization and staff presence	-	✓	✓
Vehicle and equipment use	✓	✓	✓
Access development	-	✓	✓
Marshalling yards (temporary work or storage areas)	-	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	-	✓	✓
Pipe stringing (including welding, coating)	-	✓	✓
Pipe installation – trenching and lowering	-	✓	✓
Horizontal directional drill crossings	-	✓	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	✓	✓
Backfilling and contouring	-	✓	✓
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	✓	✓
Clean-up and reclamation	-	✓	✓
Operation and maintenance of pipeline, gate station and valve sites			
Presence of pipeline, gate station, and valve sites	-	-	✓
Vehicle and equipment use	✓	✓	✓
Maintenance activities	-	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	✓	✓
Valve operation checks (annually)	-	✓	✓
Vegetation management	✓	✓	✓
Decommissioning			
Mobilization and staff presence	-	✓	-
Vehicle and equipment use	✓	✓	-
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	✓	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	✓	-

Table 10-10-3: Project interactions with health and well-being			
Project activities/components	Reduction in air quality	Increase in noise levels	Increased stress
Rehabilitation	-	✓	-
Clean-up and demobilization	-	✓	-

✓= Potential interaction
– = No interaction

10.4 Assessment of project effects

While effects to health and well-being could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction and operation and include the following:

- Decrease in air quality
- Increase in noise
- Increase in stress

10.4.1 Effects pathways

10.4.1.1 Decrease in air quality

Analytical assessment techniques

The assessment of human health risk from the inhalation of criteria air contaminants is based on the change in exposure experienced by an individual that is predicted to occur between baseline (existing) and project conditions. Criteria air contaminants for the project are primarily associated with vehicle and equipment emissions, mainly during the construction phase.

Human health risks associated with air quality under both existing and future project related conditions are typically estimated by comparing measured or calculated chemical concentrations in air to regulatory benchmarks for the protection of human health. The concentrations of criteria air contaminants were not measured or modeled for this project. Instead, a qualitative assessment of human health risk from exposure to criteria air contaminants from the project is based on comparisons with other Manitoba Hydro gas transmission projects like the Northwest Gas Transmission Project.

Construction

The main effect pathway related to a decrease in air quality is the emission of exhaust and generation of dust from the operation of vehicles and equipment, particularly during right of way preparation and other construction activities.

Air quality is determined by the levels of gases and particulate matter in the air. Gases commonly emitted by passenger vehicles and other machinery include nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and carbon monoxide (CO), all of which can have harmful health effects above certain concentrations.

Particulate matter is classified according to particle size, with fine particulate matter defined as PM_{10} (less than 10 μm diameter) and $PM_{2.5}$ (less than 2.5 μm diameter). Smaller particles pose a greater health risk, as they can travel deeper into the respiratory system when inhaled (Environment and Climate Change Canada 2017).

Exhaust and dust emissions from the operation of vehicles and equipment during project construction, operation, and decommissioning activities may cause a change in local air quality. Project-related change to air quality poses a potential human health risk if levels of gases and particulates exceed health-based air quality objectives. Change in air quality is of particular importance to sensitive individuals, e.g., children, the elderly, and people with existing cardio-respiratory health problems such as asthma and chronic obstructive pulmonary disease (Health Canada 2021).

Exhaust and dust emissions are anticipated to be highest during the construction phase which will involve right-of-way preparation, creation of temporary work areas, topsoil stripping, trenching, stringing, bending, joining and lowering of pipeline and horizontal directional drilling. During the construction phase, heavy equipment and vehicles will emit combustion by-products (e.g., NO_2, SO_2, CO and particulate matter). Construction activities may also emit fugitive dust (dust from disturbed soils becoming airborne) during the operation of heavy machinery.

Operation

Similar effects are anticipated for the operation and maintenance phase of the project but to a lesser extent given the smaller workforce size and work activities being shorter-term and more isolated.

Spraying herbicides, if required for vegetation management will alter air quality in a very localized area for short periods of time during their application. Operators will be wearing proper protective equipment.

Decommissioning

Effects like those described for construction are anticipated during the decommissioning phase of the project, but the effects would be to a lesser extent than those during construction.

Purging during decommissioning will also alter air quality, but in a very localized area and the effects will be short term.

10.4.1.2 Increase in noise

Analytical assessment techniques

Manitoba's provincial guidelines for maximum desirable 1-hour equivalent noise levels for residential and commercial areas are 45 dBA for nighttime and 55 dBA for daytime. These guidelines represent acceptable levels to prevent public annoyance and to protect public health and welfare with an adequate margin of safety and were used to assess predicted noise levels associated with project activities.

The qualitative assessment of human health risks from noise is based on comparisons of noise burdens associated with the construction and operation of other Manitoba Hydro transmission projects.

Health Canada does not have noise guidelines or enforceable noise thresholds or standards and recommends the use of standards or regulations specified for project-specific districts. Health Canada provides recommendations for the evaluation of projects where construction noise at a given receptor location lasts for more than one year, for operational noise, and where noise levels are in the range of 45-75 dB (Health Canada 2010; Health Canada 2017). As the project is not anticipated to produce noise levels above baseline conditions over the long-term, and provincial noise regulations are available, Health Canada guidance was not used in this assessment. Manitoba's provincial guidelines for outdoor ambient daytime and nighttime noise levels were used to assess potential human health risk from audible noise associated with construction activities and vehicle and machinery use during operation.

Construction

During project construction, activities that have the potential to increase noise levels, include mobilizing staff and equipment, using access routes, creating and using marshalling/fly yards, preparing the right-of-way, and installing the pipeline including the use of horizontal directional drilling. Noise levels during the night will remain unchanged from the existing conditions because the above-noted construction activities are only anticipated to occur during the day.

Research on maximum noise levels generated during the construction phase of a project from combined construction equipment sources is suggested to be 89 dBA at a 15-metre distance from noise sources (Stantec Consulting Ltd. 2015). At 480 metres from noise sources, construction activities on a past transmission project were expected to generate 59 dBA of noise, which is comparable to the noise level of indoor conversation (Stantec Consulting Ltd. 2015). During project construction, noise would generally be localized at pipeline installation sites and, due to the staging of construction activities, would occur over a limited duration at a given site.

There are 16 homes within 500 m of the PDA. These homes and residences are the most likely to experience elevated noise levels during construction activities.

Operation

The noise generated from the operation phase of the project is expected to be far less than during the construction phase. The main source of noise during the operation phase of the project will be from maintenance activities and the use of vehicles and equipment during routine maintenance. This will include inspections, vegetation management and pipeline inspection surveys. The noise resulting from these activities will be temporary and localized, contained mostly within the PDA.

Decommissioning

The noise generated from the decommissioning phase of the project is expected to be associated with the disassembly and removal of the equipment but is anticipated to be less than during the construction phase.

10.4.1.3 Increased stress

Analytical assessment techniques

The assessment of project impacts on increased stress levels are based on baseline information developed from similar environmental assessments and applications, information gathered through project engagement, an understanding of project interactions and mitigation, and professional judgement.

Construction

While perceived effects of the project are anticipated to be highest during operation, construction activities may cause an increase in stress, particularly for individuals who have concerns about the effects of the project.

Prior to construction, the project could cause stress and annoyance to individuals living in the area who are concerned about how the project may affect them, their households, and safety. Anticipation of future project impacts during the operation phase may contribute to an increase in stress during construction when construction activities are known or observed to be taking place in the area.

Operation

During project engagement, RRAFN expressed concern with the safety of the pipeline, specifically gas leaks and the potential for an explosion.

Existing research has shown that living near industrial activity can be associated with increased stress, depressive symptoms, and feelings of powerlessness (Bell et al. 2024). Living close to active oil and gas development has been linked to fear around health and safety, particularly related to gas leaks and explosions (Carlson and Caretta 2021).

As a result of the concerns raised during project engagement, it is anticipated that stress from perceived impacts from the project will be present during construction and operation but will likely be the highest during the operation phase due to increased stress related to safety risk.

Decommissioning

As decommissioning of the proposed project involves the abandonment and removal of project components (no longer in use) it is anticipated that there will be no stress generated from perceived effects during decommissioning activities.

10.4.2 Mitigation measures

10.4.2.1 Mitigation for air quality

Mitigation measures to reduce project-related combustion and dust emissions during the construction and operation phases include:

- Mud, dust and vehicle emissions will be managed in a manner that considers the safe and continuous public activities near construction sites where applicable.

10.4.2.2 Mitigation for noise

Mitigation measures for noise emissions during the construction and operation phases include:

- Conducting construction activities as per applicable noise bylaws
- Noisy construction activities where noise and vibration may cause disturbance and stress in built-up areas will be limited to daylight hours
- Use of passive or active techniques to minimize noise such as construction of barriers or noise cancellation in areas of prolonged noise generation to the extent feasible

10.4.2.3 Mitigation for increased stress

Manitoba Hydro will implement the following measures to reduce effects on stress from perceived project effects:

- Manitoba Hydro will provide information to private landowners whose land is crossed by the project.
- Manitoba Hydro will construct and operate the pipeline following CSA standards, which are followed by Canadian gas utilities.
- Proper safety measures and protections will be implemented including use of proper materials, pressure testing, shut off valves, and regular pipelines surveys (corrosion and leak and depth of cover).

10.4.3 Characterization of residual effects

This section characterizes the residual project effects on health and well-being predicted to remain after the application of mitigation measures.

10.4.3.1 Decrease in air quality

Project-related air emissions during the construction phase are expected to be minor, resulting in temporary, short-term reductions in localized air quality at and immediately around construction sites, but are not anticipated to result in emissions exceeding Manitoba's Ambient Air Quality Guidelines. Residual health risk effects associated with changes in air quality during the construction phase are adverse.

Vehicles and heavy machinery will generate fugitive dust, particulate matter, and combustion products, but the magnitude of change in health risk from air quality is expected to be negligible.

Residual human health risk effects associated with changes in air quality during the operation and maintenance phase are adverse. However, particulate matter and dust generated during routine activities will be minor because of limited vehicle and equipment use during operations, and transient change in air quality will be limited to the PDA and immediately adjacent areas.

Project air emissions during the decommissioning phase are expected to be like the construction phase. After the application of mitigation measures, the residual effects of the project on air quality are predicted to be:

- Direction: Adverse
- Magnitude: Negligible
- Geographic extent: PDA

- Duration: Short-term
- Frequency: Multiple irregular events
- Reversibility: Reversible

10.4.3.2 Increase in noise

Residual effects on health and well-being related to noise are anticipated to be the most pronounced during the construction phase of the project as there will be the most noise-generating activities taking place during construction. However, the frequency of these activities will be multiple regular events along the right-of-way and not a continuous frequency. During the construction phase, residual effects for human health risk associated with noise levels are adverse. However, the magnitude of change in noise level will be low and anticipated to be like ambient noise levels. Similar effects are anticipated during the decommissioning phase of the project.

Residual effects for human health risk associated with noise levels during operation and maintenance are adverse. Noise generated by vehicles and equipment during routine maintenance activities may be noticeable but of short duration and are therefore deemed negligible.

After the application of mitigation measures, the residual effects of the project on noise levels are predicted to be:

- Direction: Adverse
- Magnitude: Negligible for operation, low for construction and decommissioning
- Geographic extent: LAA during construction and decommissioning; PDA during operation
- Duration: Long-term
- Frequency: Multiple regular events
- Reversibility: Reversible

10.4.3.3 Stress

Concerns and fears regarding safety related to the presence of the pipeline (mainly leaks and explosions) may contribute to adverse mental health outcomes including stress and anxiety. Manitoba Hydro will continue to address safety concerns related to leaks and explosions by providing information to concerned individuals, which has the potential to decrease associated risk perceptions. However, perceived risks are subjective and there is the potential that individuals and communities will continue to have concerns related to safety throughout the operation phase of the project.

The magnitude of project effects on stress has been assessed as ranging from negligible to moderate because perceived health risks are subjective, and stressors and the experience of stress may vary broadly between individuals. Individuals living closer to the pipeline or frequently visiting the area may experience higher levels of stress based on a greater magnitude of perceived risk and impacts (Brock et al. 2023).

Risk perceptions may change over time for some individuals and the stress caused by the perceived effects of the project may increase or decrease. The decommissioning of the project is anticipated to remove stress from the perceived risk of leaks and explosions caused by the presence of the project.

After the application of mitigation measures, the residual effects of the project on stress are predicted to be:

- Direction: Adverse
- Magnitude: Negligible to moderate depending on the individual
- Geographic extent: LAA
- Duration: Medium-term
- Frequency: Continuous
- Reversibility: Reversible

10.4.3.4 Summary of residual effects characterizations for health and well-being

Table 10-4 characterizes the residual effects on health and well-being.

Table 10-4: Project residual effects on health and well-being

Residual effects characterization						
Project phase	Direction	Magnitude	Geographic extent	Duration	Frequency	Reversibility
Decrease in air quality						
Construction	A	NC	PDA	ST	IR	R
Operation	A	NC	PDA	ST	IR	R
Decommissioning	A	NC	PDA	ST	IR	R
Increase in noise						
Construction	A	L	LAA	LT	R	R

Operation	A	NC	PDA	LT	R	R
Decommissioning	A	L	LAA	LT	R	R
Increase in stress						
Construction	A	NC	LAA	LT	C	R
Operation	A	NC-M	LAA	LT	C	R
Decommissioning	A	NC	LAA	LT	C	R

10.4.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For health and well-being, both conditions are present. The project is anticipated to have adverse effects on air quality, noise, and stress. Each of the residual effects could interact with other past, present, or reasonably near future physical activities.

10.4.4.1 Project residual effects likely to interact cumulatively

Table 10-5 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact health and well-being. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 10-5: Potential cumulative effects on health and well-being

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects		
	Decrease in air quality	Increase in noise	Increased in stress
Existing/ongoing projects and activities			
Domestic resource use (e.g., hunting, trapping, fishing)	-	-	-

Table 10-5: Potential cumulative effects on health and well-being			
Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects		
	Decrease in air quality	Increase in noise	Increased in stress
Recreational activities (e.g., canoeing, snowmobiling, hiking)	-	-	-
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	✓	✓	✓
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	✓	✓	✓
Manitoba Hydro gas and electricity transmission and distribution	-	✓	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

10.4.1.2 Decrease in air quality

Pathways for cumulative effect

The current projects and activities that may interact cumulatively to affect air quality are commercial resource use and infrastructure. These activities have the potential to generate fugitive dust, particulate matter and other air pollutants that lead to a potential change in ambient air quality. However, based on existing baseline data for southern Manitoba measured out of Winnipeg and Brandon, ambient air quality in the region follows the CAAQS for $PM_{2.5}$ and ozone (Manitoba Environment and Climate Change 2023).

Given that air emissions associated with the project will occur primarily during the construction phase, these effects will be experienced primarily close to active construction areas, and they will be short-term and continuous until the end of construction. Landowners and residents living near both the project and the other projects and activities identified in Table 10-5 may experience cumulative health risk from project-related changes in air quality.

Mitigation measures

Implementation of the mitigation measures described in Section 10.4.2.1 will reduce the effects of the project on air quality. Manitoba Hydro will collaborate with proponents and government agencies managing the existing and ongoing projects and activities in the area, where appropriate, to address cumulative effects.

Residual cumulative effect

The projects and activities listed in Table 10-5 may contribute to a change in air quality and related human health risk. Landowners and residents living near the project near other existing and future projects are most likely to experience cumulative health risk from project-related change to air quality. However, these effects are expected to be negligible in magnitude, short-term in duration and reversible once construction activities subside.

10.4.4.2 Increase in noise

Pathways for cumulative effect

Noise generated by current activities in the LAA and RAA have the potential to interact cumulatively with the project and could increase the overall exposure to noise experienced by people living and working in the RAA. Any activities involving the use of vehicles and equipment will contribute to noise levels. However, effects will only be cumulative if noise-generating activities occur concurrently and close to one another.

Mitigation measures

Implementation of mitigation measures described in Section 10.4.2.2 will reduce project effects on noise levels. Manitoba Hydro will collaborate with proponents and government agencies managing the existing and ongoing projects and activities in the area, where appropriate, to address cumulative effects.

Residual cumulative effect

Cumulative effects on noise will be experienced primarily close to construction areas and are anticipated to be short-term and continuous until the completion of construction. The residual potential cumulative effects due to noise will be negligible to low in magnitude, short-term in duration, and reversible once construction activities are complete.

10.4.4.3 Increase in stress

Pathways for cumulative effects

Based on engagement feedback, stress arising from the perceived effects and safety risks or existing pipeline developments are anticipated to act cumulatively with the project's residual effects on stress.

Mitigation measures

Implementation of the mitigation measures described in Section 10.4.2.3 will likely reduce the project's effects on stress from perceived effects. Manitoba Hydro will collaborate with proponents and government agencies managing the existing and ongoing projects and activities in the area, where appropriate, to address cumulative effects..

Residual cumulative effect

The cumulative magnitude of stress will range from a non-measurable change to potentially low because perception is related to proximity to the projects/existing pipelines, and individuals may have different perceptions depending on where they reside in relation to the project. Perceived health effects are subjective and may differ among individuals.

Stress will likely diminish over time after projects are operational. The project's contribution to stress is not anticipated to result in significant cumulative impacts.

10.4.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on air quality and noise are predicted to not be significant.

The project's impacts on stress are not anticipated to affect individuals' daily lives and activities. We recognize that although the project's residual effects and cumulative effects are predicted to be not significant, individuals may experience these effects uniquely and may deem such effects substantive.

10.4.6 Prediction confidence

Prediction confidence in the assessment of effects on health and well-being is based on desktop-based data compilation, engagement feedback from this project and previous projects, and an understanding of project activities, location, and schedule.

The prediction confidence is high for impacts to air quality and noise, since the environmental effects mechanisms are well understood, and Manitoba Hydro has experience on assessing the impacts of construction activities on air quality and noise from previous projects in southern Manitoba in agricultural and urban areas.

There is a moderate degree of confidence in the assessment for impacts on stress from perceived effects, given that individuals and communities may experience project effects differently. These effects were assessed qualitatively, considering indicators of the potential effect, literature reviews, engagement feedback, and professional judgment.

10.5 Follow-up and monitoring

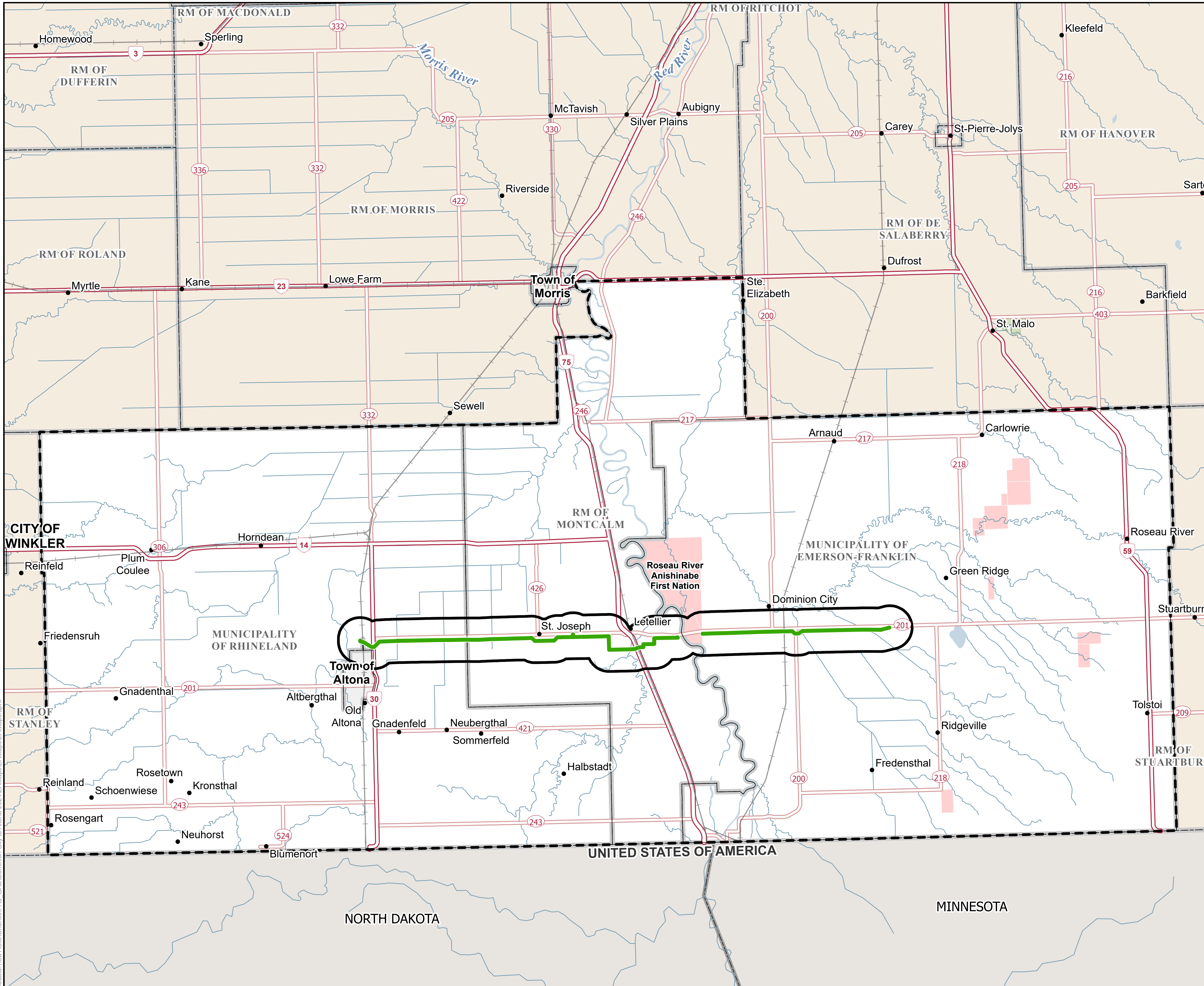
Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (Chapter 16).

10.6 Sensitivity to future climate change scenarios

Effects of climate change on health and well-being are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

There is a growing body of literature surrounding the impacts of climate change on mental health and increased anxiety, often referred to as climate anxiety (Clayton 2020). Emotional responses to climate change can be both the result of physical changes to the landscape (such as an increase in severe weather patterns) and the perception of climate change, including the dread associated with negative environmental information or feelings that environmental challenges are intractable (Clayton 2020). Any climate anxiety generated has the potential to negatively impact health and well-being, particularly related to stress from perceived effects as a result of the operation of the project (i.e., fear of leaks and explosions).

Map 10-1: Spatial boundaries for health and well-being



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure

- Preferred Route

Assessment Areas

- Health and Well-Being Local Assessment Area (1.5km buffer around PDA)
- Health and Well-Being Regional Assessment Area

Landbase

- Community
- Provincial Highway
- Provincial Road
- Railway
- City/Town
- Rural Municipality
- First Nation Lands
- Provincial Park

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Spatial Boundaries for Health and Well-Being

Draft: For Discussion Purposes Only

Map 10-1

11.0Economic opportunities

Economic opportunities refer to unique business situations or community circumstances that enhance the economic state of individuals and/or communities by providing a stimulus to the growth and/or retention of commerce and industry. Economic opportunities were selected as a valued component (VC) because of their importance to local and provincial residents, business owners, communities, and governments.

This chapter assesses the potential effects and cumulative effects of project construction, operation and maintenance, and decommissioning activities on economic opportunities.

11.1 Scope of the assessment

This assessment was influenced by engagement feedback and Manitoba Hydro's experience with other recent projects including the Northwest Gas Transmission Project, the Dorsey to Wash'ake Mayzoon (D83W) Transmission Project, and the Silver to Rosser Tap (S65R Tap Transmission Project). The assessment considers the following:

- Regional employment – employment opportunities for local and regional labour forces through construction, operation and maintenance, and decommissioning
- Regional business – contracting opportunities and increased demand for goods and services from local and regional businesses
- Regional economy – estimates of government tax revenue and contributions to gross domestic product (GDP) into the regional, provincial, and federal economies

11.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

11.1.2 Regulatory and policy setting

There are no provincial laws, and associated regulations, policies, and guidelines that were deemed relevant for the assessment of project effects to economic opportunities.

11.1.3 Consideration of engagement feedback

Project engagement (Chapter 4) actively sought to provide opportunities for concerned and interested parties to provide VC related feedback about the project.

Feedback raised during project engagement primarily related to revenue sharing, training, and employment opportunities for the project. Roseau River Anishinabe First Nation (RRAFN) inquired if there were possible revenue sharing opportunities on the project as well as inquiring about employment and training opportunities that might be available with the new project.

Overall, there is an interest in the amount and types of employment opportunities that will be generated by construction, and whether local business opportunities will arise from project work.

11.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on economic opportunities, along with effects pathways and measurable parameters are outlined in Table 11-1.

Table 11-1: Potential effects, effects pathways, and measurable parameters for economic opportunities

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Increase in regional employment	Project demand for labour during construction, operation and maintenance, and decommissioning creating job opportunities	Direct, indirect, and induced employment Labour force availability
Increase in regional business	Required purchase of goods and services during project construction, operation and maintenance and decommissioning.	Procurement of goods and services ($)
Increase in regional economy	Tax revenue generated through construction, operation and maintenance, and decommissioning.	Estimated government revenue ($) Estimated GDP ($)

11.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on economic opportunities:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA and consists of the administrative boundaries of the RMs of Emerson-Franklin, Montcalm, and Rhineland. In addition, the Town of Altona, located south of the western terminus of the project, is included in the LAA. This area is to encompass the communities for which economic opportunities could be impacted due to the project.
- **Regional assessment area (RAA):** the RAA is the same as the LAA and deemed to encompass a sufficiently broad area for assessing cumulative effects, including the incremental effects of the project. The RAA area is crucial for understanding

the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environment and socio-economic effects.

11.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on economic opportunities are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life.
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life.

11.1.7 Residual effects characterization

Table 11-2 provides the definitions used to characterize the residual effects on economic opportunities.

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	Positive – a residual effect that moves measurable parameters in a direction beneficial to economic opportunities relative to baseline. Adverse – a residual effect that moves measurable parameters in a direction detrimental to economic opportunities relative to baseline. Neutral – no net change in measurable parameters for economic opportunities relative to baseline.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	Negligible – no measurable change in the effect on economic opportunities. Low – a measurable change to economic opportunities that is not

Table 11-2: Characterization of residual effects on economic opportunities		
Characterization	Description	Quantitative measure or definition of qualitative categories
		substantial compared to other existing economic opportunities and contributors. Moderate – a measurable change to economic opportunities that is comparable to other existing economic opportunities and contributors. High – a measurable change to economic opportunities that is substantial compared to other existing economic opportunities and contributors.
Geographic Extent	The geographic area in which a residual effect occurs	PDA – residual effects are restricted to the PDA. LAA/RAA – residual effects extend into the LAA/RAA.
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	Short-term – the residual effect is restricted to the construction phase. Medium-term – the residual effect extends through to the operation phase. Long-term – the residual effect extends for the life of the project.
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule. Multiple regular event – occurs at regular intervals. Continuous – occurs continuously.
Reversibility	Pertains to whether a measurable parameter or the VC can return to its	Reversible – the residual effect is likely to be reversed after activity completion and reclamation.

Table 11-2: Characterization of residual effects on economic opportunities		
Characterization	Description	Quantitative measure or definition of qualitative categories
	existing condition after the project activity ceases	Irreversible – the residual effect is unlikely to be reversed.

11.1.8 Significance definition

For this assessment, a significant adverse residual effect on economic opportunities is defined as follows:

- The effects are adverse, distinguishable from current economic conditions and trends for the region and cannot be managed or mitigated through adjustments to programs, policies, or plans, or through other mitigation measures.

The residual effects assessment considers both positive and adverse effects after mitigation and other management measures are implemented. However, a significance determination is provided only for adverse effects.

11.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data. The existing conditions described in this section focus on:

- Regional economy
- Regional employment

The data used to understand regional employment comes from the 2021 Census. Statistics Canada (2023a, b, c) noted that the total non-response rate for the 2021 short-form census were higher in the Rural Municipality (RM) of Emerson-Franklin (4.3%) and the RM of Montcalm (5.5%), and lower in the RM of Rhineland (2.8%) in comparison to the provincial average (3.5%). The long form census non-response rates were higher in the RM of Emerson-Franklin (8.4%) and RM of Montcalm (12.5%), and lower in the RM of Rhineland (3.7%) in comparison to the provincial average (5.6%). The total non-response rate for the 2021 short-form census for the Town of Altona was 1.2% and 3.3% for the non-response long form census, both of which are lower than the provincial average.

11.2.1 Regional economy

11.2.1.1 RM of Emerson-Franklin

In the RM of Emerson-Franklin, agriculture contributes significantly to the economy because of the large amounts of Class 2 and Class 3 agricultural lands used for food and livestock production. Agriculture in the RM includes the production of canola, wheat, barley, alfalfa, dry field peas, cattle, pork, and poultry. Due to the RM being located on the border with the United States, the RM of Emerson-Franklin is involved in the agriculture and agribusiness sector and cross-border logistics and trade between Canada and the United States (Richard + Wintrup n.d.).

Dominion City, a community within the RM of Emerson-Franklin, has a variety of businesses that provide supplies and services to the local agricultural community including agricultural equipment, farm service and supplies, and crop seeding and spraying. Other business found in Dominion City to support the local community include automotive and mechanical, food and beverages, professional services such as insurance agents, brokers, and transport services, and retail (Municipality of Emerson-Franklin, 2024).

11.2.1.2 RM of Montcalm

In the RM of Montcalm, agriculture is the dominant industry driving the economy. The RM's agricultural industry includes grain production (wheat, barley, flax, oats, corn, canola, and sunflowers), hog and cattle farms, and seed production (CDEM, 2024). Agricultural businesses in the RM of Montcalm include a major grain processing plant, hauling companies, seed suppliers, aerial sprayers, and farm equipment suppliers.

In addition to agriculture, the largest wind farm in Manitoba, St. Joseph Wind, is in the RM of Montcalm. St. Joseph Wind covers approximately 125 square kilometers using 60 2.3 MW wind turbines to generate electricity (Pattern Energy, 2024). This power is sold to Manitoba Hydro under a 27-year purchase agreement (Pattern Energy, 2024).

Letellier and Saint Joseph are smaller communities in the RM of Montcalm that have a limited number of businesses that provide services, including food and retail, to rural residents. There is also a Canada Post location in the community of Letellier (RM of Montcalm, 2023).

11.2.1.3 RM of Rhineland

In the RM of Rhineland, agriculture is the dominant industry that contributes to the economy (Rhineland Municipality, 2024a). Many conventional and specialty crops are grown, including cereal grains, sunflowers, corn, beans, field peas, potatoes, and other vegetable crops. There are many businesses in the RM that support the agriculture sector, including those that supply seed, fertilizers, and chemicals, as well as equipment and mechanical services.

In addition to agriculture, manufacturing is also important with small and medium sized manufacturing firms existing in urbanized communities within the RM of Rhineland (Rhineland Municipality, 2024b). The municipal economy includes five main industry sectors: manufacturing, agriculture, retail, healthcare, and construction. These industries employ over half of the municipality's labour force (Rhineland Municipality, 2024b).

Town of Altona

The Town of Altona, located within the RM of Rhineland, is the largest urban centre near the project, (i.e., in the LAA/RAA) and an important agricultural centre supporting agricultural activities related to cattle, cereal grains, beans, peas, and specialty such as sunflowers (Rhineland Municipality 2024b; Town of Altona 2024).

Altona features several commercial, educational and medical services that service the town and greater municipality, including day care facilities, schools, a community health centre, and recreational facilities.

Altona has a 260 acre industrial park to promote business and economic development in the community (Town of Altona 2024). Altona, and the RM of Rhineland, are part of the larger Supporting Entrepreneurs, Economic Development organization, which supports the Rhineland, Plum Coulee, Gretna and Altona region in promoting business and economic development (SEED 2018).

11.2.2 Regional employment

The LAA/RAA for the project includes the administrative boundaries of the RMs of Emerson-Franklin, Montcalm and Rhineland.

Table 11-3 shows the labour force characterization and Table 11-4 shows the percent workforce per industry for the RM of Emerson-Franklin, Montcalm and Rhineland and Town of Altona (Statistics Canada 2023a, b, c).

Table 11-3: Labour force characterization for communities in the LAA/RAA for 2021					
	RM of Emerson-Franklin	RM of Montcalm	RM of Rhineland	Town of Altona	Manitoba
Total – Population aged 15 years and over by labour force status	1,770	925	4,005	3,240	1,058,415
In the labour force	1,130	635	2,710	2,015	681,505
Employed	1,070	625	2,630	1,905	625,115
Unemployed	60	15	75	105	56,390
Not in the labour force	640	285	1,300	1,225	376,905
Participation rate (%)	63.8	68.6	67.7	62.2	64.4
Employment rate (%)	60.5	67.6	65.7	58.8	59.1
Unemployment rate (%)	5.3	2.4	2.8	5.2	8.3
Source: Statistics Canada 2023a, b, c					

Table 11-4: Industry and workforce in RM of Emerson-Franklin, Montcalm, Rhineland and Town of Altona for 2021, North American Industry Classification System					
Industry	RM of Emerson-Franklin	RM of Montcalm	RM of Rhineland	Town of Altona	Manitoba
Total – Labour force aged 15 years and over by industry	1,130	640	2,705	2,010	681,505
Agriculture, forestry, fishing and hunting	215	115	470	130	27,485
Mining, quarrying, and oil and gas extraction	15	0	0	0	5,045
Utilities	0	0	15	10	6,555
Construction	155	55	365	135	52,245

Manufacturing	55	65	470	455	56,805
Wholesale trade	35	10	85	60	18,970
Retail trade	40	60	270	225	72,205
Transportation and warehousing	140	40	150	65	41,485
Information and cultural industries	0	0	15	40	9,760
Finance and insurance	30	30	40	60	52,885
Real estate and rental and leasing	0	0	10	15	8,410
Professional, scientific and technical services	10	20	40	50	32,425
Administrative and support, waste management and remediation services	30	10	100	25	26,870
Educational services	80	55	175	220	57,480
Health care and social assistance	75	70	255	230	99,895
Arts, entertainment and recreation	20	10	10	20	12,075
Accommodation and food services	40	0	50	55	37,515
Other services	30	30	150	110	28,120
Public administration	130	35	25	75	45,555
Source: Statistics Canada 2023a, b, c					

As of 2021, unemployment rates in the RMs of Emerson-Franklin, Montcalm, Rhineland, and the Town of Altona were 5.3%, 2.4%, 2.8%, and 5.2% respectively, all of which are lower than the provincial average unemployment rate of 8.3% (Statistics Canada 2023a, b, c).

The main industry supporting employment in the RM of Emerson-Franklin is agricultural, forestry, fishing and hunting (19.5%), followed by construction (14%), transportation and warehousing (12.7%), and administration (11.8).

Agricultural, forestry, fishing and hunting (18.1%) is also the main industry of employment in the RM of Montcalm, followed by transportation and warehousing (11%) and health care and social assistance (11%) and manufacturing (10.2).

In the RM of Rhineland, agricultural, forestry, fishing and hunting, and manufacturing each account for 17.4% of employment, followed by construction (13.5%), and retail trade (10%) (Statistics Canada 2023a, b, c).

11.3 Project interactions with economic opportunities

Table 11-5 identifies, for each potential effect, the physical activities that might interact with economic opportunities and result in the identified effect.

Table 11-5: Project interactions with economic opportunities

Project activities/components	Increase in regional employment	Increase in regional business	Increase in regional economy
Construction of pipeline, gate station, and valve sites			
Mobilization and staff presence	✓	✓	✓
Vehicle and equipment use	✓	✓	✓
Access development	-	-	-
Marshalling yards (temporary work or storage areas)	-	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	-	-	-
Pipe stringing (including welding, coating)	-	-	-
Pipe installation – trenching and lowering	-	-	-
Horizontal directional drilling	-	-	-
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-	-
Backfilling and contouring	-	-	-
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	-	-
Clean-up and reclamation	-	-	-
Operation and maintenance of pipeline, gate station, and valve sites			
Presence of pipeline, gate station, and valve sites	-	-	-
Vehicle and equipment use	✓	✓	✓
Maintenance activities	✓	✓	✓

Ground pipeline patrols – depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-	-
Valve operation checks (annually)	-	-	-
Vegetation management	-	-	-
Decommissioning of pipeline, gate station, and valve sites			
Mobilization and staff presence	✓	✓	✓
Vehicle and equipment use	✓	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	-	-
Rehabilitation	-	-	-
Clean-up and demobilization	-	-	-

✓ = Potential interaction

– = No interaction

Table 11-5 indicates which project activities will have an impact on regional employment, regional business, and regional economy. For the purposes of the assessment, mobilization and staff presence is intended to capture the effects of the project on economic opportunities through the general employment and subsequent business and economy opportunities associated with each project phase. Other project effects (e.g., horizontal directional drilling) have also been identified if they have the potential to generate additional local employment and business opportunities.

11.4 Assessment of project effects

Effects to employment opportunities are anticipated to occur during construction, operation, and decommissioning. However, they would be most pronounced during construction and include the following:

- Increase in regional employment
- Increase in regional business
- Increase in regional economy

While increases in regional employment, business, and economy are expected to occur during operations, these effects are anticipated to be less prominent than construction given the smaller workforce required for operations. As a result, the assessment of project effects is mostly focused on the construction phase of the project.

11.4.1 Effects pathways

There are three main effect pathways for the project to affect economic opportunities:

- Project demand for labour, creating job opportunities
- Required purchase of goods and services
- Tax revenue generated through project activities

11.4.1.1 Demand for labour

Analytical assessment techniques

The assessment of project-related effects to labour demand considers direct, indirect, and induced employment opportunities resulting from the project and labour force availability.

Construction

The construction of the project will generate employment opportunities for the local and regional labour force. Direct employment opportunities may include limited construction opportunities, management and supervisory roles, inspection services, equipment operators, health and safety, trades, and semi-skilled and unskilled labour. Project spending during construction will generate indirect and induced employment opportunities. Indirect employment is generated within industries supplying intermediate components such as raw materials, while induced employment is generated by household spending (*e.g.,* consumer products, restaurants) from wages earned by direct and indirect workers.

The demand for labour related to the project has the potential to result in employment opportunities in the LAA/RAA through direct and indirect jobs. Direct effects can be created through the employment of workers who live in the LAA/RAA. Indirect effects can result from an increased workforce in the area, placing additional demands on existing businesses and leading to more employees being hired to meet this increased demand.

Operation

The operation and maintenance phase of the project will also generate a demand for labour, but on a smaller scale. Employment opportunities will include staff positions, operators, and maintenance workers. There may also be opportunities for contractors to be employed for operation and maintenance activities.

Decommissioning

The decommissioning phase of the project will also generate a demand for labour, but at a smaller scale compared to construction. Direct employment opportunities may include management and supervisory roles, inspection services, equipment operators, health and safety, trades, and semi-skilled and unskilled labour.

11.4.1.2 Purchase of goods and services

Analytical assessment techniques

Project-related effects on the purchase of goods and services are assessed by considering the types of goods and services that project activities will require and the availability and opportunity for goods and services to be procured from businesses within the LAA/RAA.

Construction

Project spending will generate subcontracting opportunities and demand for goods and services from local and regional businesses. Such opportunities could include the provision of accommodations, parts supply, fuel, meals, and vehicles and equipment for project activities.

The procurement of equipment, goods, and services from businesses in the LAA/RAA during construction will generate direct and indirect opportunities for local and regional businesses. This increased business revenue could in turn support capital investment and hiring, thereby increasing capabilities and capacity within the LAA/RAA. Spending of wages by direct and indirect workers will contribute to positive effects on local businesses, primarily within the service sector, resulting in indirect economic benefits to businesses in the LAA/RAA.

Operation

On a smaller scale, there will also be the purchase of goods and services to support project operation. These opportunities would primarily come from routine inspection and maintenance activities.

Decommissioning

Like construction but at a smaller scale, project decommissioning-related spending will generate subcontracting opportunities and the demand for goods and services from local and regional businesses. Such opportunities could include the provision of accommodations, parts supply, and vehicles and equipment for project activities.

The procurement of equipment, goods, and services from businesses in the LAA/RAA during decommissioning will generate direct and indirect opportunities for local and regional businesses. This increased business revenue could contribute towards capital investment and hiring, thereby increasing capabilities and capacity within the LAA/RAA. Spending of wages by direct and indirect workers will contribute to positive effects on local businesses, primarily within the service sector, resulting in indirect economic benefits to businesses in the LAA/RAA.

11.4.1.3 Tax Revenue

Government tax revenue generated through project activities will contribute to the regional economy. Project spending and employment will contribute to the regional, provincial, and national economies. It will also contribute to federal, and provincial government revenue through taxation on income and on goods and services procured for the project.

Analytical assessment techniques

Tax revenue is based on estimates of government tax revenue and contributions to the GDP resulting from the project.

Construction

Project expenditures during construction will result in increased economic activity in the form of employment and procurement, as discussed in previous sections. The project's contribution to provincial and federal economies is measured through GDP (value added after the cost of intermediate goods and services). In addition to GDP contributions, the project and its workers will be subject to varying levels of taxation which will contribute to government revenues.

Operation

Any project-related spending during the operation phase of the project will also support tax revenue for the regional, provincial, and national economies, but the tax revenue would be less than that generated during construction.

Decommissioning

Like the construction phase but at a smaller scale, decommissioning-related expenditures will result in increased economic activity, primarily via employment and procurement. In addition to GDP contributions, the project and its workers will be subject to varying levels of taxation which will contribute to government revenues.

11.4.2 Mitigation measures

Facilitation of economic and employment opportunities include the following, which apply to each of the potential effects for employment and economy:

- Manitoba Hydro will contact local municipal authorities prior to project start-up.
- Manitoba Hydro will contact First Nation and the Manitoba Métis Federation representatives prior to project start-up.
- Continue to provide information to communities in the LAA/RAA on training, employment and business opportunities associated with project construction.

11.4.3 Characterization of residual effects

11.4.3.1 Demand for labour

Project construction, operation and maintenance, and decommissioning will generate direct and indirect employment opportunities for the local and regional labour force.

Across the three project phases, the workforce for the construction phase is anticipated to be the largest. During pipeline construction, we anticipate a direct onsite workforce of approximately 200 persons. As pipeline construction is likely to occur during unfrozen ground conditions,, the number of people directly employed on the project will be largest in the late spring/summer.

Construction and decommissioning activities typically require skilled and unskilled labour for short-term employment. Construction employment will require education or trades certification, or applicable construction experience for some positions. Employment opportunities typically associated with construction include:

- Management and supervisory personnel (e.g., supervisor, foreperson)
- Pipeline inspection services (for signs of damage and potential risks to pipeline)
- Equipment operators (e.g., heavy equipment, bulldozers, horizontal directional drills)
- Trades and apprentices (e.g., mechanics, technicians, welders)
- Semi-skilled and unskilled labour (e.g., labourer, mechanic's helper)
- Health and safety (e.g., health and safety coordinator)

During operations and maintenance, Manitoba Hydro staff and contractors will be used, as required. Typical employment opportunities will include staff positions, operators, mechanical technicians, and maintenance workers. Contractor staff could include patrollers and equipment operators. The average workforce requirement is anticipated to be small.

Based on previous experience, Manitoba Hydro anticipates that the decommissioning workforce size will be less than that needed for construction. Typical employment opportunities associated with decommissioning include management and supervisory personnel, equipment operators, trades and apprenticeships, semi-skilled and unskilled labour, and health and safety.

As of 2021 in the LAA/RAA, there were 710 workers employed in construction, 1,045 workers in manufacturing, 25 workers in utilities, 395 in transportation and warehousing, and 120 in professional, scientific and technical services. These occupations seem applicable to construction-related activities, and it is assumed that some of the skilled workforce required for the project will be filled by locals in the LAA/RAA. It is likely that a portion of the project's workforce will be comprised of non-local workers; in particular, for specialized labour.

Other factors, including contractor(s) use of preferred labour and the degree to which workers choose to seek employment with the project will also affect the final composition of the project workforce. It is likely that employment benefits related to the project will be highly skewed toward the existing skilled trades workforce with most construction positions comprised of skilled trades positions.

After the application of mitigation measures, the residual effects of the project on the demand for labour are predicted to be:

- Direction: Positive
- Magnitude: Low
- Geographic Extent: LAA/RAA
- Duration: Long-term
- Frequency: Continuous
- Reversibility: Reversible

11.4.3.2 Purchase of good and services

Where project expenditures occur locally, positive effects on regional businesses are expected. During construction, contracts for right-of-way preparation and pipeline construction including topsoil salvage, trenching, pipeline installation and horizontal directional drilling could result in short-term opportunities for businesses in the LAA/RAA. In addition to direct and indirect contracting, service sector businesses operating in communities near the project will experience induced economic benefits from the purchase of meals, fuel, and accommodations by workers. Incidental purchases of repairs and parts for construction vehicles and equipment, as well as the purchase of some materials required for construction, will also result in economic benefits in nearby communities.

During operations, maintenance activities could include short-term contracts for vegetation management, valve operation checks, or ground pipeline patrols. Decommissioning is expected to result in indirect and induced contracting opportunities for local and regional businesses and would also be expected to result in induced opportunities through consumer spending.

After the application of mitigation measures, the residual effects of the project on the purchase of goods and services are predicted to be:

- Direction: Positive

- Magnitude: Low
- Geographic Extent: LAA/RAA
- Duration: Long-term
- Frequency: Continuous
- Reversibility: Reversible

11.4.3.3 Tax Revenue

Quantitative estimates of GDP contributions are not available. However, considering the low magnitude characterizations associated with the project on employment and business, the project's contribution to the GDP of the local economy is deemed to be low in magnitude. At the provincial and federal level, the project's GDP contribution is deemed to be negligible in magnitude.

In terms of taxes, increases to regional government revenue would only be realized where additional property taxes are realized because of changes (*i.e.,* increases) in the assessed value of lands traversed by the project. The final preferred route of the pipeline is routed entirely on private land. The presence of the right-of-way on the land will not change the taxation status of traversed properties (*i.e.,* landowners will still own the land and be responsible for paying municipal property taxes) and it is not anticipated that the presence of the new pipeline will affect assessed land values on which property tax amounts are based. Therefore, the project is not anticipated to have a measurable effect on regional government revenue.

Benefits to provincial and federal tax revenues would occur where the taxable income of workers increases, resulting in increased income tax revenue, and through PST and GST collected on goods and services used on the project. Given the size of the workforce and duration of work, project effects on provincial and federal tax revenues are anticipated to be negligible in magnitude.

After the implementation of mitigation measures, the residual effects of the project on tax revenue are predicted to be:

- Direction: Positive
- Magnitude: Negligible
- Geographic Extent: LAA/RAA
- Duration: Long-term
- Frequency: Continuous
- Reversibility: Reversible

11.4.3.4 Summary of residual effects on economic opportunities

Table 11-6 characterizes the residual effects on economic opportunities.

Table 11-6: Project residual effects on economic opportunities

Residual effects characterization						
Project phase	Direction	Magnitude	Geographic extent	Duration	Frequency	Reversibility
Change in regional employment						
Construction	P	L	LAA/RAA	ST	C	R
Operation	P	L	LAA/RAA	MT	C	R
Decommissioning	P	L	LAA/RAA	ST	C	R
Change in regional business						
Construction	P	L	LAA/RAA	ST	C	R
Operation	P	L	LAA/RAA	MT	C	R
Decommissioning	P	L	LAA/RAA	ST	C	R
Change in regional economy						
Construction	P	NC	LAA/RAA	ST	C	R
Operation	P	NC	LAA/RAA	MT	C	R
Decommissioning	P	NC	LAA/RAA	ST	C	R

11.4.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities. Because the project is not expected to have a residual adverse effect on regional employment, business, or economy, further assessment of cumulative effects is not warranted.

11.4.5 Determination of significance

As discussed in Section 12.1.8, a significance determination is only made if the project is anticipated to have adverse residual effects. As summarized in Table 12-6, after the application of mitigation measures, there are no *adverse* residual effects predicted for economic opportunities and therefore a determination of significance is not required.

11.4.6 Prediction confidence

Prediction confidence in the assessment of effects on economic opportunities is moderate to high, based on professional judgment, quality of publicly available data, and the past effectiveness of proposed mitigation measures.

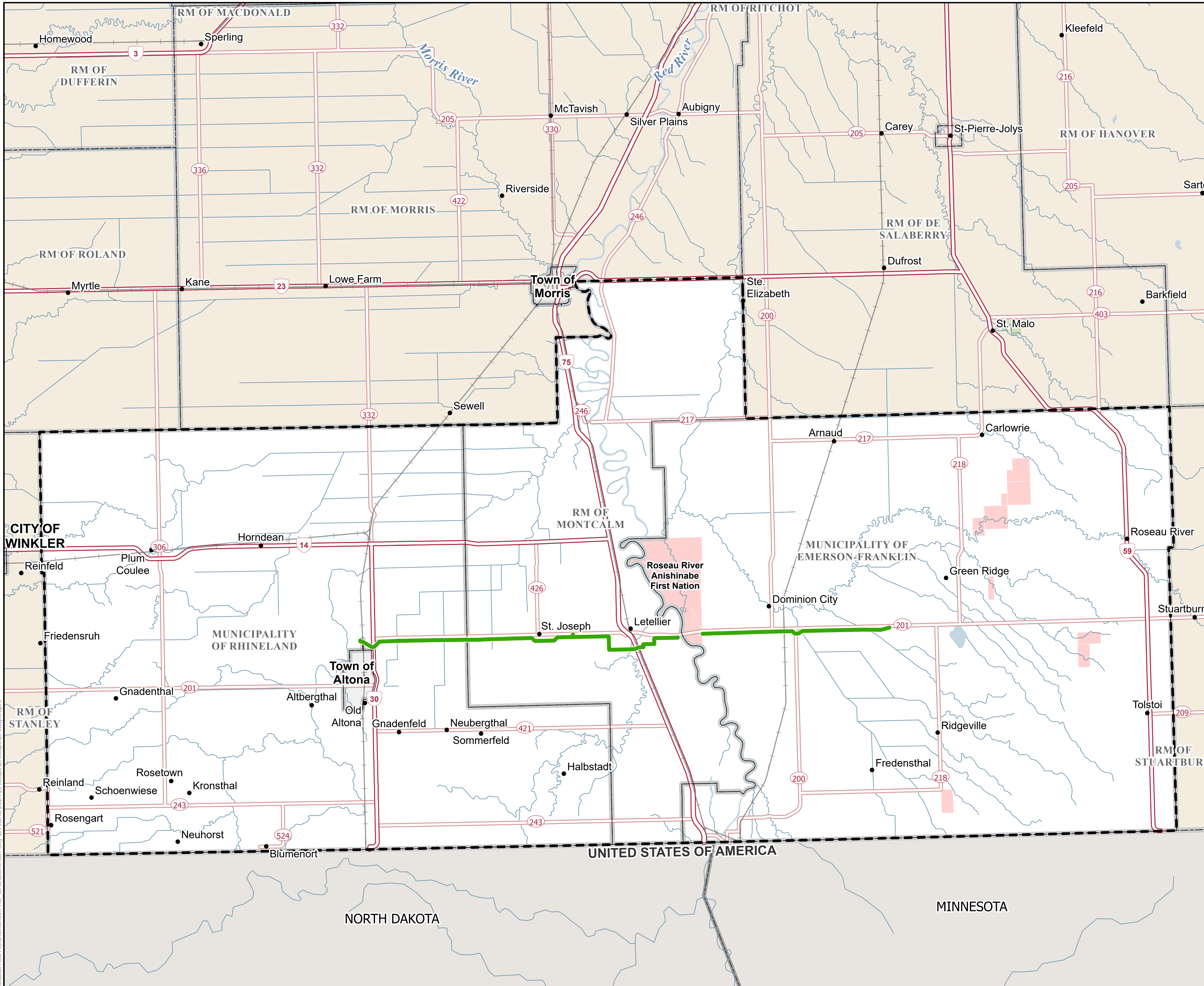
11.5 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project.

11.6 Sensitivity to future climate change scenarios

Effects of climate change on economic opportunities are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding). Infrastructure damage may occur because of higher temperatures, extreme weather events, and changes in precipitation patterns. This may create the need for more frequent repair and maintenance work on the pipeline line and associated components, resulting in increased economic opportunities related to employment and business demands.

Map 11-1: Spatial boundaries for economic opportunities, and infrastructure and community services



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Project Infrastructure

- Preferred Route

Assessment Areas

- Economic Opportunities and Infrastructure and Community Services Local and Regional Assessment Area

Landbase

- Community
- Provincial Highway
- Provincial Road
- Railway
- City/Town
- Rural Municipality
- First Nation Lands
- Provincial Park

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 3 6 9 12 Kilometres
0 1.75 3.5 7 Miles

1:260,000

Spatial Boundaries for Economic Opportunities, and Infrastructure and Community Services

Draft: For Discussion Purposes Only

Map 11-1

12.0Infrastructure and community services

Infrastructure and community services refer to the physical structures and facilities (e.g., highways, railways, water, and wastewater) and services (e.g., emergency response and health care) needed for the operation of communities.

Infrastructure and community services was selected as a valued component (VC) because the project has the potential to increase the demand for, or interfere with, local and regional infrastructure and services.

12.1 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on infrastructure and community services.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other recent transmission projects in Southern Manitoba (e.g., the Pointe du Bois to Whiteshell (PW75) Transmission Project, Dorsey to Wash'ake Mayzoon Transmission (D83W) Project, and Manitoba-Minnesota Transmission Project (MMTP)). The assessment considers the following:

- Short-term accommodations
- Traffic and transportation
- Health and emergency response services
- Solid waste management facilities

12.1.1 The project

The proposed project consists of construction, operation, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 38.7 km, beginning at an existing gate station located approximately 7.5 km east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline previously installed beneath the Red River by horizontal directional drilling and within the road allowance south of Provincial Road 201. The project components are described in more detail in Chapter 2 (Project description).

12.1.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines were considered for assessing project effects to infrastructure and community services.

- *The Traffic and Transportation Modernization Act*
- *The Dangerous Goods Handling and Transportation Act*
- *The Planning Act*
- Applicable municipal by-laws

12.1.2.1 The Traffic and Transportation Modernization Act

The Traffic and Transportation Modernization Act is administered by Manitoba Transportation and Infrastructure and regulates provincial highway and road infrastructure and traffic, roadway speed limits, vehicle registration and license plates, license requirements for highway driving, vehicles and equipment standards, and prohibitions, offences, and penalties. Through this Act, Manitoba Transportation and Infrastructure reviews all applications for development permits on provincial roadways, and reviews speed limit changes on all provincial roadways. The Act also allows local governments (i.e., municipalities and First Nations) to change speed limits on municipal and First Nation roads.

12.1.2.2 The Dangerous Goods Handling and Transportation Act

The Dangerous Goods Handling and Transportation Act and associated regulations outline the conditions and standards relating to the generation, handling, storage, transport and disposal of dangerous goods or hazardous waste. This Act and regulations will be applicable to the transportation and disposal of project hazardous wastes.

12.1.2.3 The Planning Act and Provincial Planning Regulation

Administered in cooperation by Manitoba Municipal Relations and the associated municipal councils, *The Planning Act* (C.C.S.M. c. P80) provides a framework for land use planning strategies at the provincial, regional, and local scale. The Provincial Planning Regulation, M.R. 81/2011 provides a framework to guide development planning.

Municipal jurisdictions must adopt development plans and zoning by-laws to guide land and resource use planning decisions within their respective boundaries under *The Planning Act* (C.C.S.M. c. P80). A development plan is a by-law that outlines the long-term vision and goals of a community to guide development within the planning area of a municipality or planning district. A zoning by-law is a tool used by the planning authority to implement development plan policies and typically represents what is on the ground. Zoning by-laws are guided by and conform to the development plans. Zoning regulates the use of land and locations of buildings and structures (Government of Manitoba, 2015).

Municipal jurisdictions have a variety of development controls in place along the proposed ROW. Land use development controls based on applicable development plans and zoning by-laws are described in Section 6.3.2.1.

Manitoba Hydro understands neither *The Planning Act* (C.C.S.M. c. P80), nor its regulations, apply to the Crown or Crown agencies. Manitoba Hydro notes that, as a Crown Corporation, it is not directly subject to the legislative provisions and is generally exempt from them in terms of development planning. However, it does seek to work cooperatively with the municipalities when planning, designing, constructing, and operating and maintaining its projects to limit the extent of possible interactions with their developments and plans.

12.1.2.4 Municipal by-laws

By-laws relevant to the assessment of infrastructure and community services within the municipalities traversed by the project include the following:

- RM of Emerson-Franklin By-Law No. 12-11, *Driveway and Culvert Policy:* provides provisions on building driveways and culverts onto properties, as well as installing temporary driveway approach entrances for vehicular access during construction projects.
- RM of Emerson-Franklin By-Law No. 02-18, *Operation and Management of Water Distribution Systems in the Municipality of Emerson-Franklin*: establishes terms and conditions concerning the operation, management and use of the water distribution systems and related infrastructure constructed, installed, operated and maintained in the RM of Emerson-Franklin.
- RM of Emerson-Franklin *Zoning By-law*: provides for all use and development of land and buildings in the RM of Emerson-Franklin except where otherwise noted within the By-law.
- RM of Emerson-Franklin By-Law No. 05-15, *Fire Prevention and Emergency Services By-law:* provides provisions requiring services for firefighting, fire prevention, regulations of fire and other hazards, adoption of the fire code, and the operation of emergency services within the RM.

- RM of Montcalm By-Law No. 852/24, *Garbage Collection*: outlines the special service levy for the pickup of garbage from residential, commercial and institutional property in St. Jean Baptiste, Letellier and St. Jospeh, within the RM of Montcalm.
- RM of Montcalm By-Law No. 846/23, *Fees and Rates By-Law*: establishes fees and other charges, and terms of payment for services, activities, licenses, permits and approvals for things provided or done by the municipality.
- RM of Montcalm By-Law No. 844/23, *Water and Wastewater Rates*: outlines water usage and supply rights held by the RM of Montcalm, as well as water rates and additional fees and services including conditions for connections and sewer surcharges within the RM of Montcalm.
- RM of Montcalm By-Law No. 808/91*, Maximum speed limits By-Law*: establishes speed limit regulations for highways and roadways within the RM of Montcalm, and the ability for the RM of Montcalm to adjust speed limits within their jurisdiction, if in the public interest.
- RM of Montcalm By-Law No. 809/19, *Zoning By-Law*: regulates the use, size, height and location of buildings on properties within the RM of Montcalm.
- RM of Rhineland By-Law No. 2022-04, *Maximum Speed Limits on Highways within the Municipality of Rhineland*: establishes speed limit regulations for highways and roadways within the RM of Rhineland, and the ability for the RM of Rhineland to adjust speed limits within their jurisdiction, if in the public interest.
- RM of Rhineland By-Law No. 2020-07, *Traffic and Parking By-Law:* provides for the regulation of traffic and parking of vehicles in the RM of Rhineland.
- RM of Rhineland By-Law No. 2020-09, *Noise By-Law*: Outlines authorities for the RM of Rhineland in providing for public order, morality and regulating of noises.
- Town of Altona By-Law No. 1783/2020, *Fees and Charges By-Law*: reviews the fees and charges payable to the Town of Altona for certain services rendered by officers and employees of the Town, including waste disposal.
- Town of Altona By-Law No. 1708/2013, *Noise Control By-Law:* provides provisions for activities or things in the opinion of the council which are or could become a nuisance, which may include noise.
- Town of Altona By-Law No. 1763/2014, *Off-Road Vehicles By-Law*: regulates the operating of off-road vehicles within the Town of Altona.
- Town of Altona By-Law No. 1784/2020, *Traffic and Parking By-Law:* provides regulations of traffic and parking of vehicles in the Town of Altona.
- Town of Altona By-Law No. 1792/2020, *Zoning By-Law*: regulates the use, size, height and location of buildings on properties within the Town of Altona.

- Town of Altona By-Law No. 1795/2020, *Water Conservation By-Law:* provides outdoor water use restrictions within the Town of Altona.
- Town of Saint Jospeh By-Law No. 2011-53, *Noise By-Law*: regulates and controls the timing and type of noise permitted within the Township of St. Joseph.

12.1.3 Consideration of engagement feedback

Project engagement (Chapter 4) actively sought to provide opportunities for concerned and interested parties to provide feedback about the project.

Project engagement feedback relevant to infrastructure and community services primarily related to interest in the ability to connect to natural gas service and interest in understanding the customers that the proposed natural gas line is intended to provide natural gas service to.

On past projects, we have heard concerns about potential wear and tear on local roads from heavy vehicle traffic, an overall increase in traffic during project activities, and an increased demand for accommodations from staff and contractors during construction.

12.1.4 Potential effects, pathways, and measurable parameters

The potential project effects on infrastructure and community services, along with effects pathways and measurable parameters are outlined in Table 12-1.

Table 12-1: Potential effects, effects pathways, and measurable parameters for infrastructure and community services

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Reduced availability of accommodations	Influx of workers during construction and operations may increase demand for accommodations in the region.	Availability of accommodations (e.g., inventory of rental properties) Anticipated workforce numbers
Increased traffic and strain on transportation infrastructure	Construction and operation may increase the demand on traffic infrastructure, including road, air and rail, potentially increasing travel times, affecting road conditions, and causing (or being involved in) collisions.	Current capacity of local and regional highways and roads Daily road traffic volume and incidents, and air traffic volumes Change in conditions of roads and highways due to heavy loads carried by trucks
Strain on health and emergency response services	Increased demand for health and emergency response services as the result of project activities and project-related influx of workers	Capacity of health care and emergency response services Number of workers for each phase (construction, operations, and decommissioning)
Strain on solid waste management facilities	Increased pressure on solid waste facilities resulting from wastes generated by project activities	Tonnage of waste materials generated by the project that will be disposed in local/regional facilities Capacity of local/regional waste disposal facilities

12.1.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on infrastructure and community services:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA and consists of the administrative boundaries of the municipalities traversed by the PDA: the RMs of Emerson-Franklin, Montcalm, and Rhineland, including the Town of Altona. This area is to encompass the communities for which infrastructure and community services could be impacted due to the project.
- **Regional assessment area (RAA):** is the same as the LAA. The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

12.1.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on infrastructure and community services are based on the timing and duration of project activities as follows:

- Construction – six to twelve months, commencing in summer 2026
- Operation and maintenance – the operational phase of the project including maintenance, estimated to be at least 50 years based on the pipeline's design life.
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life.

12.1.7 Residual effects characterization

Table 12-2 provides the definitions used to characterize the residual effects on infrastructure and community services.

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	Description	Quantitative measure or definition of qualitative categories
		direction beneficial to infrastructure and community services relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to infrastructure and community services relative to baseline. **Neutral –** no net change in measurable parameters for infrastructure and community services relative to baseline.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**No measurable change –** no measurable change in the effect on infrastructure and community services can be noted **Low –** a measurable change to infrastructure and community services capacity, but services can take place at similar levels as under baseline conditions **Moderate –** measurable change in infrastructure and services capacity, where services are under strain but can take place at similar levels as under baseline conditions **High –** measurable change in infrastructure and services capacity, where services and capacity are strained to a point that they cannot take place at similar levels as under baseline conditions

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	Description	Quantitative measure or definition of qualitative categories
Geographic extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

12.1.8 Significance definition

For this assessment, adverse residual effects on infrastructure and community services are considered significant if, following the application of mitigation and management measures, the proposed project disrupts, restricts, or degrades present infrastructure and community services for a duration longer than the construction phase to a point where activities cannot continue at or near baseline levels.

12.2 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data. The existing conditions described in this section focus on:

- Short-term accommodations
- Transportation infrastructure
- Healthcare, emergency, and social services
- Waste management

12.2.1 Short-term accommodations

According to Airbnb, as of November 2024 there are approximately ten listings in the LAA/RAA, mostly focused around Altona (Airbnb 2024). There are also two listings on Trip Advisor for hotels, motels and bed and breakfasts in the LAA/RAA. (Trip Advisor 2024).

12.2.2 Transportation infrastructure

12.2.2.1 Road transportation

The PDA can be accessed through Provincial Trunk Highways (PTH) and Provincial Roads (PR). Most rural areas within the RAA are also connected by a square mile grid of gravel or earth roads maintained by each municipality, while the rural areas adjacent to the Red River are connected by paved and unpaved municipal roads following the river lot system. The highways and roads in the RAA are detailed below.

There are several provincial trunk highways (PTHs) and provincial roads (PRs) that are crossed by the PDA:

- PTH 30 – partly Roads and Transportation Association of Canada (RTAC) route, majority Class A1 highway, running north-south from the town of Altona to the Canada/United States border.
- PTH 75 – RTAC route, travels north-south in the RM of Montcalm to the Canada/United States border.
- PR 200 – majority Class B1 provincial route, running north-south in the RM of Emerson-Franklin.

- PR 201 – majority Class B1 provincial route, running east-west through the LAA/RAA.

Other PTHs and PRs that traverse the LAA/RAA, but not the PDA, include:

- PTH 14 – RTAC (Roads and Transportation Association of Canada) route, travels east-west through the LAA/RAA.
- PTH 59 – RTAC route, travels north-south in the RM of Emerson-Franklin.
- PR 217 – Class B1 provincial route, running east-west in the RM of Emerson Franklin.
- PR 218 – Class B1 provincial route, running north-south in the RM of Emerson Franklin.
- PR 243 – Class B1 provincial route, running east-west from the western edge of the LAA/RAA to PTH 30
- PR 246 – Class B1 provincial route, running north-south in the RM of Montcalm.
- PR 306 – partly RTAC route, partly Class B1 provincial route, running north-south in the RM of Rhineland.
- PR 332 – Class B1 provincial route, running north-south in the RM of Montcalm.
- PR 421 – Class B1 provincial route, running east-west between PTH 30 and PTH 75 in the RM of Rhineland.
- PR 426 – Class B1 provincial route, running north-south between PTH 14 and PR 201 in the RM of Montcalm.
- PR 524 – Class B1 provincial route, running north-south from PR 243 to the Canada/United States border.

Route designations are based on maximum gross vehicle weight limits. PTH 75 has a weight maximum of 63,500 kg. All other RTAC routes in the LAA/RAA have a maximum weight of 62,500 kg. The portion of PTH 30 that is a Class A1 highway has a maximum weight of 56,500 kg. The other roads in the LAA/RAA are Class B1 routes, which have a weight restriction of 47,630 kg (*The Highway Traffic Act,* C.C.S.M. c. H60).

Table 12-3 includes current daily traffic volumes for provincial trunk highways and provincial roads and monitoring sites located in the LAA/RAA.

Table 12-3: Current traffic volumes on provincial trunk highways and provincial roads in the LAA/RAA

Road or highway	Highway section / location	Current volume of vehicles/day for annual average daily traffic
PTH 14	West of PTH 75	1,860 - 2,360
PTH 30	South of PTH 14	2,170 – 2,310
PTH 59	North of PR 201	870 – 960
PTH 75	Southbound, 1.1km north of PTH 14	2,100 – 3,430
PR 200	2.4 km north of PR 201	260 – 340
PR 201	East of PTH 75	1,420 – 2,690
PR 217	East of PR 200	170 – 220
PR 218	North of PR 201	280 – 310
PR 243	West of PTH 75	40 – 160
PR 246	5.8km north of PR 217	80 – 150
PR 306	North of PR 201	970 – 1,340
PR 332	1.9km north of PTH 14	310 – 350
PR 421	East of PTH 30	910 – 1,080
PR 426	*No data available*	
PR 524	South of PR 243	130 – 150

Source: University of Manitoba and Manitoba Infrastructure, 2019

12.2.2.2 Rail transportation

There are three major rail lines that traverse the LAA/RAA.

One rail line is owned and operated by CN Rail and runs from Winnipeg to Emerson and the Canada/United States Border, paralleling PTH 75 (CN eBusiness, n.d.). The PDA traverses the CN rail line in SW17-2-2EPM.

The other two rail lines in the RAA are operated by Canadian Pacific Railway (CP Rail):

- The CP Rail Emerson subdivision line spans the RAA running north-south in the RM of Emerson-Franklin, travelling through the communities of Arnaud, Dominion City, and Emerson. This line is traversed by the PDA in the north portion of 17-2-3 EPM.
- The CP Rail La Riviere subdivision line runs north-south in the northern portion of the RM of Rhineland. At Rosenfeld, Manitoba, the line splits in two, one of which runs west to Plum Coulee, Manitoba and is not affected by the project. The other, referred to as the Gretna subdivision line, continues south to its termination point south of Altona. The Gretna subdivision line is traversed by the PDA in the north portion of 17-2-1WPM (CN eBusiness, n.d.).

12.2.2.3 Air transportation

The Altona Municipal Airport is the only Nav Canada certified and registered airport in the LAA/RAA. It is in NE and SE 4-2-1 WPM approximately 3.5 km south of the PDA. There is also one locally owned and operated crop aerial application operation with a private runway located in the RM of Montcalm.

12.2.3 Healthcare, emergency, and social services

The Southern Health – Sante Sud Regional Health Authority serves the RAA. The Southern Health – Sante Sud Regional Health Authority is responsible for the provision of ambulance services. The closest emergency medical service stations that provide ambulance service to the RAA are from the Town of Altona and Town of Morris. Within the RAA, the closest medical centre with emergency services is the Altona Community Memorial Health Centre in the Town of Altona, and the closest general hospital is the Morris General Hospital in the Town of Morris. Other medical facilities in the RAA include a medical clinic in Emerson, a mobile health clinic in Dominion City, and community health services in Saint-Jean Baptiste.

The RM of Emerson-Franklin is a member of the Eastman Mutual Aid District, and the RMs of Montcalm and Rhineland are members of the Pembina Triangle Mutual Aid District (Manitoba Office of the Fire Commissioner n.d.). This mutual aid service involves municipalities entering into agreements with other municipalities in the same district to:

- Receive assistance with a fire or event that is too large for one department to handle;

- Receive back-up protection from a neighbouring department if a department is responding to an event in one area and another event happens somewhere else in that municipality that they don't have the resources to respond to; and
- Share resources when requested.

The Emerson RCMP detachment is responsible for providing policing services for the RM of Emerson-Franklin and the RM of Montcalm. RCMP services in the RM of Rhineland are provided through the Morden and Carman RCMP detachments, while police services in Plum Coulee are provided by the Altona Police Department.

Throughout the RAA, there are several staff and volunteer fire departments located in the communities of Saint Jean Baptiste, Letellier, Altona, Gretna, Plum Coulee, Emerson, and Dominion City.

12.2.4 Waste management

The RMs within the RAA (Emerson-Franklin, Montcalm and Rhineland) are serviced by the Pembina Valley Water Cooperative Inc. who supplies potable water that meets Canadian drinking water standards to an area that generally lacks the distribution of good water resources (Pembina Valley Water Cooperatives Inc. 2024).

The Morris Regional Water Treatment Plant is in the Town of Morris and draws and treats water from the Red River to be distributed in the RM of Montcalm. This treatment plant also partially supplies treated water to the RM of Emerson-Franklin (Pembina Valley Water Cooperatives Inc. 2023).

In the community of Letellier, in the RM of Montcalm, the Red River Regional Water Treatment Plant RRRWTP takes water from the Red River and treats water for distribution to the RM of Rhineland and Town of Altona, as well as the remaining water services required for the RM of Emerson-Franklin. (Pembina Valley Water Cooperatives Inc. 2023).

Based on data available though Manitoba Land Initiative, there are approximately 13 other wastewater treatment facilities located within the RAA; approximately five in the RM of Emerson-Franklin, two in the RM of Montcalm (in addition to the Red River Regional Water Treatment Plant in Letellier), and six in the RM of Rhineland (Government of Manitoba 2022). Based on data limitations, there are assumed to be additional wastewater treatment facilities in the RAA that are not documented geospatially. None of the wastewater facilities or water treatments plants are in the PDA for the project.

Within the RAA, there are waste transfer stations in each of the three RMs. The Emerson-Franklin waste transfer station is located approximately 14 km east of

Dominion City. In the RM of Montcalm, the waste transfer station is located approximately one mile north of the town of Letellier. In the RM of Rhineland, the Altona/Rhineland Waste Disposal Site is located northeast of the town of Altona.

12.3 Project interactions with infrastructure and community services

Table 12-4 identifies, for each potential effect, the physical activities that might interact with the VC and result in the identified effect.

Table 12-4: Project interactions with infrastructure and community services				
Project activities/components	Reduced availability of accommodations	Increased traffic and strain on transportation infrastructures	Strain on health and emergency response services	Strain on solid waste management facilities
Construction of pipeline, gate station, and valve sites				
Mobilization and staff presence	✓	✓	✓	✓
Vehicle and equipment use	–	✓	✓	–
Access development	–	–		-
Marshalling yards (temporary work or storage areas)	–	–	–	–
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	–	–	–	-
Pipe stringing (including welding, coating)	–	–	–	✓
Pipe installation – trenching and lowering	–	–	–	–
Horizontal directional drilling	–	–	–	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	–	–	–	–
Backfilling and contouring	–	–	–	–
Gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	–	–	–	–
Clean-up and reclamation	–	–	–	✓
Operation and maintenance of pipeline, gate station, and valve sites				
Presence of pipeline, gate station, and valve sites	–	–	–	–
Vehicle and equipment use	–	✓	✓	–
Maintenance activities	✓	–	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	–	–	–	–
Valve operation checks (annually)	–	–	–	–
Vegetation management	–	–	–	-
Decommissioning of pipeline, gate station, and valve sites				
Mobilization and staff presence	✓	✓	✓	✓
Vehicle and equipment use	–	✓	✓	–
Pipeline disconnection (Isolate, purge, and cap off below grade)	–	–	–	–
Removal of above-ground components (dismantling, removal from site, disposal)	–	–	–	✓
Rehabilitation	–	–	–	–
Clean-up and demobilization	–	–	–	✓

✓= Potential interaction - = No interaction

12.4 Assessment of project effects

While effects to infrastructure and community services could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction and include the following:

- Reduced availability of accommodations
- Increased traffic and strain on transportation infrastructure
- Strain on health and emergency response services
- Strain on solid waste management facilities

12.4.1 Effects pathways

12.4.1.1 Reduced availability of accommodations

Analytical assessment techniques

Project-related changes to the availability of short-term accommodations are assessed by considering pre-project inventory levels for temporary accommodations in the LAA/RAA and their vacancy rates in relation to the number of project workers who may require accommodations.

Construction

The assessment of effects on accommodations considers change in the availability of accommodations in the LAA/RAA. The influx of project workers and contractors during construction may increase the demand for short-term accommodations through patronage and in so doing reduce the availability of temporary accommodations available for local and non-local individuals (e.g., tourists) in the LAA/RAA.

Given that tourism is not a major economic driver in the LAA/RAA (see Chapter 11 – Economic opportunities), it is not anticipated that there will be a high level of competition for temporary accommodations in the LAA/RAA.

As discussed in Section 12.2.1, there are approximately 12 temporary accommodations in the LAA/RAA. The estimated workforce at peak construction is 200 workers.

Operation

The availability of accommodations may also be reduced during the operation phase of the project during maintenance and inspection activities. This would occur if maintenance and inspection activities require more than one day, and workers must stay in the LAA/RAA overnight.

Decommissioning

The availability of accommodations may also be reduced during decommissioning as the result of the mobilization and presence of staff and contractors working on decommissioning activities. The workforce during the decommissioning phase is anticipated to be smaller than during the construction phase, so the potential demand for short-term accommodations during decommissioning is anticipated to be less than during construction.

12.4.1.2 Increased traffic and strain on transportation infrastructure

Analytical assessment techniques

Project-related increases to traffic and strain on transportation infrastructure are assessed by quantitative consideration of the current capacity of local and regional highways and roads, daily traffic volumes, and incidents in relation to increases in traffic that will result from project activities, and though the qualitative consideration of the conditions of existing roads and highways and the manners in which the project vehicles and equipment travelling in the area may change those conditions.

Construction

The assessment of potential project effects on traffic and transportation infrastructure focuses on the movement of workers, materials, and equipment to and from the project site along PTHs and PRs as discussed in Section 12.2.2.1. PR 201 is likely to be utilized the most by construction crews to access the right-of-way (*i.e.,* PDA) during construction, given that the PDA runs in-field adjacent to PR 201. Mile roads will also be used to access the right-of-way where the FPR is in-field to reduce impacts on agricultural fields.

Project construction is anticipated to directly increase road traffic due to the presence of up to 100 project-related vehicles (*e.g.,* cars, pickup trucks, and heavy trucks and equipment) per day (*i.e.,* up to one vehicle per two workers at the peak of construction), which will be needed to transport people (*i.e.,* project workers/contractors and service providers), materials, and equipment. Adverse impacts on road infrastructure could occur due to:

- An increase in vehicles on the road from project-related traffic

- A change in the type and weight of vehicles that will be on the road (e.g., heavy trucks with construction materials and equipment)
- An increase in utilization (*e.g.,* wear and tear) of roads.

<u>Operation</u>

Given the small workforce and infrequent activities during the operation phase of the project, maintenance and inspection activities are anticipated to have a negligible effect on traffic and transportation infrastructure, only bringing a small number of vehicles and equipment into the LAA/RAA for short, isolated periods of time.

<u>Decommissioning</u>

The effects of the project on traffic and strain on transportation infrastructure during the decommissioning phase are anticipated to be like, but less than, the construction phase given the smaller workforce anticipated during decommissioning.

12.4.1.3 Strain on health and emergency response services

<u>Analytical assessment techniques</u>

Project-related increases to strain on health and emergency services are assessed by considering the number of workers that project will bring to the area across the construction, operations, and decommissioning, and the current capacity of health care and emergency services in the LAA/RAA.

<u>Construction</u>

There is the potential for the presence of the temporary workforce to place additional demand (*i.e.,* strain) on available capacity of local health and emergency response services in the LAA/RAA. The project activities that involve an increase in non-local workers and/or increased use of vehicles and equipment in the area, may result in increased strain on health and emergency response services due to the inherent increase in risk for injuries, illnesses, and/or accidents (see Chapter 15 – Accidents and malfunctions).

It is anticipated that there will be up to 200 workers during the peak construction period. If some of the workforce is hired locally, those individuals would already be accessing local health and emergency response services and would therefore contribute less incremental strain than non-local workers visiting the area exclusively to work on the project.

Operation

Given the small workforce and infrequent activities during the operation phase of the project, maintenance and inspection activities are anticipated to have a negligible effect on health and emergency services.

Decommissioning

There is the potential for the workforce during the decommissioning phase to place additional demand on the capacity of local health and emergency response facilities in the LAA/RAA like the construction phase, but to a lesser extent given the smaller workforce.

12.4.1.4 Strain on solid waste management facilities

Analytical assessment techniques

The assessment of potential for strain on solid waste management facilities focuses on the potential for an increase in the quantity (weight) of waste materials generated by the project that will be disposed in local/regional disposal facilities and the capacity of local/regional waste disposal facilities.

Construction

During the construction phase, the project will cause an influx of workers and contractors, materials, and equipment to the LAA/RAA which will result in increased consumption of goods and materials, and associated waste generation that could strain the existing waste management facilities in the LAA/RAA. In addition to the mobilization and presence of staff, project activities that may generate waste during construction include horizontal directional drilling, pipe stringing, and clean-up and demobilization.

Drilling fluid waste will be produced during horizontal directional drilling. Construction of the pipeline will also involve the production of steel shavings and pieces of steel pipe as wastes during pipe stringing.

The generation of hazardous wastes due to the project is anticipated to be related to accidents and malfunctions such as hydrocarbon spills. Hazardous wastes are disposed of at appropriate licensed facilities.

Operation

During operations, solid wastes that may be produced from the presence of staff, maintenance activities, and vegetation management will ultimately disposed of at local waste disposal facilities.

Given the small workforce and infrequent activities during the operation phase of the project, maintenance and inspection activities are anticipated to contribute negligible strain on solid waste management facilities.

Decommissioning

The decommissioning phase is anticipated to have similar effects on solid waste management facilities to the construction phase of the project, through the influx of workers, materials and equipment. In particular, the removal of above-ground components (*e.g.,* control points) is likely to generate waste that may be disposed of in the LAA/RAA and increase the strain on existing waste management facilities.

12.4.2 Mitigation measures

12.4.2.1 Mitigation for reduced availability of short-term accommodations

The following mitigation measures will be implemented to reduce demands on temporary accommodations due to the project:

- Mobile construction camp(s) may be used to house workers where temporary accommodations within communities are not available.
- As part of project engagement, Manitoba Hydro will continue to engage with and share project information with local governments, service providers, and/or businesses.

12.4.2.2 Mitigation for increased traffic and strain on transportation infrastructure

The following mitigation measures will be implemented to reduce adverse road traffic effects of the project:

- Group transportation (e.g., buses, crew vans) will be utilized to transport workers between camp(s) and the worksites, and between temporary accommodations in nearby communities and the worksites.
- Manitoba Hydro will work with local authorities to address any damages to roads that occur because of the project.

- All materials transported by truck will be compliant with any weight restrictions or permits, spring road restrictions, or geometric constraints set out by Manitoba Transportation and Infrastructure or municipal governments.
- Vehicles transporting dangerous goods or hazardous products will display required placards and labeling in accordance with provincial legislation and Manitoba Hydro guidelines.

Manitoba Hydro will also obtain the following permits, as applicable, from Manitoba Transportation and Infrastructure, as per the *Traffic and Transportation Modernization Act*:

- Permit for construction above or below ground that falls within 250 feet of a PTH of 150 feet of a PR.
- Permit to construct, modify, or relocate an access or intensify its use.
- Permit to place any structures (including access driveways) on, under, or above the ground within 28.1 meters of the edge of the highway right-of-way.
- Permit to place any plantings within 15 meters of the edge of the highway right-of-way.
- Discharge water or other liquid materials into the ditch on any highway rights-of-way.

12.4.2.3 Mitigation for strain on health and emergency services

The following mitigation measures will be implemented to reduce adverse effects on health and emergency response services:

- As part of project engagement, Manitoba Hydro will continue to engage with and share project information with local governments, service providers, and/or businesses.
- An Emergency Response Plan will be developed. As part of the development and implementation, Manitoba Hydro will work with local emergency responders to maintain appropriate emergency response times. Project personnel will be made aware of the plan and designated staff will receive training. Among other elements, the plan will address handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response, and vehicle collisions.
- Project contractors will have first aid at project sites and camps (if required) to provide services to project workers/contractors.

12.4.2.4 Mitigation for strain on waste management services

The following mitigation measures will be implemented to reduce adverse effects on community infrastructure and services:

- Subject to suitable soil conditions and drainage, and compliance with The Public Health Act and/or The Environment Act, wastewater will be transported to an appropriate wastewater facility.
- Manitoba Hydro and its contractors will utilize Waste and Recycling Management Plans to manage waste and recycling in accordance with The Public Health Act and The Dangerous Goods Handling and Transportation Act. This plan will outline policies related to reducing the amount of solid waste generated; facilitating recycling wherever possible; and storing, transporting, and disposing of solid wastes at appropriate facilities.
- Drilling fluid waste will be managed in accordance with Manitoba Hydro's contractor environmental responsibilities (CER) related to directional drilling, which requires that all drilling fluids and waste materials, including drill cuttings, be collected and properly disposed of at an approved location, and under no circumstances drained into waterbodies, riparian areas, or wetlands.

12.4.3 Characterization of residual effects

12.4.3.1 Reduced availability of short-term accommodations

The potential for reduced availability of short-term accommodations is anticipated to be most pronounced during construction, as this phase will be associated with the highest number of project workers and contractors.

After the implementation of mitigation measures, the residual effects of the project on the availability of short-term accommodations are predicted to be:

- Direction: Adverse
- Magnitude: Negligible (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.4.3.2 Increased traffic and strain on transportation infrastructure

The potential for increased traffic is anticipated to be the most pronounced during construction because this is the phase with the highest number of workers and equipment traveling to and from the project site.

As stated in Section 12.4.1.2, there could be up to 100 project-related vehicles (or 200 daily trips to and from site) on the roads and highways during peak construction. However, crews will be working at several work sites so project traffic would be dispersed, rather than concentrated at any one site. Also, project work will be spread out temporally, lessening project-related traffic at any given time.

After the application of mitigation measures, the residual effects of the project on traffic and strain on transportation infrastructure are predicted to be:

- Direction: Adverse
- Magnitude: Negligible (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.4.3.3 Strain on health and emergency services

The potential for strain on health and emergency services is anticipated to be the most pronounced during construction because this is the phase that will bring the highest number of temporary workers into the RAA.

There could be up to 200 project workers working on the project during the time of peak construction. The addition of 200 more individuals into the RAA would represent an approximate temporary population increase of approximately 1.4% based on the 2021 reported populations of the RMs of Emerson-Franklin, Montcalm, and Rhineland, Dominion City, and the Town of Altona (Statistics Canada 2021). This is likely to be an overestimation because it is anticipated that some of the workforce will be local.

Based on the number of individuals in the area being estimated to increase by a maximum of 1.4%, it is anticipated that the health and emergency services in the area will be able to accommodate an increased demand that may result from the project. All three RMs traversed by the project are members of mutual aid districts, which involves agreements between the member municipalities to assist and back-up projection from neighbouring departments in the event that emergency services within the municipality experiencing an event do not have the capacity to respond to a situation or concurrent situations on their own (Manitoba Office of the Fire Commissioner n.d.).

After the application of mitigation measures, the residual effects of the project on traffic and strain on transportation infrastructure are predicted to be:

- Direction: Adverse
- Magnitude: Negligible (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.4.3.4 Strain on waste management facilities

The potential for strain on waste management facilities is anticipated to be most pronounced during construction as this phase will be associated with waste generation from the highest potential number of project workers as well as use of the greatest volume of materials in the LAA/RAA.

After the application of mitigation measures, the residual effects of the project on waste management facilities are predicted to be:

- Direction: Adverse
- Magnitude: Negligible (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

Table 12-5 characterizes the residual effects on infrastructure and community services.

Table 12-5: Project residual effects on infrastructure and community services

Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Residual Effects Characterization						
Reduced availability of accommodations						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				
Increased traffic and strain on transportation infrastructure						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				
Strain on health and emergency response services						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				
Strain on solid waste management facilities						
Construction	A		LAA/RAA	LT	IR	R
Operation						
Decommissioning						

12.4.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

12.4.4.1 Project residual effects likely to interact cumulatively

Table 12-6 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact infrastructure and services. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 12-6: Potential cumulative effects on infrastructure and community services

Other Projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects			
	Reduced availability of short-term accommodations	Increased traffic and strain on transportation infrastructure	Strain on health and emergency response services	Strain on solid waste management facilities
Existing/ongoing projects and activities				
Domestic resource use (e.g., hunting, trapping, fishing)	-	-	-	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	-	-	-	-
Commercial resource use (includes agriculture, gravel/quarry, fishery, forestry)	-	-	-	-
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	-	-	-	-
Manitoba Hydro gas and electricity transmission and distribution	-	-	-	-

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

The existing conditions described in Section 12.2.2 consider the traffic volumes (and therefore workforce) associated with the existing/ongoing activities and projects in Table 12-6. Given that existing and ongoing activities are captured in the baseline data for the existing conditions, these existing/ongoing activities and projects are not considered to have the potential to interact with the project to create new, cumulative effects on infrastructure and services. As there are no reasonably foreseeable potential future projects and activities, a further cumulative effects assessment was not undertaken for effects on infrastructure and community services.

12.4.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on infrastructure and community services are predicted to be not significant.

12.4.6 Prediction confidence

Prediction confidence is based on the information compiled during desktop-based data compilation, engagement feedback, and an understanding of project activities, location, and schedule. There is a moderate degree of confidence in the assessment predictions for infrastructure and community services, based on the data collected for this assessment and understanding of project pathways and effects from comparable past projects.

12.4.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro’s other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16).

12.4.8 Sensitivity to future climate change scenarios

Effects of climate change on infrastructure and community services are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

Higher temperatures, extreme weather events, and changes in precipitation patterns can lead to increased wear and tear on infrastructure. Roads, bridges, and buildings may suffer from increased deterioration and damage due to flooding, erosion, and freeze-thaw cycles. Climate change can also lead to more frequent and severe flooding events, which can damage roads, utilities, and other critical infrastructure.

Altered precipitation patterns can also potentially affect water treatment and supply systems.

Climate change can influence the frequency and intensity of extreme weather events such as heatwaves, storms, and wildfires. These events can strain healthcare facilities and emergency response services, potentially affecting the well-being of communities.

13.0Greenhouse gases and climate change

The Environment Act Proposal Report Guidelines Information Bulletin (Manitoba Environment, Climate and Parks 2022) requires the discussion of climate change implications including a greenhouse gas inventory calculated according to guidelines developed by Environment Canada (2021) and the United Nations (IPCC 2019).

Climate plays an important role in multiple aspects of the project. For example, design and operation of natural gas installations can be affected by ambient temperatures and frost heaving. Extreme climate events such as snow accumulation and prolonged heat exposure can impact pipe loading and the integrity of pressure vessel systems.

A portion of the PDA, as well as an exiting pipeline segment crossing beneath the Red River that the project will connect to, are within a flood plain known as the Red River Valley Designated Flood Area (Government of Manitoba, 2024). Therefore, hydrologic conditions are also relevant to the assessment of potential climate change implications related to the project.

Chapter 5 (Environmental setting) includes a description of historic climate conditions and each VC assessment chapter includes a discussion about sensitivity to climate change scenarios.

The following sections outline projections of how climate in the area may change in the future and a summary of the greenhouse gas assessment undertaken for the project.

13.1 Future climate

Global Climate Models (GCMs) driven by future greenhouse gas emission scenarios are used to project how Earth's climate may evolve in the future. Forty-two simulations from fourteen GCMs and three greenhouse gas emission scenarios (Shared Socioeconomic Pathways SSP2-4.5, SSP3-7.0, and SSP5-8.5) provided the basis for the assessment of future climate in the area (Riahi et al. 2017).

Descriptions of the models, pathways, methods, and mapped projections will be published in Manitoba Hydro's upcoming climate change report. The descriptions will be like those presented in Manitoba Hydro's most recent climate change report (2020) but utilize the latest GCM datasets (i.e., from the Coupled Model Intercomparison Project phase 6, or CMIP6) (Eyring et al. 2016).

For temperature and precipitation projections, Manitoba Hydro relies on an ensemble of simulations known as ESPO-G6-R2 (Lavoie et al., 2024) which have been bias-adjusted by the Ouranos Consortium. For other variables (evaporation, runoff and windspeed), projected changes derived from the raw CMIP6 GCM data are relied upon.

Agreement among GCM projections is assessed in accordance with the Sixth Assessment Report (AR6) published by the Intergovernmental Panel on Climate Change (IPCC; Gutiérrez et al., 2021), where high model agreement corresponds to cases where 80% or more of the ensemble agrees on the sign of projected change. This simple measure of agreement can provide some additional context to characterize the climate change signals.

The tables and text below characterize projections specific to a grid point near Altona, Manitoba for two future scenarios that align with Global Warming Levels (GWL) of +1.19°C and +2.19°C above the 1981-2020 period. Compared to pre-industrial conditions, which is a common baseline for IPCC related studies, these two scenarios correspond to GWLs of +2° and +3°C above the 1850-1900 (preindustrial) period. Although the specific period in which a GCM simulation realizes a given GWL varies from model to model, the ensemble median of GCMs projects the +1.19°C GWL scenario to be realized in the 2026-2065 period, and the +2.19°C GWL scenario to be realized in the 2048-2087 period.

Projected changes indicate how the overall long-term climate may differ from the reference period, so information presented in this section can be complementary to historic climate normals presented in Section 5.2.1.

Table 13-1 and Table 13-2 present the median projected changes to temperature, precipitation, runoff, windspeed, and soil moisture for GWLs of +1.19°C and +2.19°C above the 1981-2020 period respectively at a grid point near Altona, Manitoba.

Projected changes to precipitation and wind speed are expressed in terms of percentages (% change) as opposed to absolute change (e.g., mm/month or km/h). Cell colours reflect the level of ensemble agreement on the direction of the projected change. Dark green cells indicate high model agreement (≥80% of models) that the projected increase or decrease will occur. Non-coloured cells represent cases where there is less that 80% agreement on the sign of the predicted change.

Table 13-1: Median projected change of global climate change simulations for a Global Warming Level of +1.19°C above 1981-2020 at the grid point nearest Altona, MB.

Season	T min (°C)	T mean (°C)	T max (°C)	Precipitation (%)	Evaporation (mm/month)	Runoff (mm/month)	Wind Speed (%)	Soil moisture (%)
Annual	2.43	2.31	2.17	4.63	1.56	-0.35	-2.64	-0.1
Winter	3.25	2.72	2.15	9.12	1.07	1.02	-1.86	-0.03
Spring	2.08	2.04	1.98	9.14	4.74	-1.62	-2.16	-0.08
Summer	2.10	2.28	2.51	-2.38	-1.58	-0.56	-2.56	-0.2
Fall	2.06	2.10	2.18	4.11	1.06	-0.25	-2.76	-0.13

Table 13-2: Median projected change of global climate change simulations for a Global Warming Level of +2.19°C above 1981-2020 at the grid point nearest Altona, MB.

Season	T min (°C)	T mean (°C)	T max (°C)	Precipitation (%)	Evaporation (mm / month)	Runoff (mm / month)	Wind speed (%)	Soil moisture (%)
Annual	4.52	4.29	4.10	5.16	2.19	-0.36	-3.45	0.70
Winter	6.05	5.22	4.30	15.83	2.51	1.41	-2.69	0.71
Spring	3.65	3.64	3.67	16.62	7.59	-2.48	-2.49	1.26
Summer	4.15	4.29	4.49	-7.14	-3.77	-0.43	-4.49	0.95
Fall	3.67	3.83	4.06	7.31	0.6	-0.2	-5.24	0.04

Note only 27 of the 42 simulations reach this level of warming.

The ESPO-G6-R2 ensemble median projects annual average temperatures to increase by 2.31°C for the 1.19°C GWL scenario and 4.29°C for the 2.19° GWL scenario. Both future scenarios show high agreement that temperature will increase in all seasons. For minimum temperature (T_{min}) and mean temperature (T_{mean}), projections show the largest increases to occur in winter. For maximum temperature (T_{max}), projections show the largest increases to occur in summer.

There is high agreement that winter and spring precipitation will increase for both future scenarios. There is also high agreement that annual precipitation will increase for the +2.19°C GWL scenario. For both future scenarios, the ensemble median points towards potential decreases in summer precipitation, accompanied with low agreement.

As expected, increasing temperature generally results in increasing evaporation, except for the summer where evaporation is projected to decrease, possibly a result of reduced water availability. Which, depending on changes in precipitation, may result in overall wetter or drier conditions. The interaction of precipitation and evaporation, along with other water balance components, can manifest as changes in local (grid-point) runoff.

Although projections tend towards increased winter runoff and decreases in other seasons, these projections are accompanied with low agreement. This result is attributable, in-part to increased winter temperatures contributing to earlier snowmelt, which may leave less snow to melt in the spring.

GCMs generally show high agreement that future mean wind speeds will decrease and low agreement with respect to changes in soil moisture.

Daily data from the ESPO-G6-R2 ensemble was also used to drive a WATFLOOD hydrological model to simulate climate change impacts on streamflow for the +1.19°C GWL scenario.

Modelling details, including descriptions of the methods used to generate future streamflow scenarios, will be described in Manitoba Hydro's upcoming Climate Change Report (in preparation), which will be publicly available. For the Red River at Emerson site (05OC001), which represents a drainage basin of 102,000km^2, the ensemble median projects increased average flows in all seasons with strong agreement in winter, summer, and annual scales. For the Roseau River near Dominion City site (05OD001), which represent a more local drainage basin of 5,020 km^2, the ensemble median projects increased average flows in all seasons, but with low agreement and smaller relative (i.e., percent) changes.

In general, with increasing temperatures, it may be reasonable to anticipate increased flows in the late winter and early spring months due to more frequent mid-winter melt events and an earlier spring freshet. Some of the other hydrologic features seen in the projections are a result of more complex environmental interactions occurring across large spatial scales.

It is important to recognize that due to the data and methods used to compute the predicted changes presented in this section, results may require special interpretation. For example, calculations are based on multiple GCMs with varying spatial resolutions, and biases.

Furthermore, the ensemble median projections are derived independently for each variable and each season.

In general, there tends to be greater confidence in GCM abilities to simulate temperature and precipitation in comparison to other variables such as evaporation, runoff, wind speed, and soil moisture. As such, projected changes should be interpreted accordingly.

13.2 Greenhouse gases

A greenhouse gas (GHG) assessment was undertaken for the project. The GHG assessment divided project GHG effects into two main categories: 1) project infrastructure and 2) market responses.

Project infrastructure being the primary focus of this EA, the GHG assessment focused on the first category – project infrastructure. A GHG life cycle assessment (LCA) was undertaken as it is an appropriate tool to capture both primary and secondary GHG effects related to project infrastructure. It is also the standard assessment type Manitoba Hydro has undertaken for other major infrastructure projects.

Considering both construction-related and post-construction-related GHG emissions, the total considered LCA emissions for the project are estimated to be 368 tonnes of CO_2e per km of pipeline (or 13,998 tonnes of CO_2e for the entire pipeline) over the 50-year assumed lifespan of the project. When the full profile of LCA emissions is considered, Post Construction: Pipeline Operations (Table 13-3) is the single largest emissions category over the 50-year assumed lifespan, accounting for almost half of the total considered LCA emissions.

For context, 2023 operating emissions along Manitoba Hydro’s existing Natural Gas Distribution System were 40,800 tonnes CO_2e, approximately 3 times the 50-year LCA emissions of the project.

Table 13-3: LCA Emissions Summary Table			
Activity	**t CO_2e/km**	**t CO_2e**	**% of total**
Construction: Material Supply Chain	111	4,204	30%
Construction: On-Site Energy	77	2,922	21%
Construction: Worker Transportation	11	422	3%
Construction: Project Commissioning	0	1	0%
Post Construction: Pipeline Operations	167	6,331	45%
Post Construction: Pipeline Decommissioning	3	119	1%
Total	**368**	**13,998**	

The secondary category of market responses, or potential upstream and downstream effects related to the product (e.g., natural gas) being distributed through the project's infrastructure (e.g., the pipeline), were considered separately from the assessment of project infrastructure. For context, South Loop load growth is estimated to represent approximately 0.3% of total current natural gas throughout Manitoba Hydro's Natural Gas Distribution System. Due to a lack of data certainty, the GHG assessment of potential market response effects was more qualitative in nature.

In considering the various baseline candidate alternatives (to evaluate incremental market responses), Manitoba Hydro did not identify a baseline scenario that differed from the Project: The South Loop needs to be upgraded to meet existing design load requirements (at minimum TC Energy contract pressure), several new customers already have approval to connect to the South Loop, the project has a strong business case, and there is currently no provincial policy in place to restrict reasonable (i.e., business case justified) expansion of Manitoba's natural gas distribution system's capacity.

By providing additional natural gas capacity along the South Loop the project will likely increase natural gas emissions (both direct and indirect), decrease diesel and propane emissions, and decrease regional electricity generation emissions – likely resulting in a net decrease in global emissions; however, the GHG assessment did not conclude that any of these GHG effects are additional and did not make an assertion that the project will result in a reduction in global GHG emissions by facilitating fuel switching to natural gas.

Further details about the greenhouse gas assessment undertaken for the project can be found in Appendix E.

14.0Effects of the environment on the project

Effects of the environment on the project refer to effects that may result from forces of nature physically interacting with a project or hampering the ability to conduct projects activities in their normal, planned manner.

These effects may result from physical conditions, landforms, and general site characteristics that may act on the project such that project components, schedule, and/or costs could be substantively and adversely changed.

Typically, potential effects of the environment on any project are a function of project or infrastructure design and the risks of natural hazards and influences of nature.

While environmental forces (e.g., severe weather, climate change) have the potential to adversely affect a project, good engineering design accounts for environmental forces relevant to a project and the associated loadings or stresses they may pose on the project. The methods used for mitigating potential effects of the environment on the project are inherent in the planning, engineering design, construction, and operation plans of a well-designed project intended to be in service for several decades or longer.

This chapter assesses the potential effects of the environment on the project, including the pathways (*i.e.,* environmental forces) to those effects, mitigation, and characterization of residual effects.

14.1 Effects analysis

While effects of the environment on the project could occur during construction, operation, and decommissioning, they are anticipated to have the greatest likelihood of occurring during operations. Potential effects of the environment on the project include:

- Increased risk of damage to infrastructure
- Delays in construction and/or operation and maintenance activities
- Reduced visibility impacting public and worker safety

14.1.1 Effects pathways

Over the course of the project's lifecycle, it may be subject to severe weather events. While Manitoba Hydro designs its infrastructure to withstand extreme weather, it is not possible to design for all eventualities. Flooding, fires, and other extreme weather may result in effects to the project and/or its activities.

14.1.1.1 Flooding

Potential effects of severe flooding in the project area include hindering access to project components, loss of pipeline integrity and depletion of soil cover above the pipeline, which may also compromise the integrity of the pipeline and above-ground structures (Kelly WM Scott & Associates 2011; Stantec 2014, Abegaz et. al. 2024)).

The western half of the Rural Municipality (RM) of Emerson-Franklin is part of a designated flood area and has experienced many floods. This designated flood area runs the entire length of the Red River and encompasses the area around Dominion City and the Town of Emerson (WSP 2017).

As discussed in Section V of the RM of Emerson-Franklin Development Plan, the municipality has experienced many floods of varying degrees within the Red River Valley. These floods have resulted in severe damage in several years including 1948, 1950, 1966, 1979, 1996, 1997 (Flood of the Century), 2009 and 2011. Subsequently, to protect areas from flood damage ring dykes were built around Emerson and Dominion City that would provide protection from future floods up to the flood of the century in 1997.

Inherent soil drainage in the area is almost completely characterized as imperfect with level to very gentle slopes and fine textured soils. This combination results in localized (i.e., in-field) surface ponding and flooding. Surface drainage improvement in agricultural land is a prominent practice to convey water from low-lying areas of fields to municipal drainage ditches at field edges. Surface drains in the area are generally shallow (< 30 cm). Even though artificial drains have been constructed to alleviate overland flooding from spring run-off and heavy rains, there is still the potential for localized surface ponding and overland flooding. A portion of the project traverses the Red River floodplain and is subject to larger, regional flooding which occurs infrequently during the spring run-off period. For example, the 2011 flood event affected approximately 7 km of land along the proposed route from approximately 1 km west of Highway 75 to 2 km east of the Red River. The recorded level of the Red River during the 2011 flood was the third highest in 150 years (Province of Manitoba, 2024)

During construction, flooding may result in schedule delays if the PDA cannot be accessed or if flooding is present within the PDA that would make project activities impractical or unable to be conducted in a safe and environmentally responsible manner. Scheduled maintenance activities may also experience delays for similar reasons if flooding occurs during operations.

Abegaz et. al. (2024) discusses pipeline damage from flooding through additional pressure on pipelines, corrosion of pipelines from floodwaters and soil erosion. During operations, the weight and density of soil can change because of flooding causing bending and shifting of the pipeline, which gradually thins the pipeline's metal over time potentially causing ruptures (Abegaz et. al. 2024). In addition, flooding can increase water tables resulting in a net upward force of the pipeline which can result in rupture or separation of the pipe.

Corrosion has been found to be a main contributing factor is pipeline failure (Abegaz et. al.). Increased exposure to floodwaters has the potential to accelerate corrosion on the outside of the pipeline resulting in a weaking of the pipeline material and comprising the structural integrity of the pipeline. In additional, above ground components such as valves, which are used to control the flow of has in the system, are also at risk from corrosion during floods (Laciak et. al. 2019). Valves are already susceptible to corrosion from the atmosphere. Flooding creates additional risk of potential corrosion.

During operations, flooding may also affect pipelines through causing soil erosion/displacement. Depending on the amount and speed of floodwaters, floods have the potential to erode soil and damage buried pipelines. Exposure of the pipeline increases a pipeline's vulnerability to debris that may be present in floodwater (Abegaz et. al. 2024; Kelly Wm Scott & Associates 2011).

Potential reductions in the depth of soil cover present above the pipeline would trigger a need to undertake maintenance activities to restore a soil cover depth that meets standards as set out by the Canadian Standards Association and Manitoba Hydro's Depth of Cover Standard 510.02 (Manitoba Hydro 2024).

14.1.1.2 Fires

There is the potential for grass fires to occur in the ditches along roads traversed by the PDA during dry conditions. Causes of grass fires include natural causes such as lightning, and human activities including machinery sparks, smoking, and controlled agricultural burns.

Crop residue burning by agricultural producers within the RAA is a common practice. This practice is employed to reduce excess residue and moisture and to better facilitate seedbed preparation and seeding in the clay to heavy clay soils in the region. Crop residue burning is regulated in Manitoba under the Burning of Crop Residue and Non-Crop Herbage Regulation (M.R. 77/93), brought into force in 1993 primarily to protect human health and safety related to smoke and smoke events. Under the regulation, crop residue is generally permitted during the daytime period (*i.e.*, begins not earlier than sunrise and ends not later than sunset of the same day) between November 16 and July 31. Between August 1 and November 15, burning is prohibited unless authorized by the Province if weather conditions are deemed suitable. If authorized, burning is generally permitted between 11:00 am and two hours after sunset of the same day but may be limited to other hours as specified. Regardless of season, crop residue burning must be conducted following conditions outlined in the regulation, including following safety precautions to prevent the spread of fire. Burning is to be supervised and precautions that are reasonably necessary to protect persons and the property of others from the fire are taken. This is to include ensuring that the area in which the burning takes place is surrounded by a fireguard consisting of a strip of land that is tilled or substantially free of readily combustible matter and/or by natural or man-made barriers. Potential effects of fires during construction include a delay in construction activities in localized areas near to the fire for safety purposes.

During operations, fires would not pose a direct threat to the pipeline as it will be buried underground, but there is the potential to affect above-ground components including the gate station, control points, and valves.

14.1.1.3 Extreme weather

In addition to floods and fires, weather events that have adversely affected the Manitoba Hydro system in the past also include severe storms and tornados. There is potential for these to occur in the RAA for the project.

Snow and ice storms are not likely to affect construction because most construction activities are anticipated to take place during warmer months when the ground is unfrozen. Thunderstorms are more likely to overlap with planned project activities. Reduced visibility during storms may result in heightened public and worker safety risk during construction or periodic maintenance activities where equipment and materials may be travelling along roads to or from the PDA, or present along roadsides traversed by the PDA.

Although lightning and tornadoes do not pose a direct threat to the pipeline, they both may result in short-term delays to construction and maintenance activities to protect project workers from unsafe working conditions. There is also a risk that above-ground components could be damaged by lightening or a tornado.

Over the next 100 years, Manitoba will likely experience warmer temperatures, a greater frequency of storm events, increasing storm intensity and an increase in annual precipitation. Potential effects of climate change on the operation and maintenance of the project would relate to increases in the frequency of severe weather events, changes in temperature, and changes in precipitation. It is expected that increases in extreme weather events would affect operation and maintenance of the project by increasing the frequency of unexpected maintenance requirements due to storm damage. Chapter 13.0 includes a discussion about future climate predictions.

14.1.1.4 Frost heaving

Soils in Manitoba can experience frost heaving, but the extent to which it affects pipelines depends on specific conditions such as soil type and moisture. Within the project area, the winter temperatures are sufficient to cause seasonal freezing in the upper layers of the soil. Frost heaving in oil and gas pipelines is a result of water in the soil freezing and ice growth which results in soil expansion and the uneven uplift of the ground (Wang et al. 2024).

The project area is not located within a permafrost zone, which significantly reduces the potential for frost heaving in buried pipelines. The project area experiences a temperate climate with cold winters and hot summers, where the ground rarely remains frozen throughout the year.

To mitigate potential concerns regarding frost heaving design and construction of the project will meet or exceed standards as set out by the Canadian Standards Association (CSA Z662:23) along with Manitoba Hydro Depth of Cover Standard 510.02. The design has incorporated measures such as burying the pipeline at an appropriate depth. As a result, the integrity of the pipeline will be maintained, and frost heaving will not affect its operations.

14.1.2 Mitigation of effects of the environment on the project

Possible effects of the environment on the project are mitigated predominantly through consideration of environmental forces that may act upon the project during design and planning. The project is being designed and will be constructed and operated with regard for health, safety, and environmental protection to minimize potential environmental effects that could occur during construction, operations, and decommissioning, and/or result from forces of nature and affect the project physically or hamper the ability for project activities to proceed normally as planned.

Mitigations built into design and planning of the project include:

- Designing the project to meet applicable CSA standards
- Scheduling project activities to avoid periods with the highest risk of severe weather where possible.

- Ensuring the pipeline is buried to a sufficient depth to minimize effects from flooding
- Adherence to Manitoba Hydro's environmental protection plan (Chapter 16), including erosion and sediment control planning
- Preparing and maintaining an emergency response plan that includes extreme weather events and grass fires
- Regular inspections/patrols during operations, including depth of cover surveys, cathodic protection monitoring, leak surveys and valve operation checks to ensure integrity of the pipeline

14.2 Assessment conclusions

Despite the mitigation measures identified, it is possible that the environment may still cause residual effects to the project. Following the application of mitigation measures, residual effects may include:

- Delays in construction activities and/or scheduled maintenance activities resulting from flooding, fire, or other weather events compromising the safety or environmental suitability of working conditions or hindering access
- Loss of soil cover over the pipeline resulting from flooding or extreme rain events during operations
- Risk to above-ground components of the project during floods, fires, or other extreme weather that may physically interact with above-ground structures

The most likely effect of the environment on the project is a short-term disruption in construction and maintenance activities and the economic costs of repair.

The residual effects of the environment on the project are anticipated to be low in magnitude, confined to the PDA (*i.e.,* project footprint), and occurring at irregular intervals throughout the project lifecycle (*i.e.,* until decommissioning is complete).

Although the effects of an individual event could have significant effects on a localized extent, in particular if above-ground components were to be impacted, the potential for these events to occur is anticipated to be low following mitigation measures. Overall, the residual effects are anticipated to be not significant.

The level of confidence in this assessment is moderate to account for uncertainties about environmental changes that may result from climate change over time.

15.0Accidents and malfunctions

In the context of environmental assessment, an accident is an unexpected and unintended interaction of a project component or activity with environmental, health-related, social, or economic conditions, and a malfunction is a failure of a piece of equipment, a device, or a system to operate as intended (Impact Assessment Agency 2024).

Accidents and malfunctions can occur because of abnormal operating conditions, wear and tear, human error, equipment failure, or other possible causes.

Many accidents or malfunctions are preventable and can be readily addressed or prevented by good planning, design, equipment selection, hazards' analysis and corrective action, emergency response planning, and mitigation.

Pipelines are designed with safety measures to minimize the likelihood of accidents, and operators are required to follow strict regulations to ensure the integrity of the pipeline system. Regular inspections, maintenance, and emergency response plans are crucial components of pipeline safety in mitigating the potential impacts of accidents or malfunctions. Emergency responders and pipeline operators work together to address and resolve incidents promptly to protect public safety and the environment.

In this chapter, potential accidents and malfunctions associated with the project that could result in appreciable adverse environmental effects are described, discussed, and assessed. The focus is on credible accidents that have a reasonable probability of occurrence, and where the resulting residual environmental effects could be major without careful management.

It is noted that accidents and malfunctions are evaluated individually, in isolation of each other, as the probability of a series of accidental events occurring in combination with each other is deemed unlikely. These possible events, on their own, generally have an exceptionally low probability of occurrence and thus their environmental effects are of low likelihood. They have an even lower likelihood of occurring together – thus their combination is not considered credible, nor of a measurable likelihood of occurrence.

Accident and malfunction event scenarios have been conservatively selected to represent higher consequence events that would also address the consequences of less likely or lower consequence scenarios.

The following accidents, malfunctions, and unplanned events are assessed in this chapter and were selected based on experience and professional judgment:

- Worker accident
- Hazardous materials spill
- Fire
- Vehicle accident
- Encounter of a heritage site or object
- Pipeline leak or rupture
- Third-party interference

Table 15-1 presents the potential interactions between the assessed valued components and potential accidents or malfunctions. Following the table, project and cumulative effects of the accident or malfunction event on each valued component with a potential interaction are described, and the significance of the effect is determined using the same thresholds as those used to characterize residual project effects on the environment. Any event that results in human mortality is considered significant.

Table 15-1: Potential interactions between accidents and malfunctions and areas of assessment

Potential accidents and malfunctions	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Human health and well-being	Infrastructure and community services	Economic opportunities
Worker accident					✓	✓	
Hazardous material spill	✓	✓	✓	✓	✓		
Fire	✓	✓	✓	✓	✓	✓	
Vehicle accident			✓		✓	✓	
Encounter of a heritage site or object	✓				✓		
Pipeline leak or rupture	✓			✓	✓	✓	
Third-party interference					✓		

✓ = Potential interactions that might cause an effect.
- = Interactions not expected.

15.1 Effects assessment for accidents and malfunctions

This section describes the ways each potential accident or malfunction may interact with the valued components assessed in this report. Mitigation in place that manages the risk of each potential accident or malfunction and a statement characterizing the potential residual effects, following mitigation, are also included.

15.1.1 Worker accident

A worker accident has the potential to interact with human health and well-being and infrastructure and community services as it could result in harm, injury, or death to workers and could prompt the need for emergency response and medical services.

Adherence to public safety codes and regulations will help the project to be conducted in a safe manner, protecting workers and the public. Safety risks to workers will be reduced by complying with the requirements of various governing standards including the federal Canada Labor Code, the *Transportation of Dangerous Goods Act (Canada)*, the *Workplace Health and Safety Act* (Manitoba) and all associated regulations.

All workers will be professionally trained in practices to prevent workplace accidents including Workplace Hazardous Materials Information System (WHMIS), first aid, and other applicable training programs. These procedures are designed to prevent serious injury to staff and the public as well as to minimize the occurrence of unplanned events and minimize potential damage to the environment.

With the application of, and compliance with, the above-mentioned acts, regulations, and standards, including the application of safety and security measures that are known to effectively mitigate potential environmental effects, the potential effects of a worker accident during all project phases are considered not significant.

15.1.2 Hazardous material spills

Hazardous materials could be released into the air, soils, surface water or groundwater because of an accidental spill during construction, operation, or decommissioning activities.

In general, hazardous materials spills have the potential to:

- Contaminate surface and groundwater (human health and well-being, wildlife and wildlife habitat)
- Contaminate soil (important sites, commercial agriculture, vegetation, wildlife and wildlife habitat, human health well-being)

- Increase harmful emissions (GHG effects, climate change)

Spills are usually localized and cleaned up by on-site crews using standard equipment based on regulatory requirements, guidelines, and industry best practices.

Implementation of a detailed spill response plan and a well-designed construction environmental protection plan (Chapter 16) will result in minimal potential effects through accidental releases.

The contractor will be required to provide environmental training, as well as training in spill prevention and response, to construction personnel.

Prior to the commencement of construction activities, Manitoba Hydro will ensure that spill response equipment is readily available.

Spills will be contained, cleaned, and reported to applicable authorities as follows:

- Contaminated material or potentially hazardous material will be contained.
- Proper safety precautions (e.g., protective clothing and footwear) will be implemented.
- The contractor will follow their spill response plan and ensure that the province's spill-reporting line is notified for reportable spills.
- Contaminated wastes, such as used cleaning cloths, absorbents, and pads, will be stored in proper waste containers.
- Waste material will be disposed of at approved disposal facilities.

Construction equipment will be cleaned and maintained in good working condition, with visual inspections of equipment performed on a regular basis. Petroleum products such as gasoline, diesel fuel, and oil will be properly labeled in accordance with the appropriate legislation and regulations.

Refueling, oiling, and maintenance of equipment, as well as storage of hazardous materials, will be conducted in a designated and contained area(s). Servicing of equipment (e.g., oil changes and hydraulic repairs) will be completed in designated areas. Vehicles will be equipped with spill containment and cleanup materials.

Personnel handling fuels and hazardous wastes will have WHMIS training and be qualified to manage these materials in accordance with the manufacturer's instructions and applicable regulations.

Hazardous waste and storage area(s) will be clearly marked and secured. Industrial waste will be reused or recycled on a priority basis. Where reuse or recycling opportunities are not available, industrial waste will be collected and disposed of at an approved facility.

Garbage receptacles for solid non-hazardous wastes will be available. These wastes will be collected on a regular basis or as they are generated and will be disposed of at approved locations.

With these mitigation measures and emergency response procedures implemented, the potential residual environmental effects of a hazardous material spill during all project phases are considered not significant.

15.1.3 Fire

A fire may arise from the use of heavy equipment during construction or maintenance activities, or from natural causes such as a lightning strike.

Potential effects caused by a fire include:

- Carbon dioxide emissions (contribute to greenhouse gas (GHG) emissions and climate change)
- Safety risks to workers and the public (human health and well-being)
- Need for emergency response and medical services (infrastructure and community services)
- Loss or damage to property or resources (human health and well-being, commercial agriculture)
- Direct vegetation and habitat loss (vegetation, wildlife and wildlife habitat, and commercial agriculture)
- Soil and shallow groundwater contamination with sediment-laden water used in extinguishing the fire (human health and well-being, wildlife and wildlife habitat)
- Damage to infrastructure or heritage sites or objects (infrastructure and community services, important sites)

Manitoba Hydro will ensure that personnel are trained in the use of fire-extinguishing equipment. In the unlikely event of a fire, local emergency response will be able to reduce the severity and extent of damage.

A large fire could create particulate matter levels greater than the ambient air quality standard over distances of several kilometers or damage vegetation or infrastructure in the area, but such situations would be of short duration, infrequent, and are not anticipated because of planned mitigation and prevention measures. The potential residual environmental effects of a fire are therefore considered not significant.

15.1.4 Vehicle accident

A vehicle accident arising from project-related activities could cause injury or death to workers or the public (human health and well-being) and wildlife (wildlife and wildlife habitat) and could prompt the need for emergency response and medical services, or disrupt access to communities in the area in the event of a prolonged highway closure resulting from a vehicle accident (infrastructure and community services). The potential for a fire or hazardous material spill, which could be associated with a vehicle accident have been assessed above.

The potential for a vehicle accident would exist during construction, operation, and decommissioning phases of the project. Worker traffic and truck traffic to and from the site, and the operation of heavy equipment have the potential to result in an increased risk of vehicle accidents.

Project-related vehicles will observe all traffic rules and provincial and federal highway regulations. Trucking activity will observe speed limits and weight restrictions.

Because the project will comply with applicable traffic rules and regulations, and given that the project will result in a small increase in traffic volumes, the potential residual environmental effects of a vehicle accident are considered not significant.

15.1.5 Encounter of a heritage site or object

Cultural or heritage sites or objects may be encountered during activities involving ground disturbance such as construction-related excavation. It is less likely that heritage sites or objects will be encountered during operation.

The encounter of a heritage site or object has the potential to affect historical and cultural items of importance to First Nations, the Red River Métis, and the public, as well as the information that those items hold.

The heritage potential of the PDA is analyzed during the environmental assessment. If areas of high potential are found, a preconstruction archaeological survey may be conducted. Five areas have been identified for pre-construction archaeological field surveys by a qualified archaeologist.

Mitigation for the protection of heritage sites or objects is outlined in the Culture and Heritage Resource Protection Plan (CHRPP) (Appendix F).

The CHRPP will provide clear instructions on how to proceed should Manitoba Hydro, its contractors, and/or consultants, discover or disturb a cultural or heritage sites or objects and will determine the ongoing protection measures for the resources through processes outlined in this document.

If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only if approval is received from the archaeologist or the Historic Resources Branch.

Given the planned mitigation and precautions related to heritage resources, the potential residual effects are considered not significant.

15.1.6 Pipeline leak or rupture

A gas leak is a failure of pipeline in the form of pinholes or punctures while a rupture is a longitude or circumferential crack (Wang, 2014). Both pinholes/punctures and cracks in pipelines result in gas leaks.

Pipeline gas leaks and ruptures may occur because of accidental damage caused during construction or excavation activities or as a result of corrosion of the line over time (Alberta Energy Regulator, 2024; U.S. Department of Transportation, 2018, Transportation Safety Board of Canada). Mechanical failures, manufacturing defects, inadequate maintenance and natural disasters such as flooding are other sources of pipeline failures such as leaks and ruptures (U.S. Department of Transportation, 2018; Tip of the Mitt Watershed Council, n.d.).

In addition to the pipeline, valves which are crucial for controlling the flow of gas can also fail or malfunction resulting in an uncontrolled release of gas.

Potential effects caused by gas leaks and ruptures include:

- Soil and groundwater contamination from release of natural gas, condensate or other hazardous substances (e.g. corrosion inhibitors and anti-freeze agents)
- Methane emissions (contribute to GHG emissions and climate change)
- Safety risks to workers and the public from fires and explosions (Environment Defense Fund, 2023) (human health and well-being)
- Need for emergency response and medical services in event of fire or explosion (infrastructure and community services)
- Loss or damage to property or resources from fire or explosion (human health and well-being, commercial agriculture)
- Direct vegetation and habitat loss (vegetation, wildlife and wildlife habitat, and commercial agriculture) from potential fire and explosions
- Damage to infrastructure or heritage sites or objects (infrastructure and community services, important sites) from fire or explosion

Manitoba Hydro will regularly carry out maintenance and inspection activities to assess and identify areas of potential concern. Manitoba Hydro employees carrying out maintenance and inspection activities will be trained on procedures to follow in the event a gas leak or rupture is identified. In the unlikely event of a fire, local emergency response will be able to reduce the severity and extent of damage.

A gas leak or rupture could result in a fire or explosion that could damage vegetation or infrastructure in the area, but such situations would be of short duration, infrequent, and are not anticipated because of planned mitigation and prevention measures. The potential residual environmental effects of gas leaks and ruptures are therefore considered not significant.

15.1.7 Third-party interference

Third party interference refers to damage that is caused by individuals or organizations that are not part of the company that owns a pipeline (Guo 2018). Activities by third parties that can affect the integrity of a pipeline include excavation or digging during construction work or farming activities in the vicinity of a buried pipeline without prior knowledge of the pipelines' existence (Guo 2018). Vandalism and sabotage are another example of third-party interference where individuals or organizations conduct deliberate acts of vandalism or sabotage that result in damage to pipeline infrastructure. Typically, these types of attacks are in response to individuals opposed to the use of fossil fuels and overall existence of pipelines (Enbridge 2016). A third type of third-party interference involves cybersecurity threats that include hacking and cyberattacks.

Potential effects from third party-interference include:

- Risks to public safety and the environmental from pipeline failures from both inadvertent and intentional third-party interference
- Financial losses from shutdowns

Pipeline monitoring occurs on a regular basis, helping to protect against deliberate third-party interference. Since the pipeline is in an area with a lower population density, the risk of deliberate third-party interference likely will be reduced (Wang 2014). To mitigate accidental third-party interference (from excavation and agricultural activities), landowners will be aware of the location of the pipeline on their land and the pipeline will be inspected on a regular basis (i.e., depth of cover surveys). Proper signage will be located at all road crossings.

It is anticipated that situations arising from third party interference would be of short duration and localized. With the implementation of planned mitigation and prevention measures, third-party interference events are considered to have low likelihood. The potential residual environmental effects of third-party interference are therefore considered not significant.

15.2 Assessment conclusion for accidents and malfunctions

The project is being designed and will be constructed and operated with regard for health, safety, and environmental protection, to minimize potential environmental effects that could result during the normal course of construction, operation, and maintenance as well as those that could result from accidents and malfunctions.

The careful planning of the project and the implementation of proven and effective mitigation will minimize the potential for accidents and malfunctions. The effects of an individual accident or unplanned event could have notable effects at a localized scale. However, the potential for these events to occur, given the measures that will be undertaken to prevent their occurrence, is low. If an accident or malfunction were to occur, it would be of a short duration, low frequency, or limited geographic extent such that major residual adverse environmental effects will not likely occur.

Overall, given the nature of the project, the accidents and malfunctions considered, and proposed mitigation, the potential residual environmental effects of project-related accidents and malfunctions on the valued components considered in this report, are assessed as not significant.

16.0Environmental protection program

16.1 Introduction

Manitoba Hydro will implement the mitigation measures, monitoring and other follow-up actions identified during the assessment through an Environmental Protection Program (EPP). The EPP provides the framework for implementing, managing, monitoring, and evaluating environmental protection measures consistent with regulatory requirements, corporate commitments, beneficial practices, and public expectations. Environmental protection and management plans will be prepared and implemented under the EPP to address environmental protection requirements in a responsible manner.

The purpose of this chapter is to outline how Manitoba Hydro will implement, manage, and report on environmental protection measures, monitoring and other follow-up actions as well as regulatory requirements and other commitments identified in this environmental assessment report.

Manitoba Hydro developed the EPP in accordance with its environmental policy.

Manitoba Hydro's Corporate Environmental Management Policy states the corporation is committed to protecting the environment by:

- Ensuring that work performed by its employees and contractors meets environmental, regulatory, contractual, and voluntary commitments
- Recognizing the needs and views of its interested parties and ensuring that relevant information is communicated
- Continuously assessing environmental risks to help manage them effectively
- Reviewing its environmental objectives regularly, seeking opportunities to improve its environmental performance
- Considering the life cycle impacts of its products and services
- Ensuring that its employees and contractors receive relevant environmental training, and
- Fostering an environment of continual improvement

16.2 Environmental management

Manitoba Hydro is seeking self-verification under the International Organization for Standardization (ISO) 14001 Environmental Management System Standard.

An environmental management system is a framework for developing and applying an organization's environmental policy and includes articulation of organizational structure, responsibilities, practices, processes, and resources at all levels of the corporation. The environmental management system includes commitments to comply with legislation, licenses, permits and guidelines, conduct inspections and monitoring, and review the results for adherence to requirements. The ISO standard ensures quality, performance, and continual improvement in the delivery of Manitoba Hydro's environmental protection program.

16.3 Adaptive management

Adaptive management is a planned systematic process employed with the goal of continually improving environmental management practices by learning from their outcomes. The environmental protection program for the project has established the principles of adaptive management allowing for flexibility in the mitigation of adverse environmental effects that may result from the project. Manitoba Hydro will use the information gathered during follow up and monitoring activities to verify the accuracy of the environmental assessment effects predictions and the effectiveness of implemented mitigation measures.

Manitoba Hydro designed the EPP to be adaptive and responsive throughout the project lifecycle by evaluating program documents, processes, procedures, and mitigation measures through inspection, monitoring and communication programs and conducting reviews to facilitate updates to the program.

Within the EPP, adaptive management will take place in two primary areas:

- At the management level, involving changes with the program structure itself
- At the implementation level, involving individual mitigation measures as management and implementation teams evaluate the onsite effectiveness of mitigation strategies or the program

Scheduled update meetings between departments and reviews of the program and its effectiveness will take place to foster the process.

16.4 Experience from previous projects

Manitoba Hydro has extensive experience in the development of environmental protection, monitoring and follow-up plans for all sizes of projects in many different environments, that span over much of Manitoba.

The development of the EPP has allowed the standardization and consistent approach to environmental protection, monitoring and follow-up. The EPP improves through the experiences from past and current projects (e.g., monitoring and inspection results, documentation format changes).

16.5 First Nation and Red River Métis engagement

Feedback shared by First Nations and the MMF during project engagement helped inform the environmental assessment report and EPP.

The knowledge that was shared through the FNMEP assisted Manitoba Hydro with:

- Developing a greater understanding of the project development area
- Identifying key concerns in the project development area
- Identifying potential project effects
- Planning and designing the project
- Developing potential mitigation measures

There will be opportunities for additional sensitive sites to be identified in the EPP should any be discovered during construction or operation of the project.

Manitoba Hydro recognizes the unique relationship that First Nations and the Red River Métis have with their areas of land use and appreciates sharing of information about their history and culture, and perspectives on the project.

16.6 Environmental protection program framework

Manitoba Hydro's Environmental Protection Program (EPP) provides the framework for the delivery, management and monitoring of environmental and socio-economic protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and beneficial practices, and input during the public engagement process and First Nation and Red River Métis engagement process. The EPP:

- Describes how Manitoba Hydro is organized
- Functions to deliver timely, effective, comprehensive solutions and mitigation measures to address potential environmental effects
- Defines roles and responsibilities for Manitoba Hydro employees and contractors
- Outlines management, communication, and reporting structures

The EPP includes what, where, and how aspects of protecting the environment during the pre-construction, construction, operation and decommissioning of the project.

Figure 16-1 illustrates the components of the EPP. The following sections describe each component in further detail.

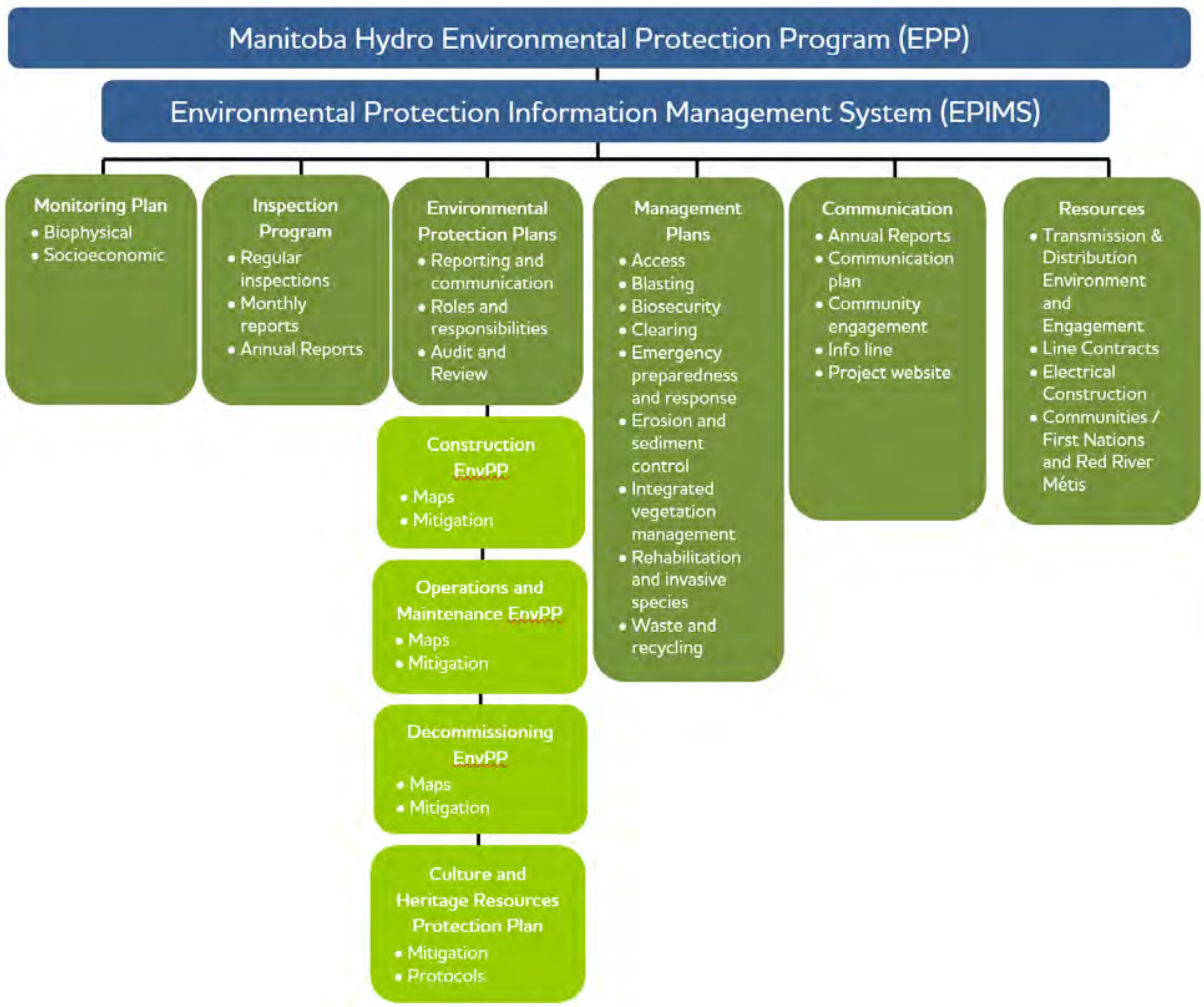


Figure 16-16-1: Environmental protection program components

16.7 Organization

The organizational structure of the EPP (Figure 16-2) includes senior Manitoba Hydro management, project management and implementation teams that work together to provide timely and effective implementation of environmental protection measures identified in environmental protection plans. Manitoba Hydro senior management is responsible for the overall EPP, including resourcing, management, and performance, and is accountable for regulatory compliance, policy adherence and interested party satisfaction.

The environmental protection management team is composed of senior Manitoba Hydro staff and is responsible for the management of environmental protection plans, including compliance with regulatory and other requirements, quality assurance and control, consultation with regulators, and related public and First Nation and Red River Métis engagement activities. Environmental consultants and advisors support the management team.

The environmental protection implementation team is composed of Manitoba Hydro operational field and office staff and is responsible for the day-to-day implementation of environmental protection plans, including monitoring, inspecting, and reporting. The implementation team works closely with other Manitoba Hydro staff as required.

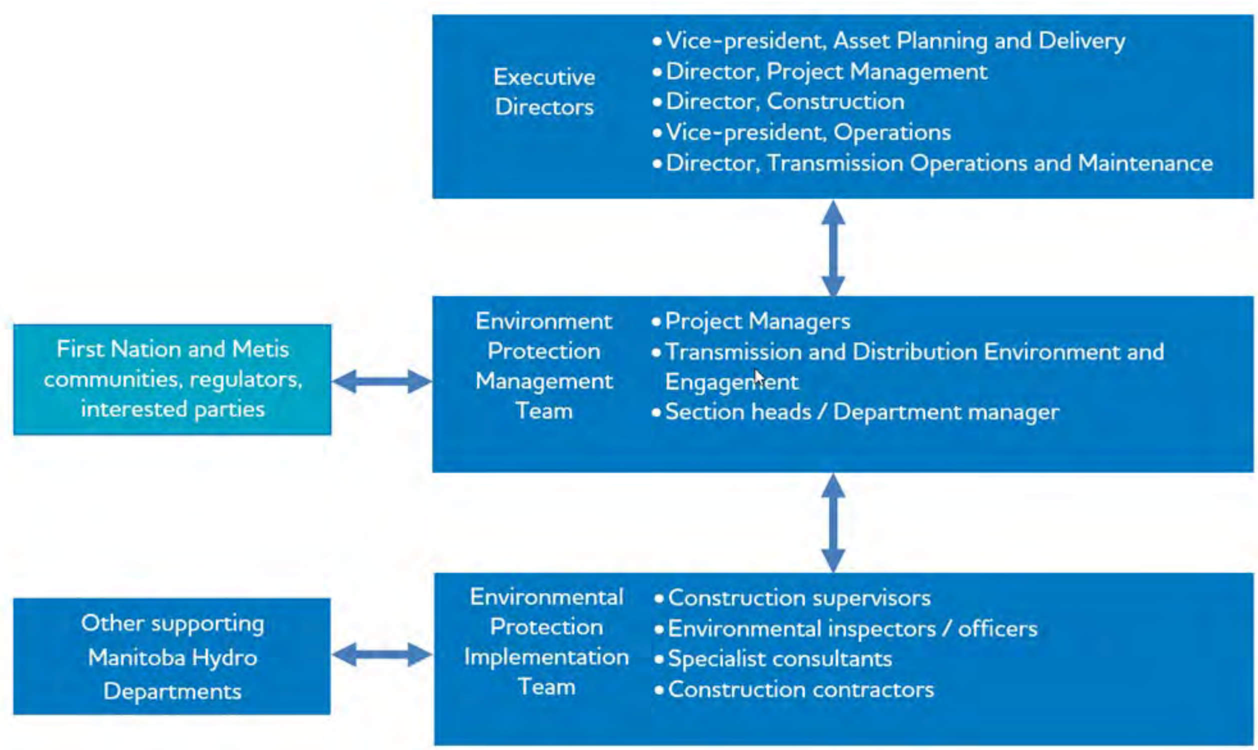


Figure 16-2: Environmental protection program organizational structure

16.7.1 Resources

Manitoba Hydro commits resources early in the planning cycle to provide effective environmental assessment, mitigation, and monitoring. Teams of engineers and environmental professionals develop preventative or avoidance mitigation measures that include design and routing alternatives. In addition, there are resource allocations for the delivery and implementation of environmental protection measures to meet corporate policy and government regulatory requirements.

Manitoba Hydro is committed to staffing the environmental protection program with environmental inspectors and providing required support, including training, financial resources, and equipment.

16.7.2 Roles and responsibilities

Figure 16-3 illustrates the typical organizational lines of reporting and communications. The roles and responsibilities for delivery of the project and implementation of environmental protection measures are as follows:

- The project engineer has overall responsibility for the implementation of the environmental protection plans and reports to a section head or department manager.
- The Transmission & Distribution Environment and Engagement Department oversees the development of environmental protection documents and associated inspection and monitoring programs, including ongoing public and First Nation and Red River Métis engagement activities.
- The construction contractor is responsible for ensuring work adheres to the environmental protection plans and reports to the construction supervisor.
- Environmental inspectors and officers have the primary responsibility to confirm that environmental protection measures and specifications are implemented per the environmental protection plans as well as provide information and advice to the construction supervisor.
- Manitoba Hydro field safety, health and emergency response officers are responsible for the development and execution of the safety program and occupational health and safety practices at the various construction sites.

Other Manitoba Hydro employees, including engineers and technicians, provide information and advice to the construction supervisor.

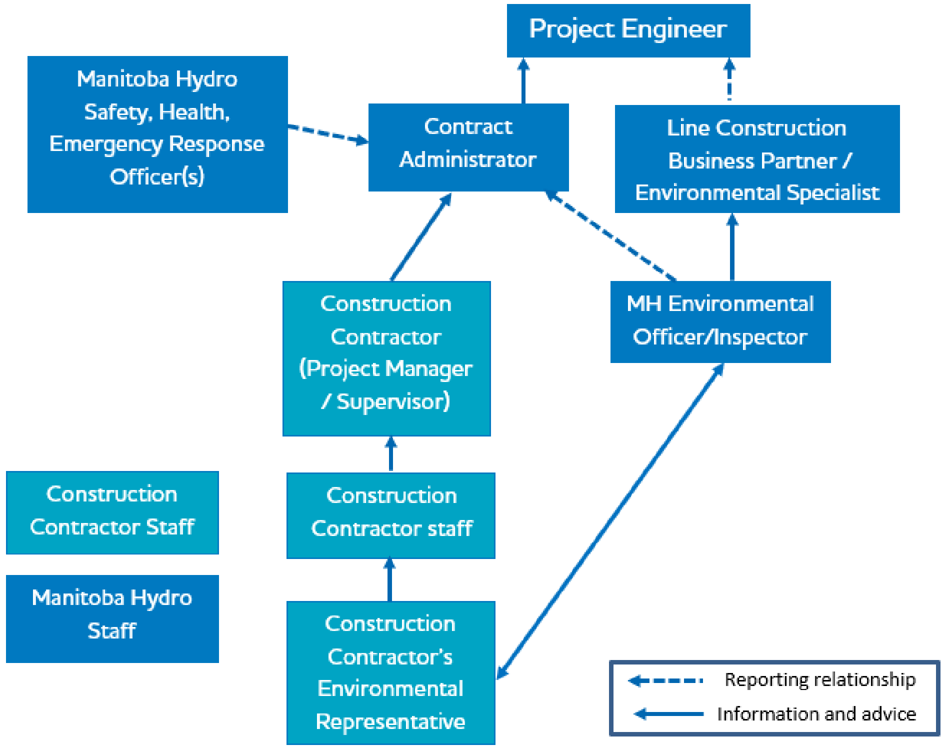


Figure 16-3: Typical organizational lines or reporting and communications

16.7.3 Communication and reporting

Manitoba Hydro personnel will maintain ongoing communications with provincial and federal departments, First Nation communities and Red River Métis citizens and organizations regarding implementation of the environmental protection plan. The construction supervisor and environmental inspectors will maintain ongoing communications with the contractor and contract staff through daily tailboard meetings and weekly or otherwise scheduled construction meetings at the worksite. Inspection reports as well as incident, monitoring and other reports will be prepared and available for the regulators, contractors, and Manitoba Hydro staff.

Manitoba Hydro will provide First Nation communities and Red River Métis citizens and organizations, landowners, interested parties and the public with ongoing opportunities to review and comment on the project. Manitoba Hydro developed a dedicated project webpage to facilitate communication with First Nation communities and Métis citizens and organizations, landowners, interested parties and the public. The environmental protection management team will record and review formal enquiries or complaints for response or action.

16.7.4 Environmental protection plans

Environmental protection plans document environmental protection measures to provide for compliance with regulatory and other requirements, and to achieve environmental protection goals consistent with corporate environmental policies.

Manitoba Hydro designed the environmental protection plans as user-friendly reference documents that provide project managers, construction supervisors and contractors with detailed lists of environmental protection measures and other requirements implemented in the design, construction, and operation phases of a project.

Manitoba Hydro organized the environmental protection measures by construction component and activity, and environmental component and issue to assist project personnel in implementing measures for work sites and activities.

Manitoba Hydro will develop the environmental protection plans described in the following sections.

16.7.4.1 Construction

The construction environmental protection plan (CEnvPP) will be prepared prior to construction. It is a key element in implementing effective environmental protection and limiting the potential adverse environmental effects identified in the environmental assessment report. It also outlines actions to identify unforeseen environmental effects and implement adaptive management strategies to address them. An important component of an environmental protection plan is review and updating. This allows environmental protection measures to remain current, continually improving environmental performance.

A CEnvPP is composed of general and specific environmental protection measures that cover all aspects of the work and the environment. General environmental protection measures for the project include mitigation measures and follow-up actions identified in the environmental assessment report, including design mitigation, provincial and federal regulatory requirements, beneficial practice guidelines, Manitoba Hydro environmental policies and commitments, and input during public and First Nation and MMF engagement.

The CEnvPP lists the general environmental protection measures for major components and activities associated with the project. Environmental protection measures are provided for environmentally sensitive sites (ESS) identified during public and First Nation and Red River Métis engagement and assessment activities. Environmentally sensitive sites are locations, features, areas, activities, or facilities along or immediately adjacent to the corridor/right-of-way or other project components that are ecologically, socially, economically, or culturally important and sensitive to disturbance by the project and, as a result, require site-specific mitigation measures.

The CEnvPP will contain orthophoto map sheets that provide Manitoba Hydro project managers, construction supervisors, employees, contractors, and contract employees with detailed site-specific environmental protection information that can be implemented, managed, evaluated, and reported on in the field.

16.7.4.2 Operation and maintenance

Standard mitigation measures will apply during operations. A specific operation and maintenance environmental protection plan is currently not planned.

16.7.4.3 Decommissioning

A decommissioning environmental protection plan will be prepared at the end of the project's operational life and will contain decommissioning methods, waste and recycling management, and mitigation measures to address environmental effects and legislation that is in effect at that time.

16.7.4.4 Cultural and heritage sites / objects

The fact that cultural and heritage sites / objects have intrinsic value to Manitobans is understood by Manitoba Hydro and addressed through a separate protection plan. The culture and heritage resource protection plan (Appendix F) outlines protection measures in the event of the discovery of previously unrecorded cultural and heritage sites / objects during construction and describes the ongoing monitoring of known cultural and heritage sites / objects for disturbance.

Through First Nation and Red River Métis engagement and previous projects, Manitoba Hydro understands and acknowledges the importance of cultural and heritage sites / objects to Indigenous communities. Manitoba Hydro has developed mechanisms such as notification of discovery and involvement in site investigations, which are further explained in the culture and heritage resource protection plan.

Results from the heritage resources monitoring program will be addressed in conjunction with First Nation and Red River Métis engagement on an as required basis during construction, as well as through a heritage resources impact assessment to the Manitoba Historic Resources Branch per the terms of the Heritage Resources Act (1986) and heritage permit(s) issued to Manitoba Hydro.

16.7.5 Management plans

Management involves the organization of activities and resources to resolve or respond to environmental problems, issues, or concerns. Management plans provide reasoned courses of action to achieve pre-defined goals or objectives. Management plans will be prepared to address important management issues, regulatory requirements and corporate commitments identified in the environmental assessment report. The management plans will describe the management actions, roles and responsibilities, evaluation mechanisms, updating requirements and reporting schedules. The following management plans will be prepared prior to the start of construction of the project:

- Access
- Biosecurity
- Blasting
- Erosion protection and sediment control
- Emergency preparedness and response
- Rehabilitation and invasive species management
- Waste and recycling

Environmental inspectors / officers will conduct regular inspections during construction to monitor adherence to the plans. The following sections describe each plan.

16.7.5.1 Access management plan

Prior to the start of construction, Manitoba Hydro will prepare an access management plan to minimize the need to construct new access roads and trails.

The access management plan will outline:

- The use of existing roads and trails to the extent possible during construction
- Management objectives and principles
- Security requirements, including
    - Terms and conditions for access
    - Restrictions on firearms
    - Hunting and fishing
    - Other resource use activities
- Environmental protection measures including
    - Timing windows
    - Vehicle cleaning and servicing
    - Load restrictions

  - Warning signage
  - Speed limits
  - Sensitive area avoidance
  - Stream crossings
  - Other environmental issues
- Access management issues and mitigation strategies
- Safety of construction workers and the public
- Respect for First Nation and Red River Métis rights and resource users
- Protection of natural, cultural and heritage sites / objects

16.7.5.2 Biosecurity

Prior to the start of construction Manitoba Hydro will prepare a biosecurity management plan for the project to provide guidance to Manitoba Hydro staff and contractors to prevent the introduction and spread of weeds and other pests, including invasive species, in agricultural land and livestock operations through project pre-construction and construction activities.

16.7.5.3 Blasting

Prior to the use of explosives, the contractor will prepare blasting plans to manage the storage and use of explosives at construction sites in accordance with environmental protection measures, provincial and federal legislation and guidelines, and corporate policies for explosives.

16.7.5.4 Emergency preparedness and response

Prior to the start of construction, each contractor will prepare an emergency preparedness and response plan to prepare for and respond to emergencies at construction sites in accordance with provincial legislation and guidelines, and corporate policies and procedures for the protection of human health and the environment. The plan will include the following:

- Spills or releases of hazardous substances, including petroleum products
- Accidents involving hazardous substances
- Medical emergencies
- Explosions and fire

16.7.5.5 Erosion protection and sediment control

Prior to the start of construction, Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing an erosion protection and sediment control plan to limit adverse environmental effects of sediment releases on the aquatic environment in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.

The plan will prescribe environmental protection measures including:

- Frozen ground conditions
- Establishment of buffer zones
- Avoidance of sensitive areas
- Use of bioengineering techniques

16.7.5.6 Rehabilitation and weed management

Prior to the start of construction, Manitoba Hydro will prepare a rehabilitation and weed management plan in accordance with environmental protection measures and provincial guidelines for rehabilitation.

The plan will prescribe measures for:

- Washing equipment and vehicles prior to entering construction sites
- Controlling vegetation at construction sites
- Restoring and re-vegetating disturbed sites

16.7.5.7 Waste and recycling

Prior to the start of construction, Manitoba Hydro or the contractor will develop a waste and recycling management plan to manage waste at construction locations in accordance with provincial legislation and guidelines, and corporate policies and procedures for the protection of human health and the environment.

The plan will include measures for:

- Waste reduction
- Recycling and reusing initiatives
- Storage of kitchen wastes
- Recycling and disposal of construction wastes
- Disposal of wastes at licenced facilities

16.8 Follow-up and monitoring

Follow-up and monitoring are conducted to verify the accuracy of the environmental assessment of a project, assess the effectiveness of measures taken to mitigate adverse effects and determine compliance with regulatory requirements. Manitoba

Hydro implements the follow-up and monitoring activity as discussed further in the sections below.

16.8.1 First Nation and Red River Métis engagement

Manitoba Hydro will offer Indigenous communities and organizations environmental protection program meetings to review and discuss the findings of the environmental assessment and engagement and how the information shared will inform the EPP.

Manitoba Hydro will also engage Indigenous communities in monitoring of the project.

16.8.2 Inspection program

Inspection is the organized examination or evaluation involving observations, measurements and sometimes tests for a construction project or activity. The results of an inspection are compared to specified requirements, drawings, and standards for determining whether the item or activity is in conformance with these requirements. Environmental inspection is an essential and key function in environmental protection and implementation of mitigation measures.

Manitoba Hydro has established a comprehensive integrated environmental inspection program to comply with regulatory approvals and meet corporate environmental objectives. The program includes environmental inspectors onsite during construction activities. Manitoba Hydro's approach to environmental inspection includes:

- Compliance with regulatory approvals
- Adherence to environmental protection plans
- Onsite environmental inspectors
- Training and education
- Regular monitoring and inspection during construction
- Interaction with contractors (e.g., pre-construction meeting, daily discussion)
- Regular review of inspection and monitoring information
- Quick response to incidents or changing conditions
- Monthly summary reports
- Regular reporting to regulators
- Notification of regulators of emergency or contingency situations

Environmental inspectors / officers will:

- Visit active work sites to inspect for compliance with licence, permit or other approval terms and conditions, and adherence to environmental protection plan general and specific mitigation measures
- Report all instances of non-compliance to the construction supervisor, contractor, and applicable regulatory authority
- Report incidents such as accidents, malfunctions, spills, fires, explosions, and environmental damage to the construction supervisor and applicable regulatory authority
- Record all inspection activities in a daily journal and complete daily inspection forms
- Provide daily and monthly inspection reports electronically to the environmental protection information management system for review and viewing by applicable project staff

Incidents will be dealt with immediately and followed up in subsequent daily inspection reports.

16.8.3 Monitoring program

Due to the minimal natural habitat traversed by the final preferred route and information learned from similar projects in southern Manitoba, an environmental monitoring plan has not been prepared for this project. However, should inspection discover unexpected effects, one will be prepared and implemented.

Should it be required, monitoring will be carried out by Manitoba Hydro and may be contracted to environmental consultants possessing the necessary expertise, equipment, and analytical facilities. As well, Manitoba Hydro will also engage Indigenous communities in monitoring of the project.

16.8.4 Environmental protection information management system

An environmental protection information management system (EPIMS) is the internal central repository of environmental protection information, including:

- Environmental protection documents
- Reference information such as regulations and guidelines
- Inspection reports
- Monitoring field data and reports

The environmental inspection program will employ modern electronic recording, reporting and communication systems using field computers, geographic positioning systems and digital cameras. Field computers will have project and other reference information needed for effective implementation of environmental protection measures, including regulations, guidelines, licences, permits, engineering drawings, specifications, maps, reports, and data.

EPIMS is a tool that helps Manitoba Hydro monitor and report on environmental protection implementation, regulatory compliance, and incident reporting. EPIMS, along with the project share point site, will be the mechanisms used to provide reporting and tracking of environmental protection performance, and the foundation of an auditable EPP.

16.9 Pre-construction activities

Manitoba Hydro will undertake several activities prior to commencing construction of the project to set the direction for environmental protection and compliance with legislated requirements. Manitoba Hydro will endeavour to meet with interested Indigenous communities and organizations during the finalization of the construction environmental protection plan to discuss, address and mitigate concerns, to the extent possible, with cultural and environmentally sensitive sites.

Manitoba Hydro will obtain licenses, permits, authorizations and other approvals, including property agreements, right-of-way easements and releases, prior to commencement of construction of each project component. Additional terms and conditions of these approvals will be incorporated into the construction environmental protection plan. Additional approval requirements to be obtained by the contractors will be identified and communicated to the successful bidders.

The Transmission & Distribution Environment and Engagement Department will typically participate in the tender / direct negotiated contract development process to make sure environmental requirements are included as contract specifications. Bidders are required to list and defend their environmental record and must have an environmental policy, including a commitment to environmental protection.

Meetings will be held with the contractors to review the environmental protection requirements, establish roles and responsibilities, management, monitoring and other plans, inspection and reporting requirements, and other submittals. Prior to the start of construction, contractor employees will be trained and/or oriented on environmental protection requirements.

16.10 Work stoppage

The duty to stop work rests with everyone encountering situations where the environment, including biophysical, socio-economic and heritage sites / objects, are threatened by an activity or occurrence that has not been previously identified, assessed, and mitigated. Work stoppage is also to occur in the event of an environmental accident, extreme weather event or exposed human remains. Individuals discovering such situations are to inform their supervisor who will report the matter to the construction supervisor or environmental inspector / officer immediately. The contractor is also required to stop work voluntarily where construction activities are adversely affecting the environment or where mitigation measures are not effective in controlling environmental effects. Remedial action plans or other environmental protection measures will be developed and implemented immediately after discussion and prior to resumption of work if previously halted. Work is not to resume until the situation has been assessed and responded to and Manitoba Hydro approves the resumption of work. Stop work orders will be documented, reported to regulatory authorities (if applicable) and reviewed at construction meetings.

16.11 Review and updating

16.11.1 Incident reviews

CEnvPP will be subject to review in the event of an incident, including environmental accidents, fires and explosions, reportable releases of hazardous substances and non-compliance situations.

16.11.2 Auditing

Auditing is a systematic approach to defining environmental risk and/or determining the conformance of an operation with respect to prescribed criteria. An environmental audit typically involves a methodical examination of evidence that may include interviews, site visits, sampling, testing, analysis, and verification of practices and procedures. Environmental protection plans for the project will be subject to internal and external audits. The audit results will help to evaluate the effectiveness of environmental protection measures, to learn from inspection and monitoring programs, and to improve project planning and environmental assessment performance.

16.11.3 List of revisions

A list of revisions will be maintained at the beginning of each environmental protection plan that identifies the nature of the revision, section revised and dates.

16.12 Summary

This chapter outlined the environmental protection program where environmental protection commitments, mitigation measures and follow-up actions identified in this environmental assessment report will be implemented, managed, reported, and evaluated. The purpose, organization, responsibilities, management, communication, and other aspects of the environmental protection program were described. Environmental protection plans are described as they relate to the construction, operation and decommissioning stages in the project planning cycle and environmental assessment and licensing process. Implementation of follow-up actions, including inspection, management and auditing are discussed. Environmental management and monitoring plans are also identified.

17.0Conclusion

The environmental assessment outlined in this report evaluated the potential biophysical and socio-economic effects of the proposed Dominion City to Altona gas transmission project. The environmental assessment was focused on seven valued components namely important sites, vegetation, wildlife and wildlife habitat, commercial agriculture, health and safety, economic opportunities and infrastructure and services.

Feedback and perspectives obtained through project engagement were considered in the selection of valued components and helped to inform the assessment of project effects on the biophysical and socio-economic elements discussed throughout this report.

Manitoba Hydro understands that effects on all aspects of the environment have the potential to be experienced by the public, First Nations people, and Red River Métis citizens, and that the severity of the residual effects are experienced uniquely by different individuals, nations, and communities.

Mitigation measures informed by Manitoba Hydro's experience with similar projects as well as engagement feedback from this and other projects will be implemented to reduce adverse effects of the project.

Residual effects to the biophysical environment consist mainly of project activities and associated effects to wildlife, through a change in wildlife habitat because of sensory disturbance.

Residual effects to the socio-economic environment include, but are not limited to:

- Important sites
- Commercial agriculture
- Infrastructure and community services
- Change in regional employment, regional business and regional economy (positive residual effect)
- A localized decrease in air quality and increase in noise
- Increased stress for certain individuals resulting from concerns about project related health and well-being (e.g., gas leaks and explosions)

With the implementation of measures developed to mitigate and manage potential adverse effects, the residual effects of the project are predicted to be not significant.

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19.0 Appendices

Appendix A: Project engagement materials

Appendix B: Heritage technical report

Appendix C: Vegetation technical data and field reports

Appendix D: Wildlife technical data and field report

Appendix E: Greenhouse gas lifecycle assessment

Appendix F: Cultural and heritage resources protection plan

APPENDIX AA

Engagement MaterialsA

December 2024A

Manitoba Hydro
360 Portage Ave (18) • Winnipeg, Manitoba • R3C 0G8
Telephone: 1-877-343-1631

July 3, 2024

[Insert Address here]

Dear [Insert Leadership Representative here]

Subject: Manitoba Hydro – Dominion City to Altona gas transmission pipeline

I am reaching out to begin a conversation with [Insert interested party name here] about a new proposed gas pipeline project.

Manitoba Hydro is planning to construct an 8-inch steel transmission pipeline running approximately 36.6km from east of Dominion City to northwest of Altona. The pipeline will connect to an existing pipeline system to address capacity constraints in the area. Manitoba Hydro will be preparing and submitting an environmental assessment report to Manitoba Environment and Climate Change to seek approval as a Class 2 development.

A majority of the proposed line will parallel existing in-field gas pipeline infrastructure and will require additional easement on private properties. The proposed pipeline will tie into existing infrastructure that was installed in 2023 (Red River/Letellier gas pipeline replacement). The tie-in points for this new pipeline will be on agricultural land outside of the west and east boundaries of the Roseau River 2 reserve, south of PR 201.

Please see an outline of the project area in the attached map. Control points show proposed above-grade structure locations which allow access to the pipeline. Tie-in locations, as shown on the map, would be completed below grade. The existing gate station to the east of Dominion City would be expanded to accommodate additional above-grade infrastructure.

We are also in the early stages of designing an additional gas transmission pipeline between Altona and Winkler and will provide more information as it becomes available.

We would like to meet with you to begin discussions about the project and further understand [Insert interested party name here] preferences for engagement on the project.

Please feel free to contact me by email at kmartel@hydro.mb.ca or by phone at 431-337-5013, to suggest potential meeting dates that would work for your schedule or to share initial feedback or questions.

Kind regards,

Karine Martel, Indigenous Engagement Officer
Indigenous & Community Relations

Manitoba Hydro
360 Portage Ave (18) • Winnipeg, Manitoba • R3C 0G8
Telephone: 1-877-343-1631

July 3, 2024

[Insert Address here]

Dear [Insert name here]

Subject: Manitoba Hydro – Dominion City to Altona gas transmission pipeline

I am reaching out to begin a conversation with the RM of [Insert here] about a new proposed gas pipeline project.

Manitoba Hydro is planning to construct an 8-inch steel transmission pipeline running approximately 36.6km from east of Dominion City to northwest of Altona. The pipeline will connect to an existing pipeline system to address capacity constraints in the area. Manitoba Hydro will be preparing and submitting an environmental assessment report to Manitoba Environment and Climate Change to seek approval as a Class 2 development.

A majority of the proposed line will parallel existing in-field gas pipeline infrastructure and will require additional easement on private properties. The proposed pipeline will tie into existing infrastructure that was installed in 2023. The tie-in points for this new pipeline will be on agricultural land outside of the west and east boundaries of the Roseau River reserve, south of PR 201.

Please see an outline of the project area in the attached map.

Control points show proposed above-grade structure locations which allow access to the pipeline. Tie-in locations, as shown on the map, would be completed below grade. The existing gate station to the east of Dominion City would be expanded to accommodate additional above-grade infrastructure.

Details on the route and upcoming engagement opportunities will be shared with a broader group when we start engagement in the coming weeks. We would like to meet with you to begin discussions about the project and understand your preferences for engagement interests and if there are any other proposed developments in the area that may impact routing. We would also like to host an in-person information session in your area in July and would appreciate your feedback as to preferred dates and venue.

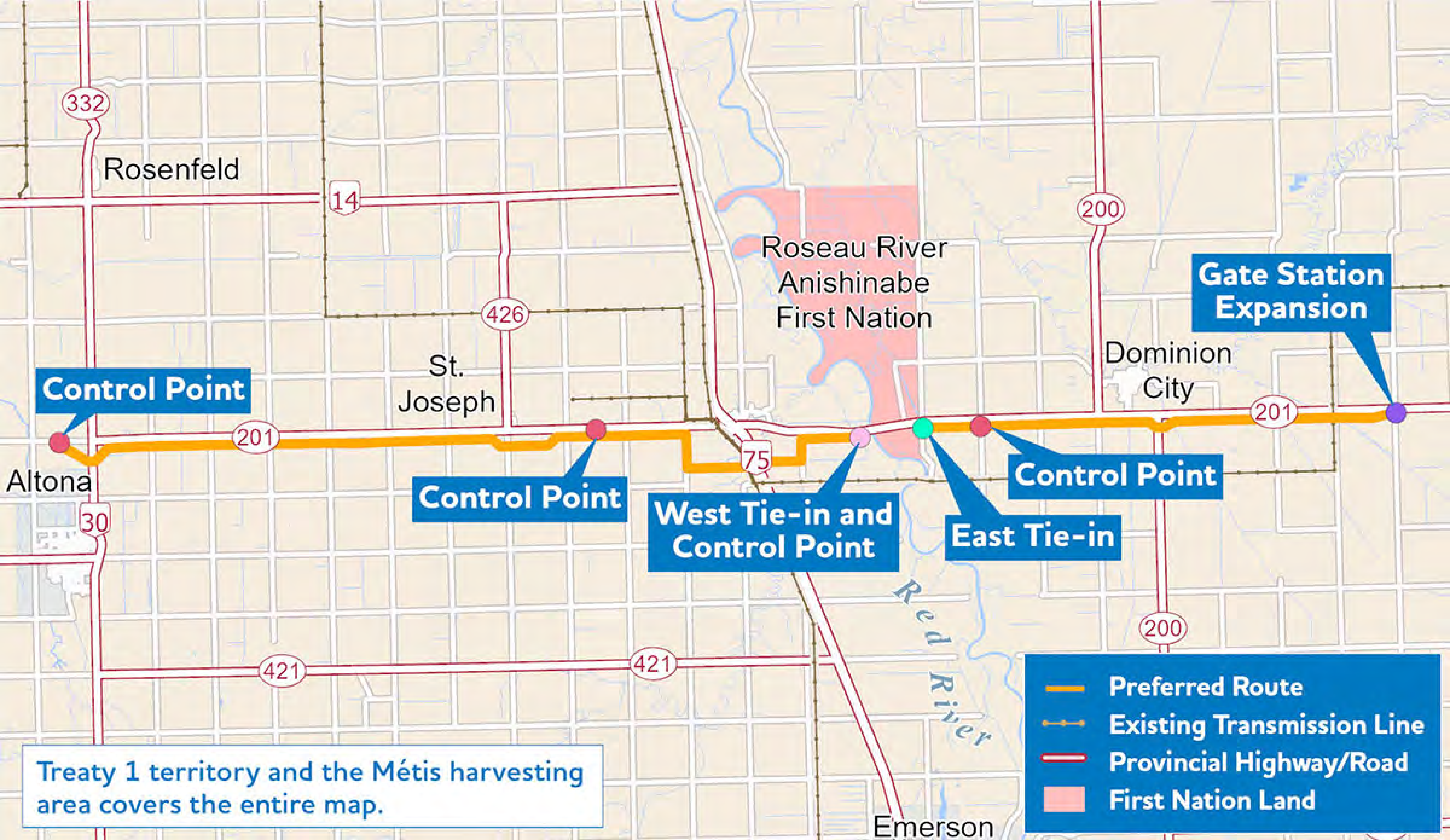
We are also in the early stages of designing an additional gas transmission pipeline between Altona and Winkler and will provide more information as it becomes available.

If you wish to meet or have any initial concerns or questions, please feel free to contact me by email at manger@hydro.mb.ca or by phone at 204-391-7355.

Kind regards,

Megan Anger
Environmental Specialist, Transmission & Distribution Environment and Engagement Dept.

The following map was included as an attachment in the letters to interested parties.



332
Rosenfeld
14
426
Roseau River
Anishinabe
First Nation
200
Gate Station
Expansion
Dominion
City
St.
Joseph
Control Point
201
Altona
Control Point
75
West Tie-in and
Control Point
Control Point
East Tie-in
30
Red River
421
421
200
Preferred Route
Existing Transmission Line
Provincial Highway/Road
First Nation Land
Treaty 1 territory and the Métis harvesting
area covers the entire map.
Emerson

Dominion City to Altona transmission gas pipeline

July 2024

Purpose of the meeting

Share initial project information

Answer questions

Listen to feedback

About the project

- 36.6km of 8-inch steel transmission pipeline from east of Dominion City to northwest of Altona
- This new pipeline will address capacity constraints in the area
- Majority of the pipeline parallels existing pipelines built in 1962 & 1989
- Tie into existing pipeline which as installed along PR 201 in the road allowance through RRAFN crossing Red River
- Manitoba Hydro will need to prepare and submit an environmental assessment report to Manitoba Environment and Climate Change to seek approval for a Class 2 Development license.

Why is it needed?

The pipeline will connect to an existing pipeline system to address capacity constraints in the area

Construction methods

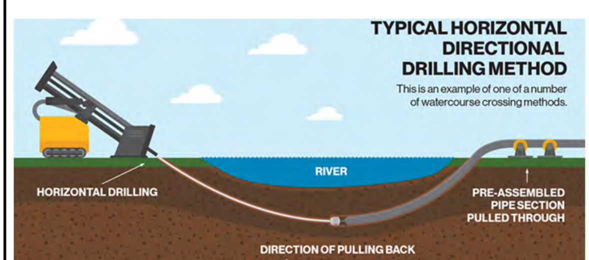
Horizonal directional drilling

- Drains
- Railway
- Roadways

Trenching

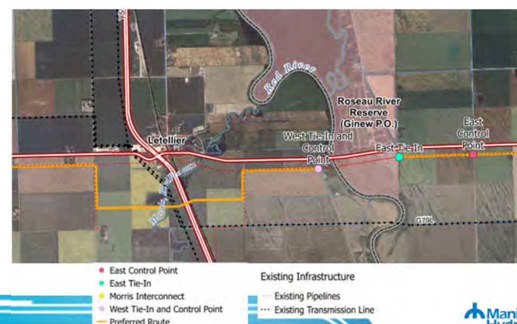
- In-field

Horizontal directional drilling (HDD)

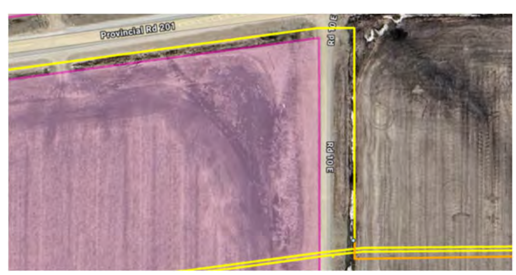


Horizontal directional drilling (HDD)

Trenching



East tie-in



West tie-in

Recap of the Red River Pipeline Replacement

- In the summer of 2021, when water levels were low, a 4-inch gas main which runs through RRAFN land (south of PR 201) was found to be partially exposed within the Red River
- In the fall 2021, temporary repairs took place to enable the exposed main to be isolated and run only during peak conditions.
- In 2023, MH installed a new replacement line in a different location, entirely within the public right-of-way along the south side of PR 201. The river crossing portion of the line required horizontal drilling below the Red River. The existing line was decommissioned.

Recap of the Red River Pipeline Replacement

- The cyan line represents an approximate 800 m drill crossing under the Red River.
- The red line represents the remainder of the relocation.
- The yellow/orange lines represent existing mains.

Potential impacts within the project area:

- Potential to uncover heritage resources during ground disturbance
- Removal of trees
- Noise disturbance
- Impediments to traff c along PR 201 (s ower speed zone)
- Potential temporary impediments to access to properties south of PR 201 dur ng construct on
- Temporary parking of machinery along MI right of way

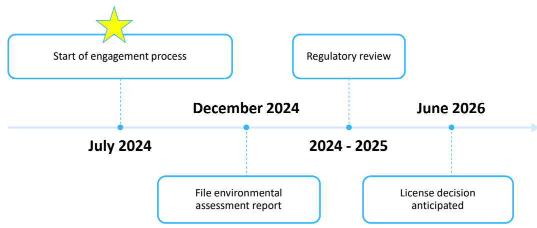
Engagement

- Roseau River Anishinabe First Nation, Peguis First Nation & the Manitoba Métis Federation
- 54 landowners
- The entire proposed transmission gas pipeline will be on private land

Manitoba Hydro values working with RRAFN to understand:

- Any concerns your community or Nation may have with this project
- Suggestions about how concerns may be addressed
- How to properly respect and protect important sites in the area
- Any protocols Manitoba Hydro should be aware of when working in this area
- Preferred methods of participating
- Opportunities to enhance benefits to the community

Schedule



Next steps

- Begin engagement for the project
- Prepare environmental assessment
- Conduct heritage work

How does your Community or Nation want to be engaged/kept informed on this project?

- MEETINGS
- CONDUCT YOUR OWN STUDY OF THE AREA
- FIELD TOURS

Other upcoming gas projects

- Transmission - Altona to Winkler
  - Staged approach allows observation of load growth magnitude before finalizing Altona to Winkler design and diameter
  - Either 6 inch or 8-inch steel pipeline

Questions, Concerns, Feedback?

Key contact at Manitoba Hydro:
Karine Martel, Indigenous Engagement Officer
Phone: (431)- 337-5013
Email: kmartel@hydro.mb.ca

Meeting notes

Meeting: MMF and MH meeting to discuss Silver to Rosser Tap & DC to Altona Transmission Gas Pipeline		
Date: July 15, 2024	Time: 1:30pm	Location: Teams
Meeting type (virtual or in-person)	Virtual	
Facilitator	Karine Martel	
Note-taker	Geneva Cloutis	
Number of participants	4	
Attendees		
Name	**Organization**	
Christian Goulet	Manitoba Métis Federation (MMF)	
Karine Martel	Manitoba Hydro (MH)	
Geneva Cloutis	MH	
Megan Anger	MH	
Meeting description		
A meeting to discuss Pre-engagement for the new proposed Dominion City to Altona natural gas transmission pipeline: share project information, gather initial concerns or feedback from the MMF and determine the MMF's preference for engagement going forward.		

Owner	Action item:	Status
MH	MH to look into whether the Revitalization Agreement covers engagement funding for gas projects.	According to the Revitalization Agreement, the engagement funding provided under Section 5.02 is specific to electrical transmission projects, however we would welcome a proposal from the MMF for engagement funding as we would on any Manitoba Hydro project.
MH	MH to determine whether the future Altona to Winkler gas transmission pipeline could function without the Dominion City to Altona line?	The future Altona to Winkler gas transmission pipeline will be in addition to the Dominion City to Altona pipeline, and will both be part of a loop system which transmits gas from our supplier, TC Energy. It is anticipated the future Altona to Winkler transmission pipeline will be built at either 6" or 8" diameter, and will be determined once the proposed Dominion City to Altona pipeline is

		installed and load is assessed. Installing the proposed 8" transmission pipeline from Dominion City to Altona would allow for greater transmission capacity, and additional capacity would be required to supplement the loop system from Altona to Winkler.

Dominion City to Altona Natural Gas Transmission Pipeline		
Gas transmission	The MMF asked where the gas comes from.	MH shared that this pipeline will connect to an existing TransCanada pipeline that runs from the south to the north. Natural gas is not produced in Manitoba but is imported from either the United States or the western provinces.
Heritage	The MMF shared the potential for adverse heritage effects, at sub-river crossings and anywhere with near-water construction.	MH noted this concern and shared that the proposed route for this gas transmission pipeline does not traverse any major body of water (the portion under the Red River was previously installed in 2023).
Land and Resource Use	The MMF shared that some citizens may harvest in existing right of ways and road allowances.	MH noted this feedback.
Routing	The MMF asked why the route for the transmission gas pipeline jogs in certain places.	MH shared that the jogs are to avoid having to conduct horizontal directional drill the line underneath homes.
Gas transmission	The MMF asked whether the existing pipeline underneath RRAFN would be removed after it is capped off and de-energized.	MH shared that the current plan is to leave the infrastructure in the ground.
Gas transmission	The MMF asked whether the future Altona to Winkler gas transmission pipeline could function without the Dominion City to Altona line.	MH will follow up with the MMF regarding this question (see answer above).

Heritage	The MMF shared that they dislike the archaeology/heritage approach of Western Heritage whom MH currently has on contract as a project archeologist. The MMF also shared that they are disappointed with most consultants and the Heritage Resource Branch's approach to incorporating Métis heritage in their work, as they mostly operate from a First Nations lens and forget that the Métis are a post-contact Indigenous nation.	MH noted this concern.
Heritage	The MMF shared that they continue to work on a Red River Métis-specific heritage protocol which they will share with MH once ready.	MH looks forward to receiving this protocol.
Engagement	The MMF noted they may request funding in advance to do a desktop search of whether there are any Red River Métis homesteads or other heritage sites in the area.	MH noted this interest and is open to receiving a work plan proposal and further discussion about activities the Manitoba Métis Federation may wish to undertake to help inform the project.
	Other	
Employment and Business	The MMF shared that there is interest in a more refined procurement strategy between Manitoba Hydro and the MMF to have more opportunities for Métis employment and businesses.	MH noted this interest.

Dominion City to Altona transmission gas pipeline

Manitoba Hydro and Town of Altona

July 16, 2024

Manitoba Hydro

Purpose of the meeting

- Share initial project information
- Answer questions
- Listen to feedback

About the project

- 36.6km of 8-inch steel transmission pipeline from east of Dominion City to northwest of Altona
- Majority of the pipeline parallels existing pipelines built in 1962 & 1989
- Manitoba Hydro will prepare and submit an environmental assessment report to Manitoba Environment and Climate Change to seek approval for a Class 2 Development license.

Why is it needed?

The pipeline will connect to an existing pipeline system to address capacity constraints in the area

Manitoba Hydro

Construction methods

Horizonal directional drilling

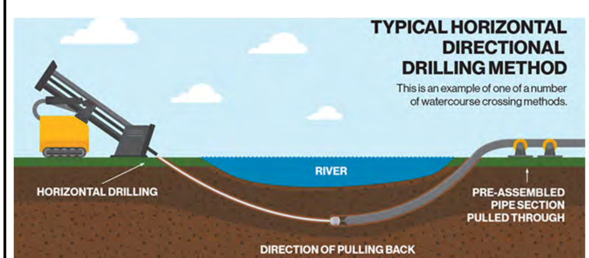
- Drains
- Railway
- Roadways

Trenching

- In-field

Manitoba Hydro

Horizontal directional drilling (HDD)



Manitoba Hydro

Horizontal directional drilling (HDD)

Manitoba Hydro

Trenching

Manitoba Hydro

Manitoba Hydro

Potential impacts within the project area:

- Potential to uncover heritage resources during ground disturbance
- Removal of trees
- Noise disturbance
- Impediments to traff c along PR 201 (s ower speed zone)
- Potential temporary impediments to access to properties south of PR 201 dur ng construct on
- Temporary parking of machinery along MI right of way

Manitoba Hydro

Engagement

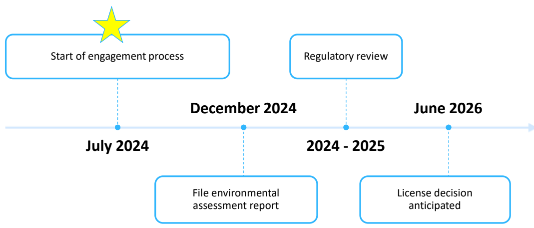
- Roseau River Anishinabe First Nation, Peguis First Nation & the Manitoba Métis Federation
- 54 landowners
- RM's
  - o Emerson Franklin
  - o Rhineland, Montcalm
  - o Town of Altona

Manitoba Hydro

Manitoba Hydro values working with the Town of Altona to understand:

- Any concerns the Town of Altona may have with this project
- Suggestions about how concerns may be addressed
- Preferred methods of participating in engagement or staying informed
- Any future planned development in the area

Schedule



Manitoba Hydro

Next steps

Begin engagement for the project

Prepare environmental assessment

Conduct heritage work

Manitoba Hydro

How does the Town of Altona want to be engaged/kept informed on this project?

MEETINGS

CONDUCT YOUR OWN STUDY OF THE AREA

FIELD TOURS

Manitoba Hydro

Other upcoming gas projects

- Transmission - Altona to Winkler
  - Staged approach allows observation of load growth magnitude before finalizing Altona to Winkler design and diameter
  - Either 6 inch or 8-inch steel pipeline

Manitoba Hydro

Questions, Concerns, Feedback?

Key contact at Manitoba Hydro:

Megan Anger, Environmental Specialist

Phone: (204)- 391-7355

Email: manger@hydro.mb.ca

Manitoba Hydro

Meeting notes

Meeting: RRAFN and MH Meeting to discuss Dominion City to Altona gas transmission pipeline		
Date: July 16, 2024	Time: 10:30am	Location: Chief and Council Offices, Roseau River Reserve
Meeting type (virtual or in-person)	In person	
Facilitator	Karine Martel	
Note-taker	Maria M'Lot	
Number of participants	9	
Attendees		
Name	**Organization**	
Maria M'Lot	Manitoba Hydro (MH), Indigenous & Community Relations	
Megan Anger	MH, Transmission, Distribution, Environment &	
Karine Martel	MH, Indigenous & Community Relations	
Andrew Greaves	MH, Gas Design	
Nick Bruce	MH, Gas Design	
Councillor Evan Roberts	Roseau River Anishinabe First Nation (RRAFN)	
Councillor Jason Henry	RRAFN	
Vincent Pierre (Chief's office)	RRAFN	
Meeting description		

A meeting to discuss future and previous gas projects near RRAFN, including:

1. The new proposed Dominion City to Altona natural gas transmission pipeline (share project information, gather initial concerns or feedback from RRAFN and determine RRAFN's preference for engagement going forward)
2. The 2023 Red River Pipeline Replacement
3. The previously communicated pipeline lowering south of PR 201 which is now no longer needed due to the DC to Altona Pipeline project.

Owner	Action item:	Status
MH	MH to share with RRAFN a copy of the Powerpoint presentation.	Done. Included as an attachment to this email.
MH	MH to connect RRAFN with an Energy Service Advisor from the Major Accounts Department to discuss feasibility and cost of connecting RRAFN to natural gas.	Jamie Pelletier japelletier@hydro.mb.ca from Manitoba Hydro's Major Accounts will assist in preliminary conversations regarding RRAFN's interest and needs in connecting to

		natural gas. MH will set a meeting specifically to discuss connecting RRAFN to natural gas.
MH	MH to coordinate with Legal and Property Departments to determine the process for an easement discharge for the 1962 easement south of PR 201 on RRAFN reserve land.	Ongoing. MH will reach out when we have more information.
MH	MH to connect RRAFN with someone to assist with discussing the meter reading opportunity.	Ongoing.
MH	MH to connect RRAFN with an Efficiency Manitoba representative.	For more information on Efficiency Manitoba and its Indigenous Community Energy Efficiency Program, please contact Amy Tuck at amy.tuck@efficiencymb.ca or Art Ladd at art.ladd@efficiencymb.ca or visit the following page: Indigenous Community Energy Efficiency Program — Efficiency Manitoba (efficiencymb.ca)
MH	Set a date for a meeting between MH and RRAFN leadership.	A meeting has been set for September 24th, at 10:30am in RRAFN.
MH	MH and RRAFN to coordinate on a community open house to discuss the project.	Ongoing.

Discussion category	Community comment/concern	Summary of MH response
Red River Pipeline replacement 2023	A RRAFN Councillor asked why they did not receive compensation for the Red River Pipeline replacement that was completed in 2023.	The Red River Pipeline replacement happened entirely within the public right-of-way along the south side of PR 201 and along municipal road allowances. RRAFN and MH signed a funding agreement for a community coordinator to assist with engagement and heritage monitoring activities.
Engagement	A RRAFN Councillor asked why they were being included in engagement if the new	A MH representative shared that RRAFN is included in engagement because we

Discussion category	Community comment/concern	Summary of MH response
	DC to Altona pipeline does not pass through their reserve land.	understand that RRAFN may have interest in the project as they have traditional and current land use in the project area, and that they are in close proximity to the pipeline, with the tie in points being directly next to the reserve boundaries.
Gas distribution	A RRAFN Councillor asked if they are eligible for natural gas connections.	MH representatives shared that yes, it is possible to connect the community to natural gas however MH will need to look into an estimated timeline and cost associated with this and that RRAFN would be responsible for the cost. A MH representative shared that we will connect RRAFN with an Energy Service Advisor able to look into the feasibility and cost of this request. MH's Indigenous Relations representatives will assist in liaising between RRAFN and our Energy Services Advisors and ensure our presence during those conversations to help RRAFN navigate the process.
Need for the project	A RRAFN Councillor asked about the need for the project.	A MH representative shared that the pipeline is being built to accommodate the growing demands from the town of Altona and the surrounding area.
Gas distribution	A RRAFN Councillor inquired about the energy savings between gas and electricity, noting that many of their community members have high hydro bills due to their method of heating and not having access to natural gas.	MH noted this concern. The most up to date information on electricity and natural gas rates can be found here: Residential rates (hydro.mb.ca)
Landowner compensation	A RRAFN Councillor asked whether MH is compensating affected landowners for the pipeline passing through their property.	A MH representative shared that landowners will be compensated for the easements that will run through their property and they will also be entitled to any compensation relating to crop damages, should they occur during construction.
Existing pipeline decommissioning	A RRAFN Councillor noted that the older easement that traverses through the RRAFN reserve south of PR 201 that	MH acknowledged this concern.

Discussion category	Community comment/concern	Summary of MH response
	originates from the 1960s was not done with proper consultation or compensation to RRAFN.	
Existing pipeline decommissioning	A RRAFN Councillor asked whether the capped off and de-energized pipelines within the easement that traverses through RRAFN reserve land south of PR 201 will be left in the ground.	A MH representative shared that the plan is to de-energize and cap off the pipeline within this easement and leave it in the ground. This option causes the least impact to the environment as digging up the infrastructure would cause significant ground disturbance.
Existing pipeline decommissioning	A RRAFN Councillor asked how deep the de-energized pipeline will be.	MH shared that the de-energized pipeline depth of cover ranges. The range could be between 1 meter, which is typical depth of cover for a pipeline, to 0.75m, where the pipeline was flagged as insufficient cover.
Existing pipeline decommissioning	RRAFN shared that they have development plans for their community on their reserve land south of PR 201 where the MH easement currently exists, and shared concerns that the easement and the lack of ability to build over an easement may pose challenges to their development plans.	MH noted this concern.
Existing pipeline decommissioning	A RRAFN Councillor asked whether MH can remove the infrastructure in the ground that is no longer operational within this easement.	A MH representative shared that we would look into this to determine the feasibility of MH removing the infrastructure. MH shared that typically, this has been left to the responsibility of developers as it does not require a skilled labour force and once the pipeline is de-energized, it typically does not pose a safety risk. Typically, leaving the infrastructure in the ground causes the least amount of ground disturbance.
Existing pipeline decommissioning/ Dischargement of existing easement	A RRAFN Councillor asked if this easement south of PR 201 on reserve land can be returned to RRAFN ownership once all infrastructure is removed.	A MH representative shared that we could look into this and coordinate with our Legal and Property departments on the feasibility and process for the dischargement of an easement.

Discussion category	Community comment/concern	Summary of MH response
Existing pipeline decommissioning	A RRAFN Councillor asked if there would be any chemicals left in the ground with the de-energized and capped off pipelines?	A MH representative said the only thing that would remain in the pipelines is the odour that is added to the gas to detect leaks. Depending on the age of the pipelines, there may be some asbestos remaining on the pipelines. Prior to any removal of the infrastructure, MH would determine this.
Connecting RRAFN to Natural Gas	A RRAFN councillor noted that no one has ever come to discuss gas service opportunities with the community.	A MH representative noted that connecting RRAFN with an energy service advisor will be helpful to explore gas opportunities.
Engagement	A RRAFN Councillor asked what other kind of feedback we have heard from other engaged Nations.	A MH representative shared that we met with the Manitoba Métis Federation on July 15th, and they expressed interest in heritage work. A MH representative also shared that we are meeting with Peguis First Nation on July 25th.
Engagement	A RRAFN Councillor shared that it would be beneficial to host an engagement event bringing together all the engaged Nations on this project.	A MH representative noted this and shared that we have done this on previous projects, and it has been well-received by communities as an opportunity to learn from each other.
Construction/ Safety/ Red River Pipeline replacement	A RRAFN Councillor shared that they have safety concerns for their community members regarding the construction of the new DC to Altona pipeline, as during the previous Red River pipeline replacement construction, there was increased traffic along PR 201 with some equipment and materials left overnight which children played on.	A MH representative shared that we could work with RRAFN to mitigate this concern and could look into, for example, hiring local security for the evening and overnight.
Economic Activities	A RRAFN Councillor asked how this project will benefit RRAFN.	Through engagement with RRAFN, we can explore opportunities for RRAFN during the construction of the pipeline such as employment opportunities, on the job training, or the funding of an Indigenous Knowledge Study.
Other	A RRAFN Councillor shared that they have been working with MH on meter reading, however there are some	MH will look how meter readings are done at RRAFN and if there is opportunity

Discussion category	Community comment/concern	Summary of MH response
	concerns when the readings are not done in real time.	for someone from RRAFN to be hired to read them. MH also shared that we would connect RRAFN with Efficiency Manitoba who can assist the community in energy savings, as well as the hiring of an energy efficiency advocate from RRAFN. Please contact Amy Tuck at amy.tuck@efficiencymb.ca or Art Ladd at art.ladd@efficiencymb.ca or visit the following page: Indigenous Community Energy Efficiency Program — Efficiency Manitoba (efficiencymb.ca)
Gas distribution	A RRAFN Councillor asked about the difference in the cost of natural gas and hydroelectricity.	The most up to date information on electricity and natural gas rates can be found here: Residential rates (hydro.mb.ca)
Construction/ Safety	A RRAFN Councillor asked about the safety measures in place to ensure there are no leaks or explosions on pipelines.	A MH representative shared that the following safety measures help us ensure our pipelines are monitored for safety: • All pipelines are built to CSA Standards Z662:23. All steel pipe and fittings meet CSA Z245.1 These are national standards followed by all Canadian gas utilities. • The new pipeline will be smart-pigged,which is a smart device which helps confirm that nothing was overlooked or inadvertently damaged during installation. • The new pipe will be inspected for coating deficiencies using electrical currents to detect anomalies. • Pressure testing will be completed prior to putting the line into service. Lines are tested to 140% of their maximum operating pressure. Hydraulic (water) pressure tests are used wherever

Discussion category	Community comment/concern	Summary of MH response
		possible instead of pneumatic (air), which increases onsite safety. • Cathodic monitoring is done every year to measure the effectiveness of the pipeline's cathodic protection system, which protects the pipeline from corrosion. • Leak surveys are done every year, this is done by a contractor using handheld equipment, no ground disturbance is required. • Depth of cover surveys are performed on a multi-year cycle. • Water crossing surveys are performed on a multi-year cycle. • Integrity digs are performed on an as needed basis to visually inspect areas where other tests indicate anomalies (some localized ground disturbance possible). • Coating surveys are conducted if cathodic monitoring indicates irregularities
Safety	A RRAFN Councillor asked if there are any safety concerns to their community.	A MH representative shared that a leak would be detected through the smell of the odour added to the gas, and MH would rely on RRAFN to report the smell.
Economic Activities	A RRAFN Councillor asked if there are any revenue sharing opportunities on natural gas.	A MH representative shared that we do not produce natural gas within Manitoba. Rather it is bought from elsewhere (typically the United States or western Canada) and moved through our infrastructure, therefore there would be no opportunity for revenue sharing.
Employment, Training, and Business Opportunities	A RRAFN Councillor inquired about the employment and training opportunities that would come with this new pipeline project.	A MH representative shared that we are interested in hearing about RRAFN's employment, training and business interests in the project. When drafting the Request for Proposals for contractors to bid on the project, we can include as part

Discussion category	Community comment/concern	Summary of MH response
		of "Indigenous content" an evaluation of potential contractors' plans to include Indigenous participation in their workforce and use of Indigenous businesses as subcontractors or suppliers. Once a contractor is identified, MH can work with them to identify opportunities for RRAFN that may include stipulations such as requiring the contractor to fuel at the RRAFN gas bar, for example.
	A RRAFN Councillor asked whether this project would affect the ring dyke?	An MH representative shared that we considered this when routing the pipeline, which is why we moved the control point one mile east to avoid the dyke rather than adding the control point to the east tie in point (see map of the project).
Engagement	A RRAFN Councillor shared their preference for engagement on the project which would include a community open house for community members which would discuss the following topics: • To learn more about gas projects • To ease any safety concerns community members may have • To educate community members on right of ways and easements near their community • To gauge community interest on what the "Indigenous content" should include in the request for proposals for contractors	MH shared that we would work with RRAFN to plan a Community Open House.
Construction	A RRAFN Councillor inquired about the total construction time needed for this project.	A MH representative shared that construction is estimated to take anywhere from 6 to 12 months.

Meeting notes

Meeting: S65R Tap Round 2 Engagement and Information on Dominion City to Altona Gas Pipeline Project meeting with Peguis First Nation		
Date: July 25, 2024	Time: 13:30 14:30	Location: MS Teams
Meeting type (virtual or in-person)	Virtual	
Facilitator	Karine Martel	
Note-taker	Emily Unger	
Number of participants	6	
Attendees		
Name	**Organization**	
Garth Sutton	Peguis First Nation	
Kinnan Stevenson-French	Peguis First Nation	
Karine Martel	Manitoba Hydro	
Maria M'lot	Manitoba Hydro	
Geneva Cloutis	Manitoba Hydro	
Emily Unger	Manitoba Hydro	
Meeting description		
Round 2 engagement meeting between Manitoba Hydro and Peguis First Nation (PFN) to introduce the Dominion City to Altona Transmission Gas Pipeline Project.		

Owner	Action item:	Status
Manitoba Hydro	Coordinate meeting between Peguis First Nation, Roseau River Anishinaabe First Nation (RRAFN), the MMF and project archaeologist (Western Heritage) for the Dominion City to Altona Transmission Gas Pipeline Project.	Ongoing
Manitoba Hydro	Confirm the width of the trenches for the Dominion City to Altona Transmission Gas Pipeline Project, and share information with PFN.	Complete. The trench depth will be about 1.3 meters deep and 1 meter wide and will be back filled with the original soil.
Manitoba Hydro	Determine if trenches along the route for the Dominion City to Altona Transmission Gas Pipeline Project will be backfilled or filled with the original soil and share information with PFN.	Complete. Complete. The trench depth will be about 1.3 meters deep and 1 meter wide and will be back filled with the original soil.

Manitoba Hydro	Speak with RRAFN and the MMF to determine their interest in participating in a ceremony with PFN prior to heritage work being conducted on the Dominion City to Altona Transmission Gas Pipeline Project.	Ongoing
Manitoba Hydro	Contact Energy Services to inform them that PFN is interested in energy generation opportunities, specifically with wind turbines.	Ongoing
Peguis First Nation	Develop proposal for heritage monitoring and desktop work for the Dominion City to Altona Transmission Gas Pipeline Project.	Ongoing
Peguis First Nation	Review LIDAR to determine if any areas of special interest along the Dominion City to Altona Transmission Gas Pipeline Project exist and provide Manitoba Hydro more information upon review.	Ongoing

Discussion category	Community comment/concern	Summary of MH response
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN noted they have interest in aiding the project archaeologist with the HRIA. PFN indicated that they are interested in having someone from PFN monitor, take notes, and ask questions, of the project archaeologists, as well as support the HRIA reporting process for the Dominion City to Altona Transmission Gas Pipeline Project.	Manitoba Hydro noted PFN's interest in supporting the project archaeologist in heritage monitoring and desktop work. Manitoba Hydro noted that PFN can provide a proposal to Manitoba Hydro to undertake this work, and that Manitoba Hydro can review this proposal and help coordinate the work. Manitoba Hydro recommended this as a discussion item for the meeting with the project archaeologist and the other nations engaged on the project (RRAFN and the MMF).
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN shared that an area to the north of the gas pipeline, as well as near the reservoir may hold higher potential for the presence of heritage resources.	Manitoba Hydro noted this concern.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN inquired about the depth and width of the trenches on this project.	Manitoba Hydro shared that the trenches will be approximately 1.3 metres deep and 1m wide. Manitoba Hydro was able to share that there is currently ten metres of existing easement on each side of the pipeline, and that they are looking to obtain an additional 15 metres of

Discussion category	Community comment/concern	Summary of MH response
		easement on each side of the pipeline, for a total of 50 metres. Manitoba Hydro explained that while they may obtain this additional easement, that does not mean that all 50 metres of width will be trenched.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN inquired if the trenches will be backfilled or filled with the original soil from the region.	Manitoba Hydro can share that the trenches will be filled with the original soil.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN shared that there was previously a swamp in the region, and that the landscape has changed drastically since the 1800's. They believe that the swamps were further west, towards Altona, and that this is likely not to be a concern for this project.	Manitoba Hydro thanked PFN for sharing this information.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN noted that other projects they have been engaged in within the area have identified heritage resources, especially along the Red River. They noted concerns for heritage resources to be present in this project.	Manitoba Hydro thanked PFN for sharing this information, and noted that while the area was previously developed, no heritage assessments took place. They noted the importance of heritage work in the region, and said they would pass on information on areas of concern to their contractors as well, as it is important to determine if heritage resources are still present along the pipeline. Manitoba Hydro also clarified that no work would be occurring at the Red River crossing, as this work was completed in 2023.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN requested that prior to heritage work commencing, that a ceremony take place. They also shared that they welcome RRAFN and the MMF to participate in the ceremony.	Manitoba Hydro agreed that it would be suitable for a ceremony to take place prior to commencing heritage work, and that they are happy to facilitate bringing the MMF and RRAFN together, as well as provide support for an engagement meeting or workshop with all three

Discussion category	Community comment/concern	Summary of MH response
	PFN also shared they would be willing to share what they are working on with other engaged nations in regard to standards and guidelines for heritage resources, and would like to collaborate to help determine an agreed upon set of standards and protocols for heritage.	Nations. Manitoba Hydro will discuss this with RRAFN and the MMF to determine their interest in participating in a ceremony with PFN. Manitoba Hydro told PFN that if other nations are completing their own studies and willing to share this information, they can do so, however it would be necessary for other the nations to confirm they are willing to share information with PFN.
Heritage – Dominion City to Altona Transmission Gas Pipeline Project	PFN identified previous heritage work undertaken in the region by the MMF was noted to be challenging due to environmental factors including weather. They were also made aware that there was heritage resources found in the surrounding region.	Manitoba Hydro thanked PFN for sharing this information and let PFN know this information will be valuable for Manitoba Hydro when undertaking cultural awareness training with contractors. Manitoba Hydro asked PFN if they could identify any important areas or heritage resources that may be present in the project region. PFN said they would review the LiDAR in depth and provide Manitoba Hydro more information upon review.
Generation	PFN discussed the St Joseph wind farm and identified interest in undertaking a wind generation project with Manitoba Hydro. PFN also shared information on the Cowessess First Nation renewable energy project as an example.	Manitoba Hydro had previously provided PFN contact information with an Energy Services Advisor to further explore this opportunity. Manitoba Hydro encouraged PFN to reach out to the previously shared contact. Manitoba Hydro mentioned they would let Energy Services know that PFN is interested in associated opportunities. Manitoba Hydro will review the Cowessess First Nation renewable energy project.
Generation	PFN asked if the St Joseph wind farm sells the power they produce to Manitoba Hydro.	Manitoba Hydro purchases St Joseph Wind's electricity generation under a 27-year power purchase agreement.

Manitoba Hydro
360 Portage Ave (18) • Winnipeg, Manitoba • R3C 0G8
Telephone: 1-877-343-1631

August 2, 2024

[Name]
[Mailing address]

Dear [Name]

Dominion City to Altona gas transmission pipeline

Manitoba Hydro is planning to construct a new 8-inch steel gas transmission pipeline line to connect Dominion City gate station to a termination point north of Altona. This project will address gas capacity constraints from new business development in the area.

I am reaching out to you because the preferred route Manitoba Hydro has developed for the new transmission pipeline crosses property you own, [insert legal description]. I have included a map of the newly proposed transmission pipeline with this letter. The planned gas pipeline is routed in-field from an existing gate station east of Dominion City to the termination point north of Altona. A majority of the proposed line has been routed in-field to follow existing gas pipeline easement, with some exceptions to avoid homes and businesses.

As part of the engagement process, Manitoba Hydro will be collecting feedback from landowners, Indigenous communities, interested parties, and the public on the preferred route. This feedback will help determine the final line placement and inform the environmental assessment work being undertaken. We plan to submit our environmental assessment to Manitoba Environment and Climate Change for approval in Winter 2024 to seek approval to start construction in 2026.

We want to hear from you

You are encouraged to share your feedback on the preferred route through our online feedback portal, at our open house, at one of our virtual information sessions, or with me directly at the phone number provided below.

Open House

Drop-in any time between **5:30 and 8:30 p.m.** on **August 22** at the Dominion City Community Hall to learn more about the project and share your feedback.

Virtual information sessions

We will be holding virtual information sessions on Microsoft Teams on the following dates:

- August 14 at 12:00pm
- August 15 at 7:00pm

To register for a session, visit the project website www.hydro.mb.ca/dominioncity-altona. If you have any difficulties or need assistance registering, please email us at projects@hydro.mb.ca or call 1-877-343-1631.

Online feedback portal

On the project website, we have an interactive feedback portal for you to share your feedback about the project. This will be available on our website until August 31, 2024 at: www.hydro.mb.ca/dominioncity-altona.

If you would like to schedule a meeting, please contact me directly at manger@hydro.mb.ca or 204-391-7355. If you would like to discuss the project or have feedback you would like to share, I would be happy to receive it by email, phone call, or letter.

Thank you,

Megan Anger
Environmental Specialist, Transmission & Distribution Environment and Engagement
204-391-7355

360, avenue Portage, bureau 18 • Winnipeg (Manitoba) • R3C 0G8
Téléphone : 1 877 343-1631

Le août 2024

«Address»

Objet : Gazoduc reliant Dominion City à Altona

Bonjour,

Nous vous écrivons pour vous informer que Manitoba Hydro envisage d'aménager un nouveau gazoduc en acier de 20 centimètres pour relier la station de distribution de Dominion City à un point de terminaison situé au nord d'Altona. Ce projet permettra de résoudre les problèmes de capacité gazière qui se posent en raison de l'arrivée de nouvelles entreprises dans la région.

Vous recevez la présente lettre du fait que le tracé privilégié pour ce projet traverse des biens-fonds qui vous appartiennent («Legal»). Ce tracé, que vous trouverez sur la carte ci-jointe, reliera une station de distribution qui se trouve à l'est de Dominion City jusqu'au point de terminaison, au nord d'Altona. La plus grande partie de la ligne proposée passera à travers les champs en suivant le corridor de la servitude actuellement prévue pour l'aménagement de gazoducs, sauf à quelques endroits où une déviation du tracé permettra de contourner des zones résidentielles et commerciales.

Dans le cadre de ses travaux de consultation, Manitoba Hydro recueillera les commentaires des propriétaires fonciers, des communautés autochtones, des parties intéressées et du public au sujet du tracé privilégié. Les observations reçues éclaireront le choix de l'emplacement définitif de la ligne de transport de gaz naturel et le déroulement des activités d'évaluation environnementale en cours. Nous prévoyons de présenter notre rapport d'évaluation environnementale à Environnement et Changement climatique Manitoba à l'hiver 2024 afin de solliciter l'approbation du ministère en vue d'une mise en chantier en 2026.

Nous voulons connaître votre avis.
Nous vous invitons à partager vos idées au sujet du tracé privilégié dans notre portail en ligne, lors de notre journée portes ouvertes ou de l'une de nos séances d'information en mode virtuel ou, encore, directement avec moi, au numéro de téléphone figurant à la fin de la présente lettre.

Séance portes ouvertes
Vous pouvez vous présenter à tout moment le **22 août 2024** entre **17 h 30 et 20 h 30** au Dominion City Community Hall pour en savoir plus et vous exprimer sur le projet.

Séances d'information en mode virtuel
Nous tiendrons des séances d'information en mode virtuel sur Microsoft Teams aux dates et heures suivantes :

- le 14 août à midi;
- le 15 août à 19 h.

Manitoba Hydro 360, avenue Portage, bureau 18 • Winnipeg (Manitoba) • R3C 0G8
Téléphone : 1 877 343-1631

Vous pouvez vous inscrire à une séance sur le site Web du projet à www.hydro.mb.ca/dominioncity-altona. Si vous éprouvez des difficultés ou avez besoin d'aide pour vous inscrire, veuillez nous envoyer un courriel à projects@hydro.mb.ca ou composer le 1 877 343-1631.

Portail consultatif en ligne

Rendez-vous dans notre portail interactif pour vous exprimer sur le projet. Le portail sera accessible sur le site Web du projet jusqu'au 31 août 2024 à l'adresse www.hydro.mb.ca/dominioncity-altona.

Si vous souhaitez planifier une réunion, veuillez communiquer directement avec moi à l'adresse manger@hydro.mb.ca ou au 204 391-7355. Si vous désirez discuter du projet avec moi ou m'exprimer votre avis, vous pouvez le faire par courriel, par téléphone ou par la poste.

Je vous remercie de votre attention,

Megan Anger
Spécialiste de l'environnement, Transmission et distribution, environnement et consultation
204-391-7355

Dominion City to Altona transmission gas pipeline

Virtual Information Session

August 14, 2024

To request accessible formats visit hydro.mb.ca/accessibility

Meeting Outline

- Welcome and Introductions
- Project presentation by Manitoba Hydro
  - Project background
  - Routing
  - Project and engagement timelines
- Questions and Answers

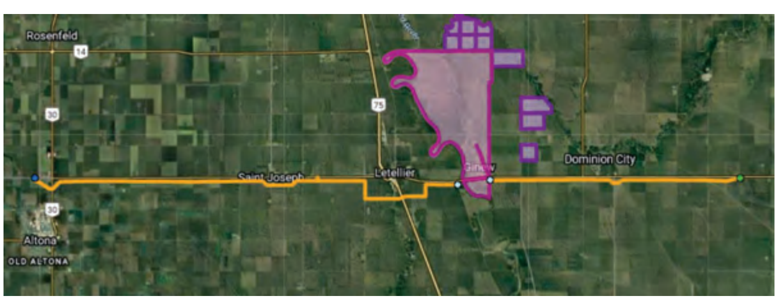
About the project

- 36.6 km of 8-inch steel transmission pipeline from east of Dominion City to north of Altona.
- Majority of pipeline parallels existing pipelines built in 1962 and 1989, in-field
- Manitoba Hydro will prepare and submit an environmental assessment report to Manitoba Environment and Climate Change to seek approval for a Class 2 Development licence.

Why is this project needed?

The pipeline will connect to an existing pipeline system to address capacity constraints in the area

Routing

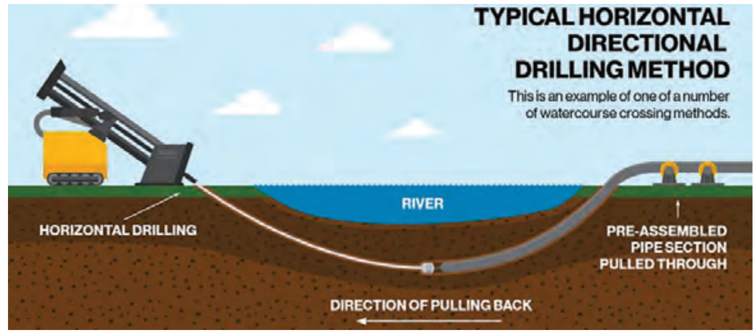


Construction Methods

- Horizontal directional drilling (HDD)
  - Drains
  - Railways
  - Roadways

Trenching
  - In-field

Horizontal directional drilling (HDD)



Horizontal directional drilling (HDD)

Trenching

Potential impacts within the project area

- Noise disturbance
- Impediments to traffic during construction
- Impacts to crops and access

Engagement Schedule

- July 2024: Start of engagement process
- December 2024: File environmental assessment report
- 2024 - 2025
- June 2026: Construction start if regulatory approval received

How we are engaging

- Mail-outs (e-mails and letters)
- Virtual information sessions
- In-person open house
- Online map & feedback portal

Concerns we've heard so far

- Impacts to agriculture
- Changes in access to properties
- Property values/ compensation
- Safety measures in place

Other upcoming gas projects

- Transmission - Altona to Winkler
  - Staged approach allows observation of load growth magnitude before finalizing Altona to Winkler design and diameter
  - Either 6-inch or 8-inch steel pipeline

Manitoba Hydro

Questions, Concerns, Feedback?

Visit:
https://www.hydro.mb.ca/corporate/operations/transmission/#dominion-city-altona

Megan Anger, Environmental Specialist
Phone: (204) 391-7355
Email: manger@hydro.mb.ca

Manitoba Hydro

Meeting notes

Meeting: Dominion City to Altona Gas Transmission Pipeline Public Open House		
Date: August 23, 2024	Time: 5:30 8:30pm	Location: Dominion City Community Hall
Meeting type	Open House	
Manitoba Hydro representatives	Megan Anger, Lindsay Thompson, Emily Unger, Ryan Romans, Nick Bruce, Carlos Gomez	
Number of participants	15	
Meeting description		
Manitoba Hydro hosted an open house in Dominion City, Manitoba to share information and gather perspectives and feedback on the proposed Dominion City to Altona Gas Transmission Pipeline Project. The event was a drop in style, where participants were invited to view storyboards and maps that highlighted key components of the proposed project, and had the opportunity to ask questions, and share their thoughts and concerns.		

Owner	Action item:	Status
Manitoba Hydro	A property owner shared concerns that the pipeline on their property is exposed. Manitoba Hydro Gas representatives responded that they would look into the issue.	Complete. A Manitoba Hydro service person met with the landowner and determined there were no exposed pipelines on their property.
Manitoba Hydro	Confirm the location of the Pembina Valley water line	Complete.
Manitoba Hydro	A few landowners who attended the open house informed Manitoba Hydro that they did not receive a letter to inform them of the open house. Manitoba Hydro to add the landowners to their contact list for the project.	Complete.
Manitoba Hydro	Look into whether compensation was provided for a landowner for the installation of a control structure near their property.	Complete. Manitoba Hydro confirmed that at the time of construction, the control point was constructed on Crown Land.
Manitoba Hydro	Develop a zoomed in map of the project area for a landowner and connect the landowner with an ESA to see if they can tap into existing system.	Complete. Applications for gas connection can be submitted through:

		Service connections (hydro.mb.ca)
Manitoba Hydro	Look into why the transmission line at Road12E is sagging and options for the line.	In progress. Manitoba Hydro confirmed that there is a 15'9" overhead height requirement, and are looking into options to resolve this issue.
Manitoba Hydro	A landowner suggested a route change near Letellier as there is drainage in the area, and the road crossing is frequented by heavy equipment.	In progress. Manitoba Hydro confirmed that a route change is possible and is working with the landowner to confirm a route adjustment on their property.
Manitoba Hydro	Confirm whether or not an above ground valve that was moved onto a landowner's property will be relocated again if the proposed pipeline is built.	Complete. Manitoba Hydro confirmed that this is a farm tap that was constructed in 2020 and will remain in its current location.
Manitoba Hydro	A landowner would like more information on whether Manitoba Hydro could build a larger pipe to his neighbor's property so that they could share.	Complete. Applications for gas connection can be submitted through: Service connections (hydro.mb.ca)

Discussion Category	Community comment/ concern	Summary of Manitoba Hydro response
Construction	A participant asked who the contractor is.	Manitoba Hydro has not tendered the work yet. We still need to file an environmental assessment report for the project and would need to receive regulatory approval to proceed.
Compensation	One participant shared that they would prefer if we purchased their property.	Manitoba Hydro is looking to secure easement for the entirety of the right-of-way and will not be purchasing any property.

Discussion Category	Community comment/ concern	Summary of Manitoba Hydro response
Construction	A participant asked how deep the pipeline is installed.	Trenching will be done in-field and trench depth would be approximately 1.3 meters (the top of pipe would be approximately 1 meter below surface).
Construction	Many participants shared concerns about the depth of the pipe. A participant shared that the frost pushes up the pipe.	Manitoba Hydro builds the pipelines to meet or exceed CSA requirements.
Exposed pipes	A participant shared that they currently have exposed pipe on their property at the top of a ridge.	Manitoba Hydro will investigate this issue.
Drains	A participant shared concerns with blocking external drains	Manitoba Hydro noted this information. Field drains are contoured as close to original ground after installation of pipeline is complete.
Schedule	A participant shared that their ideal timeline would be construction starting at the end of September.	Manitoba Hydro has to file an environmental assessment report for the project and would need to receive regulatory approval to proceed. The construction schedule will depend on if/when an Environment Act Licence is received.
Tile drainage	Participants shared concerns about the project impacting their ability to install tile drainage. Tile drainage is installed at 6 feet. A participant shared that they are concerned about impacts to their grandkids. They are concerned about the effects 100 years from now.	A Manitoba Hydro representative shared that landowners would still be able to install tile drainage, but they would need a safety watch.
Exposed pipes	A participant asked about the two or three spots near Roseau River Anishinabe First Nation that have not been fixed. Why have they not been repaired?	Manitoba Hydro shared that they were having challenges with getting contractors to do the repairs.
Old infrastructure	A participant shared concerns with Manitoba Hydro leaving old infrastructure in the ground.	Manitoba Hydro thanked the participant for sharing concerns.
Water	A participant asked if Manitoba Hydro has considered the Pembina Valley water line.	Manitoba Hydro will look into the water line.

Discussion Category	Community comment/ concern	Summary of Manitoba Hydro response
Previous project	A participant shared that the control structure was installed on their property and they were not compensated. They also shared frustrations that the contractor staged equipment on their property.	Manitoba Hydro to investigate this concern.
Mitigative route	A participant drew a mitigative route segment to address concerns with routing on a 7-foot deep field drainage. They also shared concerns about access. They recommended moving the route to the northern and western boundary of the quarter section, rather than route through the middle of the quarter section	Manitoba Hydro will look into the mitigative route.
Agriculture	A participant shared that they still have issues with yield after the wind project in St. Joseph. They shared that they have had to plant alfalfa in areas with poor yield as it produces more nitrogen and creates deeper roots.	A Manitoba Hydro representative explained the crop damages process.
Existing line	A participant shared that they were told they could not tap off the existing line because there was not enough available gas. They would like Manitoba Hydro to build a bigger pipe to their neighbours that they could tap off of.	Manitoba Hydro shared that applications for gas connection can be submitted through: Service connections (hydro.mb.ca)
Existing line	A landowner shared they receive annual notifications from Manitoba Hydro stating that the landowner must refrain from driving heavy equipment within 100 metres of the pipeline	Manitoba Hydro to follow up with landowner and confirm the accuracy of this letter.
Crop damage	A participant asked if there would be damage to crops during construction. They shared that construction taking place in the	There is the potential for crop damages during construction. Manitoba Hydro will work with affected landowners to provide compensation for damage or losses, should they arise.

Discussion Category	Community comment/ concern	Summary of Manitoba Hydro response
	winter may mitigate potential losses.	
Schedule	One participant stated that if trenching is to occur in the winter, there is concern for issues with draining in the spring.	Manitoba Hydro noted this concern.
Pressure	A participant asked what pressure the new line will operate at.	Manitoba Hydro shared that the line will operate at a maximum operating pressure of 6070 kPa (880 psig).
Schedule	A participant asked how long construction will take.	Manitoba Hydro shared that construction is anticipated to take 6-12 months.
Road access	A participant shared that there is no through road access to the pipeline on the proposed route along their property. They asked how Manitoba Hydro plans to access the area.	Manitoba Hydro shared that if they need to gain access to a property, they will develop an access agreement with the landowner.
Connections	A participant asked if the pipeline connects to other pipelines in the area.	Yes, the pipeline does connect to other lines in the area at tie-in locations shown on the project overview map.
Project description	A participant asked about the length of the line, and potential connections to other lines.	The proposed pipeline length is approximately 36.6km, from Dominion City to Altona. It is anticipated there will be a need for a future line from Altona to Winkler, which similar to this project, is a Class 2 development and would require an Environment Act Licence.
Compensation	A participant asked if there is compensation for seeding if the crops have already been seeded for the year.	Yes, compensation is provided for crop damages. The amount of compensation is analyzed on a case-by-case basis, and the market value of that year is considered prior to settling on a compensation agreement. Compensation is often provided for the first year of loss, and can potentially be provided for two consecutive years if yields have been considerably reduced following construction activities on the property.
Construction	A participant inquired about the number of kilometers of trench, which is dug within a day.	This depends on several factors, including weather and soil conditions, temperature, and the contractor undertaking the project.
Project description	A participant asked how deep the section of pipeline under the Red	The pipeline is approximately 30 meters below the riverbed.

Discussion Category	Community comment/ concern	Summary of Manitoba Hydro response
	River is, that runs through Roseau River Anishinaabe First Nation.	
Connections	A landowner asked if the price of gas will decrease once the new pipeline is in place.	No, the cost of natural gas is dependent on the market and public utilities board (PUB).

Dominion City to Altona Gas Transmission Pipeline Feedback Form

Do you have any concerns about the preferred route?

____
____
____
____
____
____

Do you have any suggestions on how to mitigate or address your concerns?

____
____
____
____
____
____

Please provide any general comments regarding the project

____
____
____
____
____
____

Would you like to receive project updates?

☐ Yes ☐ No

If yes, please provide us:

Name: ____

Email address: ____

Please return this completed comment sheet to a Manitoba Hydro representative at the open house or feel free to complete at home and mail to us at:

Attn: Maria M'Lot

360 Portage Avenue (14)
Winnipeg, Manitoba R3C 0G8

Manitoba Hydro

Dominion City to Altona Gas Transmission Pipeline Engagement Evaluation Form:

Name (Optional):

Did you find this meeting to be a useful form of engagement? (Circle one: Ten being the most useful)

1	2	3	4	5	6	7	8	9	10

What did you like about today?

What would you change about today?

What is something you learned or will take away with you?

Other comments:

Dominion City to Altona Gas Pipeline

Information Sheet

Manitoba Hydro is planning to construct a new 8-inch steel transmission pipeline running approximately 36.6 km from east of Dominion City to north of Altona. This project will connect to an existing pipeline system to address gas capacity constraints from new business development in the area.

Construction Methods

Trenching involves excavating the ground and placing the pipeline within the excavated area.

- A typical trench depth is 1.3 meters, and the top of the pipe lays 1 meter below the surface.

Horizontal Directional Drilling (HDD) is used to install the pipeline where it crosses drains, railways and roadways.

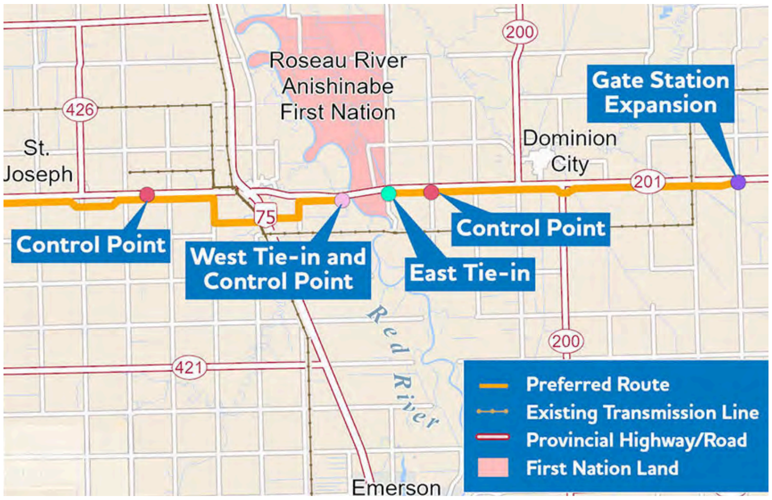
- HDD is a technique used to install underground utilities, like pipelines. A tunnel that follows an arc shape is drilled under the designated area, and the pipeline is pulled through the drilled underground tunnel, resurfacing on the opposite side.

Environmental Assessment

An environmental assessment is a multi-disciplinary evaluation of a project that examines what potential effects the project might have on the human and natural environment and how to minimize potential effects. This project is classified as a Class 2 development under The Environment Act. An environmental assessment report will be developed and submitted to the Environmental Approvals Branch of Manitoba Environment and Climate Change for review.

Timeline

December 2024	File environmental assessment for regulatory review
Summer 2026	Licensing decision anticipated
Summer 2026	Construction begins if license is approved



Contact us for related inquiries

1-877-343-1631

projects@hydro.mb.ca

Manitoba Hydro
energy for life

The following storyboards were displayed at the open house engagement sessions in Dominion City and Roseau River Anishinabe First Nation.

Community Open House

Dominion City to Altona gas transmission pipeline

To request accessible formats visit hydro.mb.ca/accessibility.

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What is the project?

A new 8-inch steel transmission pipeline running approximately 36.6 km from east of Dominion City to a termination point north of Altona.

Why are we doing this?

The pipeline will connect to an existing gas pipeline system to address capacity constraints in the area.

When is it happening?

- **December 2024** File environmental assessment
  For regulatory review
- **Summer 2026** Licensing decision
  Anticipated
- **Summer 2026** Construction
  If licence is approved

Schedule subject to change

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Construction Methods

Trenching involves excavating the ground and placing the pipeline within the excavated area.

- A typical trench depth is 1.3 meters, and the top of the pipe lays 1 meter below the surface.

Horizontal Directional Drilling (HDD) is used to install the pipeline where it crosses drains, railways and roadways.

- HDD is a technique used to install underground utilities, like pipelines. A tunnel that follows an arc shape is drilled under the designated area, and the pipeline is pulled through the drilled underground tunnel, resurfacing on the opposite side.

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Environmental Assessment

An **environmental assessment** is a multi-disciplinary evaluation of a project that examines what potential effects the project might have on the human and natural environment and how to minimize potential effects.

- This project is classified as a Class 2 development under The Environment Act.
- An environmental assessment report will be developed and submitted to the Environmental Approvals Branch of Manitoba Environment and Climate Change for review.

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Compensation

For this project, Manitoba Hydro is looking to secure easements along the preferred route.

Easements allow for landowners to maintain ownership and continue farming practices. Compensation for easements is based on current market value of the land.

Affected property owners are compensated for:

- **Easement for below-ground gas infrastructure**
- **Easement for above-ground gas infrastructure, if applicable**
- **Crop damages during construction**
- **Ancillary damage during construction, if applicable**

Our goal is to make every reasonable effort to develop a mutually acceptable agreement for compensation on privately owned land.

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Keep in touch

- If you have any further questions, send them to **projects@hydro.mb.ca** or call **1-877-343-1631**
- You can stay up to date with project information at **https://www.hydro.mb.ca/corporate/operations/transmission/#dominion-city-altona**

Scan this QR code to visit the project webpage.

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Manitoba Hydro

360 Portage Ave (18) • Winnipeg, Manitoba • R3C 0G8
Telephone: 1-877-343-1631

Subject: Manitoba Hydro – Engagement Circle for Dominion City to Altona gas transmission pipeline

Manitoba Hydro would like to invite up to four representatives from your nation to attend an engagement event on **October 30th, 2024 from 10am – 3pm in Roseau River Anishinabe First Nation at their Niichi Oasis Gaming Centre** about a proposed 8-inch steel natural gas transmission pipeline proposed to run approximately 36.6 km from east of Dominion City to northwest of Altona (see attached map).

Manitoba Hydro has heard interest in a collaborative engagement event that would bring engaged nations together to discuss the project, hear each other's values, interests and concerns, and to share feedback about the project and the environmental assessment process.

Representatives are being invited from Roseau River Anishinabe First Nation, Peguis First Nation, and the Manitoba Métis Federation. Your representatives may include Knowledge keepers, Elders, women, youth, or leadership representatives from your nation that you feel would bring valuable perspectives and feedback to this discussion.

The event will include a combination of presentations, interactive activities/stations, and group discussions focused on sharing information and hearing concerns and perspectives that are important to consider in the environmental assessment (EA) report that Manitoba Hydro will submit to Manitoba Environment and Climate Change to seek approval as a Class 2 development.

Lunch will be provided, and participants will be reimbursed for their time and mileage expenses in accordance with Manitoba Hydro's reimbursement policy.

A high-level agenda is included below:

Time	Agenda item
10:00 to 10:30 am	Opening prayer, welcome & introductions
10:30 to 11:00 am	Project updates and overview of the EA process
11:00 to 11:15	Break
11:15 am to 12:00 pm	Environmental Assessment updates and activity
12:00 to 1:00 pm	LUNCH
1:00 to 1:30 pm	Environmental assessment activity cont'd
1:30 to 2:15 pm	Interactive stations
2:15 to 2:30	Break
2:30 to 3:00 pm	Open discussion and closing

360 Portage Ave (18) • Winnipeg, Manitoba • R3C 0G8
Telephone: 1-877-343-1631

If you are interested in having representatives from your nation participate, feel free to forward this invitation to those representatives, and either accept this meeting request or respond to me by email (mmlot@hydro.mb.ca) by **October 28, 2024** to confirm attendance and share any dietary restrictions.

If you have any questions, please contact me at *mmlot@hydro.mb.ca* or 204-390-2468.

We look forward to continuing the discussion and hearing what matters to you.

APPENDIX BA

Heritage Technical ReportA

December 2024A

Manitoba Hydro

Technical Report
Manitoba Hydro – South Loop Natural Gas Capacity DC to Altona Upgrade Project

Prepared for:
Manitoba Hydro
360 Portage Ave (18)
Winnipeg, MB
R3C 0G8

Prepared by:
Jim Finnigan
Lisa Bobbie
Ashley Cameron
Western Heritage

October 7, 2024
v. 1.0

Executive Summary

Manitoba Hydro (MH) plans to install approximately 37 kilometres of gas pipeline between Altona and Dominion City, Manitoba. The proposed pipeline will cross the Red River and Riviere aux Marais. The project area is located within the Rural Municipalities (R.M.) of Rhineland, Montcalm, and Emerson-Franklin.

A detailed history of the project area was compiled and information on existing sites in the area was obtained from the HRB. This information was used in addition to lidar and other information on landforms to screen the project for heritage concerns. Five areas of concern were identified and on June 12, 2024, two Western Heritage employees, Ashley Cameron and Emili Bohle, conducted a windshield survey of the five areas. The information from the windshield survey helped in validating the initial screening results.

Based on the history and the windshield survey, there are areas of heritage potential along the pipeline right of way. In addition, there are four existing heritage sites located within the LAA. Based on these finding, Western Heritage recommends that a HRIA be completed for this development.

Table of Contents

1. Project Description

1.1 Objectives

The objective of this report is to document potential archaeological concerns associated with the proposed Altona to Dominion City gas pipeline upgrade project. This report describes the existing cultural historical background, outlines initial heritage screening of the project and describes a windshield survey of areas of concern identified in the initial project screening. Finally, this report outlines any heritage concerns and makes recommendations on addressing these concerns.

1.2 Project Description

Dominion City to Altona is part of the South Loop system, which connects to the TC Energy system at existing gate stations near both Dominion City and Oakville. There are two existing 4' pipelines running from Dominion City to Altona within an existing easement built in 1962 and 1989. The South Loop system has reached capacity and requires additional supply to meet the needs of existing and future customers in the area serviced by the South Loop.

The proposed project consists of the construction of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 36.6 km, beginning at an existing gate station located approximately 7.5 km to the east of Dominion City and ending at a control point north of Altona. The proposed pipeline will tie into an existing pipeline installed beneath the Red River by horizontal directional drilling. The proposed right-of-way (RoW) width for the pipeline project will range from 30 to 40 meters.

An existing gate station is located on NW-18-2-4-E, approximately 7.5 kilometers east of Dominion City. The existing gate station footprint will be expanded approximately 10 meters by 10 meters to the south to allow for tie-in to TC Energy and installation of above-ground valve components.

2.0 Study Area

The proposed study area is located within the Rural Municipalities (R.M.s) of Rhineland, Montcalm, and Emerson-Franklin, on NTS 1:50,000 topographic map sheet 62H/ 03. To be consistent with the EA document being prepared for this study, a regional assessment area (RAA) of 5 km around the project right of way (RoW) and a local assessment area (LAA) of one km around the project RoW are defined. Figure 1 shows the entire project area.

Figure 1: Map of the South Loop Development Showing the LAA and RAA - see map 6-1 attached

The RAA is situated in the Prairie Ecozone, the northern extension of the former open grasslands of the Great Plains of North America. Topographic relief is generally subdued (Smith et al, p205). Originally, a large part of this ecozone in Manitoba consisted of tall-grass prairie. Most of this region has been converted to cropland or has been strongly modified by drainage, grazing and haying (ibid p206).

Soil materials in the Red River Basin were deposited during the time of glacial Lake Agassiz and primarily consist of deep, clayey lacustrine sediments. Soil drainage of these fine-textured sediments is dominantly poor and imperfect, given the generally level to gently sloping landscape.

The RAA was historically tall-grass prairie communities with some strips of forested land along waterways. Small wetlands and wet meadows are also present. Currently, most of the landscape is cropped.

The major drainages are the Red and to a much lesser extent, the Roseau [Reed] River. Other drainages include Buffalo Creek and Riviere aux Marais [Marsh]. Both the Red and the Roseau River played an important role in the early exploration and settlement of the region.

3.0 Cultural and historical setting

The cultural history for Manitoba is complex and covers a period of approximately 8,000 years from the receding of the glaciers to present day (Klassen 1983:108). The area was deglaciated some 12,000 years ago but was largely inundated by glacial lake Agassiz until 8000 years ago (Figure 2). The significance of this is that the area was largely uninhabitable until some 8000 years ago.

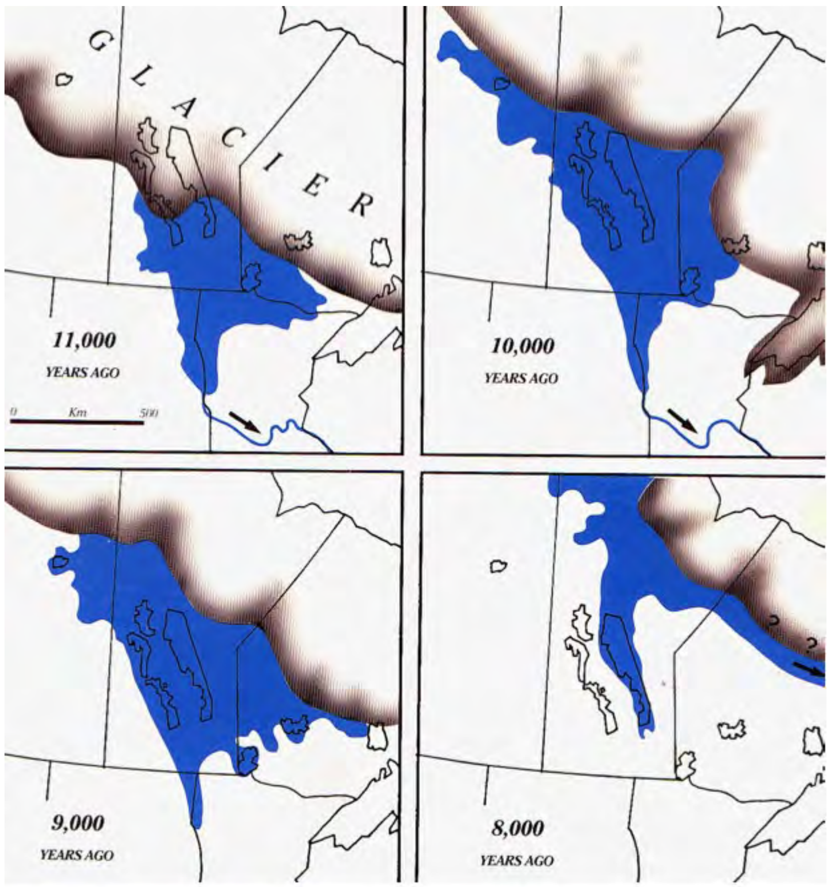

Figure 2: Deglaciation of the RAA

The following is a brief summary of cultural history in Manitoba. The chronology comprises two major periods: the Indigenous Period and the Indigenous European Period.

Early Indigenous Period (ca. 8,000 – 300 B.P.[1])

The earliest Indigenous period, known as the Palaeo (or Early) Period, begins around ca. 12,000 years Before Present (B.P.). to ca. 8,000 B.P. As mentioned above, the RAA was not

[1] B.P. "Before Present" – a dating technique based on the number of years before 1950 A.D., the date that is used as the base for radio-carbon dating.

habitable during this time period due to either being covered by glaciers or by glacial lake Agassiz.

The Intensive Diversification (or Middle) Period (8,000 to 2,000 B.P.) represents a time of technological shift reflected by the introduction atlatl darts and side-notched projectile points, and a shift of subsistence strategies from megafauna to small-scale hunting. The major cultural complex occupying central Manitoba during the Middle Period is the Shield Archaic, which may have developed out of the Plano complex of southern Keewatin District and eastern Manitoba (Wright 1995:261). Shield Archaic technology is characterized by bifacially flaked stone knives, side-notched and lanceolate projectile points, and large end scrapers. Another characteristic of the Shield Archaic is the manufacturing of tools and ornaments from copper. Most of this copper was obtained from sources in the upper Great Lakes region around the shores of Lake Superior. However, there are sources in the Northwest Territories that may have also been used. (Wright 1995:265). Subsistence hunting focussed on Bison, supplemented with other resources.

The Intensive Diversification Period was followed in the south portion of the province by the Woodland (or Late) Period (2,000 to 300 B.P) which is characterized by the introduction of pottery and the use of the bow and arrow. Rock art, in the form of petroforms, pictographs, and petroglyphs, also becomes prominent throughout the landscape.

It is likely that Plains pottery traditions made their way into the area with a continued focus on bison hunting. The stone tools consist of side-notched and triangular projectile points, a variety of scrapers, modified cobbles, and hammer stones.

Another important characteristic of Woodland culture in Southern Manitoba was the practice of burying the deceased beneath earthen mounds. This custom of burying the dead beneath mounds is largely confined in Western Canada to southern Manitoba (Pettipas, 1996:77). A total of five mounds have been located outside the study area. The Altona mound, Roseau River Mound, Swan Lake Mound, Letellier Mound, and Currie's Landing show the wide distribution of these types of sites within the study area.

<u>Indigenous European Period (c.a. 300 B.P. to present)</u>

Prior to its establishment as a settlement the area was known for its rich buffalo resources. A number of Indigenous trails criss-crossed the study area and this network was later used by European explorers and traders. The first European explorer to arrive in southern Manitoba was Christophe Dufrost de la Jermerais, nephew of Pierre Gaultier de La Vérendrye and his "second in command" in the venture to discover the "Western Sea" (Champagne 2003). In 1731, Dufrost's first expedition was with his uncle where they constructed Fort Saint-Pierre at the western end of Lac La Pluie (Rainy Lake). The following year he accompanied the explorer to Lac des Bois (Lake of the Woods) and helped build Fort Saint-Charles. In 1733, with his cousin Jean-Baptiste Gaultier de La Vérendrye, he travelled within a few kilometers of Lac Ouinipigon (Lake Winnipeg). A small post was constructed at the junction of the Roseau and Red rivers, known as Fort Roseau and this was the location where Dufrost fell ill and died on 10 May 1736 while travelling between Fort Maurepas and Fort Saint-Charles. He was buried “at the Fourche des Roseaux” near the present village of Letellier, Manitoba (Champagne 2003). His is the first recorded burial site of a European on the Canadian prairies (Ledohowski 2003). It was not until 1738 that Pierre Gaultier de La Vérendrye, reached the Prairies and established a fort on the Red River.

'The explorer, Alexander Henry, is known to have established his major post at nearby Park River in 1800, sending small detachments to winter at Riviere aux Marais (near St Joseph) and Hair Hills. (Manitoba Culture, Heritage and Citizenship 1994: 3).

The Rivière aux Roseaux, which flows nearby, served as a river route for the indigenous peoples who travelled there. The Sioux reportedly named it the “warriors’ route” and travelled the river during their war expeditions or their hunting and fishing trips. It was on this route that the indigenous guides led the explorer Pierre Gaultier de La Vérendrye and his companions during their expeditions from Lac des Bois, near which the Rivière aux Roseaux originates. The French explorers likely used this river to continue their explorations in the West. Then, in 1869, the Hudson’s Bay Company founded a trading post along the Rivière aux Roseaux.

The major trails in the Project Area were a small section of the cart trail from Fort Garry to Pembina along the west bank of the Red River near Letellier and the Crow Wing Trail along the east side of the Red River. The Boundary Commission Trail extended west from the Red River at the town of Emerson (Fort Dufferin) and was originally used by traders and hunters until the l870s and 1880s when it was adopted as a route for the North West Mounted Police

For a relatively small section of Manitoba, the area has a diverse ethnic population. Altona was settled by Russian Mennonites in 1880, St Joseph and Letellier were settled by the Quebecois French in 1877 (although Métis may have settled here earlier), and Dominion City was settled by English settlers from Ontario in 1876. Each of these settlements is briefly described.

Altona is located in the West Mennonite Block which was granted in 1876. Old Altona was laid out in traditional Mennonite style with a main road and farms on either side. New Altona, or Altona, was essentially a railway town.

The community of St Joseph is situated northwest of Emerson. St. Joseph was first known as Mission de la Riviere aux Marais, after the river flowing past Letellier. Archbishop Tache established a parish here in 1877 and named it St Joseph, after the patron saint of Canada. The area was largely settled by French Canadians from Quebec (Manitoba Conservation 2000).

Letellier was originally known as Catherine and the name was changed to Letellier in 1881, after the lieutenant-governor of Quebec. The first to come and settle permanently in the region were Métis who came mainly from Saint-Norbert. Most of the Métis did not keep their land there after 1870 and left the region to settle further north. Starting in 1866, English-speaking settlers came to settle in the region served by Presbyterian ministers from Emerson. French-Canadian settlers, mainly from the United States, also arrived in large numbers between 1876 and 1877 at the site of Letellier.

The town of Dominion City dates to 1874 when the first settlers began to arrive from Ontario. The townsite had been known as Roseau Crossing because of an excellent ford over the Roseau River. That same year the Canadian Pacific Railway started construction on the Pembina Branch rail line. The Pembina Branch was a 67 mile stretch of track that ran north, along the east side of the Red River from St. Vincent, Minnesota to St. Boniface. The last spike was driven in at Dominion City in 1878. By 1879, the CPR built spur tracks from Roseau Crossing to what is known as Greenridge to mine gravel. The spur track on the south side of town had a camp of a thousand men to load the cars carrying gravel every half hour. The track operated until 1882 (Waddell 1970).

3.1 Registered Heritage Sites

A review of the Provincial and Municipal designated sites and commemorative plaques indicated a total of 20 Provincial sites, 6 Municipal sites and 2 plaques are in the RAA. There are also 2 centennial farms registered.

The provincial site registry listed 20 archaeological sites within the RAA. These sites are listed in Table 1. Few of the sites have evidence of cultural affiliation and it is not clear how much subsurface testing took place. With such a small data set, any observations on this data set should be treated as speculation. Plotted on a map, these sites are clustered along the Buffalo Creek, Red River, and Riviere aux Marais. This clustering of site likely reflects settlement patterns, but it may also represent ease of site discovery (sites are exposed in eroding riverbanks).

Table 1. Registered Provincial Heritage Sites

Borden	Principal_	General (needs editing)	Site_Type	Age

DgLh-010	Name Not Available	lithic scatter on the east side of Red River.	CAMPSITE	PRECONTACT
DgLh-013	KEROSENE LAMP	farm implements & household debris embedded in the riverbank.	FARMSTEAD	1870 - 1920
DgLh-004	MCCLELLAND SITE	site is located along the Riviere aux Marais in and near a very steep bend in the creek	CAMPSITE; KILL SITE	Late Middle
DgLh-006	CALDER SITE	scatter of cultural material located within a cutoff loop of the river	CAMPSITE; KILL SITE	BESANT
DgLh-009	Name Not Available	2 artifacts recovered in isolation	ISOLATED FIND	WOODLAND
DgLi-001	BRAUN SITE	site centers on a small low spot that used to run at a nw-se angle.	CAMPSITE	PROBABLY LATE WOODLAND
DgLj-003	BRAUN SITE-1	site was not inspected, but told that it consisted of the same general setting with the same kind of artifacts	SETTLEMENT	ARCHAIC; WOODLAND
DgLj-004	BRAUN SITE TWO	site is on east bank of buffalo creek north and south of car track	CAMPSITE	ARCHAIC; WOODLAND
DgLj-005	DUECK SITE	site was not inspected	SETTLEMENT	
DgLh-014	Riviere aux Marais Biface	site consists of a single Pre-Contact tool (biface) made from Swan River Chert. The isolated artifact was recovered from a cultivated field 150 metres from a large pond.	Isolated Find	PRECONTACT
DgLh-016	Tower 184 Site	Site consists of 14 of bison bone fragments recovered at 70-100 cm below surface, at the bottom of the agricultural plow zone.	Kill Site	Pre-contact - based on depth of faunal remains (70-100 cm bs) and identification as bison.
DgLh-018		A small scatter of lithic flakes found in and near a strip of trees that provide a break between agricultural fields	Workshop Site	PRECONTACT

DgLh-019	River Well Area Site	The site has been disturbed or destroyed by agricultural practices. It is possible that there is a complete site beyond the boundaries of the testing regimen.	Campsite	Laurel complex, Mid and Late Woodland (due to Blackduck/Sandy Lake body sherds).
DgLj-009Y		Site has been archaeologically assessed and marked in HRB NTS maps no form has been submitted.	Uninterpreted	Unknown
DgLj-011Y		Site has been archaeologically assessed and marked on HRB NTS Maps, but no form has been submitted.	Uninterpreted	Unknown
DgLj-012Y		Site was archaeologically assessed and marked on HRB NTS maps, but no form was submitted.	Uninterpreted	Unknown
DgLj-013Y		Site was archaeologically assessed and marked on HRB NTS maps, but no form was submitted.	Uninterpreted	Unknown
DgLj-014Y		Site was archaeologically assessed and marked on HRB NTS maps, but no form was submitted.	Uninterpreted	Unknown
DgLj-015Y		Site was archaeologically assessed and marked on HRB NTS maps, but no form was submitted.	Uninterpreted	Unknown
DgLj-016Y		Site has been archaeologically assessed and marked on HRB NTS maps, but no form was submitted.	Uninterpreted	Unknown

Shaded site is historic

One of the sites was a historic campsite (DgLh-013), the rest can be considered early or pre-European contact. The earliest sites are a possible Pelican Lake and a Besant projectile point (DgLh-006), and two sites noted as Archaic-Woodland (DgLj-003 and DgLj-004). The remainder of the identified sites fall within the last 2000 years. Three of the sites were identified as Bison kill sites (DgLh-004, DgLh-006 and DgLh-016) and those with artifacts contain elements of Plains bison hunting cultures. Two of these have associated campsites.

There is one site with Laurel/Blackduck ceramics and five listed as Woodland (DgLh-019, DgLh-009, DgLi-001, DgLi-003 and DgLi-004) suggesting the presence of Woodland subsistence patterns which are more diversified than the Plains bison hunting. This suggests that Woodland cultures were moving into the area and the importance of traditional plains bison hunting was diminishing. Métis bison hunting, which represented a new bison hunting tradition, is not represented in these sites.

Of the 20 sites, four are in the LAA: DgLj-015Y, DgLi-001, DgLh-006 and DgLh-009. DgLi-001 is an artifact scatter, DgLh-006 produced a Besant point, and DgLh—009 is recorded as an isolated find. DgLj-015Y is uninterpreted. The location of all four sites will need to be checked, and these sites may require additional assessment.

In addition to the above, there are five burial sites registered by the HRB within the RAA (Table 2). Four of the sites are likely pre-European contact. Two of them are burial mounds. The Roseau River Mound is reported to be destroyed. The importance of the mounds and burials lend to the cultural significance of this area.

One burial, DgLh-015Y, would be the burial of La Verendrye's nephew la Jereraye. This burial location is estimated from historical documents.

Table 2: Burials Registered by the HRB within the RAA

Borden No.	Name	Location
DgJh-001	Roseau River Mound	Roseau River
DgLh-003	Lettelier Mound	Riviere aux Marais
DgLh-015Y	La Jemeraye Burial	Location estimated
DgLj-002	Buffalo Creek Site	Buffalo Creek
DgLj-003	Braun Site 1	Buffalo Creek

There are six municipally designated sites located just outside the LAA. These consist of three historic sites in Altona and three historic sites in Dominion City. These sites are listed in Table 3. All the Municipal Heritage sites belong to settlement era sites.

Table 3. Registered Municipal Heritage Sites

Location	Name	Age	Description
Altona	Bergthaler Church Waisenamt	1870s	The Bergthaler Waisenamt is a good illustration of the mutual aid institutions introduced by Mennonites
Altona	Klippenstein House		The picturesque Klippenstein House, built for Altona pioneers Bernhard and Agatha Klippenstein, is a fine example of a large four-square dwelling in an urban setting.
Altona	Schwartz House		The Schwartz House is a fine example of the kind of substantial dwellings prosperous families, such as that of businessman Johann Schwartz of Altona
Dominion City	All Saints Anglican Church	1908	All Saints Anglican Church, originally an Episcopal Methodist church, is one of Dominion City's oldest buildings and a good example of an early wood-frame building designed in a modest Gothic Revival style.
Dominion City	Dominion City Cemetery	1890s	The Dominion City Cemetery, a spacious, formally organized burial ground, presently containing more than 100 graves, serves as Dominion City's only cemetery
Dominion City	Timber Truss Bridge	1938	What makes this bridge special is its material; where most truss bridges were made with steel, this one was of wood

There are only two plaques registered within the RAA, although this does not count steel markers and monuments for early schools. The existing plaques are located outside of the LAA. These sites are listed in Table 4. The First Railway plaque documents the completion of the Pembina Branch of the Canadian Pacific Railway in 1878. The Pembina Branch ran some 100 kilometres from St. Boniface to the international boundary at Emerson, connecting Manitoba to eastern Canada by rail through the United States (http://www.mhs.mb.ca/docs/sites/firstrailway.shtml). This plaque is located besides the Manitoba Biggest Sturgeon, which was caught in the Roseau River in 1903.

Table 4. Plaques located in the RAA

Location	Description
Dominion City	First Railway in Western Canada
Dominion City	Manitoba's Biggest Sturgeon

Finally, there are two Centennial Farms registered in the area, one in 1894 and one is 1884 (Table 5). Homesteading began in Canada in 1872. The farmers in the RAA were likely the Mennonites, who received their block of land in 1874.

Table 5. Centennial Farms located in the RAA

Region	***Farm***	***Farm location***	***Year established***
Altona	Donald & Dorothy Friesen	NW21-1-1W	1894
Dominion City	Ronald & Marlys Pearse	SE22-3-2E NE22-3-2E	1884 1890

4.0 Screening Methodology

Heritage screening was informed by three pieces of information: documented history, known archaeological sites and detailed landscape analysis. LiDAR imagery was overlaid onto the study area to allow for visual examination of relict channels. The land use primarily consists of agricultural fields.

All this data was analyzed using professional experience to determine specific areas of heritage potential that would require ground-truthing investigation. Although archaeologists are unable to predict the location of a site, they can predict where sites would most likely be located. If a landform is likely to contain archaeological sites, the landform is labelled as having archaeological potential.

Based on our analysis, five Areas of Concern (AOC) were identified.

AOC one was located to the west-southwest of Buffalo Creek.
AOC two was located near a known archaeological site.
AOC three was located near the Riviere aux Marais and numerous archaeological sites.
AOC four was flagged as it is near both the Riviere aux Marais and the Red River.
AOC five was flagged as it is near both the Riviere aux Marais and the Red River.

5.0 Field Observations

On June 12, 2024, Western Heritage employees, Ashley Cameron and Emili Bohle, conducted a windshield survey of the five AOCs. The survey was comprised of viewing the AOCs from the road and noting any features in the proposed (RoW) within the AOC. The goal was to visually assess the landscape rather than completed an archaeological survey. The results of this survey are presented in Appendix A.

The field observations confirmed the landscape features identified in the initial screening and no new areas of concerns were identified. The entire RoW was cultivated. A number of the relic channels identified in google earth imagery were not clearly visible at ground level suggesting they had been modified through cultivation.

The field observations confirmed the screening results and documented no historic structures or plaques along the RoW. However, the field observations were not at a sufficient resolution to record or document any archaeological sites.

6.0 Assessment of Effects

Much of the LAA is cultivated which indicates that any cultural materials to a depth of approximately 30 cm are disturbed. Cultivation can move or damage artifacts and small features such as hearths. There can be some residual information remaining in archaeological sites that have been heavily cultivated.

There can be some damage from overbank flooding which can also erode features and move artifacts. Depending on the distance to the river, overbank flooding can also preserve archaeological deposits. The sediments can help determine whether sites would be preserved or damaged by the flooding.

Within the LAA, the primary area of concern is the pipeline trench. For the pipeline installation, although there will be some damage from wheeled and tracked vehicles, the primary disturbance is the trench for the pipeline installation. However, pipeline trenches are narrow linear disturbances, and they are more likely to damage rather than destroy buried archaeological sites.

The primary methods for protecting archaeological sites are discovery and mitigation. The purpose of an HRIA is to facilitate site discovery. Within the AOCs we propose to walk the cultivated fields and to excavate shovel tests. If we can discover archaeological sites prior to any potential effects from the development, we can sometimes move some activities related to the development (remove the effect) or capture the information contained within the archaeological site before it is damaged or destroyed (mitigation).

7.0 Recommendations

Based on a historical summary, preliminary screening, and a survey from a vehicle, the LAA is largely cultivated, with most of the topographic relief arising from Buffalo Creek, the *Riviere aux Marais* and the Red River. Several archaeological sites in the RAA have been found at a depth below conventional shovel testing depth. Other drainages, paleochannels from immediate post-glacial events have been infilled and cultivated flat.

Given that there are four recorded archaeological sites in LAA, and the importance of the above river systems, the proposed pipeline will disturb areas with heritage potential. To address this, shovel testing is recommended at each of the defined Areas of Concern.

The locations of previously recorded archaeological sites in the LAA should be checked (these sites were recorded pre-GPS). These sites should be assessed if they are located adjacent to or within the RoW.

Within each of the AOCs, the amount of shovel testing will be dependent on the number of features of interest. There is a nearby archaeological site and one relict channel in AOC 1. This will require fewer shovel tests than AOC 4 which has numerous relic channels. The testing program will need to be approved by the HRB.

8.0 Refences

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Manitoba Hydro

2014 St. Vital Transmission Complex: Environmental Assessment Report: 6.4.10 Heritage Resources

North Roots

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Appendix A: Field Observations

This field observations were collected by Ashley Cameron and Emili Bohle in the summer of 2024. This appendix was authored by Ashley Cameron. AOC refers to Areas of Concern, which are areas with archaeological potential.

A.1 AOC 1

AOC 1 was flagged as it is located to the west-southwest of Buffalo Creek. The beginning of the AOC 1 starts along Road 9 N and travels south for 100 m before turning southeast and ending at the railway track approximately 720 m away in NW and NE 17-02-01 W1M (Figure A.1). The AOC is within a relatively flat cultivated field with a deep ditch, for the road, running west-east along the northern perimeter of the section (WP1). There is a relict channel running SE-NW (WP3). In the NE corner of the NE quarter there is a hydro power station under construction (not shown on google maps) beside the railway. This AOC ends at the railway tracks on the eastern border of the section.

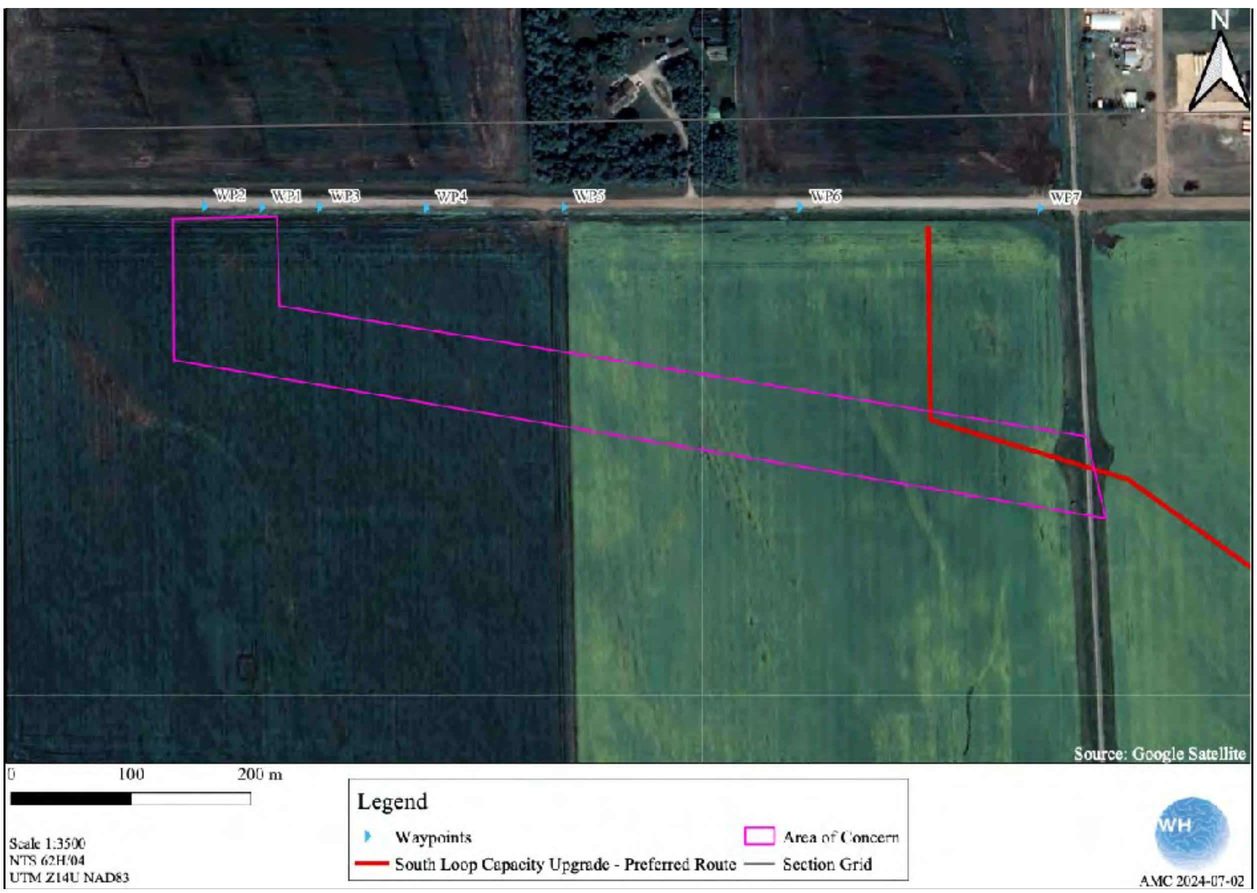


Figure A.1. AOC 1

A.2 AOC 2

AOC 2 was flagged as it is located near a known archaeological site. The beginning of this AOC starts along Road 2 W and travels west-east across the NW and NE quarter sections of 14-02-01 W1M. The route crosses a private driveway between the NW and NE quarter sections that runs north-south towards a farm in the southern portion of the section. There are trees planted along the northern edge of the section as well (Figure A.2).

AOC 2 is within a relatively flat cultivated field and runs adjacent to both fibre optic and gas lines. There is a shallow relict channel present in the field running E-W (WP10) within the NW section. Another relict channel is located approximately 150 m down the private driveway and travels south-east (WP12). This channel crosses the AOC approximately 50 m to the east off the private driveway.

Figure A.2. AOC 2

A.3 AOC 3

AOC 3 was flagged as it is located Riviere aux Marais and numerous archaeological sites. The beginning of this AOC starts approximately 190 m south of Provincial Road 201 in a cultivated field in the NW-SW 18-02-02 E1M. The route continues to travel south for approximately 980 m before turning east and travelling for 1180 m from 7-18-02-02 E1M, across Riviere aux Marais, before ending at the Lord Selkirk Highway in 5-17-02-02 E1M (Figure A.3).
The AOC is within a mostly flat, cultivated field with no easily identifiably relict channels seen during the windshield survey (WP15). Along the section that ends in the highway, there are powerlines present in the field and a large, deep ditch is present off the highway (WP16).

FigureA.3. AOC 3

2.4 AOC 4

AOC 4 was flagged as it is near both the Riviere aux Marais and the Red River. The beginning of this AOC starts along the Lord Selkirk Highway from 6-17-02-02 E1M and continues east to 7-17-02-02 E1M for approximately 500 m before traveling north 625m to the south-east portion of 15-17-02-02 E1M. From here, the route continues east for approximately 2 km before ending in the NE 16-02-02 E1M at Manchester Ave (Figure A.4). The Red River is roughly 300 m east from the end of the AOC.

AOC 4 is within relatively flat to slightly undulating cultivated fields. Within the SE of 17-02-02 E1M, the route passes through three relict channels including the channel from WP20 that extends through the entire quarter section, and intersects the proposed route at the corner, from the SE to the NW. Additional relict channels were noted (WP21, 22, and 23) within the quarter section, however the proposed route does not intersect them. There are multiple relict channels present in the NE 17-02-02 E1M with six intersecting the proposed route, though they were not visible during the windshield survey (WP 25). From WP25, the proposed route crosses Road 8 E and continues straight within a drainage ditch between two fields (WP25). At WP27, the field slopes up towards the NE and SE and continues to WP28. There is an old approach and evidence of disturbance (old dug up culvert and gravel pit) within the field close to Provincial Road 201. At WP32 there is a solitary tree in the field with a relict channel 179 m south of the road. The AOC ends at WP33 where both a small weather station and natural gas pipeline are present.

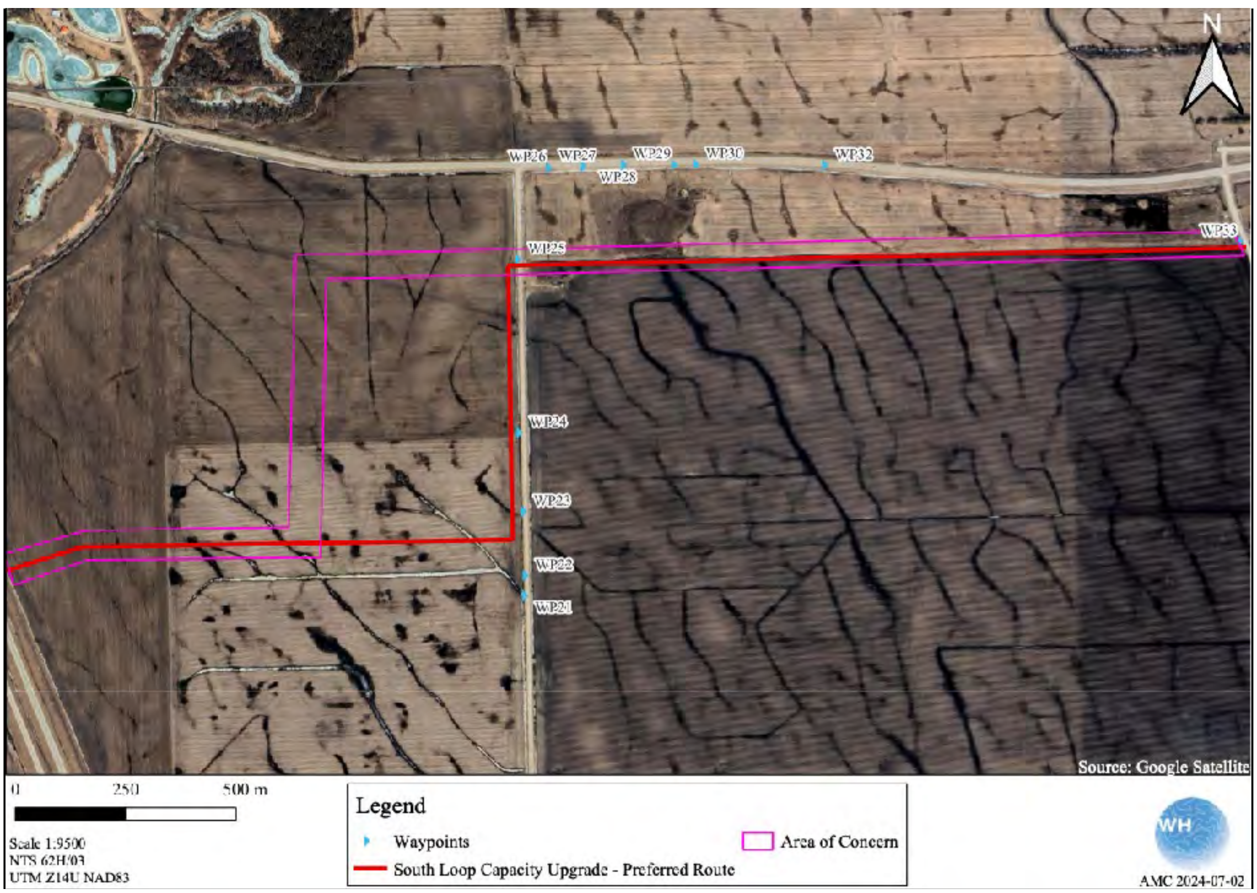


Figure A.4. AOC 4

2.5 AOC 5

AOC 5 was flagged as it is near both the Riviere aux Marais and the Red River. The beginning of the fifth AOC starts at NW 14-02-02 E1M along Road 10 E and travels across the quarter section (Figure A.5).

This AOC is within mainly flat, cultivated field with five relict channels intersecting the proposed route roughly north to south from Provincial Road 201. At least two of these relict channels continued on the north side of Provincial Road 201; they were bisected when the road was constructed.

Figure A.5. AOC 5

Table A.1: Waypoint Table

Waypoint Number	Zone	NAD83 Easting	Zone 14 Northing	Notes
WP1	14U	604380	5443217	**AOC 1** -Relatively flat cultivated field with relict channel running SE-NW -Deep ditch running down road -AOC ends at railway tracks Photos— **AOC1-1** Facing route E, drainage present —**AOC1-2** Ditch NE
WP2	14U	604332	5443218	Start of AOC 1 Hydro stakes present as well as other utilities Photos— **AOC1-3** Facing SE —**AOC1-4** and **AOC1-5** facing route E
WP3	14U	604428	5443217	Shallow relict channel in field Photo— **AOC1-6** Facing SE
WP4	14U	604517	5442317	Continuation of relict channel Square area of disturbance Photo—**AOC1-7** facing SE
WP5	14U	604632	5443218	Start of next 1/4 section Very slight undulations Cultivated Photo— **AOC1-8** facing SE
WP6	14U	604829	5443217	Slight relict channel, slight undulations Photo— **AOC1-9** facing SE
WP7	14U	605029	5443216	Hydro power station, being constructed Route ends -201m SE at railway tracks Photo—**AOC1-10** facing SE
WP8	14U	609082	5443098	**AOC 2** -Minimal undulation -relict channel cuts through N-S Cultivated field Location adjacent to fibre optic and gas lines Photos— **AOC2-1** facing E along road **AOC2-2 ditch** facing E **AOC2-3** facing NE towards utilities

WP9	14U	609307	5443327	Flat field Photo—**AOC2-4** facing SE
WP10	14U	609338	5443330	Relict channel present in field running E-W, shallow Photos— **AOC2-5 Facing** SE **—AOC2-6**
WP11	14U	609467	5443329	Route crosses private driveway into another cultivated field Trees planted on either side No real elevation difference, still relatively flat Photos—**AOC2-7** facing SE —**AOC2-8** facing E towards other field
WP12	14U	609501	5443327	Relict channel starting from private driveway Photo—**AOC2-9** facing SE
WP13	14U	609669	5443332	Cultivated field, farmyard in the background Photo— **AOC2-10** facing SE
WP14	14U	609889	5443333	End of AOC2, line of trees -dirt mound can be seen in distance -Photo—**AOC2-11** facing SE
WP15	14U	622963	5443641	**AOC 3** -Mainly flat cultivated field -no easily identifiable features from road -Photos— **AOC3-1** facing S along route —**AOC3-2** facing SE towards utilities Substation present on other side of road -wide ditch off road
WP16	14U	624169	5442575	Along side of highway facing route, area mainly flat -powerlines in field -wide ditch for highway -Runs across Riviere aux Marais -Cultivated field Photos— **AOC3-3 AOC3-4 facing** south

WP17	14U	624535	5442038	**AOC 4-** other side of highway -railway tracks near end -mainly flat cultivated field Photos— **AOC4-1**, **AOC4-2** facing North WP17- looking towards the route, facing NW, relatively flat cultivated field Photo—**AOC4-3** facing NW **AOC4-4** N **AOC4-5** N **AOC4-5 N AOC4-6** N
WP18	14U	624659	5442037	Section line, near large metal hydro tower -area still mainly flat Photo— **AOC4-7** facing NW
WP19	14U	624985	5442046	Turn of route, area flat Photo— **AOC4-8**
WP20	14U	625472	5442108	Start of relict channel that intersects route at corner Photo— **AOC4-9** facing NW
WP21	14U	625460	5442522	Another relict channel that is adjacent to proposed route, connects with channel from WP20 -Slightly undulating area Photo—**AOC4-10, AOC4-11, AOC4-12** facing NW
WP22	14U	625461	5442567	Relict channel from another angle Field slopes down on both sides to drainage Photo—**AOC4-13** facing W route to the right of drainage
WP23	14U	625457	5442712	Facing W towards route, relict channels present -Slight undulation Photo **AOC4-14** facing W
WP24	14U	625447	5442890	Section change Cultivated field Relatively flat Photo—**AOC4-15** facing W

WP25	14U	625444	5443282	Route intersects with dirt road Slight undulation, one ridge can be seen Natural gas line -Cultivated on W side, disturbed on E side -More undulating than S fields -drainage to the S -tower and cultivated field S of relict channel Looks like channel runs along 1/4 section photos— **AOC4-16 SE**, **AOC4-17 E**, **AOC4-18 SE**, **AOC4-19 E, AOC4-20 E**
WP26	14U	625514	5443490	Facing S towards route, previously cultivated field Photo—**AOC4-21** facing S
WP27	14U	625592	5443492	Slope up to the NE and SE -Native prairie type vegetation Photo— **AOC4-22** facing SE
WP28	14U	625683	5443495	Continuation of elevated slope area Photo **AOC4-23** facing SE?
WP29	14U	625797	5443496	Disturbances- old approach and gravel pile Undulating Photo— **AOC4-23** facing S
WP30	14U	625847	5443497	Another view of gravel pile Old dug up culvert in field Photo—**AOC4-24** facing SE
WP31	14U			Cultivated field, power lines in field Slight undulation Photo— **AOC4-25 SE** and **AOC4-26** E
WP32	14U	626140	5443495	Solitary tree in field -Drainage ditch present Route 179m S of WP Photo **AOC4-27** facing SE
WP33	14U	627080	5443323	End of AOC 4 Portion of area slopes towards highway Natural gas pipeline Weather station Photo— **AOC4-28** and **AOC4-29**

WP34	14U	628770	5443574	**AOC 5** Steep ditch to cultivated field Area is flat Drainage ditch to the N —dirt road built up, water in ditch Photo—**AOC5-1** facing E
WP35	14U	628922	5443768	Relict channel that intersects proposed route Photo **AOC5-2** facing E
WP36	14U	629166	5443771	Larger relict channel that intersects proposed route Photo—**AOC5-3** facing E
WP37	14U	629331	5443776	Very shallow relict channel that intersects proposed route Photo— **AOC5-4** facing SE
WP38	14U	629456	5443783	Area still mainly flat Relict channel intersects proposed route SE Photos **AOC5-5 SE** and **AOC5-6 S**
WP39	14U	629602	5443787	End of AOC5 Drainage ditch between the two sections Relatively flat Photo **AOC5-7** facing S

Field Photos

Photo are listed by their number in the Waypoint Table. They are not always sequential.

AOC1-1. Facing proposed route to the east with relict channel present (WP1)

AOC1-3. AOC1; Start of AOC 1, facing southeast (WP2)

AOC1-6. AOC 1; Shallow relict channel in field, facing southeast (WP3)

AOC1-7. AOC 1; Continuation of relict channel with a square area of disturbance (circled), facing southeast (WP4)

AOC1-8. AOC 1; Start of next quarter section, very slight undulation, facing southeast (WP5)

AOC1-9. AOC 1; Relict channel in cultivated field with slight undulation, facing southeast (WP6)

AOC1-10. AOC 1; Power substation under construction with railway to the left, facing southeast (WP7)

AOC2-1. AOC2; Relict channel cutting through north-south in cultivated field, facing east (WP8)

AOC2-4. AOC 2; Relatively flat, cultivated field, facing southeast (WP9)

AOC2-6. AOC 2; Relict channel present in field running east-west, facing southeast (WP10)

AOC2-7. AOC 2; Area where proposed route crosses private driveway, facing southeast (WP11)

AOC2-9. AOC 2; Relict channel starting from private driveway, facing southeast (WP12)

AOC2-10. AOC 2; Cultivated field with farmyard in the background, facing southeast (WP13)

AOC2-11. AOC 2; End of AOC, facing southeast (WP14)

AOC3-1. AOC 3; Mainly flat, cultivated field, facing south along proposed route (WP15)

AOC3-3. AOC 3; Along the side of the highway facing proposed route in cultivated field with large ditch in the foreground, facing south (WP16)


AOC4-4. AOC4; Start of AOC4 in mostly flat, cultivated field (WP17)


AOC4-6. AOC 4; Looking towards the proposed route, facing northwest (WP17)

AOC4-7. AOC 4; Section line along route, facing northwest (WP18)

AOC4-8. AOC 4; Where the proposed route turns (WP19)

AOC4-9. AOC 4; Start of relict channel that intersects proposed route (WP20)

AOC4-10. AOC 4; Relict channel adjacent to proposed route that connects with channel from WP20, facing northwest (WP21)

AOC4-13. AOC 4; Relict channel from WP21 from another angle showcasing slight slope on both sides of channel, facing west (WP22)

AOC4-14. AOC 4; Facing proposed route with relict channel, facing west (WP23)

AOC4-15. AOC 4; Cultivated field with slight undulation, facing west (WP24)

AOC4-17. Area where proposed route crosses dirt road into another cultivated field with a drainage ditch, facing east (WP25)

AOC4-18. AOC 4; Tower and cultivated field near proposed route, facing southeast (WP25)

AOC4-21. AOC 4; Looking towards proposed route with tower from WP25 in the background, facing south (WP26)

AOC4-22. AOC 4; Previously cultivated area that slopes up towards the northeast and southeast, facing southeast (WP27)

AOC4-23. AOC 4; Old approach and gravel pile near proposed route, facing south (WP29)

AOC4-24. AOC 4; Another view of old gravel pile, facing southeast (WP30)

AOC4-26. AOC 4; Along proposed route that runs in slightly undulating, cultivated field with powerlines present, facing east (WP31)

AOC4-27. Relict channel with solitary tree in the background, facing southeast (WP32)

AOC4-29. AOC 4; End of AOC 4, facing west (WP33)

AOC5-1. AOC 5; Steep ditch leading to cultivated field where proposed route is located, facing east (WP34)

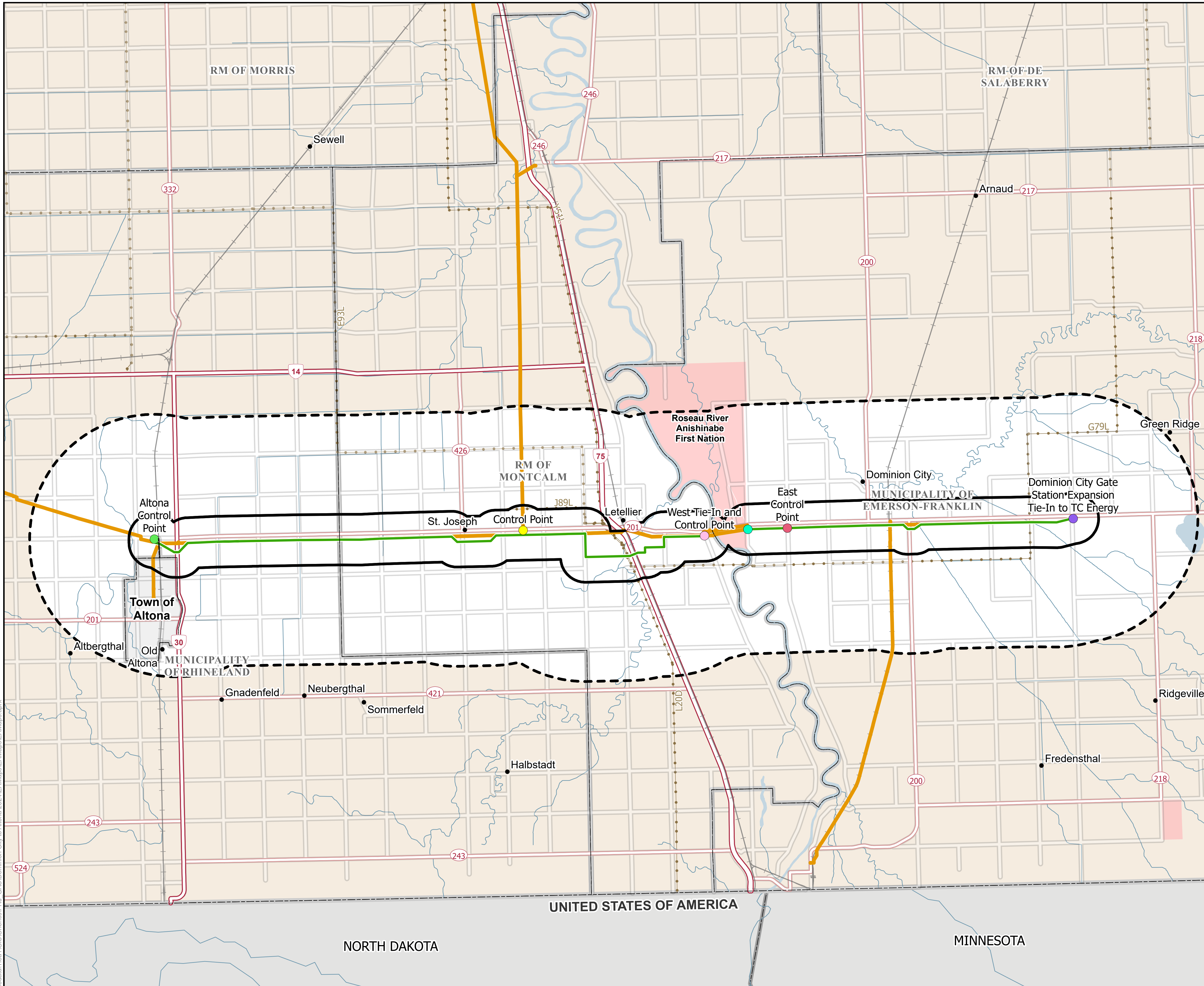
AOC5-2. AOC 5; Relict channel that intersects proposed route, facing east (WP35)

AOC5-3. AOC 5; Larger relict channel that intersects proposed route, facing east (WP36)

ACO5-4. AOC5; Very shallow relict channel that intersects with proposed route, facing southeast (WP37)

AOC5-6. AOC 5; Relict channel that intersects proposed channel, facing south (WP38)


AOC5-7. AOC 5; End of AOC with drainage ditch present, facing south (WP39)



Manitoba Hydro

Dominion to Altona Gas Transmission Pipeline

Components

- Altona Control Point
- Control Point
- Dominion City Gate Station Expansion Tie-In to TC Energy
- East Control Point
- East Tie-In
- West Tie-In and Control Point
- Preferred Route

Assessment Areas

- Local Assessment Area (1 km buffer around PDA)
- Regional Assessment Area (5 km buffer around PDA)

Infrastructure

- Transmission Pressure Gas Line
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line

Landbase

- Community
- Provincial Highway
- Provincial Road
- Local Road
- First Nation Lands
- City/Town
- Rural Municipality

The proposed Dominion City to Altona Gas Transmission Project is on Treaty 1 lands, the original territories of the Anishinaabeg, Anishininewak and Ininewak, and the National Homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 03, 2024

N

0 1.5 3 4.5 6 Kilometres
0 1 2 4 Miles

1:150,000

Spatial Boundaries for Important Sites

Draft: For Discussion Purposes Only

Map 6-1

APPENDIX CA

Vegetation Technical Data and Field ReportA

December 2024A

Memorandum

June 30, 2024

Subject: Dominion City to Altona Gas Transmission Project

To: Jonathan Wiens
Manitoba Hydro

From: Kevin Szwaluk
Szwaluk Environmental Consulting Ltd.

A botanical survey was conducted for the Dominion City to Altona Gas Transmission Project on June 20, 2024. The proposed pipeline originates at the GS-146 Dominion City Primary and passes through cultivated land in a west direction, crossing the Red River and Highway 75 to the new Altona Control Plant, north of Altona. The portion of the pipeline crossing beneath the Red River has been previously installed, with tie-in locations on the east and west sides of the river.

Prior to cultivation, this area existed largely as grassland, surrounded by the Aspen-Oak Section where the boreal forest met the prairie landscape (Rowe 1959). Plants typical of the grassland would have included big bluestem (*Andropogon gerardii*), prairie dropseed (*Sporobolus heterolepis*), prairie cord grass (*Sporobolus michauxianus*), blue-eyed grass (*Sisyrinchium* spp.), black-eyed susan (*Rudbeckia hirta*), and goldenrods (*Solidago* spp.). Over 200 species of flora and fauna would be expected to occur in the tall grass prairie (NatureNorth 2024). Today, the tall grass prairie is reduced to less than 1% of its original size, making it one of the rarest and most endangered ecosystems in the world (Manitoba Habitat Heritage corporation 2024). The project area occurs within the Lake Manitoba Plain Ecoregion, with a shift to agricultural production of cereal grains and oil seeds as the dominant land use (Smith et al. 1998).

A search of rare plants previously known to occur in the area was obtained from the Manitoba Conservation Data Centre in 2024, prior to fieldwork. Culver's-root (*Veronicastrum virginicum*) and small white lady's-slipper (*Cypripedium candidum*) are both species at risk known to occur within 5 km of the project boundary (Manitoba Conservation Data Centre 2024).

The botanical survey on June 20 consisted of qualitatively documenting the vegetation in the ditches at several road crossings. A meandering walk occurred in these areas noting each plant species encountered. Along Provincial Road (PR) 201, the ditch closest to the pipeline footprint was also surveyed to document the vegetation, in the event that some segments of the pipeline end up being routed through the PR 201 road allowance. Cultivated land supporting field crops of corn and cereal grains typically occurred adjacent to the roadside ditches. A total of 16 roadside sites were surveyed for the project (DCA-01 through DCA-16).

The roadside vegetation in the project area consisted dominantly of grasses with a mixture of forb species, with varying presence. Smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*) and quack-grass (*Elymys repens*) were common grasses throughout the ditches. Frequent forb species included northern bedstraw (*Galium boreale*), Canada goldenrod (*Solidago canadensis*), bastard toadflax

(*Comandra umbellata*) and Canada anemone (*Anemonastrum canadensis*). Also common but less abundant were smooth aster (*Symphyotrichum laeve*), prairie sage (*Artemisia ludoviciana*) and wild licorice (*Glycyrrhiza lepidota*). Prickly rose (*Rosa acicularis*) was a common low shrub (<1 m) in the ditches.

Two water drains were surveyed along the proposed pipeline route, both located east of Hwy 75 (640228 E, 5443857 N; 635663 E, 5443673 N). These municipal drainage systems were vegetated with shrubs of sandbar willow (*Salix interior*), red-osier dogwood (*Cornus sericea*), western snowberry (*Symphoricarpos occidentalis*) and prickly rose along the banks. Common reedgrass (*Phragmites australis*), orchard grass (*Dactylis glomerata*), sedges (*Carex* spp.) and common cat-tail (*Typha latifolia*) were frequent species.

The Red River crossing and Roseau River Reserve were not surveyed as tie-in locations were beyond the riparian area and reserve boundaries. However, species observed at nearby road crossings of the Red River included trees of cottonwood (*Populus deltoides*) and bur oak (*Quercus macrocarpa*), while tall shubs (>1m) were chokecherry (*Prunus virginiana*), fireberry hawthorn (*Crataegus chrysocarpa*) and beaked hazelnut (*Corylus cornuta*). According to Smith et al. (1998), typical riparian species that occur in this area include American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), Manitoba Maple (*Acer negundo*) and bur oak with associated shrubs such as hazel (*Corylus* spp.) and Saskatoon (*Amelanchier alnifolia*).

West of Hwy 75, the proposed pipeline crosses the Marais River at 623774 E, 5442515 N. The river was surveyed approximately 500 m south of the crossing (623881 E, 5442013 N). The riparian vegetation along the river's edge included abundant cover of broad-fruited bur-reed (*Sparganium eurycarpum*). Other species recorded included Manitoba maple (*Acer negundo*), bluejoint reedgrass (*Calamagrostis canadensis*), water smartweed (*Persicaria amphibia*), stinging nettle (*Urtica dioica*) and greater burdock (*Arctium lappa*).

Three wind breaks or shelterbelts were observed west of Hwy 75, along the proposed pipeline route (618829 E, 5443320 N; 616120 E, 5443231 N; 609901 E, 5443103 N). These shelterbelts supported deciduous trees of green ash and Siberian peashrub (*Caragana arborescens*). Along PR 201, species commonly included smooth brome, Kentucky bluegrass, common reedgrass and common cat-tail.

Woodlands were nearly absent in the project area. South of Dominion City, a small stand of deciduous trees occurred within a cultivated field that was inaccessible (633173 E, 5443197 N). The proposed pipeline avoids this stand. A second small stand of deciduous trees occurred on private land, west of Hwy 75 (623503 E, 5442523 N). The preferred route occurs along the southern edge of this forest stand.

A number of non-native, invasive and noxious species occurred in the project area. These species often follow human activities and are introduced along roads, rivers and right of ways. Abundant to sporadically occurring species recorded were smooth brome, quack-grass, Canada thistle (*Cirsium arvense*), tufted vetch (*Vicia cracca*), alfalfa (*Medicago sativa*), common dandelion (*Taraxacum officinale*), common milkweed (*Asclepias syriaca*), field sow-thistle (*Sonchus arvensis*), alsike clover (*Trifolium hybridum*), goat's-beard (*Tragopogon dubius*), lamb's-quarters (*Chenopodium album*), field bindweed (*Convolvulus arvensis*), orchard grass (*Dactylis glomerata*), field pennycress (*Thlaspi arvense*), Siberian peashrub, giant ragweed (*Ambrosia trifida*), common ragweed (*Ambrosia artemisifolia*), greater burdock, curly dock (*Rumex crispus*) and redroot pigweed (*Amaranthus retroflexus*). Of these plants, 11 species are considered invasive (Canadian Food Inspection Agency 2008; Invasive Species Council of Manitoba 2024) due to their tendency to outcompete native species and dominate habitats once introduced, and included smooth brome, quack-grass, field sow-thistle, tufted vetch, alfalfa, Canada thistle, lamb's-quarters, field bindweed, orchard grass, field pennycress and redroot pigweed. Nine species recorded are listed as Tier 3 noxious plants according to the Noxious Weeds Act (Manitoba Government 2024), and included field sow-thistle, common milkweed, Canada thistle, lamb's-quarters, field pennycress, common dandelion, giant ragweed, common ragweed and greater burdock.

Three species of conservation concern ranked Vulnerable by the Manitoba Conservation Data Centre were recorded during the survey and included narrow-leaved puccoon (*Lithospermum incisum*, S3), common milkweed (S3S4) and possibly cottonwood (S3S5). At the location where cottonwood was recorded, identification was made roadside, approximately 15 m away due to high water levels. No plant species at risk listed with either the *Endangered Species and Ecosystems Act* (ESEA), *Species at Risk Act* (SARA) or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were encountered during the survey.

Locations for species of conservation concern were as follows:

narrow-leaved puccoon (S3)	UTM 14U 641859 E and 5443997 N
common milkweed (S3S4)	UTM 14U 640228 E and 5443857 N
common milkweed (S3S4)	UTM 14U 635504 E and 5443923 N
common milkweed (S3S4)	UTM 14U 632047 E and 5443668 N
common milkweed (S3S4)	UTM 14U 625445 E and 5442665 N
common milkweed (S3S4)	UTM 14U 622205 E and 5443400 N
common milkweed (S3S4)	UTM 14U 618932 E and 5443338 N
cottonwood (S3S5)	UTM 14U 626780 E and 5443582 N

Key Findings and Recommendations

The project area supports low diversity of habitat types as virtually all soils along the proposed pipeline route are cultivated for agriculture. Beyond the roadside ditches, routing of the proposed pipeline appears to essentially avoid native vegetation that may support rare or listed plant species based on the landuse and surveys conducted.

It is recommended that low ground disturbance occur during construction activities at the water drains, Marais River, shelterbelts and at the roadside locations where species of conservation concern were recorded.

Mitigative measures should be implemented to avoid the movement of non-native and invasive plant species during construction activities in the project area. Winter or dry ground conditions for construction is recommended.

Photograph 1. Typical roadside ditch vegetation along the preferred route.

Photograph 2. Municipal drain along the preferred route.

Photograph 3. Narrow-leaved puccoon recorded roadside.

Photograph 4. Common milkweed recorded in roadside ditch.

Photograph 5. Possible cottonwood recorded roadside along the preferred route.

Photograph 6. Shelterbelt with green ash along preferred route.

Table 1. Field reconnaissance sites visited.			
Sites Visited	**UTM Zone**	**Easting**	**Northing**
DCA-01	14U	641868	5443996
DCA-02	14U	640228	5443857
DCA-03	14U	635511	5443946
DCA-04	14U	632047	5443668
DCA-05	14U	628780	5443582
DCA-06	14U	627068	5443312
DCA-07	14U	622212	5443408
DCA-08	14U	619743	5443555
DCA-09	14U	618933	5443319
DCA-10	14U	615659	5443219
DCA-11	14U	612370	5443150
DCA-12	14U	609079	5443085
DCA-13	14U	605816	5442632
DCA-14	14U	604934	5443207
DCA-15	14U	623881	5442013
DCA-16	14U	625445	5442665

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APPENDIX D

Wildlife Technical Data and Field ReportA

December 2024A

Appendix D - Table 1. Bird species listed at risk in the Lake Manitoba Plain Ecoregion (S1-S3) (MBCDC, 2024).

Scientific Name	Common Name	MBCDC Rank	ESEA	SARA	COSEWIC
Acanthis hornemanni	Hoary Redpoll	S3B, S5N	-	-	-
Aechmophorus occidentalis	Western Grebe	S3S4B	-	SC	SC
Ammodramus savannarum	Grasshopper Sparrow	S2S3B	-	-	-
Anas rubripes	American Black Duck	S2S3B	-	-	-
Anthus spragueii	Sprague's Pipit	S2B	T	T	T
Antrostomus vociferus	Eastern Whip-poor-will	S2S3B	T	T	SC
Aquila chrysaetos	Golden Eagle	S1B, S2N	-	-	-
Ardea alba	Great Egret	S3B	-	-	-
Asio flammeus	Short-eared Owl	S2S3B	T	SC	T
Athene cunicularia	Burrowing Owl	S1B	E	E	E
Buteo lagopus	Rough-legged Hawk	S2S3B, S4M	-	-	-
Butorides virescens	Green Heron	S1B	-	-	-
Calcarius lapponicus	Lapland Longspur	S3B, S4B	-	-	-
Calcarius ornatus	Chestnut-collared Longspur	S1S2B	-	-	-
Calidris alpina	Dunlin	S3B	-	-	-
Calidris himantopus	Stilt Sandpiper	S3B, S4M	-	-	-
Calidris pusilla	Semipalmated Sandpiper	S1S2B, S4M	-	-	-
Cardellina canadensis	Canada Warbler	S3B	T	T	SC
Cardinalis cardinalis	Northern Cardinal	S1S2	-	-	-
Centronyx bairdii	Baird's Sparrow	S1B	E	SC	SC

Chaetura pelagica	Chimney Swift	S2B	T	T	T
Charadrius melodus circumcinctus	Piping Plover	S1B	E	SC	SC
Chordeiles minor	Common Nighthawk	S2S3B	T	SC	SC
Coccothraustes vespertinus	Evening Grosbeak	S2S3	-	SC	SC
Contopus cooperi	Olive-sided Flycatcher	S2S3B	T	T	SC
Contopus virens	Eastern Wood-pewee	S3B	-	SC	SC
Coturnicops noveboracensis	Yellow Rail	S3B	-	SC	SC
Cygnus buccinator	Trumpeter Swan	S2B	E	-	-
Dolichonyx oryzivorus	Bobolink	S3S4B	-	T	SC
Egretta thula	Snowy Egret	S1B	-	-	-
Eremophila alpestris	Horned Lark	S3B	-	-	-
Euphagus carolinus	Rusty Blackbird	S3S4B, S2N	-	SC	SC
Falco peregrinus	Peregrine Falcon	S2B,S3M	E	SC	-
Hydroprogne caspia	Caspian Tern	S3S4B	-	-	-
Ixobrychus exilis	Least Bittern	S2S3B	E	T	T
Lanius borealis	Northern Shrike	S2S3B, S4N	-	-	-
Lanius ludovicianus excubitorides	Prairie Loggerhead Shrike	S1B	E	T	T
Lanius ludovicianus migrans	Migrant Loggerhead Shrike	SXB	E	E	NL
Melanerpes erythrocephalus	Red-headed Woodpecker	S3B	T	E	E
Melanitta deglandi	White-winged Scoter	S3B,S4M	-	-	-
Melanitta perspicillata	Surf Scoter	S3B, S4M	-	-	-

Numenius borealis	Eskimo Curlew	SXM	E	E	E
Plegadis chihi	White-faced Ibis	S2S3B	-	-	-
Podiceps auritus	Horned Grebe	S3B	-	SC	SC
Podiceps nigricollis	Eared Grebe	S3S4B	-	-	-
Spiza americana	Dickcissel	S1S2B	-	-	-
Strix nebulosa	Great Gray Owl	S3S4	-	-	-
Strix varia	Barred Owl	S3S4	-	-	-
Vermivora chrysoptera	Golden-winged Warbler	S2S3B	T	T	T
Zonotrichia querula	Harris's Sparrow	S3B	-	SC	SC

Appendix D - Table 2. Fish Species that have the potential to occur in the Red River (Manitoba Hydro 2014)

Scientific Name	Common Name	MBCDC Rank	ESEA	SARA	COSEWIC
Fundulus diaphanus	Banded Killifish	S2	-	-	-
Ictiobus cyprinellus	Bigmouth Buffalo	S5	-	SC	SC
Notropis dorsalis	Bigmouth Shiner	S4	-	-	-
Ameiurus melas	Black Bullhead	S5	-	-	-
Pomoxis nigromaculatus	Black Crappie	S5	-	-	-
Notropis heterdon	Blackchin Shiner	S4	-	-	-
Rhinichthys atratulus	Blacknose Dace	S5	-	-	-
Notropis heterolepis	Blacknose Shiner	S5	-	-	-
Percina maculate	Blackside Darter	S5	-	-	-
Lepomis macrochirus	Bluegill	S3S4	-	-	-
Pinephales notatus	Bluntnose Minnow	S4	-	-	-
Hybognathus hankinsoni	Brassy Minnow	S5	-	-	-
Culaea inconstans	Brook Stickleback	S5	-	-	-
Salvelinus fonyinalis	Brook Trout	S5	-	-	-
Ameiurus nebulosus	Brown Bullhead	S5	-	-	-
Salmo trutta	Brown Trout	SNA	-	-	-
Lota lota	Burbot	S5	-	-	-
Umbra limi	Central Mudminnow	S5	-	-	-
Ictalurus punctatus	Channel Catfish	S5	-	-	-
Ichthyomyzon castaneus	Chestnut Lamprey	SU	-	-	-
Coregnis artedi	Cisco	S5	-	-	-
Cyprinus carpio	Common Carp	SNA	-	-	-
Luxillus comutus	Common Shiner	S5	-	-	-
Semotilus atromaculatus	Creek Chub	S5	-	-	-
Notropis atherinoides	Emerald Shiner	S5	-	-	-
Pimephales promelas	Fathead Minnow	S5	-	-	-

Poxinus neogaeus	Finescale Dace	S5	-	-	-
Platygobio gracilis	Flathead Chub	S5	-	-	-
Aplodinotus grunniens	Freshwater Drum	S5	-	-	-
Moxostome erythrurum	Golden Redhorse	S4	-	-	-
Notemigonus crysoleucas	Golden Shiner	S5	-	-	-
Hiodon alosoides	Goldeye	S5	-	-	-
Carassius auratus	Goldfish	SNA	-	-	-
Nocomis biguttatus	Hornyhead Chub	S4	-	-	-
Etheostoma exile	Iowa Darter	S5	-	-	-
Etheostoma nigrum	Johnny Darter	S5	-	-	-
Cousius plumbeus	Lake Chub	S5	-	-	-
Acipenser fulvescens	Lake Sturgeon	S2	-	-	-
Coregonus	Lake Whitefish	S5	-	-	-
Clupeaformis	Largemouth Bass	S5	-	-	-
Percina caprodes	Logperch	S5	-	-	-
Rhinichthys cataractae	Longnose Sucker	S5	-	-	-
Notropis volucellus	Mimic Shiner	S5	-	-	-
Hiodon tergisus	Mooneye	S5	-	-	-
Pungitius pungitius	Ninespine Stickleback	S5	-	-	-
Esox Lucius	Northern Pike	S5	-	-	-
Phoxinus eos	Northern Redbelly Dace	S5	-	-	-
Margariscus margarita	Pearl Dace	S5	-	-	-
Lepomis gibbosus	Pumpkinseed	S4	-	-	-
Carpoides Cyprinus	Quillback	S5	-	-	-
Osmerus mordax	Rainbow Smelt	SNA	-	-	-
Oncorhynchus mykiss	Rainbow Trout	SNA	-	-	-
Percona shumardi	River Darter	S5	-	-	-
Notropis blennius	River Shiner	S5	-	-	-
Ambloplites rupestris	Rock Bass	S5	-	-	-
Notropis percobromus	Carmine Shiner	S1	-	E	E
Notropis stramineus	Sand Shiner	S5	-	-	-

Stizostedion canadense	Sauger	S5	-	-	-
Moxostoma macrolepidotum	Shorthead Redhorse	S5	-	-	-
Coregonus zenithicus	Shortjaw Cisco	S2	-	-	T
Macrhybopsis storariana	Silver Chub	S5	-	-	-
Ichtyomyzon	Silver Lamprey	SU	-	-	SC
Moxostoma anisurum	Silver Redhorse	S5	-	-	-
Micropterus dolomieu	Smallmouth Bass	SNA	-	-	-
Cyprinella spiloptera	Spotfin Shiner	S4	-	-	-
Notropis hudsonius	Spottail Shiner	S5	-	-	-
Noturus flavus	Stonecat	S5	-	-	-
Noturus gyrinus	Tadpole Madtom	S5	-	-	-
Percopsis omiscomaycus	Troutperch	S5	-	-	-
Stizostedion vitreum	Walleye	S5	-	-	-
Rhinichthys obtuses	Western Blacknose Dace	S5	-	-	-
Morone chrysops	White Bass	S5	-	-	-
Pomoxis Annularis	White Crappie	SU	-	-	-
Castostomus commersoni	White Sucker	S5	-	-	-
Perca flavescens	Yellow Perch	S5	-	-	-

From colin.murray@gov.mb.ca

Sent On 2/21/24 9:06:06 AM

Subject RE: New distribution line near Dominion City

Message Hi Jonathan

Thank you for your information request. I completed a search of the Manitoba Conservation Data Centre's (CDC) rare species database for your area of interest. This includes the primary location: Dominion City South Loop Option 1 Route (KML file provided) ; and 500m, 2km, and 5km radius buffers from the footprint boundary.

I am attaching a Microsoft Excel spreadsheet summarizing these occurrences. The spreadsheet includes scientific and common names, the provincial (SRank) rank for each species as well as the Manitoba Endangered Species and Ecosystem Act, and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species at Risk Act (SARA) designations. I'm also including the GIS files used to fulfill this request.

Further information on this ranking system can be found on our website at:
https://www.natureserve.org/conservation-status-assessment.
These designations can be found at:
http://web2.gov.mb.ca/laws/statutes/ccsm/e111e.php,
https://www.cosewic.ca/index.php/en-ca/ and
https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html.

Manitoba's recommended setback distances can be found at:
https://www.gov.mb.ca/nrnd/fish-wildlife/cdc/pubs/mbcdc-bird-setbacks-nov2021.pdf

The information provided in this letter is based on existing data known to the Manitoba Conservation Data Centre of the Wildlife Branch at the time of the request. These data are dependent on the research and observations of CDC staff and others who have shared their data, and reflect our current state of knowledge. An absence of data does not confirm the absence of any rare or endangered species. Many areas of the province have never been thoroughly surveyed, therefore, the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. The information should not be regarded as a final statement on the occurrence of any species of concern, nor should it substitute for on-site surveys for species or environmental assessments. Also, because our Biotics database is continually updated and because information requests are evaluated by type of action, any given response is only appropriate for its respective request.

Please contact the Manitoba CDC for an update on this natural heritage information if more than six months passes before it is utilized.

Third party requests for products wholly or partially derived from our Biotics database must be approved by the Manitoba CDC before information is released. Once approved, the primary user will identify the Manitoba CDC as data contributors on any map or publication using data from our database, as the Manitoba Conservation Data Centre; Wildlife Branch, Manitoba Natural Resources and Northern Development.

This letter is for information purposes only - it does not constitute consent or approval of the proposed project or activity, nor does it negate the need for any permits or approvals required by the Province of Manitoba.

We would be interested in receiving a copy of the results of any field surveys that you may undertake, to update our database with the most current knowledge of the area.

If you have any questions or require further information contact me directly at colin.murray@gov.mb.ca or 204-914-2849.

Colin

Reference screen clip:
NA

From: jwiens@hydro.mb.ca
Sent: 2/20/24 9:24:38 AM
To: colin.murray@gov.mb.ca
Subject: New distribution line near Dominion City

Hello Colin,

Could you please review the CDC database for evidence of SOCC along this proposed distribution line KML near Dominion City? Thanks!

APPENDIX EA

Greenhouse gas lifecycle assessmentA

December 2024A

DOMINION CITY TO ALTONA (DC TO ALTONA) GAS TRANSMISSION PROJECT – GREENHOUSE GAS ASSESSMENT REPORT

ENERGY RESOURCE PLANNING DEPARTMENT

INTEGRATED RESOURCE PLANNING

PROVINCE OF MANITOBA
J. D.
CRUISE
12/03/2024
Member
42611
REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:

J. D. CRUISE, P. ENG.

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REVIEWED BY:

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D. BLOCK, M.SC.

APPROVED FOR RELEASE BY:

L.M.K.MELVIN, P.ENG.

DATE: NOVEMBER 2024

Manitoba Hydro

REPORT: IRPD 24_15

ACKNOWLEDGMENTS

The following people provided meaningful contributions to this report:

- **Jordan Cruise** (Greenhouse Gas Analysis Engineer, Energy Resource Planning Department, Asset Planning & Delivery) led the Dominion City to Altona Gas (DC to Altona) Transmission Project greenhouse gas assessment of project infrastructure and was the primary report author.
- **K. Michael Shaw** (Section Head – Greenhouse Gas Expertise, Energy Resource Planning Department, Asset Planning & Delivery) led the Dominion City to Altona (DC to Altona) Gas Transmission Project greenhouse gas assessment of market responses and was the primary technical and report reviewer.
- **Amy Stevenson** (Environmental Assessment Officer, Transmission & Distribution Environment and Engagement Department, Asset Planning & Delivery) was the primary point of contact for questions and information related to this greenhouse gas assessment.
- **David Block** (Enterprise Projects Environmental Lead, Transmission & Distribution Environment and Engagement Department, Asset Planning & Delivery) provided review of relevant report sections.
- **Nick Bruce** (Engineering Design Technologist, Gas Engineering and Construction Department, Asset Planning & Delivery) provided estimates and details for all construction activities and construction material procurement, was the main contact for construction-related questions, and provided review of relevant report sections.
- **Andrew Greaves (**Gas Design/Renewables Section Head, Gas Engineering and Construction Department, asset Planning & Delivery) provided input on construction timelines and processes.

- **Lindsay Hunter** (Integrated Resource Planning Policy & Coordination Department Manager, Integrated Resource Planning Division, Asset Planning & Delivery) provided managerial review.
- **Lindsay Melvin** (Integrated Resource Planning Division Director, Asset Planning & Delivery) approved the report for release.

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1 INTRODUCTION

1.1 Company Profile

Manitoba Hydro and its wholly-owned subsidiaries (“Manitoba Hydro”), including Centra Gas Manitoba Inc. (“Centra”), is a provincial Crown Corporation and one of the largest integrated electricity and natural gas distribution utilities in Canada.

Centra distributes natural gas to 298,639 residential, commercial, and industrial customers in Manitoba [1].

1.2 Project Purpose and Description

The South Loop pipeline system (“South Loop”) is a two-way feed, natural gas distribution system servicing nearly 11,000 customers. The South Loop is fed from the Dominion City Primary Gate Station and Oakville Primary Gate Station, connecting to the TC Energy Emerson Lateral and Empress lines respectively. The South Loop services Carman, Morden, Winkler, Altona, Morris, several other small towns/villages, and large agricultural customers along the route.

South Loop operations have exceeded planning criteria for some time. A best-efforts operating pressure agreement with TC Energy, which currently provides higher than tariff pressures to the South Loop, has been necessary to meet ongoing customer reliability requirements. TC Energy is expecting near-term upgrades to the South Loop to be implemented (by Centra) so that peak South Loop capacity can be met at minimum contract pressure (i.e., not higher than tariff pressures).

Natural gas service growth on the South Loop has been significant since 2017 and is expected to continue. A combination of urban, agricultural, and industrial growth has been observed, with grain dryers being a primary source of increased peak load.

The Dominion City to Altona Gas Transmission Project (“Project”) will both increase the capacity and reliability of the South Loop. This will allow the South Loop to meet both existing and future design loads (at minimum contract pressure). The Project consists of the construction and installation of a new 38 kilometer (“km”) underground 8” steel natural gas pipeline to supply additional capacity to the South Loop (which is owned by Centra) to serve growing businesses in the Altona area. Some existing pipeline sections on the South Loop have noted reliability concerns. The Project will run parallel to these sections, helping to mitigate the risk of Centra customers losing service.

Additional Project and South Loop details can be found in other Environmental Assessment (“EA”) documentation.

1.3 GHG Assessment/Report Organization

The Project’s Greenhouse Gas Assessment (“GHG Assessment”) divided Project effects into two main categories: 1) Project infrastructure and 2) market responses.

The primary focus of the EA is the Project infrastructure (e.g., the 38 km pipeline). As with GHG Assessments of other Manitoba Hydro projects [2] [3] [4], it was determined that life cycle assessment (“LCA”) would be the appropriate tool to capture both primary and secondary effects related to Project infrastructure, including “embedded emissions”.

Potential Project secondary effects could also include demand-side market responses to the modification of Manitoba Hydro’s Natural Gas Distribution System. Potential upstream and downstream effects related to the product (e.g., natural gas) being distributed through the Project’s infrastructure were considered separately from the LCA. Due to a lack of data certainty, the GHG assessment of potential market response effects is more qualitative in nature.

The intended use of this report is to function as a point of reference for the environmental assessment (“EA”) of the Project, documenting the applied GHG emissions (“emissions”) estimation methodologies and assumptions. This report is intended to help interested parties understand the near- and long-term emissions implications of the Project. A summary of this GHG Assessment is included in Chapter 13 of the EA.

2 PROJECT INFRASTRUCTURE

2.1 LCA Objective

Infrastructure installed as the result of the Project will have GHG effects throughout its life, from construction to decommissioning. The Project LCA includes estimates of construction-related emissions, supply chain emissions, ongoing operation and maintenance emissions, and flaring emissions during decommissioning. The functional unit selected for emissions representation in this LCA is **tonnes of carbon dioxide equivalents per km of the installed pipeline** (“**t CO_2e/km**”). Emissions are also presented on a gross basis, in tonnes of carbon dioxide equivalents (“t CO_2e”) in square brackets for added clarity.

Where possible and reasonable the Project LCA draws on methodologies from LCAs of other Manitoba Hydro projects [2] [3] [4], and the LCA principles therein. Despite the fundamental differences between this Project and these other Manitoba Hydro projects, many of the principles and methodologies are applicable to this Project.

The Project LCA relies on readily available construction information and LCA emission factors (“EFs”). This approach was deemed reasonable because, although a more comprehensive analysis might provide greater accuracy, this was not considered necessary for a project where construction-related emissions are relatively small (compared to total operational emissions of Manitoba Hydro’s Natural Gas Distribution System). Where detailed construction and system information was readily available it has been incorporated.

2.2 LCA Boundaries

This LCA considers relevant construction emissions and relevant post-construction emissions. Construction-related emissions are further disaggregated into supply chain emissions, on-site energy use, worker transportation to and from the Project site, and emissions from pipeline commissioning. From a Corporate[1] GHG Accounting [5] perspective, this LCA will consider emissions that would fall both inside and outside of Manitoba Hydro's scope 1 inventory, from an operational control perspective, as construction for the Project will be completed by a third party.

The boundaries on post-construction emissions include emissions from activities that occur during pipeline operation such as flaring, venting, and combustion of natural gas during pipeline distribution operations. Downstream emissions related to Manitoba Hydro's customers' end-use of natural gas are not considered in the LCA portion of this GHG Assessment – these are considered in Section 3 (Market Responses). From a Corporate GHG Accounting perspective, post-construction-related emissions only consider emissions that could potentially occur in Manitoba Hydro's scope 1 emissions inventory, from an operational control perspective.

Upon the decommissioning of the Project, it is assumed that the pipeline will remain *in situ.* Therefore, the construction-related emissions from decommissioning are assumed to be negligible compared to construction-related and operational emissions. However, the de-energizing and flaring emissions during the decommissioning phase are considered in post-construction-related emissions in this LCA.

---

[1] Corporate GHG accounting and project GHG accounting are distinct methodologies and cannot be used in place of each other. The references to corporate accounting in this GHG Assessment are used to enhance the reader's understanding and are not intended to imply that corporate accounting methodologies have been used in place of project accounting methodologies.

These differences in boundaries between the two identified phases (i.e., construction and post-construction) are deemed appropriate as they reflect the direct emissions associated with Manitoba Hydro's decision to construct, operate, and maintain the Project over its assumed lifespan but not the wider economy's decisions related to the use of natural gas as an energy source, which are considered in Section 3 (Market Responses).

As discussed in Section 3.1, a do-nothing alternative was not considered a viable baseline alternative to the Project. Manitoba Hydro did not identify a baseline scenario that differed from the Project Scenario (i.e., the Project); however, to provide meaningful insight, LCA assessment results are presented as absolute emissions (i.e., emissions are compared against a "do-nothing" scenario where the Project does not occur) not net emissions.

2.3 LCA Emissions Summaries

The following subsubsections present both the construction-related emissions and the post-construction-related emissions that fall within the established LCA boundaries. Construction- and post-construction-related emissions are aggregated at the end of this subsection to present final LCA emissions values.

2.3.1 Summary of Construction-Related Life Cycle Emissions

Table 1 provides a high-level estimate of in-scope life cycle emissions, indicating the order of magnitude of potential emissions. Aggregated construction life cycle emissions per functional unit for the Project are 199 t CO_2e/km [7,548 t CO_2e].

While aggregated emissions are presented to the nearest 1-tonne increment in this document, this is only done for comparison purposes; it is not intended to imply that this level of accuracy was achieved in the LCA.

Most construction-related emissions result from *Construction: Material Supply Chain* emissions embedded in the materials of the Project's components (e.g., steel pipe) followed by on-site energy emissions.

Table 1: Construction-Related Emissions Summary Table

Activity	t CO_2e/km	t CO_2e	% of total[2]
Construction: Material Supply Chain	111	4,204	56%
Construction: On-Site Energy	77	2,922	39%
Construction: Worker Transportation	11	422	6%
Construction: Pipeline Commissioning	0	1	0%
Construction: Land-Use change	-	-	-
Total	**199**	**7,548**	

It has been assumed that there is no net above or below-ground carbon change due to the Project. This is because the pipeline will be installed in existing rights-of-ways and fields used for agricultural purposes; no permanent clearing of above-ground biomass will be required. Although the pipeline will take up approximately 0.038 m^2 [58 in^2] in cross-section, and approximately 38 km in length, resulting in a material volume of displaced soil, it is assumed that all excavated materials are used to cover the pipeline after installation and no excavated materials are removed from the Project site. Additionally, it is assumed that soil carbon content fluctuates year-to-year due to the agricultural activities that occur on the land, and the carbon content of the soil is not sensitive to the pipeline installation in this environment. The assumption of no net above

[2] Throughout the document, column totals may not sum due to rounding.

or below-ground carbon change would not be valid if the pipeline were installed in previously undisturbed soils.

Steel manufacturing is an emissions-intensive industry resulting in approximately 91% of the *Construction: Material Supply Chain* category, or 100 t CO_2e/km [3,850 t CO_2e] for this Project. It is expected that if a longer route is selected or required, the increase in emissions in the *Construction: Material Supply Chain* category would be statistically significant.

Emissions from the *Construction: On-Site Energy* category are estimated to be 77 t CO_2e/km [2,922 t CO_2e]. For context[3], this is ~13% of the annual emissions from Manitoba Hydro's fleet (~23,000 t CO_2e in 2023) [6].

[3]As the construction of the Project will be contracted out, emissions from on-site energy use will not be inventoried in Manitoba Hydro's future scope 1 emissions inventory.

Figure 1: Visual Representation of Construction Emissions per km (in CO_2e)

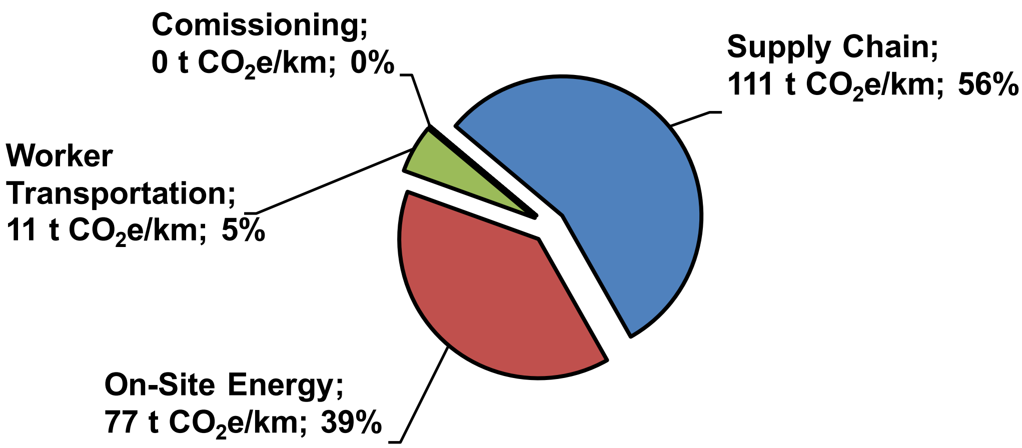
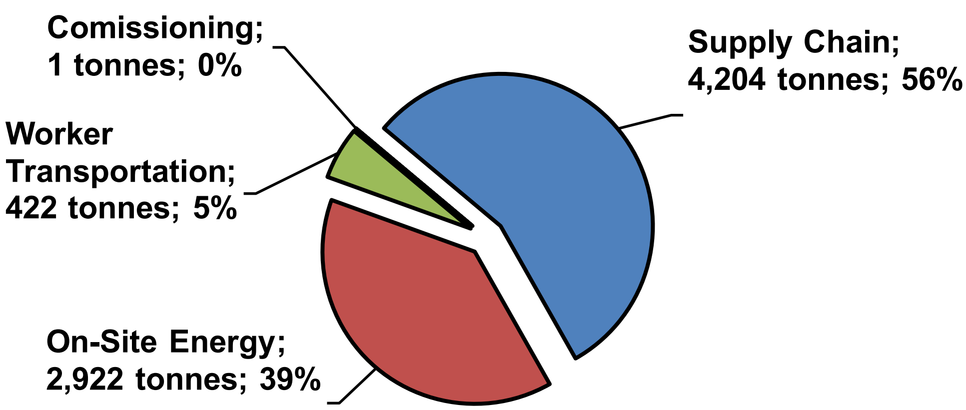


Figure 2: Visual Representation of Gross Construction Emissions (in CO_2e)



2.3.2 Summary of Post-Construction-Related Life Cycle Emissions

Only emissions from direct pipeline operations are considered for the LCA. Downstream emissions related to Manitoba Hydro's customers' end-use of natural gas are not considered in the LCA portion of this GHG Assessment – these are considered in Section 3 (Market Responses). Emissions considered in this subsubsection are the vented, combusted, and flared emissions that are likely to occur over the operational lifespan and the decommissioning phase of the pipeline.

Table 2: Post-Construction-Related Emissions Summary Table

Activity	t CO_2e/km	t CO_2e	% of total
Post Construction: Pipeline Operations	167	6,331	98%
Post Construction: Pipeline Decommissioning	3	119	2%
Total	**170**	**6,450**	

Only the flaring and de-energizing of the pipeline are considered in this LCA during the decommissioning phase. The EA for the Project indicates that the pipeline will be capped and remain *in situ* after decommissioning, therefore any other emissions during the decommissioning phase are assumed to be minimal relative to the de-energizing and flaring. A flaring efficiency of 98%, an industry standard, is assumed to calculate decommissioning emissions.

The *in situ* decommissioned pipeline is assumed to be not filled with concrete, but rather with an inert gas/air. It is expected that if the *in situ* decommissioned pipeline were to be filled with concrete, it would have a material impact on the decommissioning emissions as cement is an emissions-intensive construction material.

Over the assumed 50-year pipeline lifespan, the operational emissions, which include fugitive, vented, flared, and combusted natural gas that occurs during pipeline operations, comprise 98% of the total post-construction-related emissions at 170 t CO_2e/km [6,450 t CO_2e].

Figure 3: Visual Representation of Post-Construction-Related Emissions per km (in CO_2e)

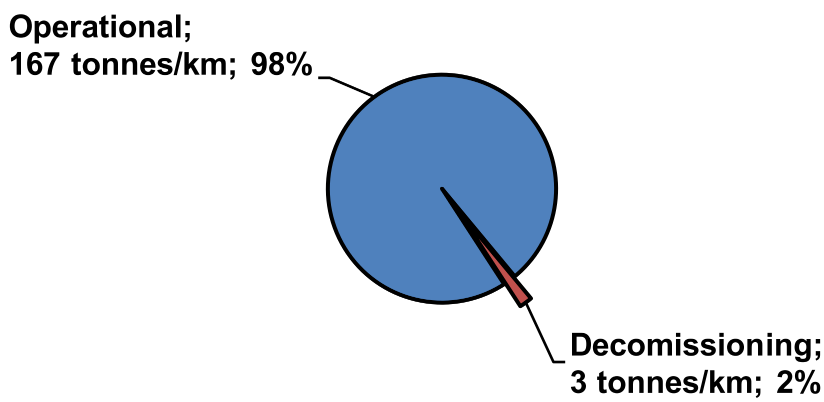
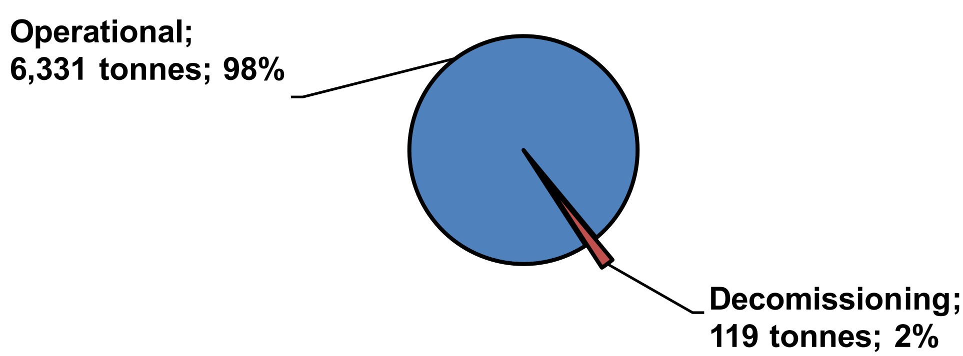


Figure 4:Visual Representation of Gross Post-Construction-Related Emissions (in CO_2e)



2.3.3 Total Life Cycle Emissions

Considering both construction-related and post-construction-related emissions, the total considered LCA emissions for the Project are estimated to be 368 t CO_2e/km [13,998 t CO_2e] over the 50-year assumed lifespan of the Project.

Table 3: LCA Emissions Summary Table

Activity	t CO_2e/km	t CO_2e	% of total
Construction: Material Supply Chain	111	4,204	30%
Construction: On-Site Energy	77	2,922	21%
Construction: Labour Transport	11	422	3%
Construction: Project Commissioning	0	1	0%
Post Construction: Pipeline Operations	167	6,331	45%
Post Construction: Pipeline Decommissioning	3	119	1%
Total	**368**	**13,998**	

When the full profile of LCA emissions is considered, *Post Construction: Pipeline Operations* is the single largest emissions category over the 50-year assumed lifespan, accounting for almost half of the total considered LCA emissions. While 50 years was the assumed lifespan, the pipeline may be in use for longer than 50 years. If this occurs, it is expected that the incremental emissions from *Post Construction: Pipeline Operations* would have a material contribution to the total emissions from the Project. For each year the pipeline operates, it is expected it will contribute 3 t CO_2e/km [127 t CO_2e].

Figure 5: Visual Representation of Total LCA Emissions per km (in CO_2e)

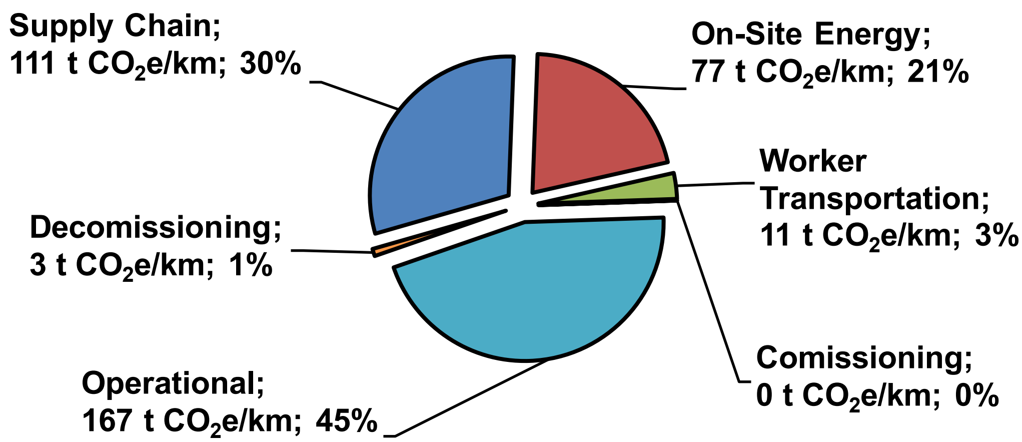
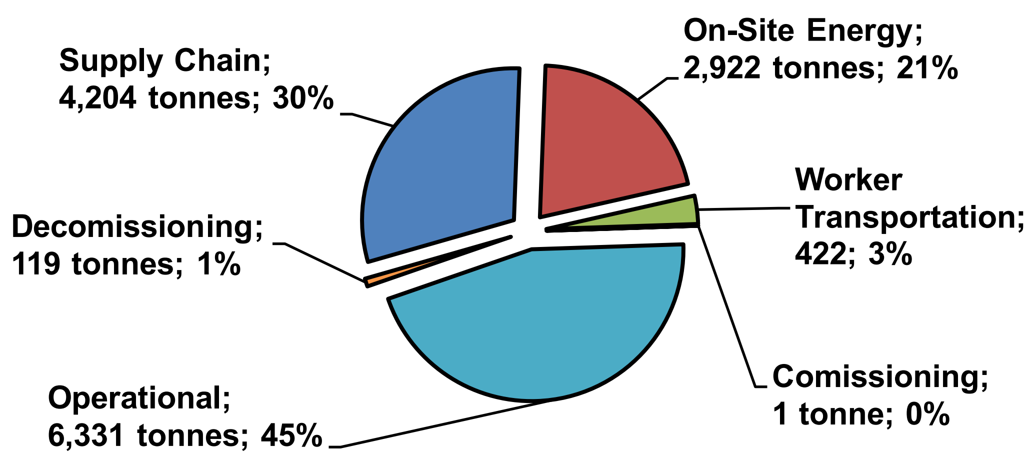


Figure 6: Visual Representation of Total LCA Emissions (in CO_2e)



Amortizing emissions over the 50-year assumed lifespan of the Project results in the following emissions contributions per year by each considered category:

Table 4: LCA Emissions Summary Table Amortized Over Project Lifespan

Activity	t CO_2e/km per year	t CO_2e per year	% of total
Construction: Material Supply Chain	2	84	30%
Construction: On-Site Energy	2	58	21%
Construction: Labour Transport	0	8	3%
Construction: Project Commissioning	0	0	0%
Post Construction: Pipeline Operations	3	127	45%
Post Construction: Pipeline Decommissioning	0	2	1%
Total	**7**	**280**	

2.4 LCA Emissions Methodology

Due to the scale of the Project, and uncertainty related to construction contracts and arrangements, it was considered reasonable to use readily available construction information and LCA EFs and not undertake any comprehensive, fully project-specific analyses specifically for this GHG Assessment. However, where detailed construction information was readily available, it has been incorporated.

Assumptions related to the construction of the Project are based on both project-specific details and other publicly available pipeline LCAs which were used as a reference [7]. Additionally, assumptions from the S65R Tap [4] and the R44H [3] GHG assessments, and other transmission projects, were applied when appropriate. This is the first GHG assessment Manitoba Hydro has performed for a pipeline construction project.

Construction assumptions incorporated into this GHG Assessment are intended for emissions estimation purposes only. Construction estimates in this GHG Assessment should not be taken as an indicator of the workforce required for construction. Both the workforce required and the time it takes to complete the project will be a function of the experience and available resources of the construction contractor.

For this LCA emissions have been disaggregated into construction-related emissions and post-construction-related emissions to better understand the emissions profile of the Project.

2.4.1 Construction Emissions

Construction activities for the Project have been broken down into four aggregated activities:

1. Material supply chain
    a. Embodied (i.e., “embedded”) emissions in construction materials
    b. Transport of materials to the Project site
2. On-site energy use (i.e., fuel used in construction equipment)
3. Worker transportation to and from the Project site
4. Pipeline commissioning

2.4.1.1 Material Supply Chain Emissions

Key material supply chain assumptions used in this LCA are as follows:

1. The Project will be 38 km long.

2. The Project is designed with an 8.625” [219.1 mm] outer diameter steel pipe with a wall thickness of approximately 0.22” [5.56 mm]. The Project is designed with a Nominal Pipe Size (“NPS”) of 8”.

3. Steel pipe will be trucked to the site in 59’ [18 m] sections and will be welded on site before below-grade installation.

4. Total steel mass required for the project, including a 10% adder, and considering the discrete lengths in which the steel pipe is procured, is estimated to be 29.3 tonnes/km.

5. The assumed logistics of construction material transportation for emissions estimating[4] are as follows:
   a. Raw materials are shipped from Türkiye to Montreal, Québec by ocean liner for consistency with previous LCAs [4]
      i. Alternative source locations (i.e., sources closer than Türkiye) for the Project steel would likely result in lower transportation emissions, however, for conservatives and consistency with previous LCAs, Türkiye is the assumed source location.
   b. Materials are shipped to Edmonton, Alberta by train from Montreal, Québec.

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[4] These assumptions were made for conservativeness and consistency based on available information at the time of this assessment. They are not meant to indicate procurement strategies and/or preferences of either Manitoba Hydro or Project vendors/suppliers.

c. Materials are shipped to Red Deer, Alberta by truck for processing.
d. Materials are shipping to Camrose, Alberta by truck for additional processing.
e. Materials are shipped to the Project site in Manitoba by truck.

6. For the purpose of the Project Assessment, only steel construction materials were considered in the emissions estimate due to the large mass of steel required for the Project, relative to other materials.

Table 5 disaggregates the supply chain emissions into material manufacturing and transportation. It is estimated that materials manufacturing emissions are significantly greater than materials transportation emissions. Table 2 shows that transportation emissions are estimated to comprise less than 1% of overall supply chain emissions, even with conservative sourcing and processing location assumptions.

Table 5: Project Supply Chain Emissions Disaggregated by Subcategories

Supply chain category	t CO_2e/km	t CO_2e	Percent of supply chain emissions
Materials Manufacturing	100	3,805	91%
Materials Transportation	10	399	9%
Total	**111**	**4,204**	

2.4.1.2 On-site Energy Use Emissions

The estimated workforce for the Project, including the mobilization phase, construction, remediation/reclamation, and demobilization is 600 person-months[5], with a total assumed construction timeline of 12 months.

Heavy construction equipment will generally include graders, backhoes, bulldozers, excavators, side boom cranes horizontal drilling rigs, light-duty trucks, and other equipment,[6] with fuel consumption estimates listed in Table 6 [7]. For the Project Assessment, it is assumed that construction vehicles are left on-site while workers commute to and from the Project site each workday.

Table 6: Heavy Construction Vehicle Fuel Consumption Estimates

Vehicle	Litres/hour	Total Vehicles Used	Utilization Factor Estimates
Graders	40	2	50%
Backhoes	15	3	25%
Bulldozers	65	1	50%
Excavators	31	4	80%
Side Boom Cranes	50	2	50%
Horizontal Drilling Rigs	30	1	50%

[5] Actual workforce and timelines will be a function of contractor resources. Estimates within this Assessment are used to estimate emissions only. Actual construction timelines are assumed to vary from the estimates in this GHG Assessment.

[6] Information supplied and or assumptions confirmed by Manitoba Hydro (including Centra) staff.

Non-heavy construction vehicles (i.e., light-duty trucks) are assumed to consume, on average, twice the 3.4 litres/hour ("L/hr") idle without load rate over 10 hours, or one construction day, in the winter months, for a total of 6.8 L/hr over a 6-month working period. It is assumed that during the summer months, non-heavy construction vehicles are not idling when not in use.

It is assumed that the clearing and digging of the pipeline trench will be completed by graders, bulldozers, excavators, and backhoes. The pipe lengths will be laid out, welded together on site, and installed into the trench using a side boom crane. Assumptions on equipment utilization and fuel usage during the construction phase are presented in Table 9.

2.4.1.3 Worker Transportation Emissions

It is assumed that crews will commute from Winnipeg to the construction site daily, for a total of ~202 km[7] traveled per workday, round-trip, for commuting purposes. Although local accommodations may be used during the week, assuming daily commutes from Winnipeg results in a higher estimate of emissions from worker transport to and from the site. This assumption is consistent with the principle of conservativeness followed in project GHG accounting [8]. It is assumed that workers will arrive at the construction site using one light-duty truck for every three workers.

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[7] The average distance from Winnipeg to Altona and Winnipeg to Dominion City is 101 kilometers.

Figure 7: Visual Representation of Emissions from Fuel Use per km (in CO_2e)

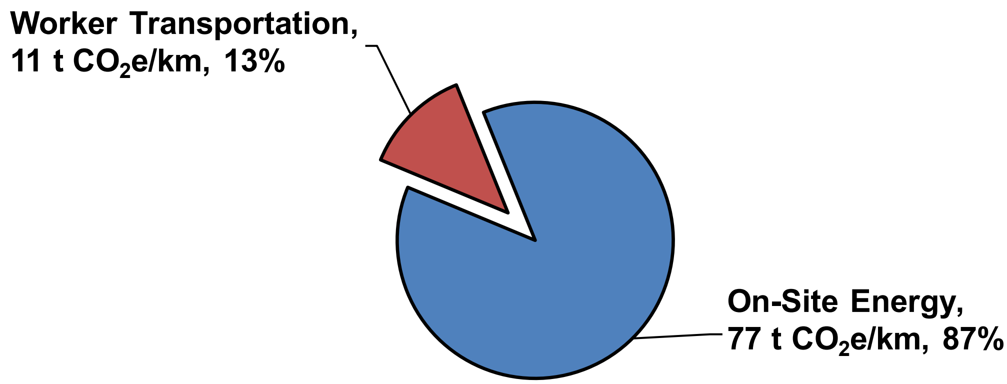
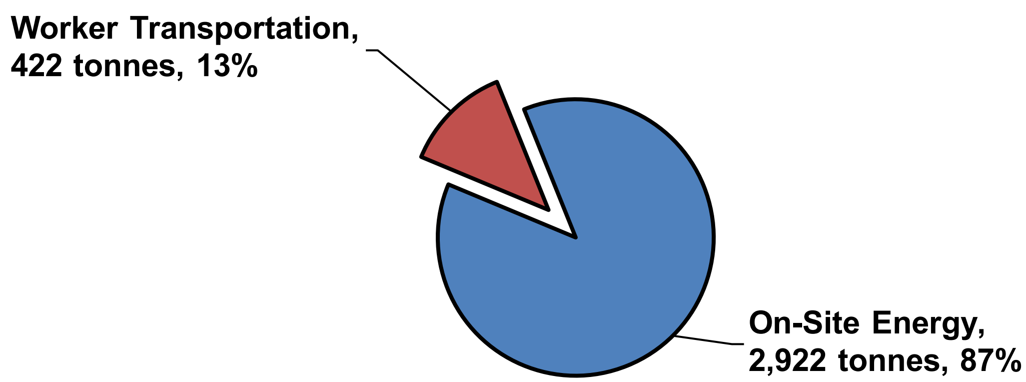


Figure 8: Visual Representation of Emissions from Fuel Use (in CO_2e)



Note that the *Construction: On-Site Energy Emissions* category in Figure 7 and Table 4 comprises the emissions from heavy construction equipment and light-duty vehicles while at the Project site. *Construction: Worker Transportation Emissions* only considers emissions from worker transport to and from the project site using the assumptions outlined in Table 9.

Figure 7 and Figure 8 presents a high-level visualization of the emissions, in t CO_2e/km and tonnes CO_2e, related to the transportation of construction crews to and from the work site and the emissions from pipeline construction and associated activities, based on information presented in the above details, Table 6, Table 7, and Table 9.

2.4.1.4 Pipeline Commissioning Emissions

During the commissioning phase of the Project, an inert gas (typically nitrogen gas) is inserted to replace the air that is in the pipeline. This is done to ensure that natural gas and air are not mixed in the pipeline, which can present safety concerns. Natural gas is purged into the pipeline while energizing to remove the air and purging will stop once the air has been removed from the pipeline. During this process, a small amount of natural gas is vented to the atmosphere.

Publicly available sources were used to estimate the emissions from vented natural gas during the commissioning phase as no Manitoba Hydro-specific data was available at the time of this LCA [7].

2.4.2 Post-Construction Emissions

For this LCA, the post-construction activities that are considered include operational emissions over the lifespan of the project and any emissions that occur during the decommissioning of the pipeline. For clarity, emissions from pipeline commissioning are included in construction-related emissions whereas decommissioning emissions are included in post-construction emissions.

2.4.2.1 Pipeline Operations Emissions

During standard pipeline operations and maintenance, natural gas is flared, vented, or combusted throughout its lifespan. Combustion emissions are part of standard pipeline operations, typically due to the operation of pipeline heaters (downstream combustion emissions related to Manitoba Hydro's customers' end-use of natural gas are not considered in the LCA portion of this GHG Assessment – these are considered in Section 3 (Market Responses)). Flaring and venting can occur when the pipeline is taken out of service for maintenance. Though flaring is the preferred option from an environmental perspective (compared to venting), there are instances where flaring is not possible and natural gas is vented to the atmosphere. Venting may also occur through leaks in seals and fittings in the pipeline over the course of its lifespan.

Operational emissions for the Project were determined by prorating Manitoba Hydro/Centra Gas' total 2023 Natural Gas Distribution System emissions based on pipeline length. Total Natural Gas Distribution System emissions are determined based on component counts, company-specific calculations, and standard industry practice. Depending on the component counts on the Project this prorating method may over or underestimate actual operational emissions. However, it is expected that the *Post Construction: Pipeline Operations* will be the largest emission source in this LCA even if the prorating method overestimates the operational emissions.

2.4.2.2 Pipeline Decommissioning Emissions

Only the flaring of the volume of gas under the Project's standard operating pressure was considered for this LCA. Additionally, a flaring efficiency of 98% was assumed with the remaining 2% of natural gas being vented to the atmosphere. Using the Ideal Gas Law the volume of gas at pipeline operating pressures was converted to a volume at standard conditions and 98% of this volume at standard conditions was multiplied by an appropriate natural gas combustion emission factor. The remaining 2% was assumed to be 100% methane for simplification and was multiplied by IPCC's Fifth Assessment

(“AR5”) GWP_{100} for methane[8] [9]. These two values are aggregated in CO_2e to estimate total emissions for the decommissioning phase.

It is assumed that the *in situ* decommissioned pipeline is not filled with concrete. If the *in situ* decommissioned pipeline were to be filled with concrete, it is expected that this would have a material impact on the decommissioning emissions as cement is an emissions-intensive construction material.

[8] The GWP_{100} for methane in AR5 is 28

2.4.3 Key GHG Assessment Assumptions and Inputs

Table 7, Table 8, and Table 9 list the key assumptions used in the estimate of infrastructure emissions. The rationale and assumptions for these values are described in Sections 2.4.1 and 2.4.2.

Table 7: Life Cycle Emissions – Key Input Assumptions

Activity	Emission Factor	Unit	Source
Ocean Transport	15.84	g CO_2e/tonne-km	NREL [10]
Rail Transport	18.97	g CO_2e/tonne-km	NREL [10]
Road Transport by Truck	79.91	g CO_2e//tonne-km	NREL [10]
Mine Iron Ore	43.04	g CO_2e/kg of ore	StatsCan
Produce Galvanized Steel Sheet	2,710.66	g CO_2e/kg steel	NREL [10]
Forge Steel into Bars/Wire/Other	354.61	g CO_2e/kg steel	Chalmers University [11]
Combust Diesel	2,761.38	g/L of fuel	ECCC [12]
Combust Gasoline	2,315.10	g/L of fuel	ECCC [12]
Produce and Deliver Fuel	979.29	g/L of fuel	ECCC [12]

Table 8: Life Cycle Emissions – Material Transport Assumptions

Assumption	Value	Unit	Source
Türkiye[9] to Montreal by Ocean	8,900	km	sea-distances.org
Montreal to Edmonton by Rail	3,000	km	rome2rio.com
Edmonton to Red Deer by Truck	200	km	Google Maps
Red Deer to Camrose by Tuck	100	km	Google Maps
Camrose to Site by Truck	1,300	km	Google Maps

Table 9: Life Cycle Emissions – Construction-related Assumptions

Assumption	Value	Unit	Source
Pipeline Mass - Steel	29.3	tonnes/km	Manitoba Hydro
Light Duty Truck Mileage	0.2	L/km	Manitoba Hydro
Vehicle Idling	6.8	L/hour	Oak Ridge National Lab
Heavy Construction fuel use[10]	248.0	L/hour	Manitoba Hydro
Hours per Construction Day	10	hours	Manitoba Hydro
Construction Days Per Month	22	days	Manitoba Hydro
Vehicle Ratio	3	Persons/vehicle	Manitoba Hydro
Construction Labour	13,200	person-days	Manitoba Hydro

[9] İzmir assumed as seaport location in Türkiye

[10] Calculated using data presented in Table 6

3 MARKET RESPONSES

GHG assessments of other Manitoba Hydro construction projects [2] [13] [14] have only considered potential market responses related to regional electricity generators (i.e., “generation effects”). Outside of electricity generation, GHG effects (e.g., fuel switching, load growth) related to the end-uses of energy have not been considered.

These other Manitoba Hydro projects were transmission and generation projects, not distribution projects. The Project will expand Centra’s system’s capacity, allowing more Manitoba customers to hook up to the natural gas system. This could, potentially, impact customers’ fuel choices and any resulting GHG effects.

The Project’s assessment of potential market responses uses project accounting methodology [8]; however, analysis indicates that establishing a baseline scenario, without the Project, is highly speculative and does not lend itself to accurate GHG assertions; however, in support of transparency, this section presents a more qualitative discussion of potential market responses to the Project. Some quantification of potential GHG effects is included to provide scale/context.

3.1 Baseline Candidate Alternatives

“Baseline candidates are alternative technologies or practices, within a specified geographic area and temporal range, that could provide the same product or service as a project activity.” [8]

The Project is providing the following attributes which would be required by any baseline scenario:

- It is allowing Centra to meet its existing design loading.
- It is enhancing the reliability of the existing system.

- It is serving expected load growth (i.e., an increase in design loading).

A do-nothing alternative was not considered a viable baseline alternative as Manitoba Hydro is expected to maintain reliable systems for its existing natural gas and electricity customers. Theoretically, Manitoba Hydro could have pursued an option that met existing design load (assuming minimum contract pressure from TC Energy) but did not accommodate new load growth; however, there was no business case to do so, and this would be counter to Manitoba Hydro's long-standing practice of providing natural gas and/or electric service to all customer services within the province where reasonable.

Manitoba Hydro analyzed three capacity upgrade options to service load growth: Liquified natural gas peak shaving, natural gas compression, and transmission pipeline looping, with the Project being selected. Assuming they provide the same design load, all these options would result in the same market response. The only difference in GHG effects would relate to project infrastructure. Assessing these alternatives was not included in the scope of the LCA, however some high-level observations are as follows:

- The peak shaving and compression alternative would very likely result in lower construction emissions as they require less infrastructure. The material required for the Project (i.e., the 38 km of pipe) is larger.
- The peak shaving and compression alternatives would likely result in higher post-construction emissions.
    - Both the compression and peak shaving options have material operational energy requirements, whereas pipeline looping has minimal operational energy requirements.
    - The peak shaving option would result in wasted fuel as about 2% of liquid natural gas is lost due to boil-off monthly; and, the well-to-wheel efficiency of liquid natural gas is poorer than that of natural gas, in general.

The cost to electrify some of the anticipated load growth, as an alternative, was considered as part of Manitoba Hydro's corporate value framework evaluation of increasing capacity along the South Loop; however, high level cost estimates, based on marginal values of electric energy and capacity, suggested the cost could potentially be an order of magnitude higher than the cost of the Project. In the absence of provincial policy explicitly restricting capacity expansion along Centra's system, electrification is not a reasonable baseline scenario.

3.2 Provincial Natural Gas Policy

Manitoba Hydro has a long-standing practice of expanding its natural gas distribution when there was an adequate business case to do so, such as:

- If incremental near-term revenue would offset any expansion costs.
- If customers were willing to cover the cost of expansion.

With annual natural gas space heating costs being lower than other fossil fuels and electric resistance heating [15], there have been many circumstances where there has been an adequate business case for Manitoba Hydro and/or its customers to expand the Natural Gas Distribution System.

The provincial government has net-zero targets which will likely require a long-term reduction in the end-use of natural gas in the province of Manitoba. Action 2.1 in Manitoba's Affordable Energy Plan [16], which is a policy document that "supports our path to net zero emissions by 2050", states that "Affordable and reliable heating and cooling is essential in our climate. As we move away from non-renewable heating sources such as natural gas, it will be important for Manitobans to be provided with new options that are not only clean but also affordable." For clarity, while annual throughput may be reduced significantly, peak gas system design load may not. Manitoba Hydro analysis [17] indicates dual-fuel space heating options (e.g., where air-source heat pumps are combined with gas furnaces) could potentially be cost-effective options to reduce provincial emissions and annual throughput, but these heating options may not be an effective means to reduce peak natural gas demand.

While the Project was based, in part, on a projection of modest load growth along the South Loop. It is possible that future provincial policy may result in a long-term reduction in South Loop annual natural gas throughput. If that is the case, then the Project will cause a negligible, or no, long-term market response. This does not mean, however, that the Project is not required to meet short-term customer needs.

3.3 South Loop Load Growth

Anticipated load growth along the South Loop will be due to the urban expansion of Morden, Winkler, Altona, and Morris (Rosenort), a high concentration of new grain dryer installations, and existing agricultural energy demand switching to natural gas from more emissions-intensive fuels (e.g., propane, diesel/fuel oil). The majority of growth in peak demand on the South Loop system is anticipated to be due to large commercial/agricultural growth (e.g., new grain dryers and existing grain dryers switching fuels) not urban growth (e.g., residential space heating).

For clarity, natural gas distribution system design is based on a peak design load, or the maximum amount of system throughput during the peak loading hour of the year. It is not based on annual throughput. Anticipated increases in annual throughput depend on the load profiles of individual customers.

Urban Load Growth: Over the next 15 years, urban load growth is estimated to increase peak on the South Loop by 158 mcfh (millions of cubic feet per hour). One mcfh can typically supply approximately 12 residential customers at peak winter conditions. Using that assumption, the estimated increase is roughly equivalent to 1,900 residential customers. Assuming 1,630 cubic metres per year per customer [15], based on an assumption of high-efficiency furnace, this would be roughly equivalent to three million cubic meters per year (i.e., 0.14% of current annual natural gas throughput of Manitoba Hydro's Natural Gas Distribution System).

Commercial/Agricultural Growth: Over the next 15 years, commercial/agricultural load growth is estimated to increase peak on the South Loop by 210 mcfh. A substantial amount of load growth will be due to both grain dryers (a seasonal load) that do impact the system design peak as well as grain dryers that don't impact the system design peak (it assumed some grain dryer load will be placed in a "seasonal rate class"). The Project will facilitate both types of load growth as some natural gas loads will require a supply that's both firm and seasonal.

At this time, Manitoba Hydro does not have detailed data regarding potential future annual throughout (in cubic metres per year) from new commercial/agricultural load along the South Loop. To provide high level context, three million cubic meters per year (the equivalent of 1,900 residential customers) will be assumed, matching the high level estimate of urban load growth.

3.4 Market Alternatives

Manitoba customers with natural gas hook-ups have natural gas distributed to them via Manitoba Hydro (i.e., Centra). Where natural gas distribution infrastructure is not available, Manitobans must choose different energy sources for their heating needs. These include electricity, propane, diesel, biofuels, and other fuels.

Urban Load: In Manitoba, the primary alternative to the use of natural gas for space heat is the use of electricity for space heat. Over the short-term (i.e., the next 5 to 7 years), since it only affects the operating margin [18], Manitoba Hydro assumes incremental electricity use results in generation effects of 0.82 kg CO_2e/kWh, based on an emission factor for "Non-Baseload Factors used for Avoided Emissions" [11] in eGRID's Upper Midwest region [19].

Over the long-term, this baseline emissions rate [18] will reduce as Manitoba Hydro builds new electricity generation resources to meet increases in provincial electrical load. Eventually, incremental electricity use will almost entirely affect the build margin [18], which could be near, or even below, 0 kg CO_2e/kWh. Manitoba Hydro does not currently have a long-term projection of baseline emission rates. [13][12] A projection is being developed as a part of Manitoba Hydro's ongoing planning.

Table 10 presents an estimate of annual space heating emissions produced by both one (average) residential customer as well as 1,900 customers (the high level estimate of 15 years of urban load growth along the South Loop). Estimates are based on assumptions listed in Table 11 and Table 12. For conservativeness, it was assumed all new electrical customers would install either air source heat pumps (ASHPs) or ground source heat pumps (GSHPs). In a baseline scenario where all urban load growth was replaced by electrification (instead of the Project), annual urban load emissions would be between 2.2 and 5.9 tonnes CO_2e higher per customer than under the Project

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[11] These emission factors do not include GHG effects upstream of electricity generators.

[12] A detailed discussion of generation effects and potential long-term avoided emission factors in regions neigbouring Manitoba can be found in the Pointe du Bois Unit Replacement Project - Greenhouse Gas Mitigation Assessment.

Scenario. Over the long-term, annual urban load emissions could potentially be up to 3.2 tonnes CO_2e lower per customer than under the Project Scenario.

Table 10: Annual Space Heating Emissions (t CO_2e) – Average Single Family Residential Customers [15]

Heating Fuel	Per Customer	Per 1,900 Customers
Propane (95% Efficiency)	3.81	7,233
Natural Gas (95% Efficiency)	3.21	6,101
Diesel/Fuel Oil (95% Efficiency)	4.51	8,577
Short-Term Electricity (Conventional ASHP – 120% Efficiency)	11.35	21,557
Short-Term Electricity (Cold Climate ASHP – 150% Efficiency)	9.07	17,236
Short-Term Electricity (GSHPs – 250% Efficiency)	5.45	10,348

Table 11: Annual Space Heating Requirements – Avg Single Family Customer [15]

Heating Fuel	Quantity	Unit
Propane (95% Efficiency)	2,465	litres
Natural Gas (95% Efficiency)	1,630	m^3
Diesel/Fuel Oil (95% Efficiency)	1,635	litres
Electricity (Conventional ASHP – 120% Efficiency)	13,842	kWh
Electricity (Cold Climate ASHP – 150% Efficiency)	11,067	kWh
Electricity (Ground Source Heat Pump – 250% Efficiency)	6,644	kWh

Table 12: Direct Emission Factors – Space Heating Fossil Fuels[13]

Heating Fuel	Emission Factor	Unit	Source
Propane	1.54	kg/L	ECCC [12]
Natural Gas	1.97	kg/m^3	MH
Diesel/Fuel Oil	2.76	kg/L	ECCC [12]

Commercial/Agricultural Growth: Unlike residential space heating, the alternative to agricultural natural gas heating (e.g., grain drying and barn heating) is often propane or diesel/fuel oil, not electricity. It is assumed that connecting large agricultural and commercial facilities will enable fuel switching away from these more emissions intense fuels (Table 10).

A baseline scenario where commercial/agricultural growth relied on propane or diesel/fuel oil instead of natural gas could potentially result in 1,000 to 2,500 tonnes CO_2e more emissions annually, in the 15th year of the forecast. For comparison, total LCA emissions related to Project infrastructure are estimated to average 280 tonnes CO_2e annually (Table 4).

3.5 Market Response Conclusions

In considering the various baseline candidate alternatives, Manitoba Hydro did not identify a baseline scenario that differed from the Project Scenario (i.e., the Project). The South Loop needs to be upgraded to meet existing design load requirements (at minimum TC Energy contract pressure), several new customers already have approval

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[13] These emission factors do not include upstream GHG effects.

to connect to the South Loop, the Project has a strong business case, and there is currently no provincial policy in place to restrict reasonable (i.e., business case justified) expansion Manitoba's natural gas distribution system's capacity.

By providing additional natural gas capacity along the South Loop, the Project will likely increase natural gas emissions (both direct and indirect), decrease diesel and propane emissions, and decrease regional electricity generation emissions – likely resulting in a net decrease in global emissions; however, it is not concluded that any of these GHG effects are additional. Manitoba Hydro is not asserting that the Project will result in a reduction in global GHG emissions by facilitating fuel switching to natural gas.

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APPENDIX FA

Cultural and Heritage Resources Protection PlanA

December 2024A






CULTURAL AND HERITAGE RESOURCES PROTECTION PLAN

Available in accessible formats upon request.

Manitoba Hydro

Document Owner
Transmission & Distribution Environment and Engagement
Project Management Division
Manitoba Hydro

Version - Final

List of Revisions

Number	Nature of Revision	Section(s)	Revised By	Date

Key messages for construction

Workers in the field should remain vigilant to watch for and report any discoveries. Manitoba Hydro expects workers to report any findings to the Manitoba Hydro On-Site Supervisor or designate.

If human remains, a cultural and/or heritage site are found, activities stop at that location.

The Manitoba Hydro Transmission & Distribution Environment and Engagement (T&DEE) is prepared to offer the required support to On-Site Supervisors including archaeological services, to preserve and protect cultural and heritage resources. T&DEE can be contacted at 1-877-343-1631 or projects@hydro.mb.ca.

Potential fines

Under The Heritage Resources Act, any person who contravenes or fails to observe a provision of this Act or a regulation, order, by-law, direction, or requirement made or imposed thereunder is guilty of an offence and liable, on summary conviction, where the person is an individual, to a fine of not more than $5,000. for each day that the offence continues and, where the person is a corporation, to a fine of not more than $50,000. for each day that the offence continues.

Preface

This standard Cultural and Heritage Resources Protection Plan outlines protection measures and protocols that Manitoba Hydro, its contractors and/or consultants will undertake in the event of the discovery of previously unrecorded cultural and **heritage resources** during construction, maintenance, or operation of an electrical or gas transmission line or facility.

The intent for this document is to be a straightforward and practical reference document for use by the Manitoba Hydro On-Site Lead, Environmental Inspector and/or Indigenous Communities and Organizations. Manitoba Hydro - Transmission & Distribution Environment and Engagement Department encourages anyone to provide feedback on this document and will review this plan on an annual basis. Feedback can be provided to projects@hydro.mb.ca.

Some words in the text are in **bold face** the first time they occur in the document and definitions are included in the glossary in section 3.0.

Table of Contents

1.0 Introduction

Manitoba Hydro understands and appreciates the value that Manitobans place on cultural and heritage resources and the rich legacy found throughout our Province. Manitoba Hydro's commitment to safeguarding these resources has led to the development of this Cultural and Heritage Resources Protection Plan (CHRPP). The CHRPP will provide clear instructions if Manitoba Hydro, its contractors and/or consultants, discover or disturb a cultural or heritage resource and will determine the ongoing protection measures for the resources through processes outlined in this document.

1.1 Commitment to environmental protection

Protecting the environment is an integral part of everything Manitoba Hydro does. Manitoba Hydro accomplishes this by integrating environmentally responsible practices in all aspects of our business. Environmental protection can only be achieved with the full cooperation of Manitoba Hydro employees, consultants, and contractors at all stages of the Project from planning and design through construction and operational phases.

The use of a Cultural and Heritage Resources Protection Plan (CHRPP) is a practical and direct implementation of Manitoba Hydro's environmental policy and its commitment to responsible environmental and social stewardship. It is a proactive approach to manage potential discoveries of **human remains**, cultural and heritage resources.

Manitoba Hydro is committed to implementing this CHRPP. Manitoba Hydro will also require companies that contract with us to follow the terms of this and other applicable plans.

1.2 Regulatory and policy setting

Legislation that commonly applies to cultural and heritage resources for construction, maintenance or operation of transmission lines or facilities includes: ***The Heritage Resources Act*** *(The Act)* and the ***Province of Manitoba Policy Concerning the Reporting, Exhumation and Reburial of Found Human Remains (Burials Policy)***. This CHRPP is consistent with and does not replace the above. In effect, the CHRPP builds on the protective measures afforded by *The Act and policy*.

1.3 Implementation

The goal of the CHRPP is to act as a reference manual to describe key actions in the event of discovery of cultural or heritage resources or human remains. Manitoba Hydro will inform relevant employees and contractors working on the project of the contents of applicable regulatory specifications, guidelines, licenses, authorizations and permits, and of this plan, and copies will be available from the on-site lead office.

The plan also allows for adaptive management to include new and evolving strategies, protocols, and information to support and protect culture and heritage resources. Appendix B includes a protocol template that interested communities and organizations can complete to augment and enhance this CHRPP.

This protocol could provide feedback on items such as:

- Whether the community/organization wants Manitoba Hydro to contact them upon discovery of unrecorded cultural or heritage resources
- Who and how to contact the community representative(s) upon discovery of unrecorded cultural or heritage resources
- When the community representative(s) would like to be contacted
- Description of the Area of Interest the community feels may contain heritage and **cultural resources** important to them
- General types of cultural and heritage resources that may be in Area of Interest
- Ceremonial or spiritual activities the community would like conducted prior to construction
- Any other concerns the community may have regarding cultural and heritage resources
- Whether the community has received a copy of this standard CHRPP

Upon the discovery of unrecorded cultural or heritage resources, Manitoba Hydro will follow the steps outlined in section 1.8 in conjunction with the applicable attached Protocols.

1.4 On-site project management structure

Manitoba Hydro staff and consultants will be required to undertake activities, steps, procedures and measures set out in the Figure 1-1 and Figure 1-2 should cultural or heritage resources or human remains be discovered during the construction, operation or maintenance of the project. There is a potential to discover cultural and heritage resources in many different locations and workers in the field should remain vigilant to watch for and report any discoveries. Manitoba Hydro expects workers to report any findings to the Manitoba Hydro On-Site Supervisor or designate.

The Manitoba Hydro Transmission & Distribution Environment and Engagement Department is prepared to offer the required support to On-Site Supervisors including archaeological services, to preserve and protect cultural and heritage resources. T&DEE can be contacted at 1-877-343-1631 or projects@hydro.mb.ca.

To conduct any type of archaeological or heritage resource investigation, a Heritage Permit is required from the Historic Resources Branch (HRB) (Manitoba Sport, Culture and Heritage Department). The HRB is responsible for the issuance and management of heritage permits. Permits can only be issued to Registered Archaeologists; T&DEE has access to archaeologists to support any investigation.

1.5 Human remains

The Heritage Resources Act (1986), Section 43 (1) states that "human remains" means:

> *"remains of human bodies that in the opinion of the minister have heritage significance and that are situated or discovered outside a recognized cemetery or burial ground in respect of which there is some manner of identifying the persons buried therein."*

Manitoba Hydro will not disturb or remove human remains from their original resting place unless removal is unavoidable and necessary. Out of respect for the remains, all work related to the remains will be conducted as much as possible out of the public eye. **Funerary (grave) goods** found with human remains will accompany human remains at all times. No reports related to any such find and its analysis will be published unless the Community Representative(s) consents to such publication, other than such reports provided to Manitoba Hydro and the Historic Resources Branch or other agencies as may be required by law. The following describes the practices that Manitoba Hydro would follow if **skeletal remains** believed or known to be human remains and/or accompanying grave goods are discovered or disturbed:

Figure 1-1 Discovery of potential human remains

Discovery of potential human remains					
	On Site Lead	**Transmission & Distribution Environment and Engagement (T&DEE)**	**Archaeologist**	**Heritage Resources Branch (HRB)**	**RCMP**
Step 1	STOP activities at this location				
Step 2	Immediately mark discovery location with flagging tape and cordon off with temporary fending (minimum buffer of 30 m radius from center of discovery). Size of buffer may be adjusted once archaeologist, in consultation with HRB, examine the site				
Step 3	Contact T&DEE	Contact Archaeologist and communities/organizations with protocols	Contact HRB	Determine wether huiman remains are present. If present contact RCMP.	
Step 4				For human remains, if not already known, cponfirm wether RCMP and or the Chief Medical Examiner have an ongoing interest in remains under the *Fatalaties Inquiries Act*.	
Step 5				If remains are non-forensic,. And their removal is required to protect remains, lead echumination of human remains	

Step 6				Determine wether huiman remains are present. If present contact RCMP.	If remains are **forensic** in nature or cannot be immediately determined wether they are, RCMP and Chief Medical Examiner have jurisdiction over area of find and human remains
Step 7		If human remains were left in place where discovered, Community Representative(s) may arrange for and facilitate anappropriate ceremony	HRB and/or archaeologist directs cautious investigation of surrounding surface prior to exhumination of remains to determine if other human remains or artifacts are in the area,.		
Step 8			Locate and document finds with GPS and record relevant data and submit with reports to HRB, construction suoervisor and Community Representative(s)	Oversee basic non-physical anthropological techniques including drawings, sketches, and initial measurements to assist in determining basic information about individual	
Step 9	Wait for approval to continue construction activities in the area. Construction cannot proceed if artifacts or related archaeological activities may be impacted	Work with communities to decide whether and what type of analysis would be done on remains	No construction activities within buffer will be allowed until archaeologist has completed their investigation		

1.6 Heritage resources

Heritage resources are the physical remains of past cultures. They are the product of human art, workmanship, or use, including plant and animal remains that have been modified by or left behind due to human activities.

The *Manitoba Heritage Resources Act* (1986) defines "Heritage Resource" as:

(a) a heritage site

(b) a heritage object

(c) any work or assembly of works of nature or of human endeavour that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural, scientific, or aesthetic features, and may be in the form of sites or objects or a combination thereof (Section 1)

There are two types of heritage resources, **artifacts,** and features. Heritage objects (artifacts) can be as small as a single stone flake (a product from stone tool production) or as large as a shipwreck. Other types of artifacts can include butchered animal bones, pottery, and historic materials such as nails, bottle glass, beads that are at least 75 years or older. Features are in situ (or in place) objects or changes to the landscape that are non-portable, meaning that they cannot be easily removed from their original location. Examples of features include petroforms (stones that have been placed in a shape or design and may be an effigy of an animal or thunderbird nest). Stones were also used as waymarkers or could indicate a food cache or burial location.

All heritage resources, whether a single isolated find (such as single artifacts) or a site with numerous artifacts and/or features, are protected under the Act. These physical remains can provide some evidence of specific activities such as campsites, workstations, quarries, kill sites, and post-contact settlement, industry, and events. Deliberate destruction or disturbance of heritage resources is considered an offence. Certain heritage resources have special consideration such as pictographs, petroforms or ceremonial sites and represent a connection to First Nation and Metis to the landscape.

1.7 Cultural resources

For the purposes of this plan, Manitoba Hydro defines cultural resources as an object, site, or location of a traditional or cultural practice that is the focus of traditional or contemporary use and is of continuing importance to people. Some examples include important resource gathering areas, sites of spiritual significance or ceremonial sites.

Although there are some commonalities, each community has a unique interpretation of what the cultural resource value represents.

1.8 Practices Manitoba Hydro will follow if cultural and heritage resources are found

Manitoba Hydro and its contractors will leave all artifacts **in situ**, that is, in the same position and will not remove objects from the site until advised by the archaeologist. There will be no activities within the buffer until the archaeologist has completed their archaeological investigation. No reports related to any such find and its analysis will be published, other than such reports provided to Manitoba Hydro and the Historic Resources Branch or other agencies, as may be required by law.

The following describes the practices that Manitoba Hydro will follow if cultural and heritage resources are found:

Figure 1-2: Discovery of cultural and heritage resources

Discovery of cultural and heritage resources				
	On Site Lead	**Transmission & Distribution Environment and Engagement (T&DEE)**	**Archaeologist**	**Heritage Resources Branch (HRB)**
Step 1	STOP activities at this location			
Step 2	Contact T&DEE and immediately establish buffer around find (30 m minimum radius from center of discovery)	Contact Archaeologist and communities/organizations with protocols	Contact HRB	
Step 3	Contact archaeologist and immeditaley send them photos of find		Talk to On Site Lead, review photos and determine significance of find	

Step 4			Obtain Heritage Permit from HRB	
Step 5			Direct cautious exploratory investigation to determine presence of other artifacts in area	
Step 6		If discovery includes sacred or ceremonial objects, provide opportunity for communities/organizations to arrange and facilitate appropriate ceremony		
Step 7			Undertake extended surface inspection -Shovel test at regular intervals perpinducular abd paralell to artifact deposit -controlled collection of artifact data including mapping; and -test excavations, if necessary	
Step 8			Locate and document finds with GPS and record relevant data	
Step 9			Collect and place artifats in protective container including relevant location data and site classification	
Step 10				Evaluate heritage resource site and findings presented by archaeologist to determine if further mitigative action is necessary before construction in site vicinity may continue

Step 11	Construction activities that will not impact artifacts or related archaeological activities may proceed		If MH cannot avoid site, direct sites removal by standard and most appropriate excavation methods	No construction activities will take place at site until HRB is satisfied that site removal is complete and meets provincial standards
Step 12			Submit copies of technical data and reports to HRB and MH	

2.0 Reporting and follow-up

The archaeologist will establish and maintain a record for each discovered or disturbed heritage object and of any human remains found during construction. Information will include the **provenience**, artifact chain of custody, as well as a conservation and /or identification plan for the heritage resource or resources associated with each record. This is a requirement of *The Heritage Resources Act*. The Province of Manitoba manages a descriptive inventory regarding the physical location and composition of archaeological sites. All artifacts and field-collected data such as notes, photographs and geo-referenced information is provided to the HRB who has ownership of heritage resources found in the province.

The archaeologist will prepare an annual report, as well as updated summaries and technical reports as are necessary, to the HRB as partial fulfillment of the Heritage Permit and to Manitoba Hydro who in turn will share with the applicable Community Representative(s). The report will provide the following information:

- A record of the human remains found. This will include the reporting, exhumation, and reburial of the found human remains per the provincial policy, the date of the report and the process by which Manitoba Hydro managed, honored, and reinterred the remains.
- A record of archaeological investigations and finds documented throughout each year.
- A summary of any directions provided by the Community Representative(s) regarding permission granted to conduct specialized analysis (where such permission is required).
- A record of the heritage objects that Manitoba Hydro found and the process by which they managed the heritage objects.
- Any additional information concerning matters of significance related to heritage resources.

Manitoba Hydro will treat information shared by Indigenous communities regarding burial sites, sacred sites and other sites traditionally and presently used for cultural and ceremonial purposes as confidential and may only be shared with the province or other authorities if agreed upon by the community to which the resource is associated.

Specific information regarding details or locational information of these cultural or ceremonial sites will not be included in the recording or reporting processes nor included in the HRB's site database.

Manitoba Hydro appreciates that this is sensitive information; the reports will be treated as confidential, unless otherwise authorized or specified by the Community Representative(s), if applicable, in discussion with the HRB.

The archaeologist will prepare an overview of the annual report and provide it T&DEE to review with the on-site supervisor. The overview report will not contain confidential information but will include information required by the on-site supervisor to fulfill regulatory and managerial responsibilities.

If requested, the archaeologist will meet with the applicable Community Representative(s), HRB and the Manitoba Hydro Transmission & Distribution Environment and Engagement Department to review the reports.

3.0 Glossary of terms

Artifacts	Any object made or modified by a human being.
Caches	Rock features in which supplies were stored.
Cultural Resource	An object, site or location of a traditional or cultural practice that is the focus of traditional or contemporary use and is of continuing importance to people.
Diagnostic	Any artifact that provides information as to cultural affiliation or age.
Exhumation	The act of removing a buried, or once buried, human body from the grave or found location.
Funerary goods	Items placed with a person at the time when they were buried. Often referred to as Grave Goods, these items are treated no differently than the person's actual skeletal remains.
Forensic	Of interest to law enforcement or Office of Chief Medical Examiner.
Heritage Resource	The Manitoba Heritage Resources Act (1986) defines "Heritage Resource" as: (as) a heritage site; (b) a heritage object, and; (c) any work or assembly of works of nature or of human endeavour that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural, scientific or aesthetic features, and may be in the form of sites or objects or a combination thereof (Section 1).
Human Remains	The remains of human bodies, normally referring to those recovered in the skeletal form. This may range from a single bone or tooth to complete skeletons.
Identification	Refers to the process of examining human skeletal remains in order to determine jurisdiction and disposition of the remains. The may be done by archaeologists trained in human osteology, or physical anthropologists. Age at death, sex, height, general health, relative age: recent, early contact or ancient age may be possible along with ethnic identification.
In situ	An artifact is found in the exact spot that it was probably deposited at some time in the past.
Manitoba's Burials Policy (1987)	Short name of: '*Province of Manitoba Policy Concerning the Reporting, Exhumation, and Reburial of Found Human Remains*.' This is the 1987 Provincial Cabinet approved policy based on *The Heritage Resources Act* (1986) governing and directing the actions, responsibilities, duties and task to be undertaken upon the discovery of found human remains in Manitoba.

Matrix	The consistency and quality of the soil.
Morphology	The form, structure, and method by which an object is created.
Non-Forensic	Not of interest to law enforcement or Office of Chief Medical Examiner.
Ochre	An earthy clay colored by iron oxide – usually red but can be yellow.
Provenience	The original place of an artifact. Can be measured by two or three-points.
Stratum	A layer of soil that is distinct and separate from that above and below it.
Skeletal Remains	Skeletal remains are all that is left of a corpse after nature has taken its course and has disposed of skin, tissue, and any other organ that may cover the skeletal frame.
The Heritage Resources Act (1986)	The Provincial legislation (law) governing the physical heritage of all Manitobans, located in Manitoba on either provincial crown lands or private lands within the province of Manitoba.
Way-markers	A sign or feature that marks a portage or trail or announces a change in direction.

Appendix A: Resources Identification Guide

Examples of cultural and heritage resources of potential interest

The following are some examples of surface or sub-surface heritage objects or features that may be encountered in the field that have the potential to be of archaeological interest or cultural significance. These descriptions are provided for information only. When the features described in these examples are encountered in the field, or when it is otherwise believed that a site potentially may be of archaeological interest, a Manitoba Hydro On-Site Supervisor/delegate or Environmental Inspector/Officer must be notified**.**

In situ artifacts

Projectile points, pottery, historic trade goods and thousands of other types of artifacts have been recovered from across the province. Before collection, the artifact will be photographed, and the surrounding vegetation and soils described in detail. If a **diagnostic** artifact is found during a controlled surface collection, the recovery of the artifact will not take place until mapping is complete.

Often metal objects are found abandoned along old portage routes, former trails and at long-forgotten cabin sites. This old, blue enameled kettle was found in the hollow of a tree with tin cups nestled inside. The way that metal tins were constructed can be dated. Glass fragments can also be identified as belonging to a certain time period. The morphology and markings on bottles help archaeologists to date sites.

Pre-contact pottery sherd

Historic period kettle and tin cups

Projectile point (left) and lithic flake (right)

Soil Staining

Discolourations in the soil may indicate an archaeological site. The following examples are common colours associated with artifacts, features that have been found within the province.

Red or yellow **Ochre** or rust stains can be found in the soil. They can be the result of oxidized metal fragments or nails; red or yellow ochre nodules may indicate a burial or ceremonial activity.

Soil staining can also be found in the form of charcoal flecks and white ash from a hearth or fire pit. Black soil stains may indicate human activity and organic materials or a living floor. Cultural strata can vary in depths depending on the length of occupation at the site. The presence of burned bone, fire-cracked rock, stone chips, pottery, and other objects may be found in association with soil discolouration and would confirm the soil staining is a cultural layer.

Ash and organic soil staining of a hearth

Animal Bone

Animal Bone (mammal, bird, fish) at a site can indicate the kinds of resources that were being used as food as well as indicate seasonality of occupation.

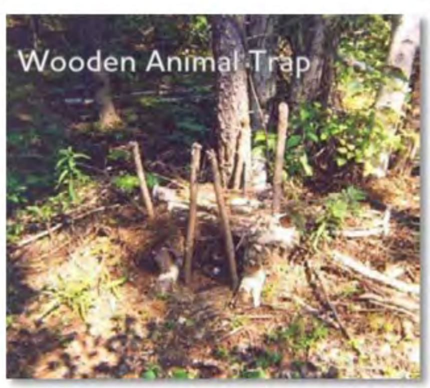
Bone was also an important material for tool manufacturing. Common bone tools include fleshers and beamers fashioned from large mammal long bones, barbed spear points and harpoons, awls, and needles. Bones at a site can indicate the kinds of animals that were being used as food. The ulna of swans, eagles and other large birds were used for bird whistles.

Animal Long Bone with red staining

Key features to look for on bones to determine if they have been deposited by humans include signs of cut-marks or burning or staining which may indicate human modification by various butchering or processing techniques.

Culturally modified trees

Occasionally evidence of cultural practices is found in the form of modified trees such as the birch trees noted in this photograph. Birch bark was used for many purposes such as storage baskets, canoes and more recently, birch-bark biting crafts. Cut wood has been used to construct an animal trap, as a material for building or for firewood and indicates that humans have been in the area.



Culturally Modified Tree

Stone features

There are many kinds of stone alignments that have been constructed by humans: **Way-markers**, **caches**, ceremonial sites, building foundations, tepee rings and burials are the major rock features that are found during archaeological investigations. These can be on or above the ground surface or buried features.


Petroform in the shape of a turtle


Rock Cairn

Ground or Structural Features

It is especially important to note unusual ground features. Depressions or mounds that are out-of-place from the surrounding landscape may indicate an underlying structure or possible burial. The way structural features are constructed can be dated.

Appendix B: Cultural and heritage resource protection protocol

Community/Organization: ______________________________

1. Do you want Manitoba Hydro to notify your community/organization about cultural and heritage discoveries?

   Yes ☐ No ☐

2. If yes, we would like to be notified about the following type of discoveries:

Human remains	Yes	☐	No	☐
Heritage/cultural resources (pictographs, petroforms, bone tools)	Yes	☐	No	☐

3. Leadership have chosen ______________________________as the community representative that Manitoba Hydro should contact for heritage or cultural resources discoveries

Phone number: ______________________________

Cell phone: ______________________________

Email address: ______________________________

Preference for contact ______________________________

(i.e.: cell phone, email)

4. Should a previously unrecorded heritage or cultural resource be encountered, would your community like to conduct a ceremonial or spiritual activity?

   Yes ☐ No ☐

5. Please sketch the cultural and heritage resource area of interest for the community/organization on an attached map. This information can be kept confidential.

6. Are you aware of recent discoveries of the following in the area near the project:

Human remains	Yes	☐	No	☐
Heritage/cultural resources	Yes	☐	No	☐

7. Have you received a copy of the Cultural and Heritage Resources Protection Plan?

   Yes ☐ No ☐

Date: ______________________________

Filled out by (Please print): ______________________________

Signature ______________________________