Environment Act Proposal Form

Name of the development:

Altona to Winkler gas transmission project

Type of development per Classes of Development Regulation (Manitoba Regulation 164/88):

Class 2, transmission pipeline over 10 km

Legal name of the applicant:

Centra Gas Manitoba Inc.

Mailing address of the applicant: 360 Portage Avenue (18th floor)

Contact Person: James Matthewson

City: Winnipeg Province: Manitoba Postal Code: R3C 0G8

Phone Number: (204) 360-3119 Fax: email: jmatthewson@hydro.mb.ca

Location of the development: Municipality of Rhineland, RM of Stanley, & City of Winkler

Contact Person: James Matthewson

Street Address: 360 Portage Avenue (18th floor)

Legal Description: See Map 2-1 within the attached environmental assessment report

City/Town: Winnipeg Province: Manitoba Postal Code: R3C 0G8

Phone Number: (204) 360-3119 Fax: email: jmatthewson@hydro.mb.ca

Name of proponent contact person for purposes of the environmental assessment:

James Matthewson

Phone: (204) 360-3119 Fax:	Mailing address: 360 Portage Avenue (18) Winnipeg, MB R3C 0G8

Email address: jmatthewson@hydro.mb.ca

Webpage address:

Date: 2026-01-22	Signature of proponent, or corporate principal of corporate proponent: Original signed by James Matthewson Printed name: James Matthewson

PRINT RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Environment Act Proposal Form**
- ☑ **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information)
- ☑ **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):

Class 1 Developments	$1,000
Class 2 Developments	$7,500
Class 3 Developments:	
Transportation and Transmission Lines	$10,000
Water Developments	$60,000
Energy and Mining	$120,000

Submit the complete EAP to:
Director
Environmental Approvals Branch
Environment and Climate Change
Box 35, 14 Fultz Boulevard
Winnipeg MB R3Y 0L6
EABDirector@gov.mb.ca

For more information:
Toll-Free: 1-800-282-8069
Phone: 204-945-8321
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$60,000.....WD B-02
$120,000...EM B-02

Manitoba Hydro

2026 01 23

Agnes Wittmann, Director
Environmental Approvals Branch
Manitoba Environment and Climate Change
Box 35, 14 Fultz Blvd
Winnipeg MB R3Y 0L6

Dear Agnes Wittmann:

ENVIRONMENT ACT PROPOSAL – ALTONA TO WINKLER GAS TRANSMISSION PROJECT

Enclosed with this cover letter are an Environment Act Proposal Form and a cheque for the application fee for the proposed Altona to Winkler gas transmission project submitted by Manitoba Hydro on behalf of its wholly owned subsidiary Centra Gas Manitoba Inc. ("Centra Gas"). Manitoba Hydro provided notification to the Environmental Approvals Branch about the project by submitting an Intent to Apply on May 27, 2025.

The environmental assessment report, sent by email, provides project information and documents the environmental assessment activities, including project engagement, leading up to this application.

We trust that the provided information is sufficient for the Environmental Approvals Branch to undertake its review process under *The Environment Act*. Should you have any questions or require further information, please contact James Matthewson at (204)-360-3119.

Regards,

Original signed by James Matthewson

James Matthewson, Manager
Transmission & Distribution Environment and Engagement
Manitoba Hydro

360 Portage Ave (18) • Winnipeg Manitoba Canada • R3C 0G8
Telephone / *N° de téléphone :* 204-360-3119 • Fax / *N° de télécopieur :* 204-360-6176
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Altona to Winkler gas transmission project

Environmental assessment report

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

Indigenous & Community Relations and Environmental Stewardship Division

Transmission & Distribution Environment and Engagement

January 2026

Prepared for: Environmental Approvals Branch

Manitoba Hydro

To request accessible formats, visit hydro.mb.ca/accessibility.

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 Altona to Winkler gas transmission project is located on Treaty 1 lands, the original territories of the Anishinaabeg, Dakota Oyate, 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 with us throughout the project.

Executive summary

The areas surrounding the Town of Altona and the City of Winkler are supplied natural gas by the South Loop system, which is owned by Centra Gas Manitoba Inc. (Centra Gas), a wholly owned subsidiary of Manitoba Hydro. The South Loop system connects to the TC Energy system at gate stations near Oakville and Dominion City. Between Altona and Winkler, there is an existing 4-inch pipeline that was built in 1962. The South Loop system has reached capacity and requires expansion to accommodate substantial urban growth in the area, increased cereal crop production, and the accompanying need for grain drying, as well as some users switching from other fuels (*e.g.,* propane) to natural gas. The Altona to Winkler gas transmission project, proposed in this environmental assessment report, is intended to respond to this growing customer demand, increasing the supply of natural gas to the area.

The proposed project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, beginning at a control point north of Altona and ending within the existing Winkler GS-140 gate station as well as two new control points at approximately the mid-point and west limit of the project. The proposed pipeline will tie into another proposed pipeline, currently under regulatory review, that would run between Dominion City and Altona, if approved (Manitoba Hydro 2024).

The project is proposed on Treaty 1 lands, the original territories of the Anishinaabeg, Dakota Oyate, 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 with us throughout the project.

The proposed project traverses the Municipality of Rhineland, the Rural Municipality of Stanley, and terminates in the City of Winkler. The eastern tie-in is located approximately 3.0 km north of the centrepoint of the Town of Altona.

As a pipeline greater than 10 km in length, the proposed project is considered a Class II development in the provincial Classes of Development Regulation (M.R. 39/2016) and requires a licence under The Environment Act (Manitoba) to proceed. Manitoba Hydro has developed this report on behalf of Centra Gas, to document the environmental assessment carried out for the project. This report describes the proposed project, the environmental assessment approach, project engagement, the

biophysical and socioeconomic environments in which the project will be built and operated, the potential effects of the project, mitigation measures, and the determined significance of anticipated residual project effects.

The environmental assessment approach was developed through a review of regulations, current environmental assessment practices, experience undertaking assessments of similar projects, site visits, and feedback received during project engagement. The environmental assessment focused on the following seven valued components:

- Important sites
- Vegetation
- Wildlife and wildlife habitat
- Commercial agriculture
- Human health risk
- Economic opportunities
- Infrastructure and community services

Anticipated project effects to the seven valued components are anticipated to be most pronounced during the construction phase of the project.

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 land, which accounts for over 85% of the proposed project footprint. The proposed project traverses approximately 0.9 ha of Crown land, which is comprised entirely of water crossings/drains.

The few areas of natural habitat crossed by the proposed project include Buffalo Creek, the Rosenheim Drain, and the Hespeler Drain. However, direct disturbance of these natural areas will be largely avoided through use of horizontal directional drilling to install the pipeline beneath these areas. As a result, adverse residual project effects to vegetation, as well as wildlife and wildlife habitat, are anticipated to be of low magnitude. Being located predominantly within previously disturbed and developed areas, where natural vegetation and habitat have already been modified, the proposed project has low potential to affect vegetation and wildlife species of conservation concern. The project is anticipated to directly alter less than 3.0 ha of forest and is not anticipated to alter wetlands.

Given that agriculture is the dominant land use in the area, the project will have adverse residual effects on agricultural land and agricultural activities. A total of 80 ha (198 ac) of land will be temporarily lost from agricultural production during project

construction. There will be a small loss of agricultural land that will be occupied by the above-ground control point near Plum Coulee throughout the lifetime of the project, resulting in the permanent loss of an estimated 0.04 ha (0.10 ac) of land from agricultural use. Construction of the project will also result in a short-term disruption to agricultural activities.

Routing the pipeline to partially parallel existing gas pipeline easement has reduced potential project conflicts with agricultural activities. With topsoil stripping and other construction mitigation measures, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. However, reductions in crop yield within the project development area may persist into the operations and maintenance phase. Manitoba Hydro understands that even though overall project effects will affect a relatively small area, local effects at individual field level can have a meaningful impact on individual agricultural operations. 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 offset the effects of project-related temporary and permanent land loss as well as residual potential conflicts with agricultural activities and damages that may be caused by project activities.

Important sites, including heritage resources and cultural sites or features, have the potential to be adversely affected primarily through project activities involving ground disturbance. Cultural experiences in the area may also be adversely affected due to project-related changes to the sensory experience and access.

Anticipated residual effects related to human health risk include an anticipated temporary increase in noise levels resulting from project activities. Project-related effects on air quality are anticipated to be negligible and the project is not anticipated to result in emissions that exceed provincial air quality guidelines.

The project is anticipated to result in small potential increases in the strain on local infrastructure and community services including the availability of short-term accommodations, increased traffic, and strains on transportation infrastructure, health and emergency response services, and waste management facilities.

Economic opportunities related to the project are anticipated to be positive outcomes of the project and include potential opportunities for employment and local spending on goods and services.

Per provincial guidelines for Class II Environment Act Proposals, this report also presents a description of climate change implications including a greenhouse gas (GHG) inventory. Based on the GHG assessment conducted for the project, project infrastructure related GHG emissions are anticipated to be most pronounced during

the construction phase of the project. As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work. Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction and maintenance activities:

- Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline
- Encouraging the productive use of wood/timber removed during clearing activities
- Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency
- Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical
- Encouraging vans/shuttle buses and/or carpooling of workers when practical.
- Using electric and/or hybrid vehicles to the extent practical
- Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical
- Planning work activities to reduce the distance of travel, *e.g.,* using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical

A comprehensive mitigation table capturing the mitigation measures that have been identified throughout the assessment and represent Manitoba Hydro's commitments related to the proposed project, if approved, is included in the conclusions chapter of the report.

Although not required in provincial environmental assessment guidelines for Class 2 developments, this report also includes an assessment of cumulative effects to each valued component as applicable, a discussion of effects that may occur because of environmental changes and hazards acting on the project, and an assessment of the environmental outcomes of potential accidents and malfunctions that might occur in connection with the project.

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 residual effects of the proposed Altona to Winkler transmission project will be not significant, and the project will provide a benefit to Manitobans, bringing energy to life.

Résumé

Les zones entourant la ville d'Altona et la ville de Winkler sont approvisionnées en gaz naturel par le réseau South Loop appartenant à Centra Gas Manitoba Inc. (Centra Gas), une filiale à 100 % de Manitoba Hydro. Le réseau South Loop est lié au réseau de TC Energy aux stations de gaz près d'Oakville et de Dominion City. Entre Altona et Winkler, il existe un pipeline de quatre pouces construit en 1962. Le réseau South Loop a atteint sa capacité maximale et nécessite une expansion afin de pouvoir accueillir une croissance urbaine importante dans la région, une augmentation de la production de céréales et les besoins connexes en matière de séchage des grains, ainsi que le passage de certains utilisateurs d'autres combustibles (p. ex., le propane) au gaz naturel. Le projet de transport de gaz d'Altona à Winkler, proposé dans le présent rapport d'évaluation environnementale, vise à répondre à cette demande croissante des consommateurs et à augmenter l'offre de gaz naturel dans la région.

Le projet proposé consiste en la construction, l'exploitation et la mise hors service d'environ 31 km d'un nouveau gazoduc de transport de gaz naturel en acier de 8 pouces de diamètre, commençant à un point de contrôle situé au nord d'Altona et se terminant à l'intérieur de la station de vannes Winkler GS-140 existante. Il vise également la mise en place de deux nouveaux points de contrôle situés approximativement au point médian et à la limite ouest du projet. Le pipeline proposé serait raccordé à un autre pipeline proposé, actuellement à l'étude dans le cadre du processus réglementaire, qui relierait Dominion City à Altona, s'il est approuvé (Manitoba Hydro, 2024).

Le projet est proposé sur des terres visées par le Traité no 1, les territoires ancestraux des Anishinaabeg, des Dakota Oyate et des Ininewak, ainsi que sur la terre ancestrale des Métis de la rivière Rouge. Nous reconnaissons ces nations qui ont occupé ces terres et en ont pris soin pendant des milliers d'années, ainsi que leurs liens culturels et spirituels durables avec la terre. Par cette reconnaissance, nous soulignons l'importance d'apprendre et de tenir compte des perspectives uniques que ces nations partagent avec nous tout au long du projet.

Le projet proposé traverse la municipalité de Rhineland et la municipalité rurale de Stanley, et se termine dans la ville de Winkler. Le point de raccordement à l'est est situé à environ 3,0 km au nord du centre de la ville d'Altona.

Comme il s'agit d'un pipeline de plus de 10 km de long, le projet proposé est considéré comme un projet d'exploitation de catégorie II dans le Règlement sur les diverses catégories d'exploitations de la province (R.M. 39/2016) et nécessite un

permis en vertu de la Loi sur l'environnement (Manitoba). Manitoba Hydro a élaboré le présent rapport au nom de Centra Gas, afin de documenter l'évaluation environnementale réalisée pour le projet. Le présent rapport décrit le projet proposé, l'approche de l'évaluation environnementale, la mobilisation relative au projet, les environnements biophysiques et socioéconomiques dans lesquels le projet sera construit et exploité, les effets potentiels du projet et les mesures d'atténuation ainsi que l'importance des effets résiduels anticipés du projet.

L'approche de l'évaluation environnementale a été élaborée d'après un examen de la réglementation, les pratiques actuelles en matière d'évaluation environnementale, l'expérience acquise dans l'évaluation de projets comparables, les visites sur le terrain et les commentaires reçus lors de la mobilisation relative au projet. L'évaluation environnementale s'est concentrée sur les sept composantes valorisées suivantes :

- Sites importants
- Végétation
- Faune et habitat de la faune
- Agriculture commerciale
- Risque pour la santé humaine
- Possibilités économiques
- Infrastructures et services communautaires

Les effets anticipés du projet sur les sept composantes valorisées devraient être les plus marqués pendant la phase de construction du projet.

Les effets potentiels sur l'environnement naturel sont limités, car la majeure partie de la zone du projet proposé a déjà été perturbée et aménagée. La couverture terrestre dans l'emprise proposée pour le gazoduc de transport est dominée par des terres agricoles, qui représentent plus de 85 % de l'empreinte prévue du projet. Le projet proposé traverse environ 0,9 ha de terres de la Couronne, constituées entièrement de traversées d'eau ou de drains.

Les rares zones d'habitat naturel traversées par le projet proposé comprennent le ruisseau Buffalo Creek, le drain Rosenheim et le drain Hespeler. Toutefois, la perturbation directe de ces zones naturelles sera largement évitée grâce à l'utilisation d'un forage directionnel horizontal pour installer le pipeline sous ces zones. Par conséquent, les effets résiduels négatifs du projet sur la végétation, ainsi que sur la faune et son habitat, devraient être de faible ampleur. Étant donné que le projet proposé est situé principalement dans des zones déjà perturbées et aménagées, où la végétation et l'habitat naturels ont déjà été modifiés, il présente un faible potentiel d'impact sur la végétation et les espèces fauniques préoccupantes pour la

conservation. Le projet devrait altérer directement moins de 3,0 ha de forêt et ne devrait pas altérer les zones humides.

Étant donné que l'agriculture constitue l'usage principal des terres dans la région, le projet entraînera des effets résiduels négatifs sur les terres agricoles et les activités agricoles. Au total, 80 ha (198 acres) de terres seront temporairement retirés de la production agricole pendant la construction du projet. Il y aura une légère perte de terres agricoles qui seront occupées par les points de contrôle en surface pendant toute la durée du projet, ce qui entraînera la perte permanente d'une superficie estimée à 0,04 ha (0,10 acre) de terres agricoles. La construction du projet entraînera également une perturbation à court terme des activités agricoles.

L'acheminement du pipeline parallèlement à la servitude de gazoduc existante a permis d'atténuer les conflits globaux du projet avec les activités agricoles. Grâce au décapage de la terre végétale et à d'autres mesures d'atténuation des effets de la construction, les classes d'aptitude des sols le long du tracé du pipeline devraient retrouver leur niveau d'avant la perturbation. Cependant, les réductions de rendement des cultures dans la zone de développement du projet pourraient se prolonger pendant la phase d'exploitation et de maintenance. Manitoba Hydro comprend que même si les effets globaux du projet affecteront une zone relativement petite, les effets locaux au niveau des champs individuels peuvent avoir une incidence significative sur les opérations individuelles. Les communications avec les propriétaires fonciers avant l'accès aux terres pour les activités du projet peuvent donner lieu à des mesures d'atténuation supplémentaires propres au site, réduisant encore plus le risque de conflit avec les activités agricoles. Une compensation sera prévue pour compenser les effets liés à la perte temporaire et permanente de terres due au projet, ainsi que les conflits résiduels potentiels avec les activités agricoles et les dommages pouvant être causés par les activités du projet.

Les sites importants, y compris les ressources patrimoniales et les sites ou caractéristiques culturels, risquent d'être affectés principalement par les activités du projet impliquant des perturbations du sol. Les expériences culturelles dans la région peuvent également être affectées par les changements liés au projet en matière d'expérience sensorielle et d'accès.

Les effets résiduels prévisibles liés aux risques pour la santé humaine comprennent une augmentation temporaire des niveaux de bruit résultant des activités du projet. Les effets du projet sur la qualité de l'air devraient être négligeables et le projet ne devrait pas entraîner d'émissions dépassant les lignes directrices provinciales en matière de qualité de l'air.

Le projet devrait entraîner une légère augmentation potentielle de la pression sur les infrastructures locales et les services communautaires, notamment en ce qui concerne la disponibilité de logements de courte durée, l'augmentation du trafic et la pression sur les infrastructures de transport, les services de santé et d'intervention d'urgence, ainsi que sur les installations de gestion des déchets.

Les possibilités économiques liées au projet devraient entraîner des résultats positifs et inclure des possibilités potentielles d'emploi et de dépenses locales en biens et services.

Conformément aux lignes directrices provinciales relatives aux propositions de loi sur l'environnement de catégorie II, le présent rapport présente également une analyse des effets du changement climatique, y compris un inventaire des gaz à effet de serre (GES). D'après l'évaluation des émissions de gaz à effet de serre réalisée pour le projet, les émissions de gaz à effet de serre liées à l'infrastructure du projet devraient être les plus importantes pendant la phase de construction du projet. Dans le cadre de son processus d'évaluation des entrepreneurs, afin de retenir les services d'un entrepreneur pour la construction de projets nécessitant un permis, Manitoba Hydro évalue les offres d'après des aspects environnementaux précis, notamment la méthodologie proposée par chaque soumissionnaire pour réduire les émissions de GES et d'autres mesures d'atténuation du changement climatique qui seront mises en œuvre pendant les travaux. Manitoba Hydro mettra en œuvre les mesures d'atténuation suivantes pour réduire les émissions de GES liées au projet et provenant des activités de construction et d'entretien :

- Limiter la quantité de végétation enlevée à ce qui est nécessaire pour construire et exploiter le pipeline en toute sécurité.
- Encourager l'utilisation productive du bois prélevé lors des activités de défrichement.
- Veiller à ce que tous les véhicules et équipements soient régulièrement inspectés et entretenus afin d'optimiser l'efficacité énergétique.
- Réduire la marche au ralenti dans la mesure du possible et utiliser des équipements ou des véhicules dotés d'un système d'arrêt automatique, s'ils sont disponibles et pratiques.
- Encourager les camionnettes, les navettes et le covoiturage des travailleurs lorsque c'est possible.
- Utiliser des véhicules électriques ou hybrides dans la mesure du possible.
- Élaborer un plan de gestion des déchets qui favorise la réutilisation ou le recyclage chaque fois que cela est possible et qui encourage le compostage des déchets organiques chaque fois que cela est possible/pratique.

- Planifier les activités de travail de manière à réduire la distance de déplacement, par exemple en utilisant des itinéraires directs, en réduisant le nombre de trajets de transport (chargements complets contre demi-chargements) et en utilisant des installations locales appropriées à proximité du site du projet pour l'approvisionnement en matériaux et l'élimination des déchets, lorsque c'est possible.

Un tableau de mitigation complet, regroupant les mesures d'atténuation identifiées tout au long de l'évaluation et représentant les engagements de Manitoba Hydro concernant le projet proposé, si celui-ci est approuvé, est inclus dans le chapitre des conclusions du rapport.

Bien que les lignes directrices provinciales en matière d'évaluation environnementale pour les projets d'exploitation de catégorie 2 ne l'exigent pas, le présent rapport comprend également une évaluation des effets cumulatifs sur chaque composante valorisée, le cas échéant, une analyse des effets susceptibles de se produire en raison des changements et des dangers environnementaux agissant sur le projet, ainsi qu'une évaluation des conséquences pour l'environnement des accidents et des défaillances susceptibles de se produire dans le cadre du projet.

Le programme de protection de l'environnement de Manitoba Hydro et les plans de protection connexes, y compris les mesures d'atténuation propres au projet, ont été adaptés et mis à jour afin de réduire au minimum les impacts globaux du projet. Compte tenu des mesures d'atténuation prévues par Manitoba Hydro et des résultats antérieurs de projets similaires dans le sud du Manitoba, l'évaluation globale conclut que les effets résiduels du projet proposé sur l'environnement ne seront pas importants et que le projet sera bénéfique pour les Manitobains, car il permettra de créer de l'énergie pour la vie.

Authors' acknowledgement

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

Department/Role	**Organization**
Staff from the departments of Transmission & Distribution Environment and Engagement; Geospatial Data Services; Gas Engineering & Construction; Partnerships & Projects Support; Water Resources; Energy Resource Planning; Property; Stakeholder Relations	Manitoba Hydro
Environmental assessment authoring (soils and agriculture) and soil survey consultant	AgriEarth Consulting Ltd. and Montrose Environmental
Project archaeologist and heritage technical report	North Roots Research
Vegetation technical data reports	Szwaluk Environmental Consulting

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Acronyms and abbreviations

AHCCD	Adjusted and Homogenized Canadian Climate Data
AOC	Area of elevated heritage concern
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council for Ministers of the Environment
CEnvPP	Construction Environmental Protection Plan
CER	Contractor environmental responsibilities
CHRPP	Culture and Heritage Resources Protection Plan
CO	Carbon monoxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
EMS	Environmental Management System
EPP	Environmental protection plan
ERA5	European Reanalysis version 5
FPR	Final preferred route
GDP	Gross domestic product
GHG	Greenhouse Gas
HDD	Horizontal directional drilling
HRB	Historic Resources Branch
HRIA	Heritage Resources Impact Assessment

HYDAT	Hydrometric Historical Data
ISO	International Organization for Standardization
LAA	Project development area
LCA	Life Cycle Assessment
MBCA	*Migratory Birds Convention Act*
MBCDC	Manitoba Conservation Data Centre
MBESEA	Manitoba Endangered Species and Ecosystems Act
MSTW	Morden, Stanley, Thompson, and Winker Planning District
NO_2	Nitrogen dioxide
PDA	Project development area
PIG	Pipeline inspection gauge
$PM_{2.5}$	Fine particulate matter
PR	Provincial Road
PTH	Provincial Trunk Highway
RAA	Regional assessment area
RCMP	Royal Canadian Mounted Police
RHA	Regional health authority
RM	Rural Municipality
ROW	Right-of-way
RPGA	Rhineland, Plum Coulee, Gretna, and Altona Planning District

RTAC	Roads and Transportation Association of Canada
SAR	Species at Risk
SARA	*Species at Risk Act*
SO_2	Sulphur dioxide
SOCC	Species of Conservation Concern
SOP	Standard operating procedure
SWAMP	Solid Waste Area Management Project
TLE	Treaty Land Entitlement
VC	Valued component
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHMIS	Workplace Hazardous Materials Information System
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 2025)
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.
Climate normals	Thirty (30)-year averages of climate variables such as temperature and precipitation, used to summarize or describe the average climatic conditions of a specific location.
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.
Cumulative effects	Incremental effects resulting from residual project effects combined with effects from past, existing, and other reasonably near future projects and activities.
Control point	An above grade natural gas facility consisting of a combination of above grade piping and valves

	that is used to control and direct the flow of natural gas within the greater pipeline network.
Direct effect	An environmental effect that is: A change that a project may cause in the environment; or A change that the environment may cause in a project. It is a consequence of a cause-effect relationship between a project and a specific environmental component.
Economic opportunities	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
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	Changes to the environment or socio-economic conditions and the positive and negative consequences of these changes.
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.
Effect pathway	The cause–effect linkage between a project and components of the human or natural environment.

Engaged audiences	This includes First Nations, the Manitoba Métis Federation, and interested parties.
Environmentally sensitive sites	Locations, features, areas, activities, or facilities along or immediately adjacent to the transmission line corridor 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.
Flaring	The controlled combustion of natural gas with a visible flame.
Gate station	An above grade gas facility that regulates the pressure and meters the flow of natural gas moving from one pipeline to another.
Gross domestic product (GDP)	The total gross value added by all resident producers in an economy (*i.e.,* province, territory, or nation) in a specific year.
Heritage resources	"...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" as protected under Manitoba's Heritage Resources Act (1986).
Hobby farm	A small agricultural land holding or small farm that is operated and maintained for purposes other than as a primary source of income.
Human health risk	The potential for harm or adverse effects to the health of individuals and communities, considering potential changes to environmental

	conditions attributable to the project that can influence human health.
Hydrostatic pressure testing	A safety and integrity test used to verify that the pipeline can safely withstand operating pressures without leaking or failing
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 project area.
Infrastructure and community services	The physical structures and facilities (*e.g.,* highways, railways, water and wastewater systems) and services (*e.g.,* emergency response and health care) that are essential for the operation of communities.
Interested parties	A general term used to describe individuals or groups outside of First Nations and the Red River Métis that have the potential to provide feedback, may be affected by the project or its decisions, have a specific interest or mandate in the area, possess relevant data to share, or have the capacity to disseminate information to their membership. This term is used in place of the term *stakeholder*.
Leak	A failure of pipeline in the form of pinholes or punctures, resulting in a gas leak
Malfunction	A failure of a piece of equipment, a device, or a system to operate as intended (Impact Assessment Agency 2025)
Mitigation measures	Features of a project intended to eliminate, reduce, control or offset the adverse effects of a project.

Permanent land loss	Refers to lands currently under agricultural production which will no longer be available for production activities following construction and through to decommissioning of the project.
Project engagement	A process of sharing information and seeking feedback to inform decision-making from those affected by or interested in our projects.
Purging	Purging a gas pipeline into service involves injecting an inert gas into the pipeline, followed by natural gas. The natural gas flows towards the other end of the pipe, pushing the inert gas ahead of it until the gas reaches the end of the pipe and is purged out of the pipeline. The inert gas serves as a buffer between the natural gas and ambient air, preventing air/gas mixtures from forming and reaching flammable limits.
Residual effect	An effect of a project that is predicted to remain following the implementation of mitigation measures.
Rupture	A longitude or circumferential crack, resulting in a gas leak
South Loop pipeline 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.
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.
Species at Risk (SAR)	Is an extirpated, endangered, threatened, or species of special concern as defined by the Species at Risk Act.
Temporary land loss	Refers to lands currently under agricultural production, which will not be available for production activities for all or a portion of a growing/production season during construction (i.e., generally during May to October each year), due to project activities.
Valued component	A biophysical, social, cultural, and economic element that, if altered by the project, may be of concern to regulatory agencies, First Nations people and Métis citizens, resource managers, scientists, other interested parties, and/or the public.
Vegetation	The diversity and characteristics of an area's plant cover
Wildlife	In this environmental assessment, wildlife includes birds, mammals, terrestrial invertebrates, amphibians, and reptiles.
Wildlife refuge	These are areas where hunting or trapping of certain wildlife species is prohibited.

1.0 Introduction

This report outlines the environmental assessment undertaken for the proposed Altona to Winkler gas transmission project (the project) which aims to increase the supply of natural gas to the Altona and Winkler area in response to growing customer demand.

The project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project.

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

This introductory chapter provides information about the proponent, the regulatory framework applicable to the project, and the purpose and structure of this report.

1.1 The proponent

The proponent of the project is Centra Gas Manitoba Inc. (Centra Gas). Centra Gas is a wholly owned subsidiary of Manitoba Hydro and is the principal distributor of natural gas in the Province of Manitoba. This report has been prepared by Manitoba Hydro on behalf of Centra Gas.

Manitoba Hydro is a provincial Crown Corporation and one of the largest integrated electricity and natural gas distribution utilities in Canada. Manitoba Hydro's vision and mission are to empower Manitoba's future with affordable and reliable energy, and to meet customer's energy needs.

The energy services that Manitoba Hydro offers Manitobans rely on natural resources which are of critical importance to us all. For this reason, environmental leadership is identified as a key principle of Manitoba Hydro's business. Manitoba Hydro has developed an Environmental Management System (EMS) that aligns with ISO 14001 Standard and commits to considering the environmental impacts of their activities, products, and services in the Manitoba Hydro Environmental Management Policy (2020).

Manitoba Hydro remains committed to continuing our work on climate change and adapting our processes to ensure Manitobans' energy expectations are met in the future. Over 99% of the electricity Manitoba Hydro produces is from non-fossil generation sources and our electrical system will be required to support additional electrification in Manitoba. While reducing fossil fuel use is necessary, a key learning

from Manitoba Hydro's integrated resource planning is that the strategic use of natural gas, by both industry and for home heating, supports an affordable pathway to net-zero in Manitoba.

1.2 Regulatory framework

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

1.2.1 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 Altona to Winkler gas transmission project requires a licence under *The Environment Act* (Manitoba). This report forms part of Centra Gas' Environment Act Proposal in pursuit of a licence under *The Environment Act* (Manitoba).

1.2.2 Federal regulatory framework

The project is not considered a designated project under the federal Physical Activities Regulations SOR/2019-285 and therefore does not require an impact assessment under *The Impact Assessment Act* (Canada).

1.2.3 Municipal planning

The proposed project traverses the Municipality of Rhineland, the Rural Municipality of Stanley, and the City of Winkler and its eastern tie-in is approximately 3.0 km north of the Town of Altona. Each of these municipal jurisdictions has their own municipal by-laws (laws, regulations, or rules of a local government), adopted under provisions of *The Municipal Act* (Manitoba) and *The Planning Act (Manitoba)*. Municipal by-laws have been considered, as relevant, within the environmental assessment process as presented in this report.

1.3 Purpose of the document

The purpose of this report is to support Centra Gas's application for a Class 2 development licence under *The Environment Act (Manitoba)* to construct, operate, and decommission the Altona to Winkler gas transmission project.

For Class 2 developments, proponents are required to submit a cover letter, an Environment Act Proposal Form, an environmental assessment report, and an application fee to Manitoba Environment and Climate Change.

This 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. It has been compiled in accordance with Manitoba Environment and Climate Change's Environment Act Proposal Report Guidelines (June 2023).

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 Altona to Winkler gas transmission project as well as the activities that will be undertaken 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 project engagement process undertaken to date, including the purpose, goals and objectives, methods, a summary of feedback received to date, and the outcomes of that feedback.

Chapter 5.0 provides existing condition information for aspects relevant to the environmental assessment that are broad and that may apply to more than one valued component (*e.g.,* historic and cultural setting; climate; ecological setting; geology, soils, and terrain; aquatic environment; communities and population; and land and resource use).

The following chapters present the assessments of potential project effects on seven valued components deemed relevant for the project including important sites (6.0), vegetation (7.0), wildlife and wildlife habitat (8.0), commercial agriculture (9.0), human health risk (10.0), economic opportunities (11.0) and infrastructure and community services (12.0). Each valued component assessment chapter begins with a summary of its conclusions. Mitigation measures are identified, and residual effects are characterized. When applicable, a cumulative effects assessment is included.

Chapter 13.0 summarizes climate and greenhouse gas assessment information related to the project, including mitigation measures for greenhouse gas emissions.

Chapter 14.0 discusses the effects of the environment on the project and Chapter 15.0 discusses 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 effects.

Chapter 17.0 provides a conclusion for the environmental assessment, including a comprehensive mitigation table capturing the mitigation measures that Manitoba Hydro has identified throughout this report. This mitigation table represents Manitoba Hydro's commitments related to the proposed project, if approved.

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 Altona to Winkler gas transmission project (the project) consists of construction, operation, maintenance, and decommissioning of an 8-inch steel gas transmission pipeline and associated above-ground control structures. The new pipeline will run approximately 31 km, beginning at a control point north of Altona and ending within the existing Winkler GS-140 gate station. The proposed pipeline will tie into another proposed pipeline, currently under regulatory review, that would run between Dominion City and Altona, if approved (Manitoba Hydro 2024)[1].

The proposed project traverses approximately 0.9 ha of Crown land, which is comprised entirely of water crossings.

2.1 Project need and alternatives

The project is part of Centra Gas' South Loop system, which connects to the TC Energy system at existing gate stations, one near each of Dominion City and Oakville. There is one existing 4-inch pipeline built in 1962 running from Altona to Winkler within existing easement.

The purpose of the project is to increase the supply of natural gas to the Altona and Winkler area in response to growing customer demand. 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 (*e.g.,* propane) to natural gas.

Alternatives considered for the project included gas compression, trucked liquified natural gas, or a 6-inch steel pipeline option. 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 but estimates for operational costs for trucked liquified natural gas to meet load forecasts resulted in the highest cost. While a 6-inch steel pipeline was initially considered, an 8-inch steel pipeline was deemed to provide the best overall

[1] See the Manitoba Environment and Climate Change Public Registry File No. 6247.00 for the Environment Act Proposal and other regulatory documents/updates (available online at https://www.gov.mb.ca/sd/eal/registries/index.html).

value to Manitoba Hydro and selected as the preferred option when the organization's corporate value framework was used to systematically compare the value of each the noted options.

2.2 Scope

The project involves construction, operation, and decommissioning of:

- Approximately 31 km of new 8-inch steel natural gas pipeline
- Tie-ins at east and west limits of the project, and control points at approximately mid-point and west limit of the project

The project components and project activities described in Sections 2.6 and 2.7 respectively represent the detailed scope.

2.2.1 Out of scope ancillary activities

Manitoba Hydro will undertake ancillary activities outside of the projects scope described above that are required to accommodate the new gas pipeline including:

- 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, are considered when routing transmission pipelines.

Factors considered in determining the pipeline route included:

- Paralleling existing linear infrastructure where possible
- Avoid routing through the community of Reinfeld
- Having the shortest and most direct route possible, from the eastern control point north of Altona to the existing Winkler gate station
- Deviating the route to avoid property and environmental features such as treelines and existing above-ground infrastructure, where possible

The pipeline route parallels an existing pipeline right-of-way for approximately 3 km, and has its own right-of-way for approximately 28 km. There will be a separation distance of approximately 5 m between the proposed pipeline and existing pipeline when running parallel.

The preliminary route shared during project engagement and the final preferred route (FPR) shown on Map 2-1 are different due to consideration of project feedback. During project engagement, Manitoba Hydro learned of a planned property development along the preliminary route, and a route adjustment was made to avoid this development, resulting in the presented FPR. Map 2-2 shows both preliminary route and the FPR.

As shown on Map 2-2, the preliminary route presented during engagement terminated within Winkler GS-140 gate station from the east, after being routed in-field within SW-2-3-4-WPM, NW-35-2-4-WPM, SW-35-2-4-WPM, NW-26-2-4-WPM and SW-35-2-4-WPM.

After the route adjustment, the FPR terminates within Winkler GS-140 gate station from the south, after parallelling the east side of Road 20 W, jogging slightly around an established farmyard in SW-2-3-4-WPM, paralleling the west side of Road 20 W until crossing Hespeler Drain at SE-34-2-4-WPM, and reaching NE-27-2-4-WPM, where the adjustment ends.

As discussed in Section 2.5.1, new easement will be required for the pipeline. After Manitoba Hydro (on behalf of Centra Gas) begins the process of acquiring easements from landowners, some route adjustments may be required.

Manitoba Hydro may encounter information that could affect the proposed FPR during ongoing project engineering design and engagement activities with First Nations, the Manitoba Métis Federation, and interested parties such as landowners. Any future route adjustments contemplated by Manitoba Hydro may be the result of unforeseen engineering constraints, previously unidentified sensitive sites (*e.g.,* cultural and heritage resources, species at risk), or in response to landowner concerns. Based on experience on past projects, Manitoba Hydro expects that such potential route adjustments (*i.e.,*

re-alignments) would likely be located within 250 m of either side of the FPR. Manitoba Hydro is requesting, as part of this proposal, that an area called a Mitigative Segment Development Area and shown on Map 2-1, be considered during the province's consultation and licensing processes for the project. It is unknown at the time of this application if any adjustments to the FPR will be required, and as such, no specific potential changes have been contemplated in this assessment. Manitoba Hydro will provide additional information as an update to this assessment as required if it is confirmed that route adjustments are needed.

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. To reduce impacts to existing infrastructure in areas where development precludes adoption of recommended separation distances, right-of-way width may vary from recommended guidelines. Right-of-way width determination also considers worker safety for the construction and maintenance of the pipeline.

As the pipeline footprint will traverse privately owned lands, new easements will be required.

Centra Gas has an existing 10 m easement within which an operational 4-inch pipeline built in 1962, runs for approximately 3 km from the control point north of Altona in NW-17-2-1-WPM to NE-24-2-2-WPM. For this area with existing easement, an additional 30 m wide easement will be needed with 10 m to the north and 20 m to the south of existing easement.

When not paralleling existing easement, 30 m of new easement, 15 m on either side of centreline, will be required. There are two exceptions to this:

- 7 m of new easement is required in the segment from Winkler gate station (NW-2-3-4-WPM) to the southern extent of SW-2-3-4-WPM when parallelling Road 20 due to proximity to a developed industrial property.
- 18 m of new easement is required in the segment south of the Canadian Pacific Rail that parallels Road 20 W in SW-2-3-4-WPM.

2.5.1 Easement procurement and compensation

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

construction damage compensation, structure impact compensation, and ancillary damage compensation.

Typically, once a final preferred route for the pipeline is selected, Manitoba Hydro, on behalf of Centra Gas, begins the process of acquiring easements from landowners.

The conventional terms of the right-of-way easement agreement provide that:

- Centra Gas obtains the legal right to construct, operate, maintain, repair, and replace their transmission pipelines within a right-of-way. This right is obtained through easements on privately owned lands or by a Crown land reservation or pending easement for right of use on provincial Crown land.
- 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 Centra Gas.
- Manitoba Hydro personnel are permitted to enter and use the right-of-way for construction, inspection, maintenance, repair, or replacement of the gas transmission pipeline facilities.

2.5.1.1 Land compensation

Land compensation is a one-time payment to landowners for granting 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), and
- Easement compensation factor, which is determined based on the location of the infrastructure (*i.e.,* whether underground or above-ground). For underground gas transmission lines, Centra Gas's compensation factor is 100% of current market value.

2.5.1.2 Construction damage compensation

Construction damage compensation is provided to landowners who experience damage to their property due to the construction, operations, and maintenance of the pipeline. A one-time payment for construction damage is negotiated on a case-by-case basis. Centra Gas will:

- Compensate or be responsible for repairing, to the reasonable satisfaction of the landowner, any damage to a landowner's property.
- Compensate a landowner for any crop losses in areas affected by construction of the pipeline. This compensation generally considers the most recent average value of the harvested crop reported by Manitoba Agricultural Services Corporation.

2.5.1.3 Structure impact compensation

Structure impact compensation is a one-time payment to landowners for any above ground infrastructure placed on land classed as agricultural. Structure impact compensation considers:

- lands permanently removed from production, determined by the size of structure constructed on the land
- reduced productivity in an area of overlap around each structure
- additional time required to manoeuvre farm machinery around each structure
- double application of seed, fertilizer and weed control in the area of overlap around each structure

2.5.1.4 Ancillary damage compensation

Ancillary damage compensation is a one-time payment that applies where Centra Gas'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, drainage, and aerial spraying activities)
- constraint effects, such as restricted access to adjacent lands

2.6 Project components

Project components include tie-ins to existing infrastructure, control points (*i.e.,* valve sites), the pipeline, temporary work areas (*i.e.,* marshalling yards, laydown areas, and other work areas), and crossings.

2.6.1 Tie-in to existing infrastructure

A gas pipeline tie-in is the process of connecting a new pipeline to an existing one by welding them together to create a safe connection where gas can flow through both pipelines in parallel.

At its eastern limit, the proposed new 8-inch steel pipeline will tie-in to Dominion City to Altona Transmission Project 's 8-inch steel pipeline at a control point located approx. 3.0 km north of Altona within NW 17-2-1-WPM (Manitoba Hydro 2024).

At its western limit, the proposed 8-inch pipeline will tie-in to an existing 4-inch pipeline at Centra Gas' existing gate station, Winkler GS-140, located within NW-2-3-4-WPM, in Winkler (see Photo 2-1). To facilitate the project, Winkler GS-140 may be expanded within Centra Gas' existing property and the need for additional easement near the gate station is not anticipated.



Photo 2-1: Winkler GS-140 gate station

2.6.2 Control points

Control points are above-grade assemblies with one or more valves that enable the control of gas flow.

There will be two control points for the project as described below.

2.6.2.1 Plum Coulee control point in NW-26-2-3-WPM

A new control point will be installed at approximately mid-point of the pipeline, about 3.2 km south of Plum Coulee, within NE-26-2-3-WPM. An additional easement area of 20 m by 20 m may be required to accommodate above grade piping, above grade valves, and bollards to protect the control point. The assembly footprint will be covered by gravel, as shown in Photo 2-2, and is anticipated to be 10 m by 5 m.

Photo 2-2 shows an example of an existing control point with an interconnection valve.



Photo 2-2: Example of a control point

2.6.2.2 Winkler GS-140 gate station

The existing Winkler GS-140 gate station footprint may be expanded within Centra Gas owned property to the north by approximately 6 m by 30 m and to the east by approximately 7 m by 20 m to allow for installation of above-ground valve components and a pipeline inspection gauge launcher. The pipeline inspection gauge launcher allows for a device called a "PIG" (pipeline

inspection gauge) 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.

2.6.3 Pipeline

The proposed pipeline will be approximately 31 km of 8-inch steel pipeline, running from a control point north of Altona to an existing gate station in Winkler.

- The trench is typically 1.3 m depth to provide a minimum of 1 m depth of cover.
- The pipeline location will be marked with signs at each mile road and in any location where the pipeline crosses waterways or other service roads.
- Corrosion on the pipeline will be controlled through use of pipe coating and cathodic protection.

2.6.4 Temporary work areas

Temporary work areas including marshalling yards and laydown areas will be established to store equipment and materials during construction. The location(s) will be finalized after a contractor is hired for the project.

Other temporary work areas required for construction of the project will be adjacent to the pipeline easement and will be temporary in nature.

2.6.5 Crossings

Ten types of crossings anticipated for the pipeline have been identified (see Table 2-1). In these areas (*e.g.,* crossings of drains, pipelines, rail, roads, and below-ground infrastructure) pipeline installation will be via horizontal directional drilling. Additional crossing sites may be identified during construction.

Horizontal directional drilling is a steerable trenchless method of installing underground pipe along a prescribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area. This method is used when trenching or excavating is not practical or could result in undesirable environmental effects or infrastructural damage and is suitable for a variety of crossings including roadways, environmentally sensitive areas, and water bodies.

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

Crossing[1]	**Quarter section (if applicable)**
Canadian Pacific Rail	SW-2-3-4-WPM
Hespeler Drain	NE-27-2-4-WPM
MTS/Bell MTS easement	Various locations including: NE-30-2-3WPM, NW-27-2-3WPM, NE-27-2-3WPM, NE-26-2-3WPM, NE-25-2-3WPM, NE-26-2-3WPM, SE-26-2-3WPM, NE-19-2-2WPM, NW-20-2-2WPM, NE-23-2-2WPM, SE-19-2-1WPM, NE 26-2-3WPM, SE 26-2-3WPM
Provincial Road 306	SE-26-2-3-WPM, SW-25-2-3-WPM
Rosenheim Drain	NW-19-2-2WPM, NE-19-2-2WPM
Manitoba Hydro overhead distribution easement	Various locations including SW-19-2-1WPM, SE 24-2-2 WPM, SW-20-2-1-WPM
Buffalo Creek	SE-19-2-1-WPM
Manitoba Hydro underground distribution easement	NW-17-2-1WPM
Centra Gas pipeline	NW-17-2-1WPM
Potential locations of irrigation pipelines[2]	Various locations including NW-19-2-3W1, NE-22-2-2W1, SE-20-2-3W1, NE-19-2-3W1 and NE-22-2-2W1

Notes:

[1] There may be additional utility crossings requiring completion by horizontal directional drilling based on utility locates findings

[2] Horizontal directional drilling may not be needed for crossing of irrigation pipelines as these water lines are typically installed at a deeper depth (*i.e.,* below frost line) than a gas pipeline.

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

The construction phase typically includes:

- Mobilization and staff presence
- Vehicle and equipment use
- Access development and use
- Preparing temporary work areas (*e.g.,* marshalling yards, laydown areas)
- Right-of-way preparation (flagging, clearing of vegetation)
- Topsoil stripping
- Trenching
- Horizontal directional drilling
- Pipeline stringing, welding and lowering
- Backfilling
- Valve site connections
- Pipeline testing
- Clean-up and demobilization

2.7.1.1 Schedule

Construction is proposed to commence in summer 2027 and is anticipated to take up to a year to complete. Table 2-2 illustrates the anticipated construction schedule, including key construction activities.

Table 2-2: Construction schedule

Construction activities	**2027**				**2028**		
	Spring	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**
Mobilization and staff presence							
Vehicle/equipment use							
Access development and use							
Temporary work areas, *e.g.,* marshalling yards and laydown areas							
Right-of-way preparation (*i.e.,* survey/flagging, clearing of vegetation)							
Topsoil stripping							
Trenching							
Horizontal directional drilling							
Pipeline stringing, welding, lowering							
Backfilling							
Pipeline testing (pressure testing)							
Gate station and valve site connections							
Clean-up and demobilization							

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 (Chapter 16). Manitoba Hydro will secure all provincial permits as required (see Section 2.8). Manitoba Transportation and Infrastructure will be contacted for access from provincial highways.

2.7.1.5 Temporary work areas

Marshalling yards and laydown areas are temporary work areas used for construction material storage, typically developed on previously disturbed areas near the construction site. They are used for the temporary storage of materials, tools, equipment and fuel storage associated with construction and may also be used

as assembly areas. Manitoba Hydro undertakes a screening for heritage and environmental factors once potential sites for temporary work areas are identified by the contractor, to identify and mitigate additional environmental effects.

The number and locations of such temporary work areas will be finalized after a contractor is hired for the project.

2.7.1.6 Right-of-way preparation

Preparation of the right-of-way prior to topsoil stripping may include the following:

- Surveying and flagging the right-of-way, the pipeline centreline, above grade valve sites/control points, and temporary work areas. This includes utility locates and identification of sensitive areas.
- Clearing of trees, shrubs and boulders. Vegetation clearing is scheduled to occur outside of the nesting and rearing period of birds (generally April 15 – August 31).
- Activities required to protect sensitive areas (these will be identified in the Environmental Protection Plan that will be developed for the project prior to construction)

In the event a licensing decision has not been made in a timeline that allows for the above-mentioned vegetation clearing schedule, Manitoba Hydro may seek approval from Environmental Approvals Branch to conduct right of way preparation activities in advance of a licensing decision as a mitigation measure to avoid the nesting and rearing period of birds. The total area that could be cleared for the project is less than 3 hectares and primarily located on private lands. If approval for such pre-license clearing is not granted, Manitoba Hydro would use alternative mitigation measures such as conducting nest sweeps and applying buffers during the nesting and rearing period.

Topsoil stripping

On agricultural land, topsoil will be stripped 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 would be stripped to the full depth of the topsoil in all excavation areas per topsoil depths identified during soil surveys that would be completed prior to construction.

2.7.1.7 Pipeline installation

Most of the pipeline will be installed in an open-cut trench. The exception to this would be for areas such as road crossings, existing underground

utilities, and water bodies where the pipe will be installed by horizontal directional drilling (see Table 2-1).

2.7.1.8 Trenching

A trench (typically 1.3 m deep) will be excavated to provide a minimum of one meter depth of cover. The trench width would be approximately 1 m. The trench will be deeper in places where the land varies in elevation as the pipe may not be able to bend with the contour of the land. There may also be some deeper trenching where the trenched pipe will tie into segments of pipe installed by horizontal directional drilling, and where there would be need to avoid other infrastructure or objects in the ground.

2.7.1.9 Horizontal directional drilling

Road crossings, existing underground utilities, and waterways will have pipeline installed by horizontal directional drilling (see Photo 2-3) to minimize ground disturbance in these areas. This technique typically involves drilling a controlled pilot hole along a predetermined bore path. After the pilot hole is complete, reaming tools are used to enlarge the bore to the desired diameter while the pipe is pulled through the enlarged hole.



Photo 2-3: Horizontal directional drill rig

2.7.1.10 Pipeline stringing, welding and lowering

Stringing

Once the construction right-of-way has been sufficiently cleared and topsoil has been stripped, sections of pipe are laid out along the right-of-way. This process is called 'stringing' the pipe.

Welding

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

Weld inspections

Non-destructive inspection of the pipeline will be done by visual and radiographic means. Radiographic testing is used to find weld defects without damaging the pipe itself.

Coating and wrapping

Steel pipe and fittings will have coatings installed to protect them from corrosion. All buried steel valves and fittings will be externally coated and wrapped in the field using either petrolatum tape or visco-elastic tapes. A majority of the pipeline will be factory coated with a multi-layered coating system consisting of epoxies and polyethylene coatings. Welded connections will be coated with field applied sleeves.

Lowering

The pipe will be lowered into the trench utilizing a pipelaying crane or excavator (see Photo 2-4).



Photo 2-4: Example of an excavated trench and lowering in steel pipe

2.7.1.11 Backfilling

After placement of the pipeline in the trench, backfilling would be completed by first placing sub-soil and then topsoil to minimize admixing (*i.e.,* mixing of topsoil with typically poorer quality underlying subsoil). Topsoil will be contoured to promote similar grade and drainage as pre-construction conditions. Backfilling will often be completed in two stages: partial backfilling prior to pressure testing, and final backfilling after successfully pressure testing the pipe.

2.7.1.12 Pipeline testing

Once the trench has been partially backfilled and prior to putting the pipeline into service, the pipeline will be pressure-tested following Manitoba Hydro Natural Gas Standard 620.05, to test for strength and leaks. Water will be used as the test medium (*i.e.,* hydrostatic pressure testing). The disposal of water used for testing will

be conducted as per Standard 620.05 and Manitoba Hydro's Environmental Protection Plan for the project.

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:

- 1.4 times the specified maximum operating pressure for the strength test
- 1.1 times the specified maximum operating pressure for the leak test
- 1.4 times the specified maximum operating pressure for a concurrent strength and leak test

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 and test medium temperatures need to stabilize 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. If hydrostatic pressure testing is completed in freezing conditions, a freezing point depressant (*e.g.,* methanol wash) is completed prior to pipeline drying. 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
    - Follows the construction environmental protection plan (CEnvPP), which will be prepared prior to construction (Chapter 16)
- The pipe will then be dried. Dry compressed air will be used during the drying procedure

2.7.1.13 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 and threaded 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 fitting installation

Hot tap fitting installation is when a fitting is welded on a live pipeline (natural gas is present). Fittings are installed to allow for pipeline segment isolation, de-energization and commissioning (purging natural gas in or out). Fittings will be installed at the Winkler GS-140 gate station to allow for pipeline segment isolation and de-energization for PIG launcher installation.

Fencing

Existing fencing around the Winkler gate station may be extended to house the new PIG launcher assembly within Centra Gas owned property.

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.

2.7.1.14 Pipeline commissioning

After installation of the pipeline, control points and pipeline test, the pipeline will be commissioned. This typically involves introducing gas to the pipeline and purging into service so that gas has completely filled the pipeline to the required pressure in accordance with Manitoba Hydro Natural Gas Standard 611.01.

2.7.1.15 Clean-up and demobilization

The final step in construction will be 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 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 16.0.

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, followed by topsoil being re-spread and leveled in disturbed areas to allow surface land use to return 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

The operational and maintenance phase for the project is estimated to be at least 50 years based on the pipeline's design life. Operation and maintenance activities are typically short-term and infrequently require staffing on site. Where physical onsite activities are needed, up to 6 workers are typically required.

2.7.2.1 Pipeline operation

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

Vehicle and equipment use during operation and maintenance may include the following:

- Passenger vehicles and smaller equipment for transportation and other minor tasks
- Material delivery trucks and trailers
- Grader or dozer for topsoil stripping
- Excavators with bucket attachment
- Hydrovac for soft digs (allows for material removal without damaging underground infrastructure)
- Drill rigs for horizontal directional drilling at crossings
- Pipelaying crane or excavator to lower pipeline into trench
- Welding trucks and equipment

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

Depth of cover surveys

Measurements of soil cover above the pipeline are taken on a multi-year cycle to assess potential risk to damaging the pipeline from erosion or typical land use activities. Depth of cover surveys are expedited in response to flood events in proximity to pipeline infrastructure.

Cathodic protection monitoring

Check point surveys and close interval surveys are both completed as part of pipeline cathodic protection monitoring. These surveys are used to assess the effectiveness of the pipelines cathodic protection system, which protects the pipeline from corrosion.

Close interval surveys are typically completed by personnel on foot by collecting data with a handheld device at predetermined intervals. These inspections are completed on a 10-year cycle.

Check point surveys are completed and collects data at predetermined test locations along the pipeline. Check point surveys occur annually.

Leak detection surveys

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

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 In-line inspection

In-line inspection is a non-destructive examination technique used to identify defects on a pipeline. These inspections are every 5 to 15 years depending on condition of the pipeline. The process involves inserting specialized tools into the pipeline through a PIG launcher. The tools are then propelled inside the pipeline for a continuous length to a receiver. The primary inspection tool (commonly referred to as the "smart PIG") is designed to detect both external and internal metal loss (with a focus on external corrosion) and geometric issues such as dents.

The in-line inspection process includes internal cleaning of the pipeline to ensure accurate results from the smart PIG. The inspection may dislodge substances typically in the form of dry powder debris. The debris is managed using filtering equipment and it is collected and disposed of at an approved waste facility.

In-line inspection using natural gas as the propelling medium involves flaring of gas to control tool speeds particularly if the normal flow rates are too low. Where nitrogen is used as the propelling medium, the pipeline must first be purged of natural gas through flaring. Flaring is the controlled combustion of natural gas, with a visible flame.

Additional work areas outside of gate station properties may be required during the inspection activities and temporary access agreements would typically be secured with landowners prior to the work as the space required is beyond normal easements.

2.7.2.6 Integrity excavations and repairs

Preventative maintenance excavations are typically performed due to results of in-line inspections or through routine verifications of select sites. These integrity excavations are approximately 10 m by 10 m and typically 2 m deep or less.

Excavations that result in the need to repair by pipe replacement (cutout) would involve purging (flaring) of the small section needing to be replaced.

Following completion of integrity excavations, the area is restored to its original condition as best as possible, consistent with the intended land use.

2.7.2.7 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. Manitoba Hydro Natural Gas Standard 723.01 for Vegetation Management on Pipeline Rights-of-Way will be followed. Conditions will be examined and the vegetation management method employed will be tailored to right of way conditions. This may involve the use of herbicides. As this project is primarily routed through cultivated agricultural land, limited vegetation management activities are anticipated. It is anticipated that use of herbicides will be utilized at the control points on an as-needed basis.

2.7.3 Decommissioning

When the project reaches end of life or is no longer required, it will be decommissioned. It is estimated that the length of decommissioning activities will be less than one-year.

The decommissioning process aligns with the Canadian Energy Regulators "Guidance Notes for the Decommissioning Provisions under the Onshore Pipeline Regulations (OPR) (CER 2020) and typically includes the following:

Isolation

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

Purging/flaring

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.

Cap off pipeline and leave in place

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 and left in place below-grade.

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 Manitoba Hydro codes of practice and relevant provincial and federal legislation.

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.

Clean-up and demobilization

Clean up and reclamation will generally be done as described in Section 2.7.1.14 (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.

2.7.3.1 Mobilization and staff presence

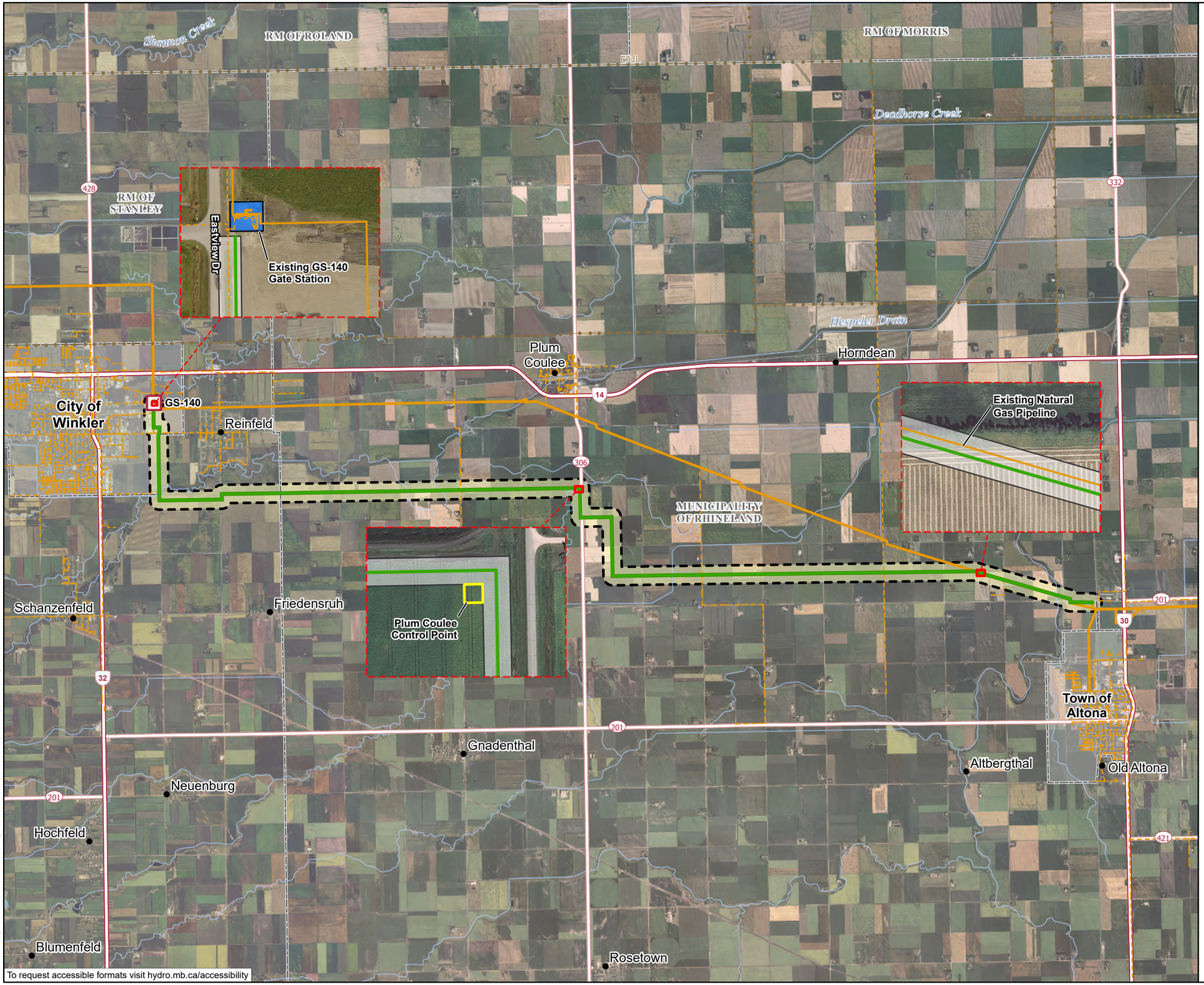
Mobilization includes the movement of Manitoba Hydro and contractor staff, vehicles, and equipment to the job site.

The following types of equipment will be required for specific project decommissioning activities:

- Excavator
- Welding trucks and equipment
- Crane truck
- Other smaller equipment for transportation and other minor tasks, as required

2.8 Funding

The project will be funded by Centra Gas Manitoba Inc.



Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route
- Plum Coulee Control Point
- Project Development Area

Mitigative Segment Development Area
- Mitigative Segment Development Area (250 m buffer around FPR)

Existing Infrastructure
- Gate Station
- Transmission Pressure Natural Gas Line
- Existing Natural Gas Pipeline
- Existing Transmission Line
- Gas Distribution Station

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

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 2 4 Kilometres
0 1 2 Miles

1:100,000

Altona to Winkler Gas Transmission Project Components

Draft/Confidential: For Discussion Purposes Only

Map 2-1

To request accessible formats visit hydro.mb.ca/accessibility

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Proposed Altona to Winkler Natural Gas Transmission Pipeline

Existing GS-140 Gate Station
GS-140
City of Winkler
Reinfeld
Plum Coulee
Horndean
RM OF MORRIS
MUNICIPALITY OF RHINELAND
RM OF STANLEY
Schanzenfeld
Friedensruh
Gnadenthal
Neuenburg
Hochfeld
Altbergthal
Old Altona
Town of Altona
Shannon Creek
Deadhorse Creek
Hespeler Drain
Buffalo Creek
428
E031
332
14
306
201
30
32
421

Project Infrastructure

- Preliminary Route
- Final Preferred Route

Existing Infrastructure

- Gate Station
- Transmission Pressure Natural Gas Line
- Existing Natural Gas Pipeline
- Existing Transmission Line
- Gas Distribution Station

Landbase

- Community
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town
- Rural Municipality

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 2 4 Kilometres
0 1 2 Miles

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Preliminary Route vs Final Preferred Route

Draft/Confidential: For Discussion Purposes Only

Map 2-2

To request accessible formats visit hydro.mb.ca/accessibility

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3.0 Environmental assessment methods

This chapter describes the methods used for assessing the project's potential effects.

Effects are changes to biophysical, socio-economic, or cultural conditions of the environment 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 of effects
- 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 regulatory requirements and past and ongoing Manitoba Hydro assessments and initiatives. The environmental assessment approach was structured to meet the requirements of *The Environment Act* (Manitoba)'s Licensing Procedures Regulation (M.R. 163/88), Manitoba's Information Bulletin - Environment Act Proposal Report Guidelines (2023), and considered feedback from project engagement on this project and past projects. The approach for assessment of cumulative effects was informed by the Policy Framework for Assessing Cumulative Effects under the *Impact Assessment Act* (Government of Canada 2023).

3.1 Scope

Scoping aims to focus the environmental assessment of a proposed project on relevant issues and concerns and establishes the boundaries of the assessment.

Scoping involves defining both the proposed project and the environmental assessment methodology, including identifying valued components to be studied, the geographic areas and timescales over which potential effects will be studied, and

the thresholds of change to be used to make determinations about the significance of predicted residual effects.

Scoping the environmental assessment was an iterative process. Manitoba Hydro adjusted the scope as new information was learned or became available.

3.1.1 Project scope

The project scope is defined by the components that make up the project and the activities occurring throughout the project lifecycle that have the potential to result in environmental effects.

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

- Approximately 31 km of 8-inch steel natural gas pipeline
- Tie-ins at east and west limits of the project, and control points at approximately mid-point and west limit of the project

Project activities, also described in Chapter 2.0 (Project description), include the following:

- Construction:
  - Mobilization and staff presence
  - Vehicle and equipment use
  - Access development
  - Temporary work areas, *e.g.,* marshalling yards, laydown areas
  - Right-of-way preparation, including flagging, clearing of vegetation, topsoil stripping
  - Pipeline stringing, including welding and coating
  - Pipeline installation by trenching and lowering into place
  - Horizontal directional drilling
  - Pipeline testing (hydrostatic pressure testing of pipeline, x-ray)
  - Backfilling and contouring
  - Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)
  - Clean-up and demobilization
- Operation and maintenance:
  - Presence of pipeline, gate station, and control points
  - Vehicle and equipment use
  - Ground pipeline patrols

    - Valve operation checks
    - Vegetation management
    - Maintenance activities including inline inspections (*e.g.,* using pipeline inspection gauges [PIGs]) and integrity digs
- Decommissioning:
    - Mobilization and staff presence
    - Pipeline disconnection (isolating, purging/flaring, capping, and leaving in place)
    - Removal of above-ground components
    - Rehabilitation
    - Cleanup and demobilization

Chapter 2.0 (Project description) also describes activities that are not within the scope of the project or the assessment as well as alternatives considered prior to identifying the proposed project as Manitoba Hydro's preferred solution to meet the need driving the project.

3.1.2 Valued components

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

Valued components are biophysical, social, cultural, and economic elements that, if altered by the project, may be of concern to regulatory agencies, First Nations people, Red River 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 proposed project components and activities, characteristics of the environmental setting, and regulatory requirements
- 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. Human health risk
6. Economic opportunities
7. Infrastructure and community services

This report includes one chapter for each of the seven VCs (Chapters 6.0 – 12.0). The structure of each of the VC assessment chapters, which includes VC-specific scoping considerations, is described in Section 3.3.

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. 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 specific spatial assessment boundaries.

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

- Existing conditions broadly relevant to the assessment or that relate to more than one VC are included in Chapter 5.0 (Environmental setting).
- Existing conditions directly relevant to a specific VC are described in the individual VC assessment chapters (Chapters 6.0 – 12.0).

In many cases, existing conditions expressly or implicitly include environmental effects that may be or may have been caused by other past or ongoing 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. 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 the significance of project and cumulative effects
Prediction confidence

Follow-up and monitoring
Sensitivity to future climate change scenarios

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 is defined by describing the regulatory and policy setting, spatial and temporal boundaries, and VC-specific feedback from project engagement that informs the assessment.

The VC-specific scope sections also present the effects and effects pathways the assessment focuses on, and defines the measures and thresholds used to characterize residual effects and determine whether effects are deemed significant.

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. Each VC chapter also describes how the feedback from engagement influenced the scope of the assessment.

3.3.1.3 Spatial boundaries

Three spatial boundaries are defined for the assessment of potential project effects based on the geographic extent over which project activities and their effects on individual VCs 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).

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 components and activities 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 foreseeable 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 of land traversed by the PDA	Administrative boundaries of the RMs of Rhineland and Stanley, and the City of Winkler.
Health & well-being	1.5 km buffer around the PDA	Administrative boundaries of the RMs of Rhineland and Stanley, including the Town of Altona, the City of Winkler, and the City of Morden.
Economic opportunities	Administrative boundaries of the RMs of Rhineland and Stanley, including the Town of Altona, the City of Winkler, and the City of Morden.	
Infrastructure and community services	Administrative boundaries of the RMs of Rhineland and Stanley, including the Town of Altona, the City of Winkler, and the City of Morden.	

3.3.1.4 Temporal boundaries

Three temporal boundaries are used throughout this environmental assessment report to identify when project-related effects may occur. The temporal boundaries are based on the timing and duration of project activities across the project's lifecycle.

The temporal boundaries used in this assessment are the same across all VCs.

Construction

Project construction is anticipated to commence in the summer of 2027 and take approximately twelve months to complete.

Operation

The project is anticipated to be in service in 2028.

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) and is anticipated to take approximately one year.

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 individually.

Table 3-2 presents 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 within that VC's respective assessment chapter. Each project activity included in the matrix is described in Chapter 2.0 (Project description).

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

Project activity	Valued components						
	Important sites	**Vegetation**	**Wildlife and wildlife habitat**	**Commercial agriculture**	**Human health risk**	**Economic opportunities**	**Infrastructure and community services**
Construction of pipeline, control points, and Winkler (GS-140) gate station expansion							
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	-	-	-
Temporary work areas (*e.g.,* marshalling yards, laydown areas)	X	X	X	X	-	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	X	X	X	X	-	-	-
Pipe stringing (including welding, coating)	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	-	-
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	X	X	X	X	-	-	-
Clean-up and reclamation	X	X	X	X	-	-	X
Operation and maintenance of pipeline and control points							
Presence of pipeline and control points	X	-	-	X	-	-	-
Vehicle and equipment use	X	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**	**Human health risk**	**Economic opportunities**	**Infrastructure and community services**
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	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	-	-	-	-
Vegetation management	X	X	X	-	X	-	-
Decommissioning of pipeline and control points							
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
Rehabilitation	X	X	X	X	-	-	-
Clean-up and demobilization	X	X	X	X	-	-	X

Key: Interaction = X No interaction = -

3.3.3 Effects pathways

Following the identification of interactions between the project activities and VCs, each VC assessment continues with a description of the effect pathways through which the interactions between project activities and the existing environment may result in environmental effects on the VC. The term effect pathway refers to the cause–effect linkage between a project and components of the human or natural environment. Effect pathways can be direct or indirect.

Once effect pathways are identified, one or more parameter(s) are selected to facilitate quantitative and/or qualitative assessment of residual project effects and residual cumulative effects. The amount of change in these parameters is used to characterize the environmental effects and to assist in evaluating their significance.

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 an objective means to characterize change in a VC attributable to the project. However, some effects lack defined measurable parameters and are therefore assessed using qualitative categories defined based on scientific literature, professional judgement, engagement input, and past project experience.

3.3.4 Mitigation of project effects

Mitigation measures are features of a project intended to eliminate, reduce, control or offset the adverse effects of a project.

Routing, strategic placement of above-grade structures, and administrative aspects such as timing or duration of project activities are the primary means for mitigating project effects (*i.e.,* through avoidance of effects where possible).

Beyond the above-mentioned primary mitigations, additional mitigation measures have been 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.

Table 17-1 in Chapter 17.0 (Conclusion) provides a comprehensive record of mitigation measures identified throughout this report. This mitigation table

represents Manitoba Hydro's commitments related to the proposed project, if approved.

3.3.5 Characterizing residual effects

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

Residual effects are characterized for each VC, after considering how the application of proposed mitigation will avoid or reduce the potential effect. The residual effects are characterized using the following terms with specific criteria defined for each VC in the VC assessment chapters (Chapters 6.0 – 12.0):

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 (*i.e.,* 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 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 the undertaking of cumulative effects assessments for Class 2 developments. However, as has been done for other recent Manitoba Hydro Class 2 transmission projects and considering the following aspects, an assessment of cumulative effects is included in the assessment for each identified VC, as applicable:

- Manitoba Hydro's utility footprint across the province
- Feedback shared during engagement on past projects about interests in considering cumulative effects

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 have effects that 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 provided in Table 3-3 identifies known past, present and reasonably near future projects and physical activities with potential residual environmental effects that could overlap spatially and temporally with the residual environmental effects of the Altona to Winkler gas transmission project.

Reasonably near future projects considered in the cumulative effects assessment include those that are publicly announced (with adequate descriptive detail), currently in a regulatory approval process, or under construction. To identify these projects, Manitoba Hydro reviewed the Manitoba Environment and Climate Change Public Registry and gathered information through the project engagement process, which included inquiring with municipal authorities about ongoing and potential future projects taking place within their jurisdictions.

Map 3-1 illustrates the general locations of the projects and activities in the inclusion list for the cumulative affects assessment (*i.e.,* the projects and activities in Table 3-3), including the reasonable near future projects identified as well as 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 and activity inclusion list

Project / activity	Description of project /activity	Potential effects
Past and ongoing projects and activities		
Domestic resource use activities	Hunting, fishing, trapping, non-commercial agriculture, and other domestic resource use activities have been undertaken and continue throughout the regional assessment area.	Potential residual effects include pressure on local wildlife populations and native vegetation species.
Recreational activities	Recreational activities (*e.g.,* various sports and leisure activities) continue throughout the regional assessment area.	Potential residual effects include noise.
Industrial and commercial resource use activities	Industrial activities and commercial activities, including commercial agriculture (*e.g.,* cropping, livestock operations, irrigation, and aerial spraying) have been occurring in the regional assessment area for over a century, and will continue.	Potential residual effects include: • Vegetation clearing, loss of habitat for wildlife, habitat fragmentation, increased mortality • Noise and dust
Existing infrastructure (non-Manitoba Hydro)	Infrastructure, including roads, railways, telecommunication lines, pipelines, water treatment facilities, and wastewater treatment facilities, have been developed across the regional assessment area for over a century and will have an ongoing presence.	Potential residual effects include: • Vegetation clearing, loss of habitat for wildlife, habitat fragmentation, increased mortality • Loss of agricultural land • Inconvenience, nuisance and increased production costs associated with operating farming equipment around structures. • Compromised biosecurity for croplands and livestock operations • Risk of disturbing unknown heritage resources due to ground disturbance
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	Hydroelectric transmission lines totalling 70 km Hydroelectric distribution lines (including sub-transmission lines) totalling 1,638 km Natural gas transmission pipelines totalling 81 km Natural gas distribution pipelines totalling 323 km	Potential residual effects include: • Reduced habitat availability for wildlife, habitat fragmentation, increased mortality • Noise and dust • Reduced area for agricultural land use • Inconvenience, nuisance and increased production costs associated with operating farming equipment around structures. • Compromised biosecurity for croplands and livestock operations • Risk of disturbing unknown heritage resources due to ground disturbance
Residential and institutional developments	Residential subdivisions and institutions have and continue to be developed in the regional assessment area.	Potential residual effects include: • Reduced habitat availability for wildlife, habitat fragmentation, increased mortality • Noise and dust • Increased demand for community services.

Table 3-3: Project and activity inclusion list

Project / activity	Description of project /activity	Potential effects
Future projects and activities		
Dominion City to Altona gas transmission pipeline (Manitoba Hydro 2024)	Proposed new natural gas transmission pipeline, also part of Centra Gas Manitoba Ltd.'s South Loop System, partly located in the RM of Rhineland immediately east of, and connecting to, the proposed Altona to Winkler gas transmission project. Undergoing regulatory review (Manitoba Environment and Climate Change Public Registry File No. 6247.00). The project is anticipated to take approximately 12 months to construct, beginning in summer of 2027, if licence is received, and is anticipated to be in operation for 50 years or more based on the design life.	Potential residual effects could include: • Low potential for effects to rare plants, wildlife, or wildlife habitat • Effects to agricultural operations, including a small loss of agricultural land around above ground structures and short-term disruption to agricultural activities for one growing season during construction. • Noise and dust potentially affecting human health risk in localized areas during construction or resulting in changes to the cultural experience of the area • Effects on community well-being resulting from potential stress and safety concerns about accidents or malfunctions. • Small increases in the strain on local infrastructure and services, mainly during the construction phase. • Potential to encounter or disrupt important sites, including heritage resources and cultural sites or features through ground disturbance
RM of Stanley Regional Wastewater Collection System (AECOM 2025)	Proposed new low pressure sewer conveyance (pipeline) system to service the communities of Schanzenfeld and Reinfeld and convey collected wastewater to the City of Winkler Wastewater Treatment Facility lagoon. Undergoing regulatory review (Manitoba Environment and Climate Change Public Registry File No. 6248.00). The proposed Altona to Winkler gas transmission pipeline will cross the forcemain pipeline component of the RM of Stanley Regional Wastewater Collection System in the vicinity of the Hespeler Drain crossing in NW 26-2-4 WPM, where the pipeline will be installed by horizontal directional drilling. The proposed project will parallel this forcemain, each running north-south on opposite sides of Road 20W, for approximately 2 km. The project is anticipated to be constructed between Q2 of 2025 and the end of 2026, pending receipt of an Environment Act Licence.	Potential residual effects could include: • Reduced habitat availability for wildlife, habitat fragmentation, increased mortality • Reduced area for agricultural land use • Inconvenience, nuisance and increased production costs associated with operating farming equipment around structures. • Compromised biosecurity for croplands and livestock operations • Risk of disturbing unknown heritage resources due to ground disturbance • Increased demand for transportation infrastructure and community services during construction • Noise and dust

Table 3-3: Project and activity inclusion list

Project / activity	Description of project /activity	Potential effects
Proposed residential developments	During project engagement, high-level information was learned about upcoming and proposed residential subdivisions that may result in residual effects that could interact spatially or temporally with the residual effects of the proposed Altona to Winkler gas transmission project. Proposed future residential developments in the region include: • Proposed development east of the City of Winkler involving approximately 100 residential lots • Proposed developments in and around the Town of Altona amounting to approximately 170 residential lots	Potential residual effects could include: • Reduced habitat availability for wildlife, habitat fragmentation, increased mortality • Noise and dust • Increased demand for transportation infrastructure and community services

✓ = 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 focus on those measures that are under Manitoba Hydro's control and would help to reduce the interaction of residual project effects with the effects from other projects and activities.

Manitoba Hydro will share information and knowledge with other proponents through this environmental assessment report which will be filed with the provincial regulator as part of the Environment Act Proposal. 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 project and cumulative effects against established threshold criteria for each VC. Where residual and cumulative effects exceed threshold criteria, the associated effects are considered significant.

The thresholds are defined with consideration for regulatory requirements, standards, objectives, or guidelines 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. If positive or neutral residual or cumulative effects are identified, they are not assessed for significance.

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

measures identified throughout the environmental assessment and captured in Table 17-1.

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 following:

- 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

Follow-up and monitoring activities 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 effects adaptively if required.

The framework for implementation, management, monitoring, and follow-up of environmental protection measures during construction and operational maintenance activities is provided by Manitoba Hydro's environmental protection program (see Chapter 16.0). As part of this assessment, three types of monitoring are considered:

1. Inspection monitoring during construction and maintenance activities in pursuit of verifying adherence to mitigation measures.
2. Valued component monitoring that is proposed in pursuit of better understanding potential project effects and effectiveness of mitigation measures.
3. Indigenous monitoring, where Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

During construction and maintenance activities, inspection monitoring will be undertaken by Manitoba Hydro to ensure the appropriate implementation of mitigation measures. The need for and description of VC-specific biophysical or socioeconomic follow-up and monitoring activities (*e.g.,* monitoring change in wildlife habitat availability) during project operation, if applicable, is presented in each VC chapter. Indigenous monitoring is discussed briefly in the important sites VC.

3.8 Greenhouse gases and climate change

The *Environment Act* proposal report guidelines (Government of Manitoba 2023) require description of climate change implications including a greenhouse gas inventory calculated according to guidelines developed by Environment Canada (Government of Canada 2023) and the United Nations (Intergovernmental Panel on Climate Change Task Force on National Greenhouse Gas Inventories n.d.). To meet this requirement, Manitoba Hydro uses quantification methods prescribed by Environment Canada and the United Nations, and undertakes GHG assessments in alignment with the GHG Protocol's Project GHG Accounting Protocol, incorporating the GHG accounting principles outlined in the Protocol, as appropriate. Climate normals and trends are provided in Chapter 5.0 (Environmental setting), while Chapter 13.0 provides details on climate change and the greenhouse gas inventory for the project.

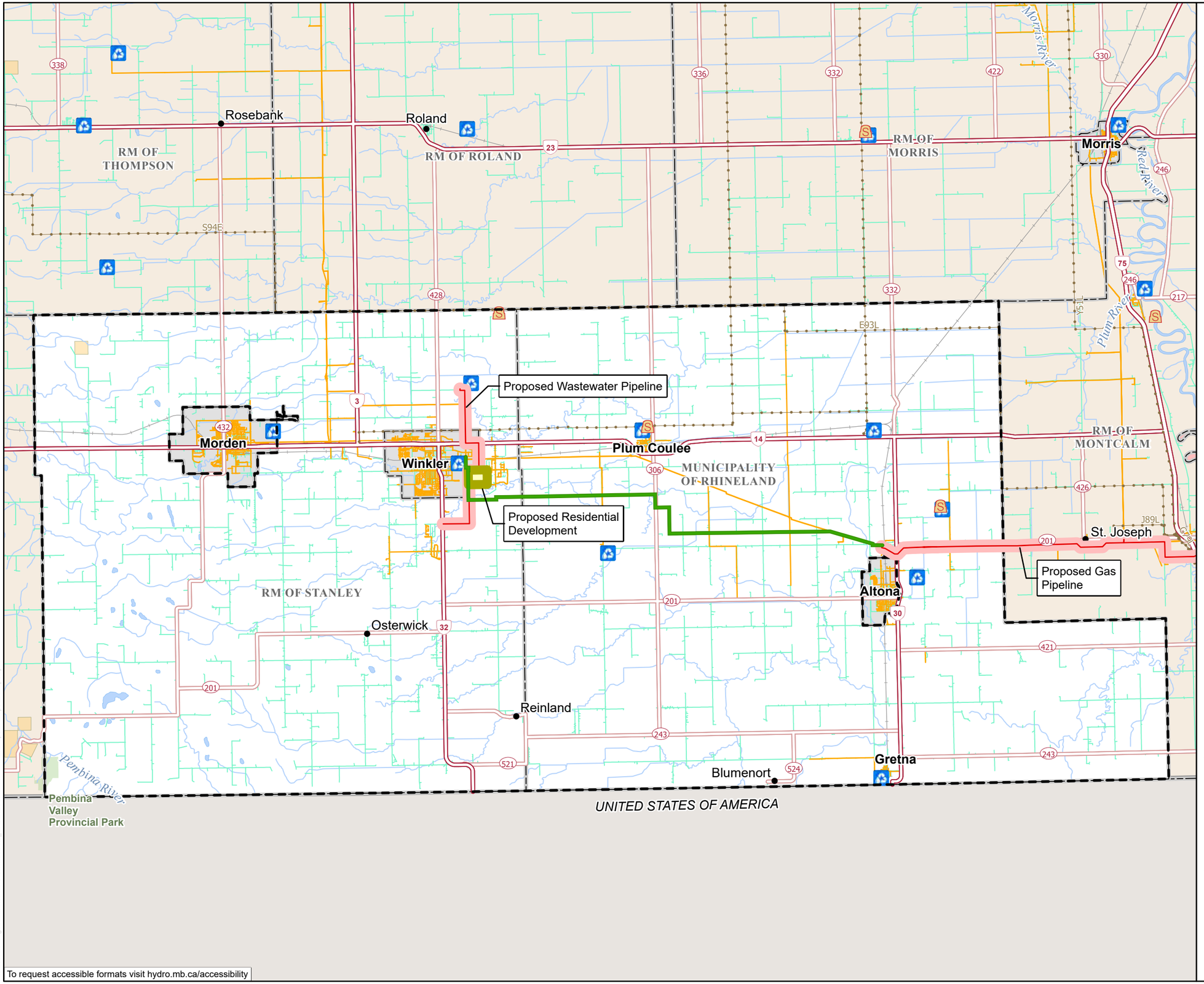
3.9 Effects of the environment on the project

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 discussed as well as the measures taken to avoid potential adverse effects. The effects of the environment on the project are presented in Chapter 14.0.

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 regarding 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 15.0.

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 other project effects.



Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Projects in the Cumulative Effects Assessment
- Linear Project in Cumulative Effects Assessment
- Project in Cumulative Effects Assessment

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

Assessment Area
- Regional Assessment Area

Landbase
- Community
- Railway
- First Nation Reserve
- Wildlife Management Area
- Provincial Park
- City/Town
- Rural Municipality

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty One territory and on the traditional territories of the Anishinaabeg and Cree Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 5 10 Kilometres
0 3 6 Miles

1:225,000

Locations of Projects Included in the Cumulative Effects Assessment

Draft/Confidential: For Discussion Purposes Only

Map 3-1

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\pcodata\Tier1\GIS\Oriental\PRJ_GAS\2026 Altona\Work\EAM\arcEAM\arcEAM.aprx

4.0 Project engagement

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

- Goal and objectives of engagement
- Approach to engagement
- Identification of engagement audiences
- Role of engagement in decision making
- Communication methods
- Engagement methods
- Engagement feedback
- How feedback influenced project decisions
- Ongoing engagement

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

4.1 Goal and objectives of engagement

Our goal of engagement is to understand and consider concerns and interests in project decisions, while building lasting relationships.

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

- Fostering early and ongoing relationship-building with engaged audiences
- Keeping engaged audiences informed with clear and accessible communication throughout the engagement process
- Engaging audiences early and providing opportunities for ongoing participation throughout the project
- Adapting engagement approaches based on audience needs and feedback
- Using multiple methods of engagement tailored to audience preferences
- Sharing how feedback and knowledge influence decision-making processes, providing opportunities for engaged audiences to share feedback throughout the project lifecycle and working to resolve concerns that arise
- Building long-term relationships through openness, honesty, and meaningful engagement

In the context of engaging directly with First Nations and the Manitoba Métis Federation, we understand meaningful engagement means seeking, discussing, and carefully considering the views of others in a timely manner, and working to weave in

ceremony, cultural values, Indigenous knowledges, Indigenous laws, and/or protocols throughout. We also recognize that the definition of meaningful engagement may vary depending on the audience.

Our engagement process is separate from any section 35 Crown consultation process that may be initiated by the Province of Manitoba. 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 strategy and plan that remains adaptive and responsive to the feedback and preferences we learn from engaged audiences. The engagement strategy sets the framework for respectful, inclusive, and transparent engagement, establishing clear objectives and responsibilities. The engagement plan provides detailed, dynamic information about engagement activities. The plan outlines which groups are engaged, when, and how, supporting a structured yet adaptable approach to participation.

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 the potential project's impacts and approach conversations with an open mind, not a predetermined solution. Listen to understand, genuinely engage, and be open to adjusting plans based on input. Be sensitive to historical issues and conscious of individual backgrounds, cultures, beliefs, and traditions.
- **Transparent:** Be open and honest, helping engaged audiences understand the scope, potential impacts, and their level of influence so they can decide how involved they want to be. Be upfront about what they can and cannot influence, and why.
- **Proactive:** Identify audiences to engage and plan for engagement early in the decision-making process, allowing for timely and meaningful engagement. Strive to be informed, responsive, and timely in our communications.
- **Inclusive:** Make participation easy and convenient, being mindful of potential barriers to participation. Seek out and show value for diverse perspectives, including those from hard-to-reach or underrepresented groups.
- **Accountable:** Report back on how input was considered and influenced the decision, providing rationale if input did not lead to changes. Provide regular updates and a direct point of contact for inquiries.
- **Trust-building:** Demonstrate genuine interest in and care for perspectives. Be consistent and strive to build trust in the engagement and decision-making processes, even if outcomes are not favorable. Create opportunities for ongoing dialogue once specific engagement activities have ended.
- **Flexibility:** Recognize that a one-size-fits-all approach is not effective. Consider how different engaged audiences prefer to participate and adapt to unique circumstances, expectations, and preferences.
- **Continuous evaluation:** Evaluate engagement activities, document successes and opportunities for improvement, and share this information internally with those who could benefit from it.
- **Accessibility:** Foster inclusion, value diversity, and remove barriers in engagement activities by developing communication and engagement processes that are inclusive and considerate of the diverse needs and abilities of audiences. Offer accessible formats upon request, provide accommodations as needed, and adopt inclusive practices to promote equitable participation in engagement activities.

The following sections outline the engagement methods and activities we undertook to work to achieve the engagement goal and objectives on the Altona to Winkler gas transmission project.

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 Altona to Winkler gas transmission project is located on Treaty 1 lands, the original territories of the Anishinaabeg, Dakota Oyate, 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 Municipality of Rhineland, the Rural Municipality (RM) of Stanley, and the City of Winkler. The Municipality of Rhineland was incorporated in 2015, when the Town of Plum Coulee and the Town of Gretna amalgamated and now contains rural and small urban communities. The RM of Stanley was incorporated in 1890 and includes the City of Morden and the City of Winkler, as well as numerous unincorporated urban centres within its boundaries. The Municipality of Rhineland and the RM of Stanley have strong agriculturally based economies focused on conventional and specialty crops, and livestock operations. Urban areas are home to industry, business, government organizations, and manufacturing operations that produce predominantly agriculture-based products and equipment.

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. Historical and/or contemporary use of the project area.
2. Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives.
3. Anticipated inclusion in regulatory processes.

To identify interested parties, we considered:

1. Proximity to the potential project area, including landowners, adjacent landowners, and local municipalities.
2. Governance and regional oversight, including municipalities and government representatives.
3. Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives.
4. Relevant local or regional impact, including audiences with specific connections to or concerns about the potential project area, such as local businesses, resource users, or organizations with expertise in the affected environment or community.

Recognizing the diverse land use, ownership, and governance within the project area, Manitoba Hydro emphasizes the importance of working with those whose priorities, interests, and knowledge can inform and shape project decisions.

Through the above scoping process, we identified seven First Nation and Métis audiences to engage with, identified in Table 4-1.

Table 4-1: First Nation and Métis audiences engaged on the project and the rationale for their inclusion in project engagement

Nation	**Rationale for inclusion (criteria that apply):**
Dakota Plains Wahpeton First Nation	• Historical and/or contemporary use of the project area • Anticipated inclusion in regulatory processes
Dakota Tipi First Nation	• Historical and/or contemporary use of the project area • Anticipated inclusion in regulatory processes
Long Plain First Nation	• Historical and/or contemporary use of the project area • Anticipated inclusion in regulatory processes

Table 4-1: First Nation and Métis audiences engaged on the project and the rationale for their inclusion in project engagement

Nation	**Rationale for inclusion (criteria that apply):**
Manitoba Métis Federation, the National Government of the Red River Métis	• Historical and/or contemporary use of the project area • Anticipated interest in the project based on previous projects • Anticipated inclusion in Crown consultation
Peguis First Nation	• 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 Anishinabe First Nation	• Historical and/or contemporary use of the project area • Anticipated interest in the project based on previous projects • Anticipated inclusion in Crown consultation
Swan Lake First Nation	• Historical and/or contemporary use of the project area • Anticipated inclusion in Crown consultation

Using the scoping criteria for interested parties, we identified the following interested parties to engage with, identified in Table 4-2.

Table 4-2: Interested party audiences engaged on the project and the rationale for their inclusion in project engagement

Audience	**Rationale for inclusion (criteria that apply):**
City of Winkler	• Proximity to the project area • Governance and regional oversight
Directly affected landowners	• Proximity to the project area
Local businesses	• Proximity to the project area • Relevant local or regional impact

Table 4-2: Interested party audiences engaged on the project and the rationale for their inclusion in project engagement

Audience	**Rationale for inclusion (criteria that apply):**
Municipality of Rhineland	• Proximity to the project area • Governance and regional oversight
RM of Stanley	• Proximity to the project area • Governance and regional oversight
Subject matters experts, advocacy organizations/groups	• Demonstrated interest in similar projects • Relevant local or regional impact
Town of Altona	• Proximity to the project area • Governance and regional oversight

The identified engaged audiences above were 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 Role of engagement in decision making

There are four main ways that engagement feedback influences project decision-making:

1. Feedback from engaged audiences helps inform the valued component selection and assessment of potential project effects for the environmental assessment through the identification of features of scientific, social, cultural, spiritual, economic, historical, archaeological, or aesthetic importance.
2. Feedback from engaged audiences helps refine the preferred route alignment to minimize potential impacts and better align the route with local land use practices.
3. Feedback from engaged audiences helps inform the development of mitigation measures and tailor the environmental protection program to address local environmental sensitivities and land use practices.
4. Feedback from engaged audiences influences construction decisions (*e.g.,* depth and method of pipeline installation) based on site-specific conditions, environmental sensitivity, and audience preferences.

4.5 Communication methods

Communication methods for the project involved the following:

- Letters and emails
- Information sheet
- Project webpage, information phone line, and email address

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

Emails and letters were sent out to First Nations, the Manitoba Métis Federation, the City of Winkler, the Town of Altona, the Municipality of Rhineland, and the RM of Stanley in late June 2025. In early July 2025, letters were sent to landowners along the preferred route and emails were sent out to other interested parties. As discussed in Section 2.4, a route adjustment was made in October 2025 based on feedback shared through project engagement, which scoped in newly affected landowners. Additional letters were sent in October 2025 to newly affected landowners along the proposed realignment, and in November 2025 to landowners along the preferred route who had not yet been heard from during the project engagement process.

4.6 Engagement methods

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

- One in-person public open house
- Two virtual information sessions
- Meetings with specific engaged audiences
- Site visit for First Nations and the Manitoba Métis Federation
- Project email address and hotline phone number

We launched engagement for the project in June 2025, by notifying First Nations, the Manitoba Métis Federation, landowners, municipalities and interested parties via email, letters, and launching the project webpage. We reached out to landowners along the preferred route via mailed letters to inform them about the project. Notifications included a project overview map asking for initial feedback on the preferred route and information on how to participate in the virtual information sessions and in-person open house. 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 welcomed feedback through email, phone calls, an open house, virtual information sessions, and meetings with engaged audiences.

We held the following information sessions as part of engagement:

Table 4-3: Open house and information sessions

Date	Number of participants	Location
July 22, 2025	3	Virtual, Microsoft Teams
July 23, 2025	~15	Open house, Winkler Arts & Culture
July 24, 2025	8	Virtual, Microsoft Teams

Based on interest expressed by engaged audiences, we held the following meetings to discuss the project.

Table 4-4: Individual project meetings

Date	Audience	Location	Notes
July 15, 2025	RM of Stanley	Virtual, Microsoft Teams	Project overview meeting
July 29, 2025	Swan Lake First Nation	In-person, Swan Lake First Nation	Project was part of meeting agenda
August 5, 2025	Peguis First Nation	In-person, Winnipeg	Project was part of meeting agenda
October 7, 2025	Peguis First Nation	In-person, Winnipeg	Project was part of meeting agenda
October 30, 2025	Long Plain First Nation	In-person, Long Plain First Nation	Project was part of meeting agenda
November 27, 2025	Landowner	In-person, Winkler	To discuss routing
November 13, 2025	Peguis First Nation	In-person, Winnipeg	Project was part of meeting agenda

Table 4-4: Individual project meetings

Date	Audience	Location	Notes
December 9, 2025	Landowner	Virtual, Microsoft Teams	To discuss project details

First Nation and Métis audiences were also invited to attend a site visit of the proposed project route on September 11, 2025. The purpose of the site visit was to provide an opportunity for engaged nations to directly inform and influence the proposed heritage work and the environmental assessment process for the project. The site visit included a driving tour of the proposed project route, where participants had the opportunity to provide feedback on the route, heritage areas of concern, and areas of importance. Feedback from the site visit is summarized below in Section 4.7.1.8.

4.7 Engagement feedback

The following sections summarize key themes and concerns we heard throughout project engagement.

4.7.1 First Nation and Métis feedback

4.7.1.1 Dakota Plains Wahpeton First Nation

As of January 2026, we have not received feedback about the project from Dakota Plains Wahpeton First Nation. Coordination efforts are ongoing to arrange a meeting to discuss this project and other non-project related items in response to a request to meet from Dakota Plains Wahpeton First Nation's leadership.

4.7.1.2 Dakota Tipi First Nation

As of January 2026, we have not received feedback about the project from Dakota Tipi First Nation.

4.7.1.3 Long Plain First Nation

We have had correspondence and a meeting with Long Plain First Nation representatives throughout the engagement process. Representatives from Long Plain First Nation also attended the site visit on September 11, 2025. Our understanding of feedback that Long Plain First Nation has communicated about the project to date includes:

- Interest in heritage work that will be undertaken as part of the project
- Potential interest in employment and business opportunities. Long Plain First Nation representatives noted that Manitoba Hydro should reach out to the Long Plain First Nation Employment and Training group to discuss project-specific employment.

If a licence is received, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation, including Long-Plain First Nation, to determine interest in a field visit(s) to observe construction activities and discuss interest in employment and business opportunities.

4.7.1.4 Manitoba Métis Federation

We have had correspondence and discussions with the Manitoba Métis Federation throughout the engagement process. A representative from the Manitoba Métis Federation also attended the site visit on September 11, 2025. The Manitoba Métis Federation submitted a proposal request to undertake a technical review and rights impact assessment of the project to determine if potential impacts may infringe on the rights, claims and interests of Red River Métis. Our understanding of feedback that the Manitoba Métis Federation has communicated about the project to date includes:

- Interest in further understanding any potential impacts the project may have on the rights, claims and interests of Red River Métis
- Concern with the potential interactions between the project and the ability of Red River Métis citizens to practice rights-based activities

As of January 2026, Manitoba Hydro and the Manitoba Métis Federation have signed an agreement to support the Manitoba Métis Federation's technical review of the Altona to Winkler gas transmission project and the Dominion City to Altona gas transmission project which is currently under regulatory review.

4.7.1.5 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 through their Consultation and Special Projects Office. Representatives from Peguis First Nation also attended the site visit on September 11, 2025. We understood from engagement that Peguis First Nation is interested in aiding the project archaeologist early on in the project planning and by monitoring fieldwork, taking notes, and supporting the Heritage Resource Impact Assessment fieldwork

and report writing process for this project. Our understanding of feedback that Peguis First Nation has communicated about the project to date includes:

- Interest in project-specific employment opportunities related to heritage fieldwork and monitoring
- Interest in conducting a Traditional Land Use Study of project area
- Preference to be involved earlier in the project planning phase for heritage planning and fieldwork
- Interest in creating a project-specific heritage committee and using the Altona to Winkler gas transmission project as a pilot
- A request for Manitoba Hydro to consider how historical waterways and water systems may have been altered by agricultural activities in the area when planning heritage and fieldwork investigations

Manitoba Hydro will continue discussions on project-specific heritage opportunities with Peguis First Nation. Manitoba Hydro shared with Peguis First Nation that they would support the nation in conducting a land use study to further enhance the work and would require a proposal for the study as a first step.

If a licence is received, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation, including Peguis First Nation, to determine interest in a field visit(s) to observe construction activities and interest in arranging ceremonies.

Manitoba Hydro remains aware of the concerns regarding proximity of the project to active and historical waterways and will further assess heritage resources in the area by completing a Heritage Resource Impact Assessment (HRIA) prior to construction.

4.7.1.6 Roseau River Anishinabe First Nation

As of January 2026, we have not received feedback about the project from Roseau River Anishinabe First Nation.

4.7.1.7 Swan Lake First Nation

We have had correspondence, discussion, and a meeting with representatives from Swan Lake First Nation throughout the engagement process. From engagement, we understood interest in potential job opportunities in the Nation including heritage work and monitoring on this project. Our understanding of feedback that Swan Lake First Nation has communicated about the project to date includes:

- Interest in project-specific business and employment opportunities
- Interest in seeing meaningful and long-term benefits for developments in their territories including business, economic and employment opportunities

- Interest in participating in heritage fieldwork and monitoring
- Apprehension towards new development projects in the area
- Interest in Indigenous Nation-specific employment targets that prioritize traditional territories in the project area
- A request for Manitoba Hydro to undertake concrete and meaningful actions towards reconciliation in all project stages

Manitoba Hydro will continue discussions on project specific heritage opportunities with Swan Lake First Nation, and will reach out to engaged First Nations and the Manitoba Métis Federation, including Swan Lake First Nation, to determine interest in a field visit(s) to observe construction activities and interest in arranging ceremonies.

4.7.1.8 Site visit feedback

Representatives from Long Plain First Nation, Peguis First Nation, and the Manitoba Métis Federation attended the site visit on September 11, 2025. Key feedback shared from the site visit included the following:

- Questions and concerns regarding heritage methods and protocols, including actions taken if a cultural or heritage resource is unearthed
- Recommendation to begin construction on projects with a ceremony
- Interest in participating in heritage monitoring on this project and future projects
- Requests for monitors to be present during construction phase ground disturbances
- Suggestion for the project route to avoid waterways and follow existing disturbances as much as possible

Feedback on the heritage process was also used to inform the identification of important sites and heritage methodologies, described in more detail in Section 6.1.

If a licence is received, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities. Manitoba Hydro will also reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be guided by each nation's cultural practices, protocols, and preferences.

4.7.2 Interested party feedback

4.7.2.1 Rural Municipality of Stanley

The RM of Stanley was notified about the project and, in response, requested a meeting to discuss the project with Manitoba Hydro representatives on July 15, 2025. The RM of Stanley shared plans for future development near the proposed route, requested additional mapping data to assist in their planning processes, and expressed their support for the project. On August 8,2025, Manitoba Hydro provided project information including a map book of the proposed project route and geospatial data files to the RM of Stanley.

4.7.2.2 Municipality of Rhineland

The Municipality of Rhineland was notified about the project and, in response, passed a resolution supporting the Altona to Winkler gas transmission project on July 9, 2025. The Municipality of Rhineland requested more information on building setbacks and project GIS data to help identify whether proposed developments in the municipality are in proximity to the gas transmission line.

Following a review of the provided documents, the Municipality of Rhineland confirmed that they are not aware of any new proposed subdivisions or major developments along the proposed pipeline route. While some subdivision development is anticipated around the community of Plum Coulee and building development is expected at the Blumengart Colony, neither of these developments are located along the proposed pipeline route.

4.7.2.3 City of Winkler

The City of Winkler was notified about the project and, in response, requested more information about the proposed alignment within the city limits, sharing that there are some planned industrial and residential developments proposed within the City of Winkler and surrounding areas. Manitoba Hydro shared detailed alignment within the City of Winkler limits.

4.7.2.4 Town of Altona

The Town of Altona was notified about the project and, in response, shared that they had limited interest in the project due to the nature and location of the project and did not share any concerns.

4.7.2.5 Information sessions and open house

Participants at the virtual and in-person information session included landowners, municipal and provincial government representatives, associations, organizations, and businesses. Feedback from the virtual information sessions included concerns about biosecurity, weed management and potential impacts to livestock. Participants also shared concerns about tile drainage and the depth at which the proposed pipeline would be installed. Participants inquired about easements and setback distances and asked for mapping data to be provided to aid in future development planning.

During the in-person open house, participants expressed interest in increasing natural gas capacity in the region. Agricultural producers shared challenges in connecting to local natural gas services, specifically for grain drying and other commercial agricultural operations.

4.7.3 Themes from engagement feedback

4.7.3.1 Commercial agriculture

Engaged audiences shared concerns about the presence of the natural gas transmission line negatively affecting existing or future tile drainage or other drainage options on their property. They also shared concerns with depth of cover not being adequate for current or future farming and drainage practices. They expressed concerns about construction impacting natural drainage of the land, and whether there will be impacts to existing water lines on agricultural fields. Some specific landowners also requested for the gas transmission line to be installed at a greater depth on their properties to support potential future tile drainage development. Concerns were raised about crop damage during construction, and how landowners may be compensated for such damages. There were also concerns about biosecurity and the potential for disruption to cattle operations, specifically during breeding and calving seasons.

Potential effects to agriculture and proposed mitigation to address them, including effects and mitigation associated with the above-noted concerns, are described in Chapter 9.0 (Commercial agriculture).

4.7.3.2 Gas service

Engaged audiences 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. Landowners and residents in the area expressed an interest in connecting to the proposed natural

gas transmission line and shared that they anticipate many requests for customer hook-ups.

4.7.3.3 Economic opportunities

Engaged audiences shared interest in the natural gas transmission line's potential impacts to future development opportunities. Participants at the open house in Winkler expressed a general sense of support for natural gas expansion in the area, noting that the project aligns well with their current development efforts and shared interest in how it could support or enhance future plans. Many landowners expressed interest in connections for agricultural use and the potential for the project to provide long-term cost savings. Landowners considering subdivision of their properties were also supportive, recognizing that future developments could benefit from access to natural gas. Engaged audiences expressed an interest in employment and business opportunities that may be available on the project.

4.7.3.4 Important sites and harvesting

Engaged audiences expressed interest in learning more about Manitoba Hydro's Culture and Heritage Resources Protection Plan.

4.7.3.5 Routing

Engaged audiences located south of the preferred route inquired whether the gas transmission line could be moved approximately 3 miles further south so that customers could tap off the line to reduce the future cost of connecting to natural gas for corn and grain dryers. Engaged audiences also inquired about easements, and what activities they may undertake along an easement.

Feedback sharing during project engagement in July 2025 included concerns with the preferred route, including a proposed subdivision and incompatible land use near the City of Winkler. In response to this feedback, and after further conversations with the property owners at these locations, an alternate alignment was proposed near the City of Winkler to avoid the proposed subdivision and to adjust the alignment of the route on the property with potential land use incompatibility. The alternate alignment was presented to the newly affected landowners in October 2025 for feedback and consideration. As of January 2026, no landowners have shared concerns with the alternate alignment. More information on the pipeline routing process can be found in Section 2.4.

Manitoba Hydro provided an informational letter to affected landowners regarding what activities may take place over an easement and continues to engage in discussions with individual landowners regarding the details of their easements.

4.8 How feedback influenced project decisions

In aligning with key engagement principle of accountability (outlined in Section 5.2.1) Manitoba Hydro strives to report back on how information from engaged audiences was considered and may have influenced decision-making. Manitoba Hydro has shared meeting minutes and summary notes from the in-person open house and virtual information sessions to participants through e-mail. These notes include action items, and summarize feedback received from engaged audiences and are included in Appendix A.

Table 4-5 further details how feedback received through the engagement process influenced project decisions through the outcomes shared.

Table 4-5: Summary of engagement feedback and associated project outcomes

Feedback	**Outcomes**
Some landowners shared concerns over the depth of coverage intended for the gas pipeline due to agricultural and drainage practices and potential future development plans for their land.	Manitoba Hydro will continue to discuss with individual property owners regarding construction and reclamation plans specific to existing and potential future agricultural infrastructure (*e.g.,* tile drainage installations).
Peguis First Nation and Swan Lake First Nation requested to participate in heritage work including heritage monitoring, and receive more information on the heritage methodologies for this project.	Manitoba Hydro will continue discussions on project specific heritage opportunities with Peguis First Nation and Swan Lake First Nation. Manitoba Hydro hosted a heritage-specific site visit on September 11, 2025 where engaged First Nations and the Manitoba Métis Federation were invited to accompany the project archaeologist to view anticipated areas of interest, discuss concerns, and share information on heritage methodologies.

Table 4-5: Summary of engagement feedback and associated project outcomes

Feedback	Outcomes
Concerns about biosecurity risks, including anthrax and weed management, and requests for engagement with Manitoba Agriculture and adherence to best practices.	Manitoba Hydro will implement the Manitoba Hydro biosecurity policy and procedures to mitigate biosecurity risks.
Requests to minimize disruption to cattle operations and protect agricultural infrastructure (corrals, barns, watering systems, pivots) during construction.	Manitoba Hydro will work with landowners to minimize disruption to farming operations where possible and confirm locations of in-ground infrastructure in pursuit of preventing damage.
A participant shared concerns in July 2025 with the proposed location of the gas transmission line where it crosses their property, as it is located where they undertake construction activities and would impact operations. They also shared that the site is prone to frost boils in the winter, so staff often auger the property and will need to be made aware of pipe location to avoid potentially auguring over the line.	Manitoba Hydro staff investigated routing options and developed an alternate alignment for the gas transmission line to be closer to the edge of the property, along the road, to address the concerns shared through engagement.
Participants shared concerns regarding a proposed subdivision along the preferred route that was identified during project engagement in July 2025. Based on the proposed plans, the gas transmission line would be within the backyard of proposed	Manitoba Hydro staff met with the participants to further discuss the development plans and identified an alternate alignment for the gas transmission line that avoids the proposed subdivision. The alternate alignment places the gas transmission line on properties owned by different

Table 4-5: Summary of engagement feedback and associated project outcomes

Feedback	Outcomes
residences and may pose future safety risks.	landowners that had not been previously engaged. As of January 2026, these landowners did not share any concerns with the alternate alignment.

4.9 Ongoing engagement

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

Following Manitoba Environment and Climate Change's decision regarding the Altona to Winkler gas transmission project, we will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the municipalities and interested parties of the outcome of the decision. If we are granted a licence, we will keep our engaged audiences informed of construction schedules, activities, and associated training, employment, and/or business opportunities. We also plan to engage in further discussions about culture and heritage monitoring opportunities.

Manitoba Hydro will also reach out to First Nation and Métis audiences to discuss interest in holding a ceremony or ceremonies at project milestones, as participants shared this as an interest during the September 11, 2025 site visit.

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, if a licence is received, through 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

This chapter provides an overview of primarily desktop-review based existing environmental conditions for the following aspects that are broadly relevant for the assessment and/or relate to more than one valued component (VC):

- Historic and cultural setting
- Climate
- Ecological land classification
- Bedrock and surficial geology
- Soils and terrain
- Groundwater and groundwater wells
- Surface water
- Communities and population
- Land and resource use

Existing conditions directly relevant to a specific VC, including their collection methods, are described in each VC assessment chapter (see Chapters 6.0-12.0).

5.1 Historic and cultural setting

The Altona to Winkler gas transmission project is located on Treaty 1 lands, the original territories of the Anishinaabeg, Dakota Oyate, 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 with us throughout the project.

The project region has changed substantially since the start of 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.

As described in Chapter 2.0, the pipeline route parallels an existing pipeline right-of-way for approximately 3 km and has its own right-of-way for approximately 28 km. Most of the proposed pipeline is located on private land primarily utilized for agricultural purposes.

The regional area of the project has a rich Indigenous history with several Indigenous groups, including the Anishinaabe and Dakota, occupying the area when the first European explorers came through the region. Indigenous trade and travel routes later became frequently utilized cart trails, which were also traversed by explorers, fur traders, hunters, and settlers. The La Vérendrye Trail in the Pembina Valley and the St. Joseph (or St. Joe) trail are two historic trails part of the extensive trade networks in the Pembina Valley area, connecting Indigenous and European peoples (City of Selkirk Museum 2025; Stewart n.d.).

In the 1860s, Red River Métis regularly crossed through what is now the Municipality of Rhineland to travel to their annual buffalo hunts, where they would join Dakota hunters at Pembina, or near the present site of Gretna (Ens 1984).

Non-Indigenous settlement in the area began with the arrival of Mennonites from the 1870s to1880s, resulting in the establishment of what is now the Town of Altona as an agricultural village. The area was originally known as the Mennonite West Reserve and was set aside by the federal government in 1875 for Mennonite settlement (Klippenstein 1975). As the population grew, the town site was established in 1895 on a Canadian Pacific Railway spur and was later incorporated into a town in 1956 (Lyon 2015a). Agriculture practices in the region were initially focused on grains, later introducing livestock farming, poultry, oil seeds, and specialty crops (Lyon 2015a). Today, the local economy is primarily supported by the agricultural sector, but the area is also home to a variety of modern amenities and businesses.

Non-Indigenous settlement in the Winkler area began in 1882, with the area also set aside as part of the Mennonite West Reserve in the 1870s. Favourable soils helped to develop the Winkler area into what is now one of Manitoba's primary agricultural regions. As the population of Winkler grew, the local economy diversified, becoming a trade, service and processing centre for the agricultural sector, and a regional retail and industrial centre after the Second World War. Winkler was incorporated into a city in 2002. The area is still known for its agricultural economy, as well as industrial production facilities, many of which develop resources to serve the agricultural sector (Lyon 2015b).

Although the project area predominantly traverses land that is now privately owned and used mainly for commercial agriculture as well as other uses including residential, other commercial, and recreational, Manitoba Hydro acknowledges that Indigenous nations have been stewards of these lands since time immemorial. Manitoba Hydro understands that First Nations peoples and Red River Métis citizens have enduring connections to these lands and may continue to visit the area to

practice rights-based activities today, including on private land with landowner permission.

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, Roseau River Anishinabe First Nation, Long Plain First Nation, and Swan Lake First Nation (Indigenous Services Canada 2017). No part of the anticipated project footprint or project development area (PDA) crosses reserve lands, a TLE selection, or an Addition to Reserve selection.

Through project engagement on previous projects in the region (*e.g.,* Dorsey to Wash'ake Mayzoon transmission line, Dominion City to Altona gas transmission line), Manitoba Hydro has heard about the rich history of the area. Engaged First Nations shared perspectives about past and ongoing harms and alterations to traditional landscapes resulting from settlement and development, including Manitoba Hydro projects and operations.

Figure 5-1 shows a non-exhaustive summary of major events or periods of change to the project area, which Manitoba Hydro understands have 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 and Red River Métis citizens 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, as reflected in the United Nations Declaration on the Rights of Indigenous Peoples. This declaration calls for reconciliation at a national level, including renewed interest in protecting language, culture, and constitutionally protected rights.

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

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

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

15th Century

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 peoples and Red River Métis citizens from the land can be traced back to this early doctrine

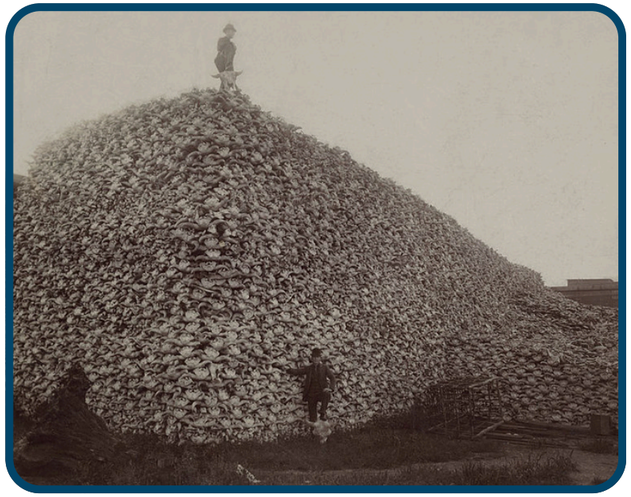


Pope Francis during a visit to Canada where the Vatican apologized for the Church's role in the residential school system, Maskwacis, Alberta, July 2022

19th Century: Eradication of the buffalo

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 peoples and Red River Métis citizens 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.

17th to mid-19th centuries: The fur trade

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).



The La Vérendrye Trail and road sign, commemorating the explorer Pierre Gaultier de Varennes et de La Vérendrye. (Source: Kirk Warren Studio. n.d.)

The fur trade era marked the some of 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). The Ojibway, Cree and Assiniboine were among those who inhabited the area and were present when the first European explorers came through the region. A number of trade and travel routes developed by Indigenous peoples criss-crossed the project area, and this network was later used by European explorers and traders, and settlers. The La Vérendrye Trail in the Pembina Valley and the St. Joseph (or St. 'Joe') trail are two historic trails part of the extensive trade networks in the Pembina Valley area, connecting Indigenous and European peoples (Historic Resources Branch n.d; Stewart, n.d.).

In the 1860s, the Red River Métis regularly crossed through what is now the Municipality of Rhineland en route to their annual buffalo hunts to join the Dakota hunters at Pembina or near the present site of Gretna (Ens 1984).

Late 19th Century: The Mennonite East & West Reserve

In the 1870s the federal government set aside two areas in Manitoba for Mennonite immigrants from Russia to settle in, known as the "Mennonite East and West Reserves." Mennonites came to this region in an effort to practice their faith and way of life freely. Approximately 7,000 Russian Mennonites arrived between 1870-1880, constituting what may have been the largest single newcomer group to enter Manitoba in that that time period (Klippenstein 1975).

An influx of settlers to the project region represented a significant leap in effect pathways that decreased Indigenous peoples' access to lands and resources available for harvesting and cultural activities.

Altona was settled in 1880, and Winkler in 1882. The region held favorable soils for farming, and became home to what is now known as one of Manitoba's primary agricultural regions.



Blumenort, one of the earliest villages in the Mennonite West Reserve, in the beginning years of its development. (Source: Manitoba Historical Society Archives. n.d.)

1871 - Signing of Treaty One



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).

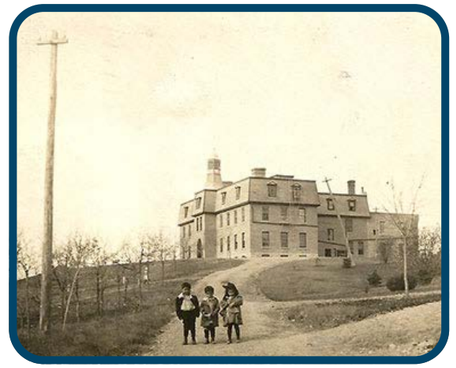
The interpretation and implementation of the numbered treaties remain a contested issue, but recent court decisions have supported the view that the honour of the Crown demands a liberal interpretation of the treaties.

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.

19th century to 1996: Residential school system

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 in or near the project region. As a result, children from nearby nations 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

1872: The Dominion Lands Act

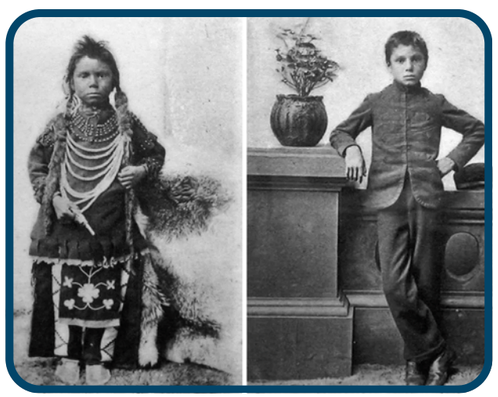
In 1872, the *Dominion Lands Act* was signed, which outlined specific policies to encourage homestead settlement throughout the west. This Act allocated "millions of prairie acres for homesteads, railway construction, and colonization companies" (Brglez 2021). As a result, settlers moved into the region. 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 near the project area, and have influenced the division of land in the region (Manitoba Historical Society 2008).



Sommerfeld Mennonites visiting in Rosenbach, near present day Winkler, Manitoba (circa 1919) Source: Mennonite Heritage Archives, Lawrence Klippenstein collection

1876 to present: The Indian Act

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 *Indian Act* outlawed traditional governance systems in favour of Band Chief and Councils with governing authority limited to Indian Reserve land. The *Indian 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).



Thomas Moore is seen in "before and after" photos at the Regina Indian Industrial School (1897). Source: Library and Archives Canada

1930: Natural Resources Transfer Act

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).

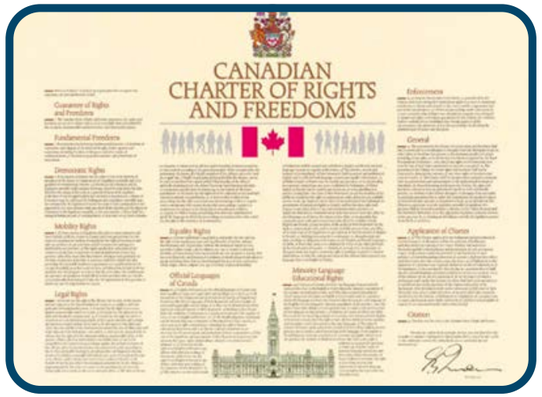


Sturgeon fishing, 1909. Source: Library and Archives Canada/PA-060742

1982: The Constitution Act

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 right, before taking that action or making 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: The Environment Act

With the enactment of *The Environment Act (Manitoba)* 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: Métis Scrip in Manitoba

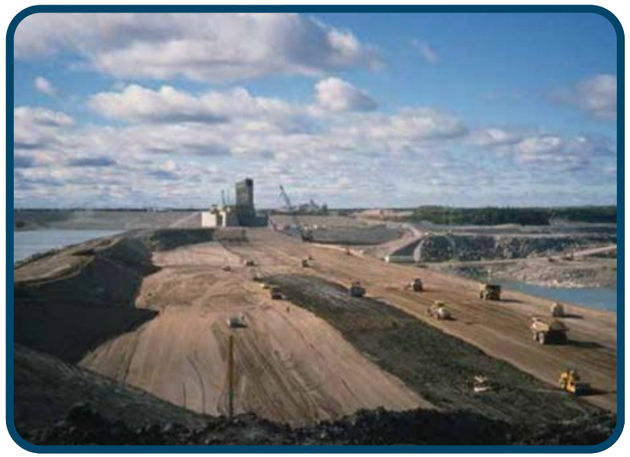
Beginning in 1885, as part of *The Manitoba Act*, the federal government offered Métis families 'scrip' in exchange for their land title (Robinson 2019). Scrip could be issued as land scrip (typically a quarter section of land), or it could also be issued as money scrip, valued at $160 or $240. Métis 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 (Auger 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)

1900s to present: Energy development

Hydroelectricity generation in Manitoba began in the early 1900s with the construction of generating stations along the Winnipeg River. These early generating stations were primarily to serve the growing City of Winnipeg, 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 Generating Station, completed in 1961. Manitoba Hydro now operates five generating stations on the Lower Nelson River and utilizes a High Voltage 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, natural gas pipelines were built in the surrounding area, connecting to the larger TransCanada Energy system.

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 First Nation peoples and Red River Métis citizens across Manitoba.

2016: The Path to Reconciliation Act

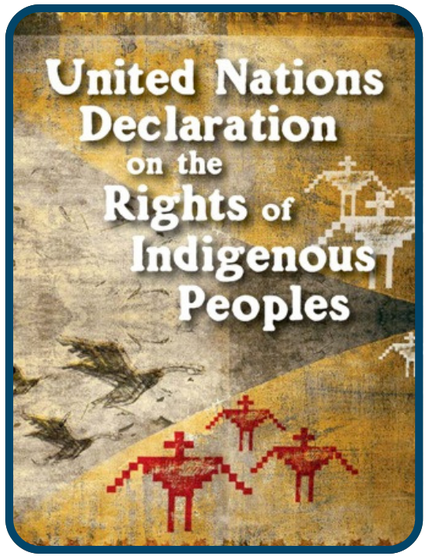
In 2016, the Government of Manitoba passed *The Path to Reconciliation Act,* which sets out the government's commitment to advancing reconciliation and is informed by, but not limited to the Truth and Reconciliation Commission Calls to Action. The Act recognizes that reconciliation of Indigenous and 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 Manitoba Métis Federation (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.



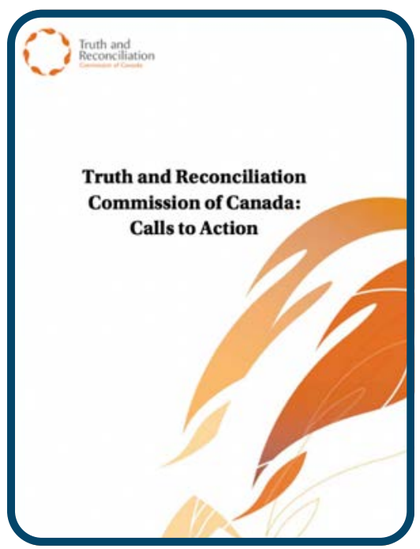
Manitoba Métis Federation President David Chartrand speaks to gathered attendees at the signing of the treaty in November, 2024. Photo by Brooke Jones for the Winnipeg Free Press.

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.



5.2 Climate

Based on Smith et al. (1998) terrestrial ecozones, ecoregions, and ecodistricts map of Manitoba, the project falls within the Winkler Ecodistrict of the Lake Manitoba Plain Ecoregion, in the Prairies Ecozone (see Map 5-1). The Winkler Ecodistrict is generally characterized by short, warm summers and long, cold winters, with mean annual precipitation that varies considerably from year-to-year with approximately one-quarter falling as snow (Smith et al., 1998).

To develop an understanding of historic climate normals and climate trends in the project area, data from the following 17 stations outlined in Table 5-1 was reviewed:

- 12 stations operated by Environment and Climate Change Canada (ECCC)
- 3 complimentary meteorological stations operated by Manitoba Agriculture (MB Ag)
- 2 hydrometric stations; one operated by Water Survey of Canada (WSC) and the other operated by U.S. Geological Survey (USGS)

Table 5-1: Meteorological and hydrometric stations of interest for the project study area including stations from ECCC and MB Agriculture

Station name	**Operated by**	**Normals availability**	**AHCCD (Y/N)**
Altona	ECCC	1981-2010: Temperature (A Code) Precipitation (C Code)	Y
Altona CFAM	ECCC		-
Altona South	ECCC		-
Emerson	ECCC	1991-2020: Temperature (C Code) Precipitation (C Code) Wind (C Code)	-
Emerson AUT	ECCC		-
Emerson Auto	ECCC		Y

Table 5-1: Meteorological and hydrometric stations of interest for the project study area including stations from ECCC and MB Agriculture

Station name	Operated by	Normals availability	AHCCD (Y/N)
Morris 2	ECCC	1981-2010: Precipitation (C Code)	Y*
Plum Coulee	ECCC	1981-2010 Temperature (C Code) Precipitation (C Code)	-
Schanzenfeld	ECCC	Precipitation (D Code)	N
Myrtle 2	ECCC	Precipitation (D Code)	N
Morden CDA	ECCC	1991-2020 Temperature (A Code) Precipitation (C Code) Wind (C Code)	-
Morden CDA CS	ECCC		Y
Altona	MB Ag	-	-
Dominion City	MB Ag	-	-
Letellier	MB Ag	-	-
Red River at Emerson	WSC	-	-
Pembina River at Neche	USGS		-

Note:

There is AHCCD data available for Morris, but it corresponds to station ID: 5021920; this data is only available from 1915 to 1987, the AHCCD data was not joined with the station ID: 5021965

Of the two hydrometric stations, the Red River at Emerson station represents broader scale hydrologic conditions whereas the Pembina River at Neche station represents a nearby, smaller, watershed in the region and is included as it may provide meaningful information on more regional hydrologic conditions. Although other hydrometric gauges are present in the project study area, these gauges may have limited datasets (*e.g.,* only water levels) or may not contain records with sufficient data for calculation of normals and trends. Additionally, the selected gauges align with the future streamflow projections discussed in Chapter 13.1 (Future climate). For the purposes of quality control and assurance for streamflow normals and trends, any year with more than 10% missing data was omitted from the analysis. Both the Red River at Emerson and Pembina River at Neche are year-round gauges which provide continuous data.

5.2.1 Climate normals

Among the stations reviewed, the following climate normals are reported herein:

- Altona
- Emerson
- Morden

Monthly climate normals (ECCC 2025) are illustrated in Figure 5-2 for temperature, precipitation, and wind speed. Among the stations reviewed, Altona reports climate normals in the 1981-2010 period for both temperature and precipitation, and Morden and Emerson report climate normals in the 1991-2020 period for temperature, precipitation, and wind. The available normals for the ECCC stations are classified as Code A for Altona and Morden temperature only (*i.e.,* no more than 3 consecutive and no more than 5 total missing years of data) and Class C (*i.e.,* at least 15 years of data) for the remaining ECCC normals presented herein. Climate normals for the Altona station during the 1991-2020 period would be most indicative of recent historic climate conditions, but these normals are not currently available from ECCC. Therefore, to supplement climate normals available from ECCC, additional climate data was obtained from a gridded reanalysis dataset named European Reanalysis version 5 (ERA5; Hersbach et al., 2023), and normals were calculated at the grid nearest Altona. Figure 5-3 presents ERA5 normals for the 1981-2020 period (40 years) which aligns with methods used to generate future projections. The ERA5 normals for precipitation from 1981-2020 showed little difference from ERA5 normals from 1981-2010 (not presented); the minor differences include slightly cooler minimum temperatures and slightly warmer maximum temperatures over the winter months for ERA5 normals over the 40-year period (1981-2020) compared to the 30-

year period (1981-2010). Note, ERA5 indicates drier winter months and slightly wetter summer months compared to the ECCC normals.

Monthly averages were computed from the MB Ag stations but are not presented. Generally, these normals were similar to ECCC for temperature although with notably cooler temperatures in February. Monthly precipitation averages on the other hand were drier during the winter and wetter during the fall. Overall, the normal annual precipitation presented by ECCC for Altona is higher than averages from the MB Ag stations. It should be noted that the MB Ag dataset record contains limited time periods and samples different years of data than what is available from ECCC.

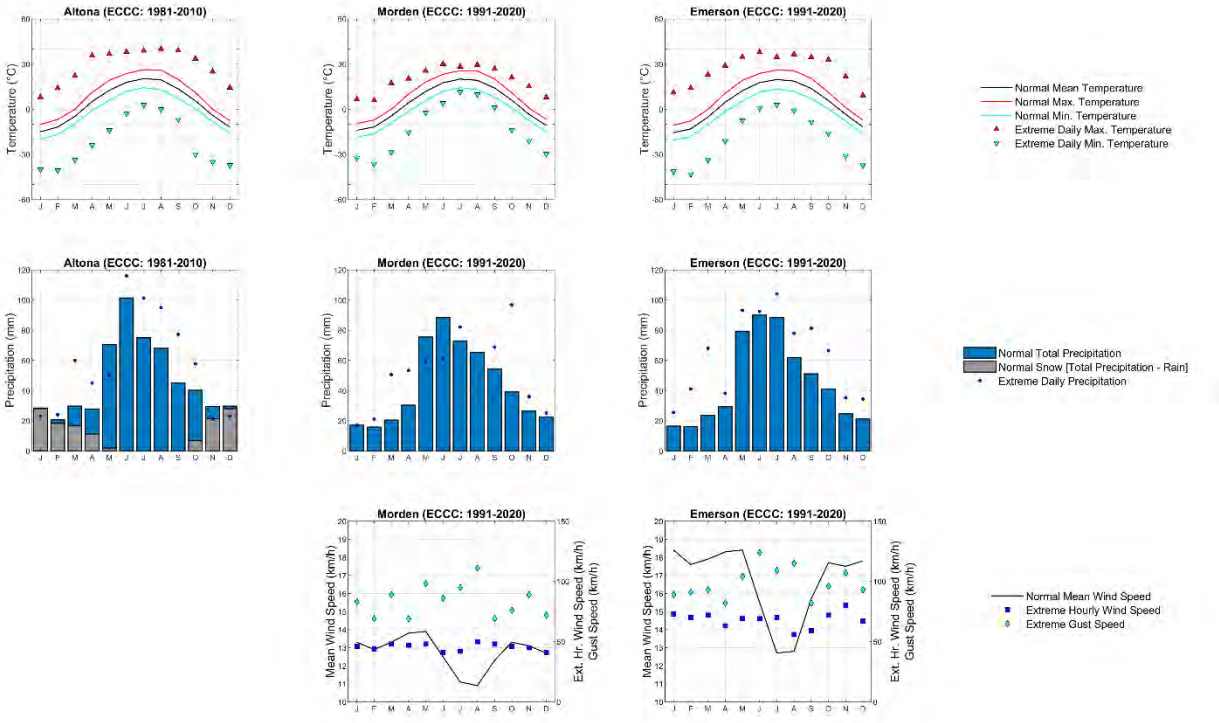


Figure 5-2: Monthly climate normals at Altona (temperature, precipitation) from ECCC during the 1981-2010 period and monthly climate normals (temperature, precipitation, and wind) for Morden and Emerson from ECCC during 1991-2020 period. Also shown (as points) are period-of-record, sub-monthly, extremes for select variables. Data retrieved from ECCC (2025).

The Morden and Emerson plots in Figure 5-2 do not provide a breakdown of precipitation into rain and snowfall components (as indicated by the stacked grey and blue bars for the Altona plot). For Emerson, this omission is due to data availability, and at Morden, the omissions are due to inconsistencies in data for different

precipitation types. Therefore, only the total precipitation is presented for these two locations.

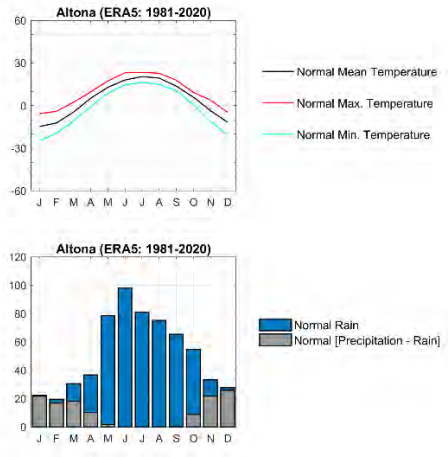


Figure 5-3: Monthly climate normals at Altona, Manitoba (temperature, precipitation) from the ERA5 reanalysis dataset for the 1981-2010 and 1981-2020 periods for temperature and precipitation respectively. Data retrieved from Hersbach et al. (2023).

Monthly streamflow averages for the WSC and USGS 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 5-4 shows monthly streamflow averages for the two hydrometric stations listed. Both sites exhibit a snowmelt dominated hydrologic regime, with April showing the highest monthly average flows. Note, USGS and WSC have a data-sharing agreement, and therefore, data for the Pembina River at Neche for the period of interest (1981-2020) is available through WSC via Hydrometric Historical Data (HYDAT).

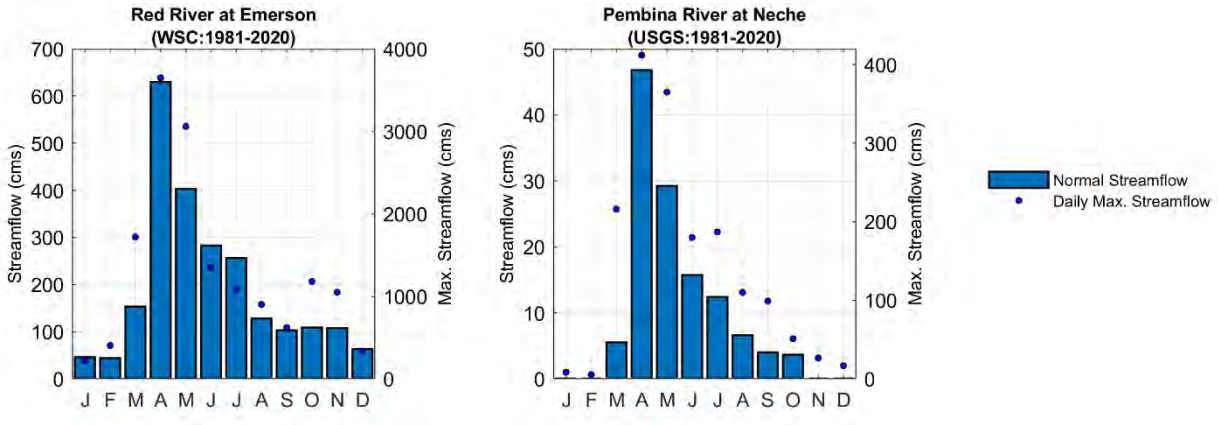


Figure 5-4 Monthly streamflow normals for Red River at Emerson and Pembina River at Neche for the 1981 –2020 time period, calculated from Water Survey of Canada (WSC; HYDAT). Also shown (points) are period-of-record maximum of mean daily streamflow.

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 (mean of daily minimum temperature)
- Mean temperature (mean of daily mean temperature)
- Maximum temperature (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)

Seasonal and annual time series from AHCCD at Altona, Morden, and Emerson for temperature are plotted in Figure 5-5. Figure 5-6 depicts the seasonal and annual AHCCD precipitation time series at Emerson and Morden. No wind data is available in the project study area, so AHCCD wind data at Winnipeg is presented in Figure 5-7. The Winnipeg station is used as a complimentary station for wind analysis even though it is approximately 80 km away from the project study area. 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 5-5, 5-6, and 5-7 may incorporate data from multiple stations (*e.g.,* those listed in Table 5-1). An updated set of AHCCD temperature data (Generation Four) is expected soon, however the latest data is not yet available for

download (Wan et al., 2025). Therefore, the previous AHCCD dataset from 2023 was utilized for this study.

For streamflow trends, the raw Water Survey of Canada data was used with no adjustments or homogenization applied for the Red River at Emerson gauge. The Pembina River at Neche data was available from WSC but only up to 2022, the data for the years 2023-2024 were downloaded from USGS National Water Information System (U.S. Geological Survey 2025). However, any year with more than 10% missing data was omitted from the analysis for the purposes to quality control and assurance as described in the normals section.

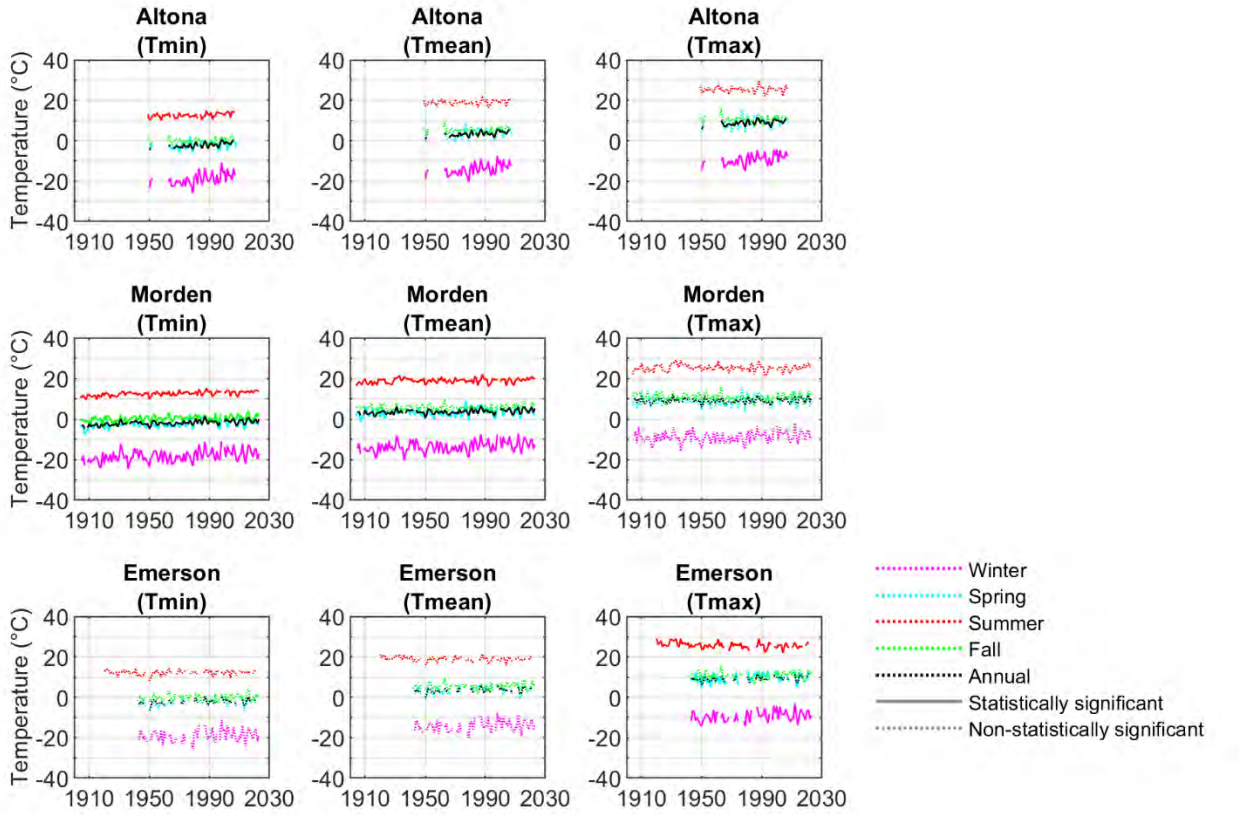


Figure 5-5: Time series of seasonal and annual temperature trends for Altona, Morden, and Emerson. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).

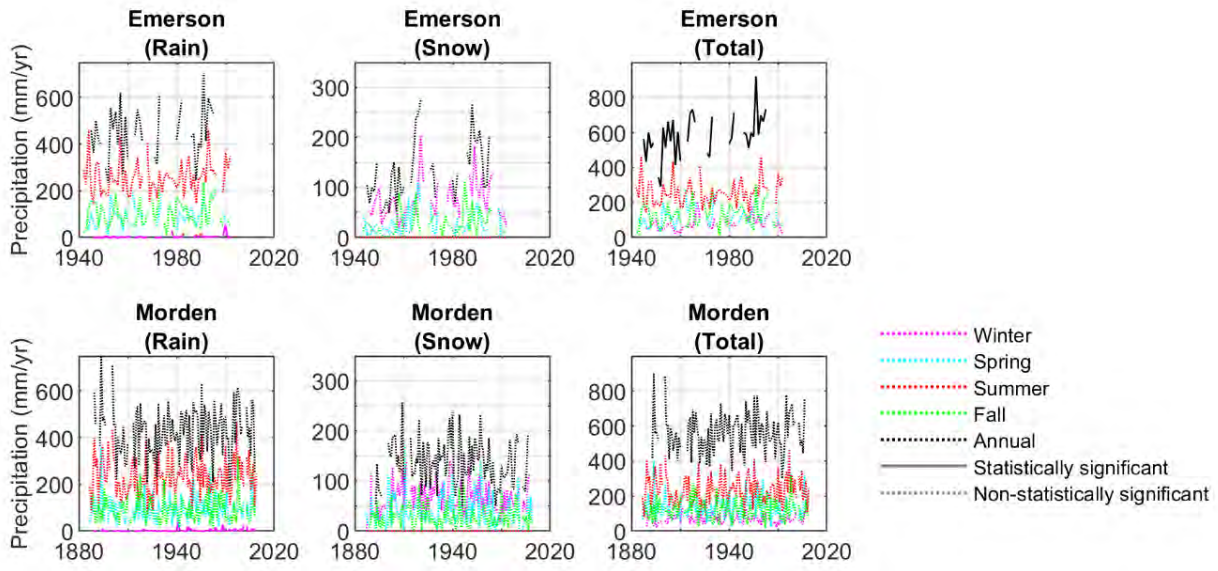


Figure 5-6: Time series of seasonal and annual precipitation trends for Emerson and Morden. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).

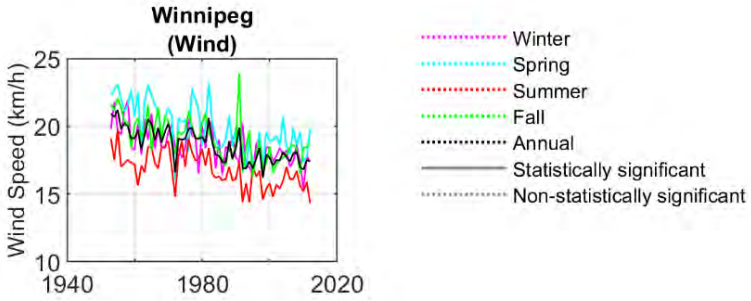


Figure 5-7: Time series of seasonal and annual wind trends for Winnipeg. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. AHCCD data is unavailable within the Project study area so Winnipeg was used as complementary stations for wind. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).

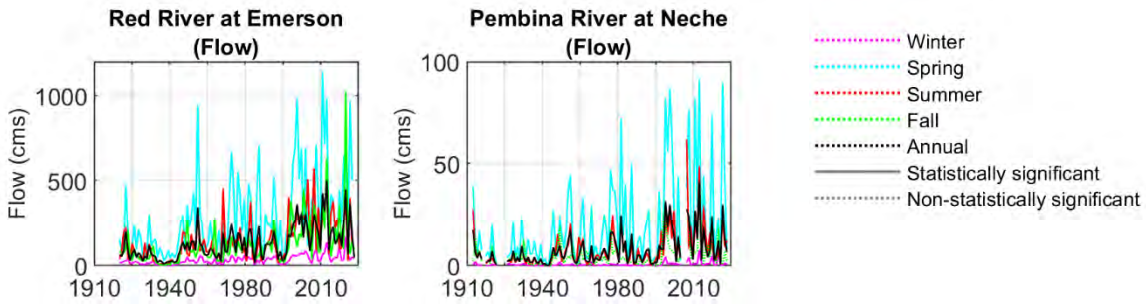


Figure 5-8: Time series of seasonal and annual flow trends for Red River at Emerson and Pembina River at Neche. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. The flow data presented is HYDAT data for the entire period of record for the two stations which spans from 1912-2023 and 1903-2024 respectively.

For the flow trend analysis, hydrological years were considered when computing trends. Each hydrological year spans from October 1st of the year to September 30th of the following year. For example, the hydrological year of 1917 spans from October 1, 1917, to September 30, 1918. Therefore, the data presented in Figure 5-8 which spans from 1912-2023 includes the hydrological years from 1912-2022.

Note the gap in the trend lines for the Pembina River plot indicates the years 1908, 1915-1918, and 2002-2003 for which the missing data exceeds the 10% quality control threshold and therefore, was discarded from the trend analysis. Conversely, there was no missing data for the Red River at Emerson gauge, and therefore, no years of data were discarded from the trend analysis at that station.

Statistically significant climate trends of note include:

- 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
- For Emerson, maximum temperature saw seasonal increases of 0.35°C/decade and 0.29°C/decade for winter and spring respectively. Maximum temperature saw a decreasing trend for summer (-0.12°C/decade).
  - Notably, Emerson is the only location of the three considered with a statistically significant decreasing temperature trend. This appears in the summer record which captures additional years compared to other seasons, including a relatively warm segment in the 1930s. Morden does show a decreasing

maximum temperature trend for summer however it is not statistically significant.
    - This statistically significant decreasing the maximum temperature trend for Emerson occurs when the entire time period of the dataset is considered. However, during exploration of different, shorter time periods (subsets of the entire dataset), several samples were found to have 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.
- For Morden, mean temperature saw increases annually (0.13°C/decade) and for all seasons except for fall. Minimum temperatures saw increases annually (0.2°C/decade) and for all seasons.
    - Winter: 0.30°C/decade
    - Spring: 0.2°C/decade
    - Summer: 0.18°C/decade
    - Fall: 0.1°C/decade
- For Emerson, annual total precipitation saw increases of 32.3 mm/decade.
- For Morden, only winter rainfall saw increases of 0.1mm/decade
- For Winnipeg, wind speed saw decreases annually (-0.55km/h/decade) and for all seasons.
- For Red River at Emerson, flow saw increases annually and for all seasons.
    - Annual: 14.8 m^3/s/decade
    - Winter: 4.0 m^3/s/decade
    - Spring: 28.0 m^3/s/decade
    - Summer: 17.4 m^3/s/decade
    - Fall: 12.2 m^3/s/decade
- For Pembina River at Neche, flow saw increases annually (0.57 m^3/s/decade) and for the winter, spring, and summer seasons.

Statistical significance was analyzed using the Mann-Kendall test as in Zhang et al. (2000). The slope of trends was estimated based on Kendall's rank correlation tau statistic (Sen, 1968). Generally, these tests are less sensitive to outliers compared to other commonly used methods (*e.g.,* linear regression to estimate trend slope). Note that the trend slope computation was performed independently on annual and seasonal time series which results in cases where the aggregation of seasonal slopes does not equal the annual slopes.

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.

As previously mentioned, the proposed project is located within the Prairies Ecozone, Lake Manitoba Plain Ecoregion, and Winkler Ecodistrict (see Map 5-1). The ecological land classification descriptions have been obtained from Smith et al. (1998) and are summarized 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

Within the Prairies Ecozone, the Lake Manitoba Plain Ecoregion extends north from the international boundary with its western extent marked by the Manitoba Escarpment. Historically, this ecoregion was comprised of prairie grasslands and stands of trembling aspen (*Populus tremuloides)* and bur oak (*Quercus macrocarpa)*, 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 (*Typha)*, sedges (*Carex*), and willows can be found in poorly drained areas of this ecoregion (Smith et al. 1998).

5.3.2.1 Winkler Ecodistrict

The Winkler Ecodistrict is bordered by the United States to the south and extends northwesterly 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 (*Fraxinus pennsylvanica)*, American elm *(Ulmus americana*), and Manitoba maple (*Acer negundo*) with shrubs such as hazel (*Corylus)* and saskatoon (*Amelanchier alnifolia)*. On riverbanks where flooding does not occur, bur oakcan 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 on Map 5-2 with the area and percent covers in the PDA shown in Table 5-2. As shown in Table 5-2, the dominant land cover class in the PDA is agricultural field, which account for greater than 86% (approximately 82 ha) of the PDA (Natural Resources Canada 2020).

Table 5-2: Land use / land cover class area (ha) and percent (%) coverage in the PDA

Land use/land cover class	**PDA**	
	ha	**%**
Agri-forage field	2	2
Agricultural field	82	86
Coniferous forest	-	-
Cultural features	-	-
Deciduous forest	3	3
Forest fire burn areas	-	-

Table 5-2: Land use / land cover class area (ha) and percent (%) coverage in the PDA

Land use/land cover class	PDA	
	ha	%
Open deciduous forest	-	-
Forage crops	-	-
Range and grassland	5	5
Roads, trails and rail lines	4	4
Sand and gravel	-	-
Water body	1	1
Wetland marsh	-	-
Total:	95	100

Values might not sum to totals shown because of rounding.

Individual VC chapters include analysis of land cover classifications relative to their specific spatial boundaries as relevant.

5.5 Soils and terrain

The project is located 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 and deltaic deposits.

The elevation ranges from approximately 267.5 m at the western extent of the project to 246.5 m at the eastern extent of the project. The land slopes from west to east at a regional gradient of 0.08%.

Soils were previously mapped in the project area, with the Municipality of Rhineland having detail scale mapping (scale 1:20,000; Podolsky 1991) as well as the Morden – Winkler area (scale 1:20,000; Smith & Michalyna 1973). The dominant soils are characterized as imperfectly drained Gleyed Rego Black Chernozems, Gleyed Black

Chernozems, Orthic Black Chernozems, Gleyed Cumulic Regosols, and Rego Humic Gleysols. The major soil associations within the project area include:

- Reinfeld Association (Gnadenthal, Reinfeld and Blumenfeld series) – imperfectly, well, and poorly drained soils developed on medium textured or coarse loamy (loam, very fine sandy loam) lacustrine sediments
- Rosengart Association (Rosengart and Nuenberg series) – well and imperfectly drained soils developed on medium textured or loamy (very fine sandy loam, loam, silty loam) over sandy or coarse (fine sand and loamy fine sand) and moderately coarse (very fine sand and loamy very fine sand) textured sandy lacustrine sediments
- Edenburg Association (Edenburg and Newton Siding series) – well and imperfectly drained soils developed on moderately fine or fine loamy (clay loam, silty clay loam) over sandy or coarse and moderately coarse lacustrine sediments
- Eigenhof association (Eigenhof, Rathwell and Neuhorst series) – mainly imperfectly drained with some well drained soils developed on moderately fine or fine loamy (clay loam, silty clay loam) lacustrine sediments
- Red River association (Red River and Osborne series) – imperfectly to poorly drained soils developed on fine textured or clayey (clay, silty clay, heavy clay) lacustrine sediments

Soil texture is predominantly very fine to moderately fine in the eastern portion of the study area near Altona, and transitions to medium to fine in the western portion of the study area towards Winkler. Soil drainage is almost completely characterized as imperfect with small areas of poor and well drained soil. 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 Bedrock and surficial geology

The project area is underlain by multiple bedrock types. Bedrock across most of the project area 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. The eastern

portion of the project area, close to Altona, is characterized as formations consisting of fossiliferous, stromatolitic, finely crystalline and dolostone of the Silurian and Ordovician periods. A geologic cross section paralleling the project approximately 5 km to the south is presented in Figure 5-9.

Bedrock elevation in the project area ranges from approximately 643 to 688 metres above sea level (Little 1980a). Overlying surficial drift thickness in the project area ranges from 52 m to 61m (Little 1980b).

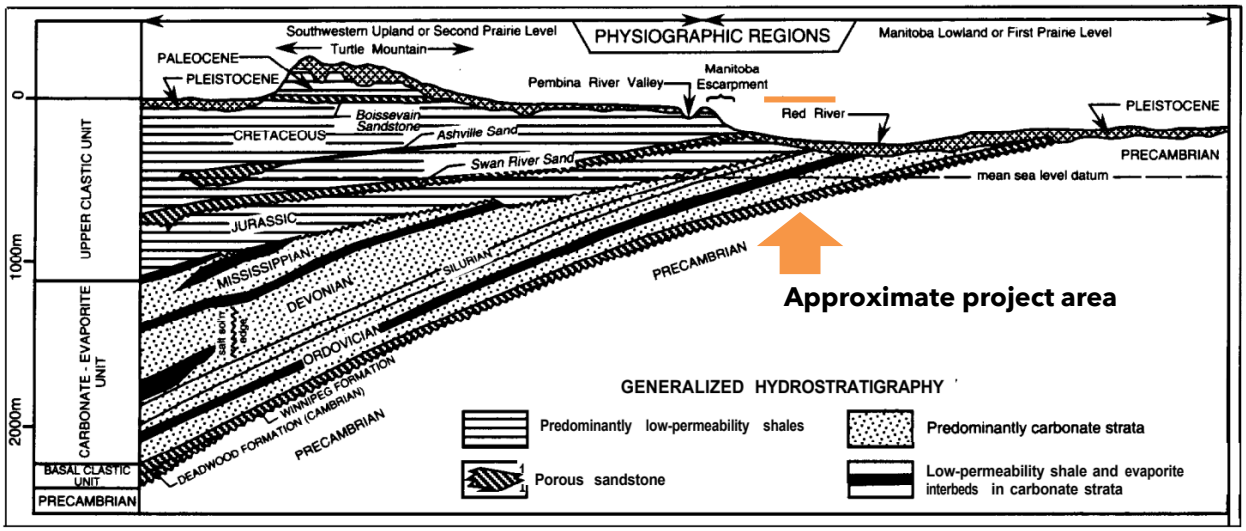


Figure 5-9 : Geologic cross-section paralleling the project approximately 5 km to the south (Betcher et al. 1995)

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 24 m to 45 m deep in the project area, with variable till thicknesses between the glaciolacustrine sediments and the underlying bedrock (Figure 5-10).

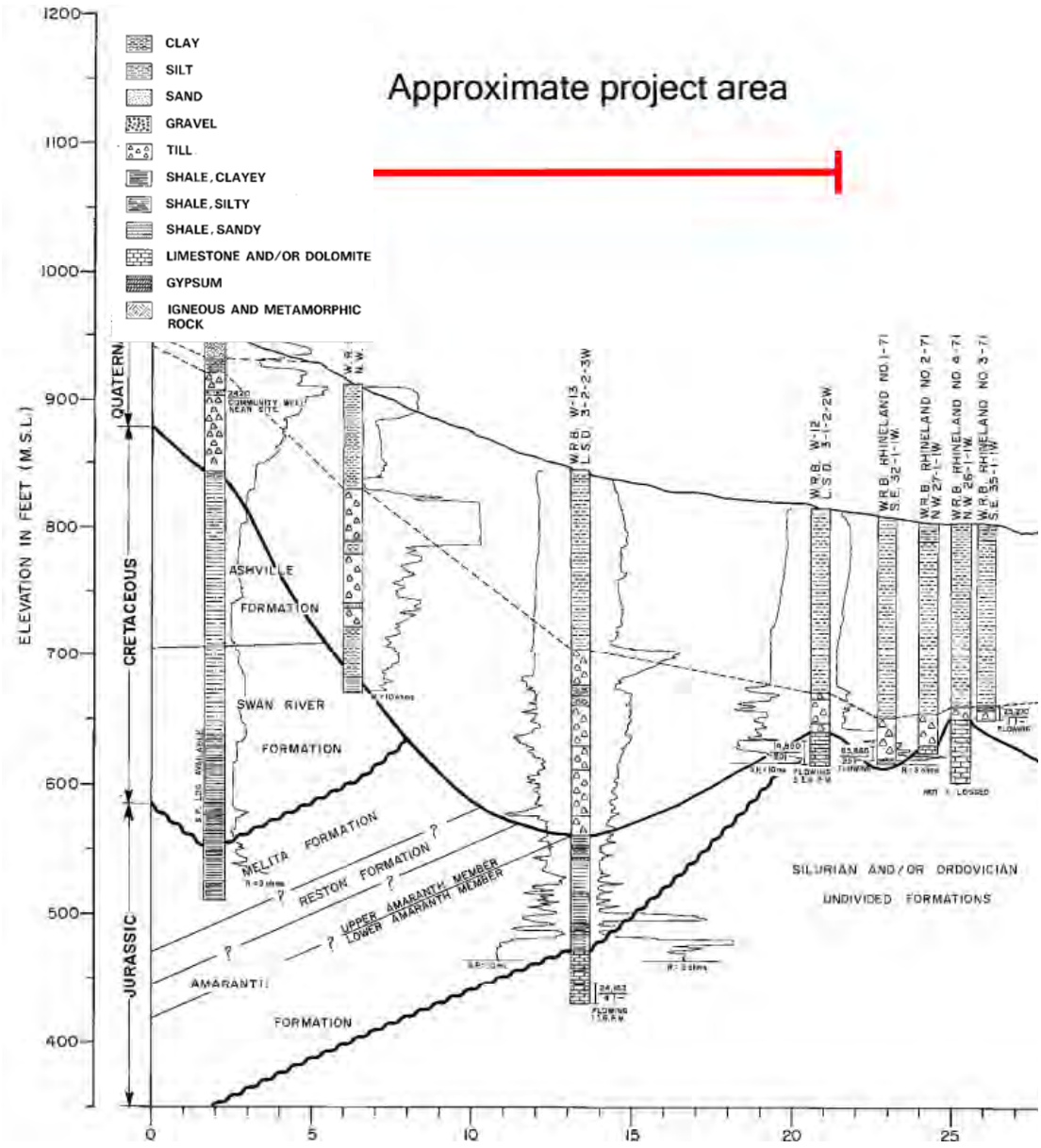


Figure 5-10: Borehole stratigraphy in the project area (Little 1980d)

5.7 Groundwater

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.

Sand and gravel aquifers within most of 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 also indicated to be in the project area, with areas mapped south of the project. Similar to 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).

The western portion of the project is underlain by the Winkler Aquifer, a major buried sand and gravel aquifer in the west end of the project in Winkler (Figure 5-11). The Winkler aquifer is an important source of water for domestic, industrial, municipal and agricultural purposes in the region (Winkler Aquifer Management Plan, 1997). In the area the project traverses the aquifer, the aquifer clay cover is approximately 30 to 43 m (100 to 140 ft) and has an approximate thickness of 3 to 30 m (10 to100 ft; Figure 5-12).

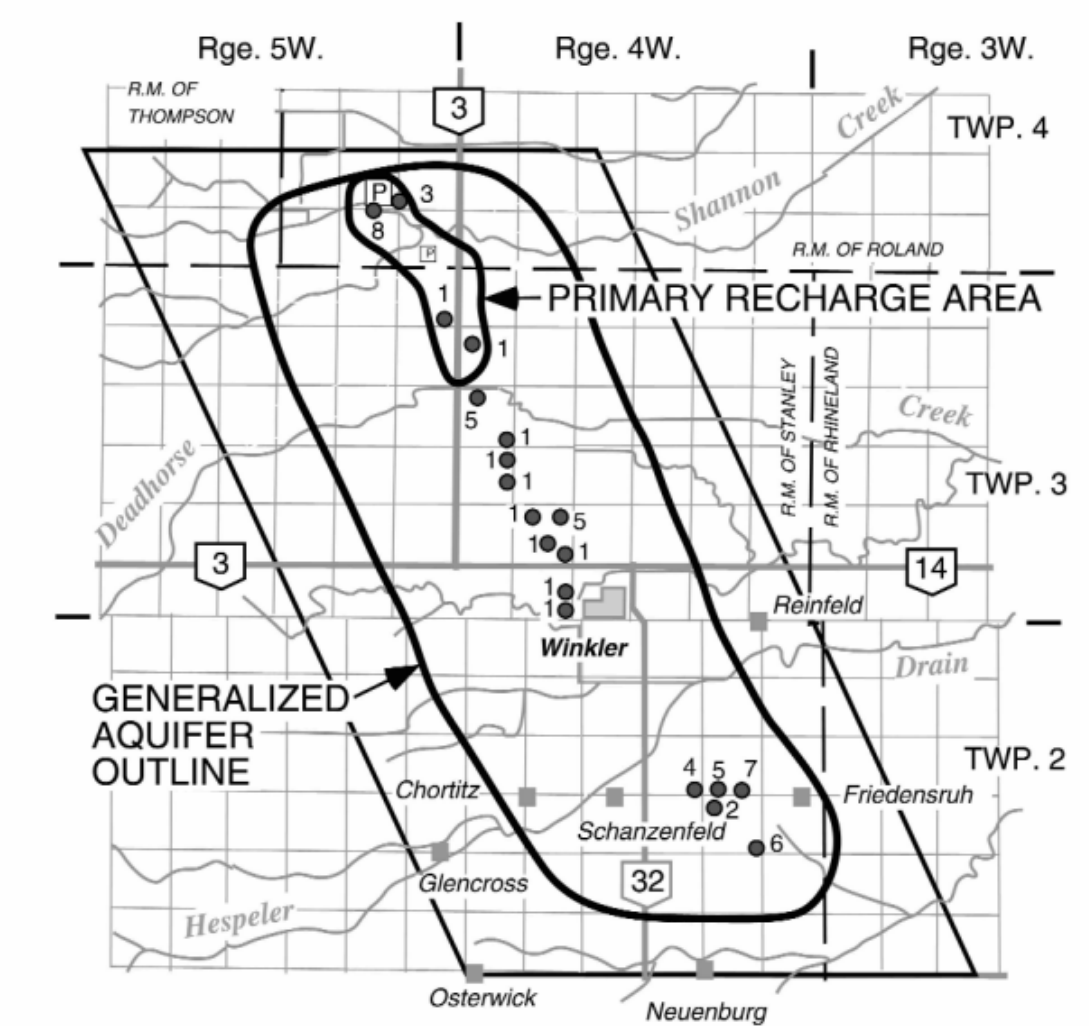


Figure 5-11: Generalized Winkler Aquifer outline (Winkler Aquifer Management Plan, 1997)

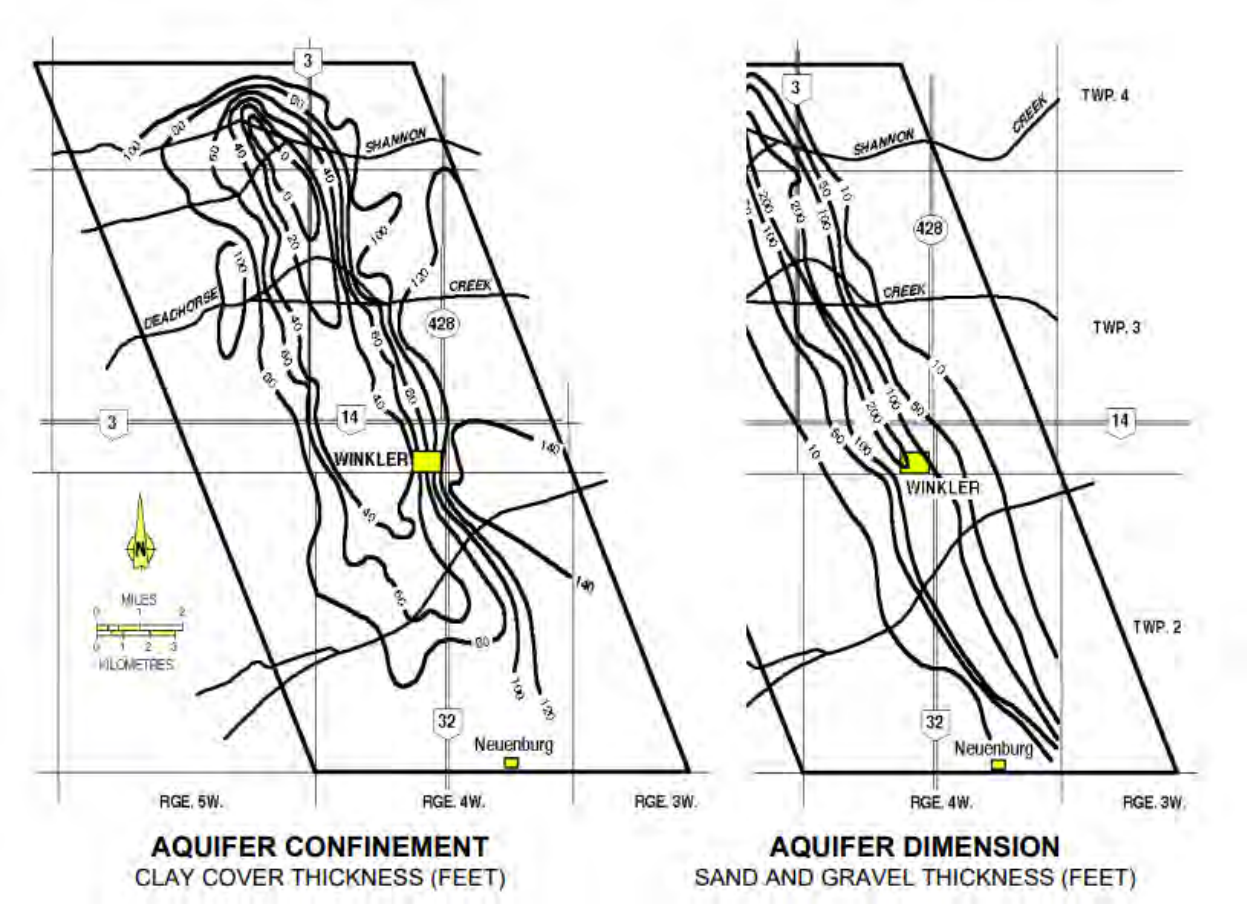


Figure 5-12: Winkler Aquifer confinement and thickness (Winkler Aquifer Management Plan, 1997)

A geological cross section close to the project (see Figure 5-10) does not show the presence of sand and gravel deposits, outside of the area of the Winkler Aquifer, that could potentially be water bearing in surficial deposits above the underlying bedrock. However, the distance between the project and the geologic cross section, 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 approximately 5-10 km of the project (Hempe and Iqbal 2016; Figure 5-13). This includes wells with recorded water levels above the ground surface (*e.g.,* south of the project and south, west and north of the western portion of the project). For example, a well approximately 5-10 km south-southwest of the eastern extent of the project is recorded as having a recorded water level more than three metres above ground surface (see Figure 5-13).

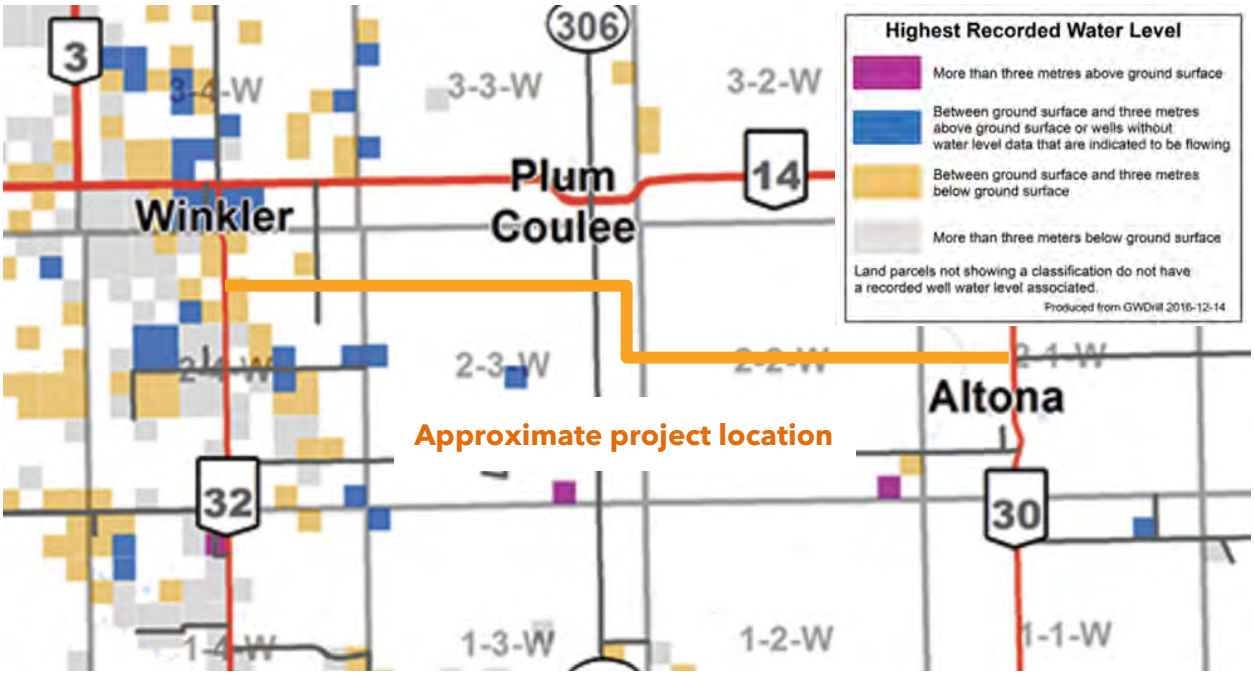


Figure 5-13: Flowing wells in the project area (modified from Hempel and Iqbal 2016)

There are 52 recorded active wells located within 5 km of the project (see Table 5-3). Of these:

- 24 are indicated to be production wells, with the following well uses: 8 domestic use, 2 domestic, livestock, 1 production, livestock, 2 production, and 11 production (municipal)
- 20 are listed as observation wells
- 8 are test wells

There are no active wells recorded within 1 km of the project.

Table 5-3: Summary of groundwater wells in the project area

Well status	Number of wells		
	Within 1 km of project	Between 1 km and 5 km of project	Total
Active	0	52	52
Inactive	0	4	4
Sealed	0	14	14
Unknown	5	263	268

Source: GWDrill Database 2018 © Province of Manitoba

5.8 Surface water

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

5.8.1 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 Buffalo Creek, Rosenheim Drain, and Hespeler Drain (Map 5-3).

5.8.2 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. Water samples collected are

typically tested for several water quality parameters including water chemistry, nutrients, metals, pesticides, and bacteria.

Water quality monitoring in the Pembina River Watershed has primarily consisted of short-term, issue-driven studies rather than continuous long-term programs. While sampling has occurred since the early 1970s and some sites have periods of consistent monitoring, no location has a complete long-term dataset. While there are no long-term monitoring stations, the WQI has been calculated for the Prairie Ecozone, which includes the Pembina River. Broadly, within the Prairies Ecozone, the waterbody average CCME WQI was 79 or fair quality (Manitoba Government 2021).

The closest major surface water body to the project footprint is the Red River, located approximately 22 km east of the project area. 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 (ECCC, 2019 & CCME 2017).

5.8.3 Fish and fish habitat

Milani (2013) sampled several drains in southern Manitoba, three of which are traversed by the proposed project, *i.e.,* Buffalo Creek, Rosenheim Drain, and Hespeler Drain. Fish species included in Buffalo Creek included black bullhead (*Ameiurus melas*) and fathead minnow (*Pimephales promelas*). For Rosenheim Drain, species captured and identified included brook stickleback (*Culaea inconstans*) and fathead minnow (*Pimephales promelas*). For Hespeler Drain, species captured and identified included fathead minnow, northern pike (*Esox lucius)*, silver redhorse (*Moxostoma anisurum*), longnose dace (*Rhinichthys cataractae)*, white sucker (*Catostomus commersonii)*, and brook stickleback (*Culaea inconstans)*. The riparian vegetation along Buffalo Creek consisted of a mixture of graminoids, tall shrubs, and trees. Hespeler Drain featured low-growing vegetation dominated by grasses, with tall cottonwoods (*Populus*) interspersed. Common cattail (*Typha latifolia*) and reed canarygrass (*Phalaris arundinacea)* were abundant along portions of the Hespeler Drain.

5.8.4 Aquatic species of conservation concern

Within the Lake Manitoba Plain Ecoregion, there are 12 aquatic species listed by the Manitoba Conservation Data Centre (MB CDC) including 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*)
- Fish: Bigmouth Buffalo (*Ictiobus cyprinellus*), Silver Chub (*Macrhybopsis storeriana*), northern pearl dace (*Margariscus nachtriebi*)

A request was made to MB CDC to determine if any aquatic species of conservation concern (SOCC) occurs within 5 km of the project footprint. Based on the MB CDC search results, no aquatic SOCC has been recorded within 5 km of the project development area.

5.8.5 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.

5.9 Communities and population

This section provides an overview of the communities in the vicinity of the project. Chapter 11.0 discusses the communities' economies while Chapter 12.0 discusses the infrastructure and community services available in the communities.

The project footprint mostly traverses the Municipality of Rhineland with smaller portions falling within the RM of Stanley before its termination in the City of Winkler (see Table 5-4).

Table 5-4: Length of proposed pipeline by traversed municipalities

Municipality	PDA	
	Length (km)	Percent (%)
Municipality of Rhineland	24.7	80
RM of Stanley	3.6	12
City of Winkler	2.6	9
Total	30.9	100

Values might not sum to totals shown because of rounding.

The Municipality 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 Municipality of Rhineland include Blumenort, Gretna, Plum Coulee, and Rosenfeld.

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

The Town of Altona, an important agricultural and large urban centre, is surrounded by the Municipality of Rhineland. It is located at the junction of PTH 30 and PR 201. Based on measurement from the centre of Altona, the town is approximately 3.0 km south of the PDA.

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. Of the total 1,760 private dwellings, 1,700 were occupied by permanent residents, and there was a population density of 456.3 people per square kilometre (Statistics Canada 2021).

The RM of Stanley borders the state of North Dakota to the south, the Municipality of Rhineland to the east, the RM of Roland to the northeast, the RM of Thompson to the northwest, and the Municipality of Pembina to the west. Communities within the RM of Stanley include Blumenfeld, Chortitz, Friedensfeld, Friedensruh, Haskett, Hochfeld, Neuenburg, Osterwick, Reinfeld, Reinland, Schanzenfeld, and Thornhill.

The 2021 population of the RM of Stanley was 8,981, which represents an approximate 0.1% decrease in population when compared to the 2016 population of 8,969. Out of the total 2,345 private dwellings, 2,279 were occupied by permanent residents, and there was a population density of 10.8 people per square kilometre (Statistics Canada 2021).

The City of Winkler is the largest urban centre near the proposed project. The economy in the region is described as mainly agricultural, with manufacturing emerging as a major employer (MSTW 2015).

The City of Winkler had a 2021 population of 13.745, which represents an increase of 8.6% when compared to the 2016 population of 12,660. Out of the total 5,239 private dwellings, 5,089 were occupied by permanent residents, and there was a population density of 663.1 people per square kilometre (Statistics Canada 2021).

The City of Morden is approximately 13 km west of Winkler. In 2021, the City of Morden had a population of 9,929, which represents an increase of 14.5% when compared to the 2016 population of 8,668. Of the total 4,162 private dwellings, 3,995 were occupied by permanent residents, and there was a population density of 609.6 people per square kilometre (Statistics Canada 2021).

5.10 Land and resource use

As mentioned in Section 5.4, agriculture is the dominant land use and economic driver in the municipalities traversed by the project, with agricultural fields accounting for approximately 86% of the land cover within the PDA. This section discusses non-agricultural types of land and resource use within the regional area of the project, the types of land on which they occur, and the structures in place to manage land and resource use. Chapter 9.0 (Commercial agriculture) describes the agricultural activities and practices occurring in the area and assesses potential project effects on this key type of land use in the area.

5.10.1 Property ownership

Land within the project area is predominantly private land, which accounts for approximately 96% of the PDA (see Table 5-5). The remaining areas of the PDA are comprised of roads (2%), Manitoba Hydro owned property (<1%), and Crown land (<1%). Because of limitations in publicly available ownership data in geospatial format, to develop property ownership approximations of land that would be traversed by the PDA, ReproMaps and other available provincial data layers were referenced where there were gaps in title ownership mapping.

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

Land ownership category	PDA	
	Area (ha)	Percent (%)
Assumed private	0.08	<1%
Assumed road	0.7	<1%
Private	92	96%
Crown	1	<1%
Roads	2	2%
Local government	-	-
Manitoba Hydro owned	0.15	<1%
Total:	95	100

Values might not sum to totals shown because of rounding.

5.10.2 Designated and protected lands

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

5.10.2.1 Provincial parks and ecological reserves

As shown on Map 5-4, there are no provincial parks or ecological reserves within the boundaries of the municipalities that will be traversed by the project. The closest provincial park to the project is Pembina Valley Provincial Park, approximately 28 km southwest, and St. Malo Provincial Park, approximately 49 km northeast.

5.10.2.2 Provincial wildlife management areas and wildlife refuges

Within the Municipality of Rhineland, there are six designated wildlife refuges, namely Rosenheim Coulee, H. Klassen, A. Enns, G.C. Froese, G. J Froese, and Hespeler Floodway.

The PDA does not traverse any wildlife refuges. The wildlife refuge closest to the project is the Rosenheim Coulee Wildlife Refuge located approximately 7.5 km northwest of project.

There are no wildlife management areas (WMA) in the municipalities that will be traversed by the project. The nearest WMA is the St. Malo WMA, located in NE 3-3-4 EPM in the RM of Emerson-Franklin, located approximately 45 km northeast of the project.

5.10.3 Land use zoning

The Municipality of Rhineland, Town of Altona, RM of Stanley, and Cities of Winkler and Morden 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.

5.10.3.1 Planning districts

A portion of the Municipality of Rhineland is within the Rhineland, Plum Coulee, Gretna, and Altona (RPGA) Planning District. The RPGA Planning District covers part of the Municipality 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 RM of Stanley is within the Morden, Stanley, Thompson, and Winker (MSTW) Planning District. The MSTW consists of the City of Morden, RM of Stanley, RM of Thompson, and the City of Winkler, and has the main goal to ensure that long-range planning brings about development that accords with the interests of the partner municipalities.

The MSTW's development plan categorizes six distinct ways the land is used: urban areas, emerging communities, Stanley corridor, village areas, rural areas, and agricultural areas. Policies were 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; waste management; and development standards (MSTW, 2015).

5.10.3.2 Municipal zoning

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

- Municipality of Rhineland Zoning By-Law No 2024-06, through which By-Law 2021-06 was recently amended
- Town of Altona Zoning By-Law No. 179/2021
- RM of Stanley Zoning By-Law No. 8-18

Where the project's footprint traverses each of the municipalities, the designations under the municipal zoning and planning instruments above are predominantly General Agriculture ("AG"). This designation generally identifies that the associated 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 between the Community of Reinfeld and the City of Winkler, the project footprint traverses parcels of land designated Agriculture Limited ("AL"). These areas are to accommodate agricultural activities and limit livestock operations in areas that are near urban settlements or other sensitive areas.

In locations along the PDA near to settlements including the Town of Altona, the project footprint traverses parcels of land designated Agriculture Restricted Zone ("AR"). 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.

5.10.4 Recreation and tourism

The municipalities traversed by the proposed 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 Plum Coulee, Friedensruh, and Reinfeld.

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

- Portion of the Trans-Canada Trail, which traverses the RM of Stanley and the Municipality of Rhineland
- Discovery Nature Sanctuary in Winker
- Winkler Butterfly Garden
- Winkler Heritage Museum
- Winkler Aquatic Centre
- 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 2024-25 Snoman map, numerous club and provincial snowmobile trails traverse the project area (Snoman Inc. 2025).

5.10.5 Resource use activities

Other resource use activities that occur in the RM of Stanley and Municipality of Rhineland include woodlot management, hunting, trapping, and domestic resource uses.

No commercial forestry management licences exist in the project area. 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 project

area is in GHA Zone 33 and species hunted within the RAA would include white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), upland birds (i.e. grouse (*Bonasa umbellus*), wild turkey (*Meleagris gallopavo*), gray partridge (*Perdix perdix*)) and migratory birds such as ducks, coots, snipes, geese, sandhill crane and woodcock.

Manitoba's Open Trapping Area Zone 1, where typical furbearer species harvested include beaver (*Castor canadensis*), coyote (*Canin latrans*), fox (*Vulpes vulpes)*, marten, raccoon (*Procyon lotor*), red squirrel (*Tamiasciurus hudsonicus)*, wolf (*Canis lupus)*, and weasel, also overlaps the entire assessment area (Trapping Guide, 2024-25).

In some instances, aggregate resources have been identified by municipalities in their development plans and associated by-laws. Within the RM of Stanley, to the west of the City of Winkler, areas of medium and high potential aggregate deposits are scattered throughout. There are no areas of aggregate potential that have been identified as overlapping 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).

5.10.6 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, occur in the area.

The project area is predominantly composed of private land and used mainly for commercial agriculture as well as other residential, commercial, and recreational uses. However, 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 where 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 regional area of the project.

Proposed Altona to Winkler Natural Gas Transmission Pipeline

Rosebank
Roland
Morris
Morden
Winkler
Osterwick
Reinland
Blumenort
Altona
St. Joseph

WINNIPEG (849) ECODISTRICT
PRAIRIE ECOZONE
WINKLER (852) ECODISTRICT
EMERSON (853) ECODISTRICT
MANITOU (766) ECODISTRICT

UNITED STATES OF AMERICA

Project Infrastructure
- Final Preferred Route

Ecoregions and Ecodistricts
- Aspen Parkland
- Lake Manitoba Plain
- Ecodistrict
- Ecozone

Landbase
- Community
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 4 8 Kilometres
0 2.5 5 Miles

1:185,000

Ecozones, Ecoregions, and Ecodistricts

Draft/Confidential: For Discussion Purposes Only

Map 5-1

To request accessible formats visit hydro.mb.ca/accessibility

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Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final 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
- Railway
- Provincial Trunk Highway
- Provincial Road

Rosebank
Roland
Town of Morris
City of Morden
City of Winkler
St. Joseph
Town of Altona
Osterwick
Reinland
Blumenort
UNITED STATES OF AMERICA

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 4 8 Kilometres
0 2.5 5 Miles

1:185,000

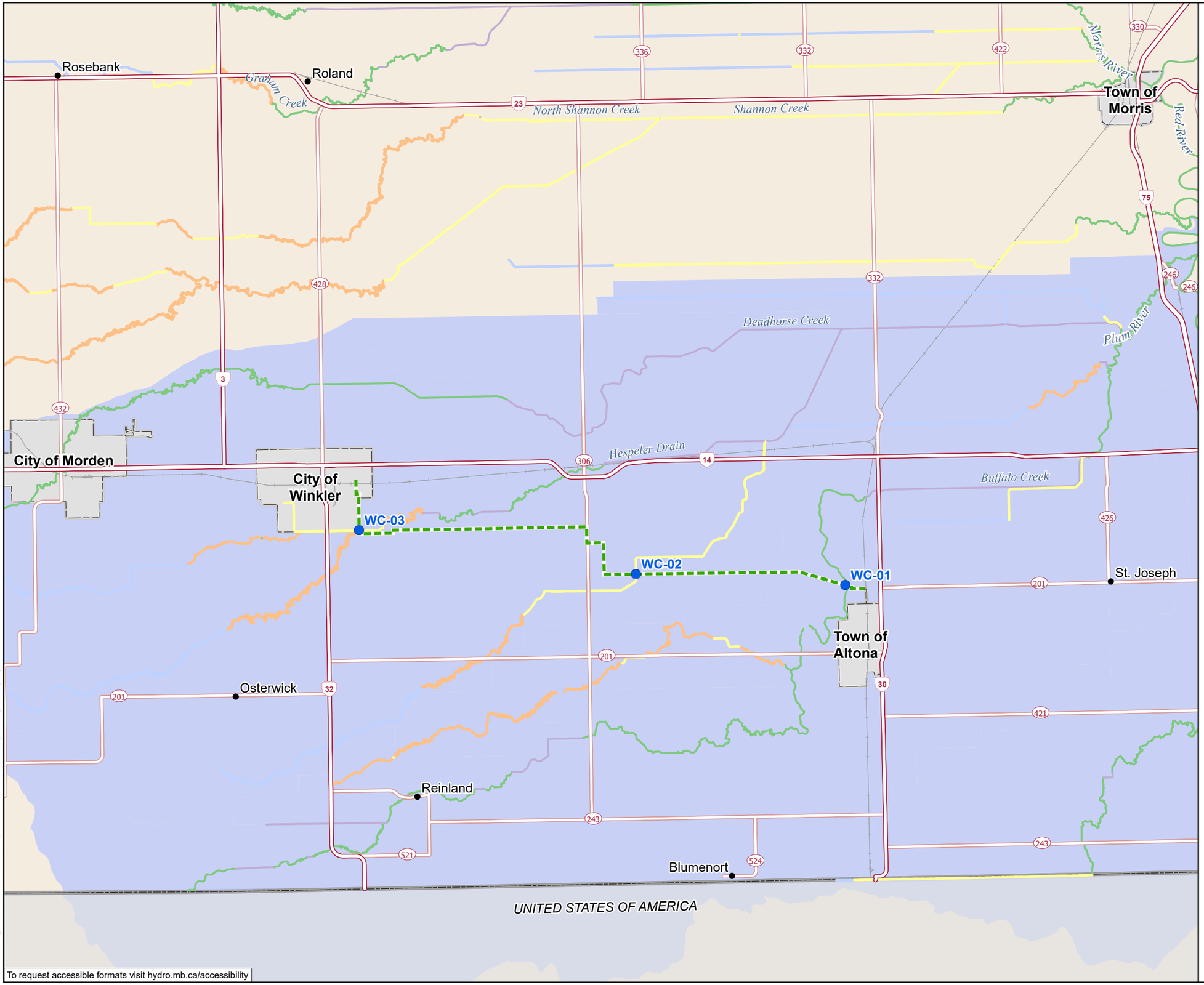
Land Cover Classification

Draft/Confidential: For Discussion Purposes Only

Map 5-2

To request accessible formats visit hydro.mb.ca/accessibility

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Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Water Crossings
- Water Crossing

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

Watersheds
- Rivière aux Marais/Plum River

Landbase
- Community
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 4 8 Kilometres
0 2.5 5 Miles

1:185,000

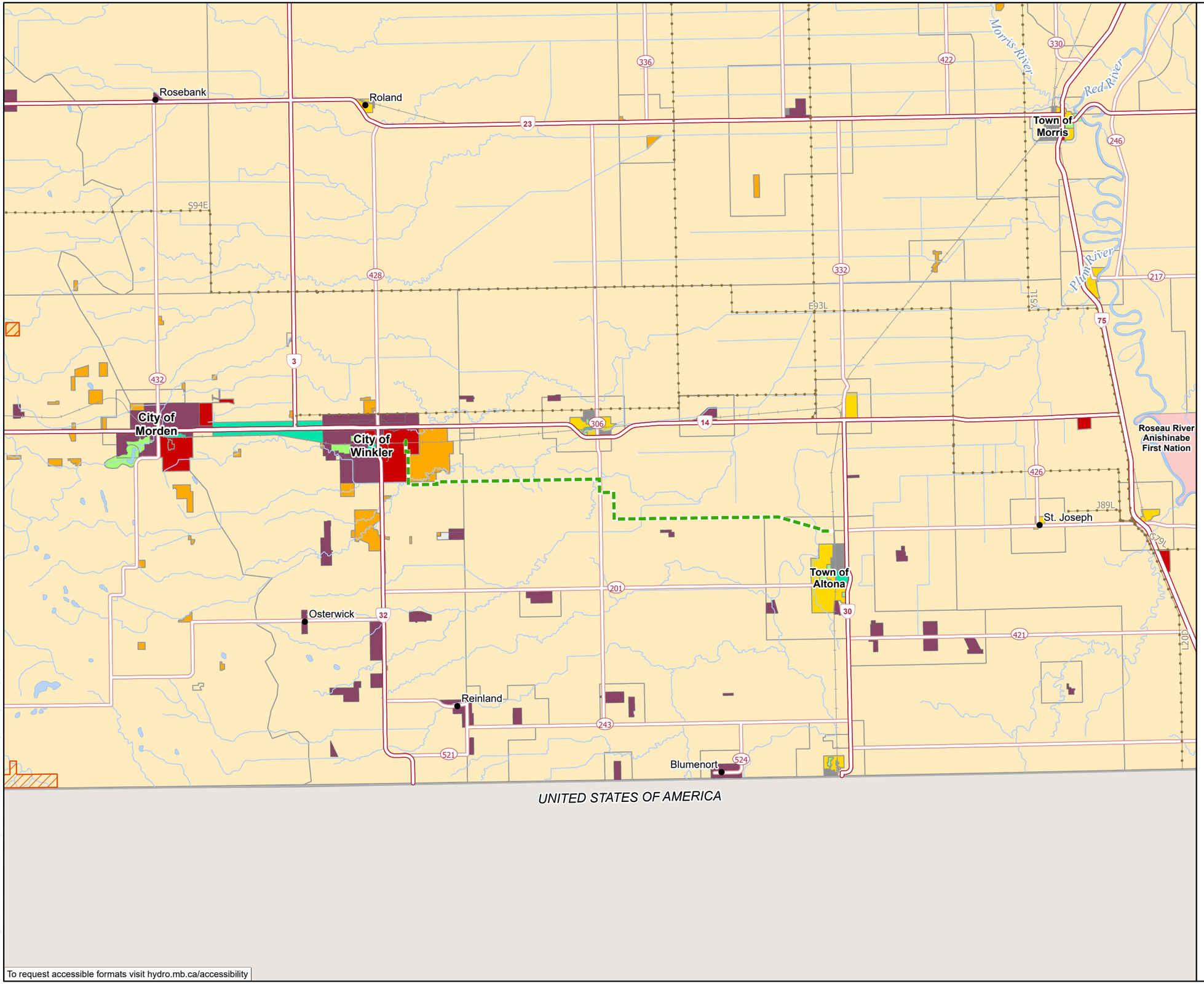
Waterways and Watersheds

Draft/Confidential: For Discussion Purposes Only

Map 5-3

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\gpdata\Tier1\GIS\Orientle\PRJ_CAS\2025 AltonaWinkler\EAMaps\EAMaps.aprx



Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final 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
- Institutional
- Mixed Use
- Parks, Recreation, and Open Space
- Residential
- Reserve Lands
- Rural/Agricultural
- Rural Residential
- Settlement Centre
- Wildlife Management Area
- Other

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

Landbase
- Community
- Provincial Trunk Highway
- Provincial Road
- Railway
- First Nation Reserve

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the 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: January 13, 2026

N

0 4.5 9 Kilometres
0 2.5 5 Miles

1:220,000

Designated Lands and Land Use Zoning

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Map 5-4

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\pwcdata\Tlea1\GIS\Orientis\PRJ_GAS\2025 AltonaWinkler\EAMaps\EAMaps.aprx

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 project 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 endeavours 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 the United Nations Educational, Scientific and Cultural Organization (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 artefacts. 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 Summary of conclusions

The proposed Altona to Winkler gas transmission project is anticipated to have adverse residual effects to both important sites (including the disturbance of heritage resources and/or the disturbance of cultural sites or features) and cultural experiences. Heritage resources are non-renewable, and disturbing or destroying them may result in irreversible loss of both the resource and its information and cultural context. Cultural experiences are also susceptible to disruption, particularly through changes to the sense of place, aesthetics, noise, and access restrictions.

Residual effects on heritage resources and cultural experiences are expected to be of moderate magnitude during construction and decommissioning, and low during operations. Effects on cultural experiences have the potential to be continuous throughout the life of the project, with potential intermittent localized access restrictions during maintenance work.

With mitigation and environmental protection measures, project and cumulative effects on important sites are predicted to be not significant because the project is not anticipated to result in the destruction of a heritage resource or a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated.

However, it is important to acknowledge that engaged audiences may experience effects to important sites in unique and differing ways. Therefore, effects may be felt to varying magnitudes depending on the individual, and some individuals may deem effects as substantive.

6.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 6.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on important sites.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Neepawa gas transmission project, the Dominion City to Altona gas transmission pipeline, and electrical transmission projects (*e.g.,* the Silver to Rosser tap transmission project, the Pointe du Bois to Whiteshell transmission line, Dorsey to

Wash'ake Mayzoon transmission project, and Manitoba-Minnesota Transmission Project (MMTP)). The assessment considers the following:

- 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
- Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites

6.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

6.2.2 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.

6.2.2.1 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 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
- Palaeontological sites
- Designated provincial sites
- Designated municipal sites
- Commemorative plaques
- Cemeteries, including abandoned historical cemeteries and other burial sites

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.

6.2.2.2 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 2024).

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*. 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.

6.2.2.3 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).

6.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for engaged audiences to provide feedback about the project. Feedback related to important sites included the following:

- During a heritage-specific site visit of the proposed project, Long Plain First Nation representatives shared with the project archeologist the importance of potential heritage resources near waterways, as waterways were, and continue to be, important areas for travel, cultural purposes, and heritage. Long Plain First Nation representatives shared that they would like to be made aware of construction at water crossings ahead of time, so that they can potentially have monitors present during those activities.
    - During the site visit, Manitoba Hydro thanked the participant for sharing and expressed that we will keep the Nation informed regarding future heritage opportunities on the project. Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.
- The Manitoba Métis Federation shared interest in further understanding any potential impacts the project may have on the rights, claims and interests of Red River Métis citizens, as well as assessing potential interactions with practicing rights-based activities through a technical review.
    - As of January 2026, Manitoba Hydro and the Manitoba Métis Federation have signed an agreement to support the Manitoba Métis Federation's technical review of the Altona to Winkler gas transmission project and the Dominion City to Altona gas transmission project.
- During a meeting with Peguis First Nation, representatives requested to be involved in the heritage work early in the project planning phases. They requested to participate in heritage monitoring fieldwork, taking notes, and supporting both the development of the Heritage Resource Impact Assessment and report writing process for this project. Peguis First Nation representatives also shared interest in creating a project-specific heritage committee with engaged Nations and using the Altona to Winkler gas transmission project as a pilot for future projects.
    - Manitoba Hydro will continue discussions on project-specific heritage opportunities with Peguis First Nation. Peguis First Nation participated in the heritage-specific site visit on September 11, 2025, where engaged First Nations and the Manitoba Métis Federation were invited to accompany the project archeologist to view anticipated areas of interest, discuss concerns, and share information on heritage methodologies.
- During a meeting with Peguis First Nation, a representative requested the LiDAR data from the project area, noting its importance in identifying historical waterways and water systems that may have existed prior to agricultural developments.
    - A Manitoba Hydro shared that the LiDAR data used by Manitoba Hydro for this project is provincial data, which is publicly available.

- During a site visit of the proposed project, Peguis First Nation representatives shared the following information:
  - Importance of recognizing that some waterways may be seasonal or may have been seasonal in the past and therefore may still hold heritage significance
  - Past agricultural and drainage activities in the project area may have altered subsurface conditions, potentially bringing intact heritage deposits closer to the surface
  - It is important to have representatives from Peguis First Nation monitor whenever there are ground disturbances throughout the project lifecycle
  - Place names, such as Buffalo Creek, may signal a high likelihood of heritage resources
  - Ground disturbance in the area from agricultural activities, such as plowing, could potentially bring intact subsurface deposits closer to the surface
  - Low lying areas would be important areas for archeological resources as there have been numerous modifications and ground disturbances in the project area over the last 150 years due to drainage activities.
- During a site visit of the proposed project, a Peguis First Nation representative requested that a ceremony take place prior to heritage work commencing or before any ground disturbances occur.
  - Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be guided by each nation's cultural practices, protocols, and preferences.
- During a meeting with Peguis First Nation, representatives shared interest in conducting a land-use study for the proposed project.
  - Manitoba Hydro shared that Manitoba Hydro would require a proposal for the study as a first step.
- During a site visit of the proposed project, a Peguis First Nation representative shared that they recently distributed a document to archaeological consulting companies that outlines Peguis First Nation's Standards for Cultural Heritage Work in their Traditional Territory.
- During a meeting with Swan Lake First Nation, representatives shared interest in having monitors from Swan Lake First Nation attend heritage monitoring and fieldwork for the project.
  - Manitoba Hydro will continue discussions on project specific heritage opportunities with Swan Lake First Nation.
- During a site visit of the proposed project, there were discussions with Peguis First Nation, Long Plain First Nation, and the project archeologist about excavations and ground disturbances. It was shared that views on this topic may vary, where

generally some may prefer not to disturb potential sites unless necessary, whereas others may view excavations as a means of preserving and documenting cultural heritage.

More information on engagement feedback and how feedback has influenced project decisions can be found in Chapter 4.0.

6.2.4 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. The PDA is described in detail in Chapter 2.0 (Project description). The total area of the PDA is 95 ha.
- **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).

6.2.5 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 – estimated to take approximately 12 months, beginning in the summer of 2027
- Operation and 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.

6.2.6 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 as the result of project 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 10.0 (Human health risk) Qualitative assessment of changes to access

6.2.7 Residual effects characterization

Table 6-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on important sites.

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

Characterization	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. **Neutral –** no net change in measurable parameters for important sites relative to baseline.
Magnitude - the amount of change in measurable parameters of 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 there is no anticipated loss to heritage resources and/or disruption to the ability or preference to visit important sites nor is the ability to undertake cultural activities expected to be diminished. **Moderate** – limited damage to heritage resources and/or cultural sites is predicted. Any encounters with unknown 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. A measurable or perceived change is predicted in which there will be short-term implications to the ability to undertake cultural activities **High** – an objectively clear change is predicted, resulting in long-term implications including the loss/damage of heritage resources, and the

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

Characterization	Quantitative measure or definition of qualitative categories
	knowledge they provide and/or long-term diminishment in the ability to undertake cultural activities.
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 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

6.2.8 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 among cultural groups and between individuals in cultural groups. Affected First Nations peoples and Red River Métis citizens may perceive the significance of these effects differently, reflecting their distinct identities, relationships to the land, connections to specific places, and visions for future use of the area. Recognizing these distinct perspectives, 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 on 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.

6.3 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 current land use primarily consists of agricultural fields.

The existing conditions described in this section focus on:

- The natural environment
- Cultural history
- Registered heritage sites
- Areas of elevated heritage concern (AOCs)
- Cultural sites and features

6.3.1 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. For more detailed information on the natural environment, refer to Appendix B.

6.3.2 Cultural history

A cultural chronology is presented in Appendix B and is divided into the Indigenous Period (8,000 – 300 years ago) and Indigenous-European Period (300 – 100 years ago). Additional context on the historic and cultural setting of the area is also provided in Chapter 5.0.

6.3.3 Registered heritage sites

The provincial site registry listed 19 registered archaeological sites within the RAA. These sites are listed in Table 6-3. These sites include ancient Indigenous campsites, isolated finds, and uninterpreted occurrences.

Table 6-3: Provincially registered archeological sites located with the RAA

Site	Site Type	Period	Description	Within LAA or RAA
DgLj-001	A. Campsite	Woodland	Plains triangular projectile point, scattered around a small low point in field	RAA
DgLj-002	A. Campsite	Middle Precontact	Laurel, Blackduck, ceramics, Oxbow, Pelican Lake, Besant, Prairie side-notched projectile points	RAA
DgLj-003	A. Campsite	Late Middle	Projectile points, ceramics	RAA

Table 6-3: Provincially registered archeological sites located with the RAA

Site	Site Type	Period	Description	Within LAA or RAA
DgLj-004	A. Campsite	Middle Precontact	Projectile points, ceramics	RAA
DgLj-005	A. Settlement	N/A	Site was not inspected	LAA
DgLi-006	H.Uninterpreted	5,000 – 1,850 yra	Altona Mound Site: Oxbow, Hanna, Pelican Lake, projectile points	RAA
DgLj-009Y	H.Uninterpreted	Undetermined	Finds near Buffalo Creek in field	RAA
DgLi-010Y	H.Uninterpreted	Undetermined	Finds near Buffalo Creek in field	RAA
DgLj-011Y	H.Uninterpreted	Undetermined	Finds near Buffalo Creek in field	RAA
DgLj-012Y	H.Uninterpreted	Undetermined	Poorly recorded site near Buffalo Creek	LAA
DgLj-013Y	H.Uninterpreted	Undetermined	Poorly recorded site in cultivated field	RAA
DgLj-014Y	H.Uninterpreted	Undetermined	Poorly recorded site near Buffalo Creek	LAA
DgLj-015Y	H.Uninterpreted	Undetermined	Poorly recorded site near Buffalo Creek	LAA
DgLj-016Y	H.Uninterpreted	Undetermined	Exact location unknown	RAA

Table 6-3: Provincially registered archeological sites located with the RAA

Site	Site Type	Period	Description	Within LAA or RAA
DgLl-006	A. Campsite	Middle Precontact; Woodland	Oxbow projectile point	LAA
DgLl-007	A. Campsite	Middle Precontact	Oxbow, Hanna projectile points	RAA
DhLl-002	A. Campsite	Middle Precontact; Woodland	Pelican Lake, Oxbow, Hanna, Avonlea, obsidian scaper	RAA
DhLl-006	I. Isolated Find	Undetermined	Sample of black metabasalt	RAA
DhLl-008	I. Isolated Find	Undetermined	Single swan river chert flake in cultivated field	RAA

The majority of the archaeological sites in the RAA are small, poorly understood, isolated finds within disturbed contexts. Larger sites have been recorded in the study area and are plotted along major drainages, specifically Buffalo Creek. Five archaeological sites are located within the LAA as indicated in Table 6-3.

A review of provincial and municipal designated sites and commemorative plaques indicated a total of:

- Three municipal sites located within the RAA, all of which are located within the Town of Altona (see Table 6-4)
- 16 commemorative plaques located in the RAA, none of which are within the LAA (see Table 6-5)

Table 6-4: Designated provincial and municipal sites located within the RAA

Name	**Site type**
Bergthaler Church Waisenamt	Municipal
Klippenstein House	Municipal
Schwartz House	Municipal

Table 6-5: Plaques

Plaque name	**Location**
Greenfarm School	S 13-3-4 W
Kleinstadt School	SW 14-2-1 W
Mennonite Heritage Centre	NE 21-2-4 W
Mennonite Settlement West Reserve	SW 8-2-1 W
Reinfeld Cemetery	NE 35-2-4 W
Rosenbach Mennonite Burial Society Cemetery	NE 9-3-4 W
Schoendorf Cemetery	NW 2-3-4 W
Winkler Aquatic Centre	City of Winkler
Winkler Bergthaler Mennonite Church	City of Winkler
Winkler Mennonite Brethren Church	City of Winkler
Winkler Park	City of Winkler
Centennial Park	NW 2-3-3 W
Schantz, Jacob Y.	SE 21-2-4 W
Prairie Green - Hoffnungsfeld	City of Winkler

Table 6-5: Plaques

Plaque name	Location
Hoffnungsfeld Mennonite Settlers	City of Winkler
Jewish Settlers of Winkler, Pioneer	S 13-3-4 W

There are also eight centennial farms registered in the area (Table 6-6). Two centennial farms are located within the LAA and are still active farm operations. They are not located within the PDA.

Table 6-6: Centennial farms

Region	Legal description	Year established
Municipality of Rhineland	SW 12-2-2-W	1892
Municipality of Rhineland	SE 32-2-1 W	1875
Municipality of Stanley	NE 16-3-4 W	1892
Municipality of Rhineland	SE 1-3-3 W	1881
Municipality of Rhineland	SE 25-2-3 W	1881
Municipality of Rhineland	NE 16-2-2 W	1897
Municipality of Rhineland	NW 13-2-3 W	1903
Municipality of Stanley	NW 22-2-4 W	1879

To summarize:

- In the RAA, there are 19 Provincially registered archeological sites, 3 Municipal sites, 16 plaques and 8 Centennial farms.
- In the LAA, there are 5 provincially designated sites, 2 centennial farms and no municipally designated sites or plaques.

6.3.4 Areas of elevated heritage concern

Based on the review of documented history, known archaeological sites, landscape analysis, and professional judgement of the project archaeologist, nine AOCs with elevated archaeological potential were identified (Table 6-7). The nine AOCs are further detailed in Appendix B.

Table 6-7: Areas of elevated heritage concern (AOC)

AOC	**Rationale**	**Legal description**
AOC 1	Buffalo Creek and near registered sites DgLj-005, DgLj-012Y, DgLj-014Y, and DgLj-015Y	SE 19-2-1 W NE 20-2-1 W
AOC 2	St. Joseph Trail	NW 23-2-2 W
AOC 3	Channel, near the confluence of two waterways	NE 26-2-3 W
AOC 4	Village of Kleefeld	NE 28-2-3 W NW 27-2-3 W NE 27-2-3 W
AOC 5	Relict channels	NW 28-2-3 W NE 28-2-3 W
AOC 6	DgLl-006, near Hespeler Drain, and Mennonite family cemeteries	NE 30-2-3 W
AOC 7	Relict channel	NE 26-2-4 W
AOC 8	Hespeler Drain (Active waterway)	SW 35-2-4 W NW 26-2-4 W
AOC 9	Relict channel	SW 2-3-4 W

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

6.3.5 Cultural sites and features

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 requiring permission.

The PDA traverses approximately 0.9 ha of Crown land, which is comprised entirely of water crossings and amounts to 1% of the PDA (Table 5-5). 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 2025).

Although there are currently no TLE selections in the RAA, Long Plain First Nation, Peguis First Nation, Roseau River Anishinabe First Nation, and Swan Lake First Nation, who are being engaged about the project, have TLE settlement agreements that are not yet entirely fulfilled. These Nations' TLE agreements include an amount of provincial Crown land to be selected and/or an amount of land to be acquired from private landowners who are willing to sell (Indigenous Services Canada, 2025).

Manitoba Hydro recognises that a lack of specific information regarding important sites for this proposed project does not represent a lack of cultural use or importance of the area. Through initial engagement, general knowledge of history, culture, and areas of interest were shared, helping shape a broader understanding of the historical, cultural, and environmental context of the project area. While some important sites may not have been identified during initial engagement, 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. Manitoba Hydro remains committed to ongoing engagement and remains open to receiving additional information throughout the lifecycle of the project. Conversations about heritage resources and important sites are continuous and foundational to both understanding and respecting the cultural and historical landscape of the project area.

6.4 Project interactions with important sites

Table 6-8 identifies, for each potential effect, the physical activities that might interact with important sites and result in the identified effect.

Table 6-8: 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, control points, and Winkler (GS-140) gate station expansion		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas (*e.g.,* marshalling yards, laydown 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	✓	✓
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	✓
Vehicle and equipment use	✓	✓

Table 6-8: 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**
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-
Valve operation checks (annually)	-	-
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
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

6.5 Assessment of project effects

As presented in Section 6.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on important sites. 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, 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
- Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 6-8, proposed mitigation measures, and the characterization of residual project effects.

The assessment draws on information shared by First Nations peoples and Red River Métis citizens during project engagement on this project and past projects.

6.5.1 Changes to important sites

6.5.1.1 Analytical assessment techniques

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.

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 Manitoba Métis Federation, and experience in the protection of these sites on past projects with the involvement of the archaeological community and Indigenous nations.

Effects on important sites are assessed using measurable parameters that capture both quantitative and qualitative indicators of change and/or disturbance. Key measurable parameters to assess changes to important sites include:

- The 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

6.5.1.2 Effects pathways

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 pathway through which important sites may be affected by the project include:

- 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.

Construction

Important 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 past overbank flooding, which can erode features and move artifacts. Depending on the distance to water features like Buffalo Creek, 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 Buffalo Creek, 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.

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, access development, right-of-way preparation (including flagging, clearing of vegetation, and topsoil stripping), horizontal directional drilling, backfilling and contouring, gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application), and clean up and reclamation.

Nine areas of elevated heritage 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 6.3.4 and in greater detail in the technical memo included in Appendix B.

During a site visit, several engaged nations raised concerns about the potential for heritage resources to be present in locations where construction is planned near active or historical water bodies. A Peguis First Nation representative also shared that when it comes to the specific construction activity of horizontal directional drilling, the depth of this activity makes it difficult to determine what the drill bit may be intersecting underground. A Peguis First Nation representative raised concerns about potentially disturbing heritage resources that are deeper in the ground and may not be visible during construction.

Although potential of encountering heritage resources in proximity to an active or historical waterbody is typically elevated, horizontal directional drilling is completed at a depth where it would limit interaction with soil horizons that may contain heritage resources. Entry and exit points of horizontal drilling have higher potential of encountering heritage resources. If these points fall near an active or historical waterbody, these locations will be mitigated by conducting a heritage resource impact assessment (HRIA) prior to construction start.

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,

vehicle and equipment use, and vegetation management. Maintenance activities such as in-line inspections and integrity digs, which involve excavation, would introduce the greatest potential for disturbing important sites.

New information shared 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 similar pathways as the construction phase. These decommissioning activities include vehicle and equipment use, removal of above-ground components (including dismantling, removal from site, and disposal), and rehabilitation.

Effects would primarily be limited to previously disturbed 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.

6.5.1.3 Mitigation for changes to important sites

The primary methods for protecting archaeological sites are encountering of sites and mitigation. The purpose of undertaking a Heritage Resources Impact Assessment is to identify and assess any heritage resources that may be negatively impacted by development. Within the AOCs, Manitoba Hydro plans to conduct pedestrian surveys by visually surveying the cultivated fields to identify surface resources and excavating shovel tests to locate below surface resources. If archaeological sites are encountered prior to any potential effects from the development, there is the ability to implement mitigation measures such as collection and preservation of resource or avoidance, depending on the resource, which would remove the effect or capture the information contained within the archaeological site before it is damaged or destroyed.

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.

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

- A pre-construction survey of areas with heritage potential will be conducted. A total of nine AOCs have been identified, including a major historic trail, relict channels, and areas in proximity to known 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
  - examining input from the HRB
  - examining input from engaged nations that participated in the September 11, 2025, site visit
  - 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, encounter 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 encountered, project work will cease around the area 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 identifying sensitive sites, including important sites, to help inform the environmental protection program for the project.
- Identified cultural and heritage sites will be incorporated into environmental protection plans prior to construction.
- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.1.4 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 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.

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

6.5.2 Changes to cultural experience

6.5.2.1 Analytical assessment techniques

Changes in cultural experience are assessed through:

- 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 10.0 (Human health risk)
- Qualitative assessment of changes to access resulting from the project

6.5.2.2 Effects pathways

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 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 as the result of project activities
- Project activities that restrict access to important sites resulting in loss of opportunities for cultural experiences, practices, and knowledge transfer

Construction

During construction, the primary project activities that may result in changes to cultural experience by affecting the sense of place include the mobilization and staff presence, vehicle and equipment use, access development, temporary work areas, right-of-way preparation, pipe stringing, pipe installation, horizontal directional drilling, backfilling and contouring, control points, 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 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 (0.9 ha, or 1% of the PDA), all of it being drains, Manitoba Hydro understands based on engagement feedback shared for 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 has previously shared for other recent projects, including the proposed Dominion City to Altona gas transmission line, 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 Red River 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 various cultural practices (*i.e.,* intangible cultural heritage).

Operations

During operations, project activities that may result in changes to cultural experience include the presence of the pipeline and control points, vehicle and equipment use, maintenance activities, 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 2.0 (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 to vehicle and equipment use, the removal of above-ground components (dismantling, removal from site, and disposal), rehabilitation, and clean up and demobilization. The pathways to the effects are similar to those during the construction phase.

6.5.2.3 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. Several

First Nations have also shared perspectives about the importance of incorporating ceremony into projects to proceed in a good way and show respect for the spirits, ancestors, and all beings (including people) that may be affected by a project. 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)
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be guided by each nation's cultural practices, protocols, and preferences.
- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.2.4 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 landowner 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 and 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

Summary of residual effects

Table 6-9 characterizes the residual effects on important sites.

Table 6-9: 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		L			C	
Decommissioning		M			IR	
Changes in cultural experience						
Construction	A	M	LAA	LT	C	I
Operation		L				
Decommissioning		M				

6.5.3 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
- 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 5.0 (Environmental setting).

6.5.3.1 Project residual effects likely to interact cumulatively

Table 6-10 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 6-10: Potential cumulative effects on important sites

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	✓	✓
Potential future projects and activities		
Dominion City to Altona gas transmission pipeline	✓	✓
RM of Stanley Regional Wastewater Collection System	✓	✓
Residential and commercial/industrial subdivisions (east of the City of Winkler and within the Town of Altona)	✓	✓

✓ = 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.

6.5.3.2 Cumulative effects on important sites

Most of the past and ongoing projects and activities in the RAA have contributed to changes to important sites in the RAA. The project has the potential to interact cumulatively on important sites with the past and ongoing projects as well as the potential future projects shown in Table 6-10.

Pathways for cumulative effect

Ongoing/existing and future 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 requiring ground disturbance, clearing of forested areas, or the creation of noise and/or access disruptions. Ground disturbances have the potential to damage or destroy important sites.

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.

Beyond the physical disturbances that these potential future developments may cause, they may also alter changes to cultural experiences, including altering sense of place, aesthetics, and/or causing stress, resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices. 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.

The effects of the proposed Altona to Winkler gas transmission project along with potential future developments in the RAA have the potential to compound impacts to important sites, leading to both tangible damage or loss of important sites and negative impacts on cultural experiences.

Mitigation measures

The mitigation measures identified in the section 12.5.2.3 will also apply to the cumulative effects of traffic and transportation infrastructure.

Project mitigation measures identified in Sections 6.5.1.3 and 6.5.2.3 will also help mitigate cumulative 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, and those proposing future projects and activities, 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.

6.5.3.3 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, and feedback heard during project engagement. The 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/existing and future 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 decommissioned). 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.

6.5.4 Determination of significance

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

Manitoba Hydro acknowledges that engaged audiences may experience effects to important sites in unique ways. Therefore, effects may be felt to varying magnitudes depending on the individual, and some individuals may deem effects as substantive. With this variation in mind, the project is not anticipated to result in the destruction of

a heritage resource or a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated based on qualitative assessments of indicators of the potential effects, literature review, engagement feedback, and professional judgment.

6.5.5 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 peoples and Red River Métis citizens, a review of publicly available literature on important sites in the project area, and experience with applying and monitoring mitigation measures on past Manitoba Hydro projects.

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 peoples and Red River Métis citizens may differ from the findings of this assessment.

6.5.6 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a VC 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 16.0).

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).

To provide opportunity for Indigenous monitoring during construction, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.7 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 associated with climate change is forest fires. Hotter and drier spring and summer weather will contribute to this. Subsurface heritage resources are less affected by fires. However, since charcoal from fires can diffuse into the soil, fires may contaminate soil and make dating of subsurface heritage resources difficult. Droughts could also 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.

Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure

- Final Preferred Route

Assessment Area

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

Landbase

- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- City/Town

Shannon Creek
Deadhorse Creek
Hespeler Drain
Buffalo Creek
Winkler
Altona
Osterwick
Reinland
428
332
14
306
32
201
30
421
243
521
524

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 2.5 5 Kilometres
0 1.5 3 Miles

1:115,000

Spatial Boundaries for Important Sites

Draft/Confidential: For Discussion Purposes Only

Map 6-1

Managed by: Sarah Wach, GDS

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\pwpdata\Tier1\GIS\Projects\PR-1_CA\2025_AltonaWinkler\EAMaps\EAMaps.aprx

7.0 Vegetation

In this environmental assessment, vegetation 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 concerns about weed management in the project area.

7.1 Summary of conclusions

The Altona to Winkler gas transmission project is anticipated to have adverse residual project effects on vegetation including the following:

- Potential loss of plant SOCC due to right-of-way preparation, topsoil stripping, and salvage during construction
- Potential loss of plant SOCC from vegetation management or other maintenance activities during operations
- No anticipated change to the abundance and distribution of invasive and non-native species
- Directly alter less than 3 ha of forest
- No direct alteration of wetlands

The residual project effects on vegetation are anticipated to be the most pronounced during the construction phase when project activities involving ground disturbance and vegetation clearing or disturbance will most occur.

Adverse residual project and cumulative effects to vegetation are anticipated to be not significant because the project is not anticipated to threaten the long-term persistence or viability of native vegetation communities or SOCC in the RAA.

7.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 7.1), including the scope/methods, baseline conditions, effects

pathways, mitigation measures, and the analysis and characterization of residual project effects on vegetation.

This assessment has been influenced by engagement feedback, information provided from a field reconnaissance surveys, and Manitoba Hydro's experience with other transmission projects (both gas and hydroelectric) in southern Manitoba (*e.g.,* Dominion City to Altona gas transmission pipeline, Neepawa gas transmission project, Northwest Gas transmission project, Silver to Rosser tap transmission project, Pointe du Bois to Whiteshell transmission project, Dorsey to Wash'ake Mayzoon transmission project, St. Vital transmission complex and Manitoba-Minnesota transmission project).

7.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

7.2.2 Regulatory and policy setting

Effects to vegetation are provincially and federally regulated. The following laws, and associated regulations, policies, and guidelines were considered for assessing project effects to vegetation.

7.2.2.1 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. SARA prohibits the following:

- 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. 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)

7.2.2.2 Provincial guidance

The Endangered Species and Ecosystems Act

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 2023). In addition to designating the status of a species at the provincial level, the purposes of *The Endangered Species and Ecosystems Act* (MBESEA) 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 the MBESEA.

At risk ecosystems can also be designated as threatened or endangered, and protected, under the MBESEA. Two ecosystems are currently designated as endangered: alvars and native tall 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 (MBCDC) 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). MBCDC 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 2025)

The Noxious Weed Act

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) (Province of Manitoba 2025).

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

7.2.2.3 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 the use of herbicides for vegetation management.

7.2.3 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 on vegetation from project engagement related to invasive plants and biosecurity. Commercial agricultural producers, including livestock producers expressed concerns about managing weeds during construction and operation.

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, development through wetlands, loss or disturbance of plants, and the spread of invasive plants.

7.2.4 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 PDA 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 6,446 ha.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 15 km buffer around the PDA (Map 7-1). 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 155,385 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 other recent gas and hydroelectric transmission projects in Manitoba.

Map 7-1 illustrates the spatial boundaries for the assessment of project effects on vegetation.

7.2.5 Temporal boundaries

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

- Construction – estimated to take approximately 12 months, beginning in the summer of 2027
- Operation and 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

7.2.6 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 SOCC abundance and distribution.	Vegetation clearing and ground disturbance resulting in direct loss of plant species of conservation concern. Ground disturbance resulting in indirect loss of species of conservation concern from the establishment of invasive and non-native plants.	Number, abundance, and spatial distribution of plant SOCC. Qualitative assessment of potential for invasive and non-native plants to alter the abundance and distribution of SOCC.
Change in invasive and non-native species abundance and distribution.	Introduction and spread of invasive and non-native plant species from ground disturbance and project materials and equipment	Number, abundance, and spatial distribution of invasive and non-native plants.

7.2.7 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 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 of conservation concern 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 in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of species

Table 7-2: Characterization of residual effects on vegetation

Characterization	Description	Quantitative measure or definition of qualitative categories
		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
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

7.2.8 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 SOCC in the RAA.

7.3 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 in July 2025 (Appendix C).

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

7.3.1 Ecological land classification

The proposed project is located in the Prairies Ecozone, Lake Manitoba Plain and Aspen Parkland Ecoregion and Emerson, Manitou, Winkler and Winnipeg Ecodistricts. Descriptions of the ecozone, ecoregion, and ecodistricts can be found in Chapter 5.0. Map 7-1 and Table 7-3 illustrate how the PDA, LAA and RAA intersect the Canada land classification ecodistricts. The PDA is 100% located in the Prairies Ecozone, Lake Manitoba Plain Ecoregion, and Winkler Ecodistrict.

Table 7-3: Ecodistrict area (ha) and percent (%) coverage in the PDA, LAA and RAA

Ecodistrict	RAA		LAA		PDA	
	ha	%	ha	%	ha	%
Emerson	13,145	8	-	-	-	-
Winkler	125,241	81	6,446	100	95	100
Winnipeg	12,488	8	-	-	-	-
Manitou	4331	3	-	-	-	-
Null[1]	155	1	-	-	-	-
Total	155,385	100	6,446	100	95	100

[1]Null category refers to data that is not available for the small portion of the RAA that extends into United States.

7.3.2 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, mixed wood forest, and marsh wetland. The water class includes rivers and streams. Agriculture includes forage crops and fields. Cultural features, roads and rail lines are also identified.

The distribution of land cover class types is illustrated in Map 7-2 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	2001	1	25	1	2	2
Agricultural Field	131,643	85	5,402	84	82	86
Cultural Features	2,326	2	34	0.5	-	-
Deciduous Forest	2,788	2	114	2	3	3
Open Deciduous Forest	7	0	-	-	-	-
Range and Grassland	9,246	6	551	9	5	5
Roads, Trails and Rail Lines	5,724	4	252	4	4	4
Sand and Gravel	9	-	-	-	-	-
Water Body	683	-	66	1	1	1
Wetland Marsh	149	-	-	-	-	-
Null[1]	141	-	-	-	-	-
Total	155,385	100	6,446	100	95	100

[1]Null category refers to data that is not available for the 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 88% of the PDA, 85% of the LAA, and 86% of the RAA. Less than two percent of the RAA and LAA consists of forested land, with only 3% 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 Buffalo Creek, the Rosenheim Drain, and the Hespeler Drain. Wetlands and waterbodies make up 1% of

the LAA and the PDA. The waterbody class in the PDA includes Buffalo Cree, the Rosenheim Drain, and the Hespeler Drain.

7.3.3 Botanical resources

A vegetation survey was conducted in June and July 2025, to qualitatively document the vegetation near watercourses and several road crossings in the PDA and LAA. Cultivated land supporting field crops of corn and cereal grains typically occurred adjacent to the roadside drains.

7.3.3.1 Roadside vegetation

The roadside vegetation in the project area is dominated by grasses with a mixture of forb species. Prickly rose (*Rosa acicularis*) and western snowberry (*Symphoricarpos occidentalis*) are common, with the addition of a variety of herbaceous plants including native and non-native species.

7.3.3.2 Drain and riparian vegetation

Buffalo Creek supports a mixture of graminoids along the water's edge, with tall shrubs and trees in the riparian area. Common cat-tail (*Typha latifolia*) and reed canarygrass (*Phalaris arundinaceae*) are abundant along a portion of the Hespeler Drain.

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.

7.3.3.3 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. Common shelterbelt tree species in the area include green ash, Manitoba maple, cottonwood, white spruce and hybrid poplar (*Populus spp*.).

7.3.4 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 SOCC include all provincially (MBESEA) and federally (SARA) listed species, as well as species ranked as Critically Imperiled to Vulnerable, by the (MBCDC) (*i.e.,* those ranked S1 through S3). Species of conservation concern ranked S1, S2, or S3 (or any combination) by the MBCDC 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 MBESEA, 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**	**MBESEA**	**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

Table 7-5 - Plant species listed at risk in the Lake Manitoba Plain Ecoregion

Scientific name	Common name	MBESEA	SARA	COSEWIC
Vernonia fasciculata	Fascicled Ironweed	Endangered	Endangered	Endangered
Veronicastrum virginicum	Culver's-root	Threatened	-	-

Based on MBCDC records, only one SOCC, American Pellitory (*Parietaria pensylvanica),* was known to occur within the LAA and RAA. The plant is ranked as S3S4 (uncommon, apparently secure) and is not designated under MBESEA, SARA or COSEWIC.

Three species of conservation concern ranked Vulnerable by the MBCDC were recorded during the survey and included narrow-leaved cat-tail (S3S4), common milkweed (S3S4) and cottonwood (S3S5). No plant species at risk listed with either *The Endangered Species and Ecosystems Act* (MBESEA), *Species at Risk Act* (SARA) or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were encountered during the survey.

7.3.5 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 and invasive species were abundant and widespread in the study area. 43 non-native species were recorded during surveys in June and July 2025 (Appendix C). Of the plants detected, 17 species were considered invasive plants with the Canadian Food Inspection Agency (2008), while nine species were listed with the Invasive Species Council of Manitoba (2025). These classifications are due to their tendency to outcompete native species and dominate habitats once introduced. These include common tansy (*Tanacetum vulgare)*; leafy spurge (*Euphorbia virgata)*; nodding thistle (*Cardus nutans)*.

7.4 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, control points, and Winkler (GS-140) gate station expansion		
Mobilization and staff presence	-	-
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas (*e.g.,* marshalling yards, laydown 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	-	-
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	-
Vehicle and equipment use	✓	✓
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	✓
Valve operation checks (annually)	-	✓
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
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

7.5 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 temporary work 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 7-6), 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, presence of the pipeline, ground pipeline patrols, valve operation checks, 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 (Table 2-1). Equipment (work area) for drilling under shelterbelts, drains and road allowances will be set up on agricultural land in the 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 control points as well as the future abandonment of the pipeline and any control point or gate station dismantling will not affect vegetation as these activities will 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.

This section presents the assessment of project effects on vegetation for the two potential effects identified above, including analytical assessment techniques, effects pathways the interactions identified in Table 7-6, proposed mitigation measures, and the characterization of residual project effects.

7.5.1 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.

7.5.1.1 Pathway of effects

The effect pathways through which the project has the potential to change SOCC abundance includes:

- Vegetation clearing and ground disturbance resulting in direct loss of plant species of conservation concern.
- Ground disturbance resulting in indirect loss of species of conservation concern from the establishment of invasive and non-native plants.

Construction

During construction, plant species diversity can be affected through vehicle and equipment use, right-of way and control point preparation on non-agricultural lands (*i.e.,* along road allowances), topsoil stripping and salvage (along road allowances), temporary work area and access development (if required), and control point development and gate station expansion.

Right-of way preparation and control point 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 work areas 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 SOCC were observed in the PDA during the field surveys conducted in June and July 2025. Species recorded included common milkweed (*Asclepia syriaca*), narrow-leaved cat-tail (*Typha angustifolia*), and cottonwood. These species were observed along roadsides, drains, and as treed vegetation. Common milkweed is known to occur in disturbed areas along field edges. Narrow-leaved cat-tail occurs in drains and roadside ditches. Cottonwood trees primarily occur as in shelterbelts traversed by the PDA.

No protected species, listed under MBESEA, SARA or COSEWIC were encountered during the field reconnaissance survey, however one species, American pellitory was known to occur within the RAA (Manitoba Conservation Data Centre 2025).

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 control point 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 SOCC with effects extending up to 1 km from the area of disturbance (Manitoba Hydro 2023).

Operations, maintenance, and decommissioning

Right-of-way maintenance has the potential to impact SOCC through using vehicles and 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.

7.5.1.2 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 buffer 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.

7.5.1.3 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 surveys 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).

Table 7-2 describes the factors used to characterize the residual effects on vegetation. 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

7.5.2 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

7.5.2.1 Effects pathways

Construction

During construction, the use of materials and equipment has the potential to spread non-native and invasive plants within the PDA. ROW and control point 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 site preparation for control points and gate station 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.).

Operations, maintenance, and decommissioning

The use of vehicles and equipment for inspection, maintenance, and eventual decommissioning of the pipeline 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.

7.5.2.2 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.

7.5.2.3 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 85%) with a portion of the proposed ROW paralleling existing pipeline or road allowances. Even though invasive and non-native species were observed in the PDA during the field reconnaissance conducted in June and July 2025, 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.

7.5.3 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 species						
Construction	No residual effects anticipated					
Operation						
Decommissioning						

7.5.4 Cumulative effects on vegetation

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

- the project has adverse 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.

7.5.4.1 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	✓
Potential future projects and activities	
Dominion City to Altona gas transmission pipeline	✓
RM of Stanley Regional Wastewater Collection System	✓
Residential and commercial/industrial subdivisions (east of the City of Winkler and within the Town of Altona)	-

✓ = 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.

7.5.4.2 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.

7.5.4.3 Pathways for cumulative effect

Ongoing and future projects and activities in the RAA (Table 7-8 and Table 3-3) 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.

Within the RAA, industrial and commercial resource use, specifically commercial agriculture, has contributed notably to changes in SOCC abundance and distribution. The RAA is extensively developed for agriculture with agricultural land currently covering approximately 85% of the RAA. Existing infrastructure (Manitoba Hydro and non-Manitoba Hydro), residential and institutional developments, and recreational activities have contributed to the loss of native habitat in the RAA over time and continue to have the potential to affect remaining SOCC abundance and distribution.

The proposed future Dominion City to Altona gas transmission pipeline is anticipated to contribute to a cumulative effect to SOCC abundance and distribution. The new 36.6-kilometre, 8-inch steel natural gas transmission line will traverse land cover types that provide some natural habitats. Based on the project's Environment Act Proposal, the project footprint will be located primarily on private property that is agricultural/developed land. Therefore, the project is anticipated to have a minimal effect on loss or disruption of SOCC.

The proposed future RM of Stanley Regional Wastewater Collection System is anticipated to contribute to cumulative effect to changes in SOCC abundance and distribution. Upgrades to the regional wastewater collection system will include new lift stations and 45km of new pipelines that will traverse natural land cover types. Based on the project's Environment Act Proposal, the project footprint will be located primarily on private property that is agricultural/developed land, with horizontal directional drilling in environmentally sensitive areas, such as watercourses. Therefore, the project is anticipated to have a minimal effect or changes to SOCC abundance and distribution.

The future proposed residential and commercial/industrial subdivisions east of the City of Winkler and within the Town of Altona are not anticipated to contribute to cumulative effects to SOCC abundance and distribution as the assumption, based on feedback, is that the developments will be located within pre-disturbed/developed areas, therefore it is not anticipated that natural habitats (forest and wetland) are likely to be altered.

7.5.4.4 Mitigation measures

Project mitigation measures, including restricting access to established roads will help reduce project residual effects to SOCC. Future projects are expected to implement similar standard mitigation measures and avoid or minimize effects to vegetation as appropriate.

7.5.4.5 Residual cumulative effect

Many of the ongoing and future 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 131,643 ha or 85% of the RAA. A much smaller area of 2,788 ha (<3%) is covered by deciduous forest. Within the PDA, as per the land cover classification, only 3 ha (less than 4% of the PDA) 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.

7.5.5 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 native vegetation communities or species of conservation concern in the PDA, LAA, or RAA.

7.5.6 Prediction confidence

Prediction confidence in the assessment of effects on vegetation is moderate-high.

The land cover classification was used to determine percentages of cover classes, revealing that most of the land traversed by the proposed project PDA is used for agriculture (>85%), which was consistent with the land use documented during vegetation 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, 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 and drains 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, 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.

7.5.7 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 environmental protection plan (Chapter 16.0).

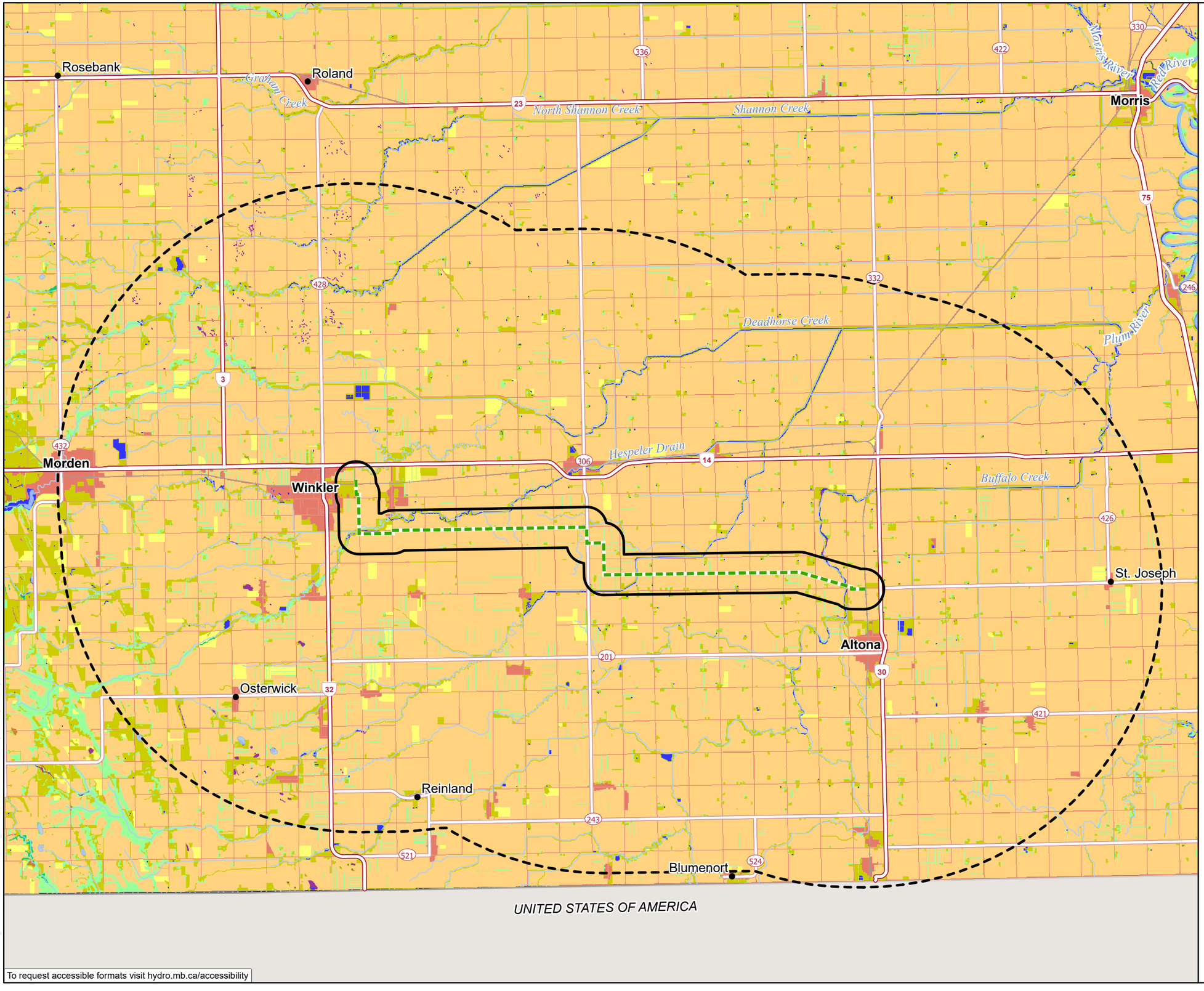
7.5.8 Sensitivity to future climate change scenarios

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).

One of the risks climate change may post on vegetation is the potential increased incidence of forest fires, which may occur as the result of hotter and drier spring and summer weather and potential changes to precipitation patterns. Changes in the occurrence of forest fires with impact native vegetation including SOCC.

As a result of climate change, there is also 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.

As part of municipal planning, 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.



Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Assessment Areas for Vegetation and Wildlife
- 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
- Marsh and Fens
- Open Deciduous Forest
- Range and Grassland
- Water

Landbase
- Community
- Railway
- Provincial Trunk Highway
- Provincial Road

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 4 8 Kilometres
0 2.5 5 Miles

1:185,000

Spatial Boundaries for Vegetation, and Wildlife and Wildlife Habitat

Draft/Confidential: For Discussion Purposes Only

Map 7-1

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\projdata\Tier1\GIS\Projects\PRJ_GAS\2025 AltonaWinkler\EAMaps\EAMaps\EAMaps.aprx

8.0 Wildlife and wildlife habitat

In this environmental assessment, wildlife includes birds, mammals, terrestrial invertebrates, amphibians, and reptiles. Wildlife are components of natural ecological cycles, provide economic benefits from viewing, hunting, guiding, and trapping, and provide a source of food and materials.

Wildlife and wildlife habitat was selected as a valued component as they provide ecological, aesthetic, recreational, economic, and cultural value to Indigenous communities, interested parties, 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 assessment areas. 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).
- Wildlife habitat is present along waterways/drains, in shelterbelts, and patches of forest within the assessment area.

8.1 Summary of conclusions

The Altona to Winkler gas transmission project is anticipated to have adverse residual project effects on wildlife and wildlife habitat. The residual project effects include the following:

- Direct alteration of less than 3 ha of forest habitat
- No direct alteration of wetlands
- Temporarily reduced effectiveness of wildlife habitat (*i.e.,* displacement of wildlife species) due to project-related sensory disturbance
- Increase to wildlife mortality risks associated with potential vehicle collisions, entrapment in trenched areas, or behavioural changes due to temporary displacement from the project development area associated with sensory disturbances (*e.g.,* noise)

The residual project effects on wildlife and wildlife habitat are anticipated to be the most pronounced during the construction phase when the majority of ground disturbance, vegetation clearing, peak traffic volumes, and other project activities that

may directly or indirectly affect wildlife habitat and/or mortality risk will occur. The magnitude of residual project effects on wildlife and wildlife habitat are anticipated to range from low (during construction and decommissioning) to negligible (during operations and maintenance).

Adverse residual project and cumulative effects to wildlife and wildlife habitat are anticipated to be not significant because the project is not anticipated to result in a threat to the long-term persistence or viability of a wildlife species in the RAA.

8.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 8.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on wildlife and wildlife habitat.

An assessment of cumulative effects on wildlife and wildlife habitat is also presented.

The assessment considers wildlife observations recorded during surveys undertaken in June and July 2025 and a desktop review of provincial and federal wildlife databases (Appendix C).

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Dominion City to Altona gas transmission pipeline, Neepawa gas transmission project and electrical transmission projects (*e.g.,* the Silver to Rosser tap 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).

8.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

8.2.2 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 wildlife and wildlife habitat.

8.2.2.1 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. SARA prohibits the following:

- 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. 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 2024)

Migratory Birds Convention Act (MBCA)

The *Migratory Birds Convention Act* (1994) and associated regulations (Migratory Birds Regulations, (2022)) provide for the protection of migratory birds, their eggs, and their nests. It applies to most native migratory bird species.

8.2.2.2 Provincial guidance

The Endangered Species and Ecosystems Act

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 (MBESEA) 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 MBESEA. Two ecosystems are currently designated as endangered: alvars and tall grass prairie (Province of Manitoba n.d.). 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 Natural Resources and Indigenous Futures 2025a). 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 2025)

8.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for Indigenous communities and concerned and interested parties to provide 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 that provide wildlife habitat.

8.2.4 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on wildlife and wildlife habitat (Map 7-1):

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project Description). The total area of the PDA is 95 ha.
- **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 6,446 ha.
- **Regional assessment area (RAA**): includes the PDA and LAA and consists of a 15 km buffer around the PDA (Map 7-1). 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 155,385 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 (Chapter 7.0). 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.

Map 7-1 illustrates the spatial boundaries for the assessment of project effects on wildlife and wildlife habitat.

8.2.5 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 – estimated to take approximately 12 months, beginning in the summer of 2027
- Operation and 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

8.2.6 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 directly altered by the project.
Change in mortality risk	Direct change in mortality risk due to project activities such as vehicle collisions or entrapment in an open trench.	Total duration and timing of construction activities Amount of wildlife habitat in the PDA (ha)

8.2.7 Residual effects characterization

Table 8-2 provides the definitions used to characterize the residual effects on wildlife and wildlife habitat.

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	**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.

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	Quantitative measure or definition of qualitative categories
	Neutral – no net change in measurable parameters for wildlife and wildlife habitat relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**Change in habitat:** **Negligible –** no measurable change in wildlife SOCC is predicted **Low –** a measurable change in SOCC 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 SOCC in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of SOCC 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 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

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	**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

8.2.8 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

8.3 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 surveys conducted for vegetation and wildlife in summer 2025 (Appendix C).

The existing conditions described in this section focus on the following:

- Overview of wildlife habitat
- Occurrence and distribution of wildlife
- Species of conservation concern

8.3.1 Overview of wildlife habitat

The proposed project is located in the Prairies Ecozone, Lake Manitoba Plain Ecoregion, and Emerson, Manitou, 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, Section 5.2.1.

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 85% of the land in the RAA is used for agriculture, (more than 84% in the LAA) with the majority consisting of cropland. Less than two percent of the RAA and LAA consists of forested land, with only 3% 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 Buffalo Creen, the Rosenheim Drain, and the Hespeler Drain. Range and grassland make up 6% of the RAA and 9% of the LAA. Wetlands and waterbodies make up less than 1% of the LAA and 1% in the PDA. The waterbody class in the PDA includes Buffalo Creek, the Rosenheim Drain, and the Hespeler Drain.

8.3.1 Occurrence and distribution of wildlife

The RAA supports a variety of bird, mammal, amphibian, reptile, and terrestrial invertebrate species, including SOCC.

8.3.1.1 Birds

Up to 100 breeding bird species potentially occur in the RAA (Bird Studies Canada, 2025). Although most of the RAA is comprised of land under agricultural use, some forested areas, deciduous tree stands and shelterbelts are interspersed within the agricultural areas. In addition, pastures, hay lands, and even no-till agricultural lands can support some 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 2025).

During the field surveys conducted in summer 2025, common bird species that were observed near the proposed project ROW included eastern kingbird (*Tyrannus tyrannus*), American robin (*Turdus migratorius)*, mourning dove (*Zenaida macroura)*, song sparrow (*Melospiza melodia)* and barn swallow (*Hirundo rustica*).

8.3.1.2 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).

During the field surveys conducted in summer 2025, coyote (*Canis latrans*) tracks, Richardson ground-squirrel (*Urocitellus richardsonii*) and white-tailed deer (*Odocoileus virginianus*) were observed. No other observations of mammals were recorded.

8.3.1.3 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, 1982; Manitoba Herp Atlas, 2021).

During the surveys conducted in summer 2025, a plains garter snake (*Thamnophis radix*) was observed adjacent to the proposed project right of way.

8.3.1.4 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).

8.3.2 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 C.

8.3.2.1 Birds

Five bird SOCC have the potential to occur in the RAA (Manitoba Conservation Data Centre, 2025). They include the following:

- Chimney swift (*Chaeture pelagica*), which is ranked as S2B (breeding population is imperiled) and designated as Threatened by MBESEA, SARA, and COSEWIC

- Bobolink (*Dolichonyx oryzivorus*), which is ranked as S3S4B (breeding population is vulnerable to apparently secure) and designated as threatened by SARA and Special Concern by COSEWIC
- Eastern wood-pewee (*Contopus virens),* which is ranked as S3B *(breeding population is vulnerable)* and designated as special concern by SARA and COSEWIC
  Red-headed woodpecker (*Melanerpes erythrocephallus),* which is ranked as S3B *(breeding population is vulnerable)*, designated as threatened by MBESEA, and endangered under SARA and COSEWIC
- Barn swallow, which can be found in the RAA, LAA and PDA and is provincially ranked as Apparently Secure (S4B) but designated as Special Concern under SARA and COSEWIC

During the field survey conducted in July 2025, barn swallows were observed.

8.3.2.2 Mammals

Two mammal SOCC can be found within the RAA, including the mule or blacktailed deer (*Odocoileus hemionus*; MBESEA – threatened) and the American badger (*Taxidea taxus taxus)*; SARA and COSEWIC – Special Concern) (Manitoba Conservation Data Centre, 2025). Riparian areas along the Buffalo Creek, Rosenheim Drain, Hespeler Drain and other natural 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.

No mammal species of conservation concern were observed during the field surveys.

8.3.2.3 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*) and the yellow-banded bumble bee (*Bombus terricola*). 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.

8.3.2.4 Amphibians and reptiles

Based on MBCDC's provincial records, two amphibian and one reptile SOCC are known to occur in the 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 incidentally encountered during the field survey conducted in summer 2025.

8.4 Project interactions with wildlife and wildlife habitat

Table 8-3 identifies, for each potential effect, the physical activities that might interact with wildlife and wildlife habitat 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, control points, and Winkler (GS-140) gate station expansion		
Mobilization and staff presence	✓	✓
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas, *e.g.,* marshalling yards	✓	✓
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	✓	✓
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	-
Vehicle and equipment use	✓	✓
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓

Table 8-3: Project interactions with wildlife and wildlife habitat

Project activities/components	**Change in wildlife habitat**	**Change in mortality risk**
Valve operation checks (annually)	✓	✓
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
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

No effects to wildlife and wildlife habitat are anticipated to result from the presence of the pipeline or control points. All other project activities have potential pathways of effect that may result in changes to wildlife habitat and/or mortality risk as identified in Table 8-3 and assessed in the following Section 8.5.

8.5 Assessment of project effects

As presented in Section 8.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on wildlife and wildlife habitat. These residual effects are anticipated to be negligible to low in magnitude and most pronounced during the construction phase of the project for each of the potential effects assessed:

- Change in wildlife habitat
- Change in mortality risk

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 8-3, proposed mitigation measures, and the characterization of residual project effects.

8.5.1 Change in wildlife habitat

Although the dominant land use in the PDA is agriculture, there is potential for project activities to interact with wildlife habitat.

8.5.1.1 Analytical assessment techniques

Project-related change in wildlife habitat is assessed through considering the amount of wildlife habitat in the PDA (ha) that may be directly altered as a result of the project. Wildlife habitat, for the purposes of this assessment, is considered to be forested area and wetland area per provincial land cover classification data.

8.5.1.2 Effects pathways

The effect pathways through which the project has the potential to result in change in wildlife habitat include:

- Direct temporary disturbance and displacement of SOCC due to project activities involving ground disturbance and changes to vegetation
- Indirect effects to wildlife from sensory disturbance resulting from project activities occurring within areas that provide wildlife habitat

Past environmental assessments on other pipeline projects have found that construction and maintenance activities can result in potential effects on SOCC

through the loss of habitat, disruption of breeding activity, and temporary displacement due to noise within areas providing habitat (Kelly WM Scott & Associates 2011; Energy East Project Consolidated Application 2016).

Construction

During construction, wildlife habitat can be affected directly through project activities involving ground disturbance and changes to vegetation including access development, right-of-way preparation (*i.e.,* the clearing of vegetation and stripping of topsoil), trenching during pipeline installation, horizontal directional drilling, and installation of above-ground components where ground disturbance is involved (*i.e.,* compaction of subsoil). These construction activities have the potential to directly alter wildlife habitat, particularly if forested areas, wetlands, or road allowance ditches are disturbed by the activities.

The PDA represents the area within which wildlife habitat could be directly affected/altered by project activities. Based on provincial land cover classification data, the PDA traverses no wetlands and contains approximately 3 ha of deciduous forest, representing the maximum amount of vegetation clearing and direct wildlife habitat alteration that could result from the project if mitigation measures were not implemented.

Direct effects to wildlife habitat will not occur in areas along the PDA where the pipeline will be installed by horizontal directional drilling (HDD), which avoids surface disturbance.

Indirect effects on wildlife habitat are those that reduce the effectiveness of existing or remaining habitat for wildlife. Indirect effects may result from project activities that generate sensory disturbances (*e.g.,* noise, visual) that may displace wildlife. All construction activities have the potential to generate noise and alter the sensory experience for wildlife in the area from mobilization and staff presence, vehicle and machinery use, activities involved in preparing the right-of-way and installation of the pipeline via trenching and horizontal directional drilling, through to clean-up and remediation. As such, the activities that occur throughout construction have the potential to result in the temporary displacement of wildlife within the LAA due to altered sensory experience.

Operations

During operations, wildlife habitat may be directly altered periodically during vegetation management and maintenance activities that may involve ground disturbance. For example, if an inspection reveals a deficiency in the pipeline and the

repair/maintenance work requires that an area be excavated/trenched, there may be direct disturbance to wildlife habitat in a localized area.

Similar to construction, project activities that create noise may result in indirect effects to wildlife habitat that may alter the sensory experience and cause temporary displacement. In addition to vegetation management and maintenance activities, vehicle and equipment use, ground pipeline patrols, and valve operation checks may cause these sensory disturbances.

The presence of the pipeline and above-ground components are not anticipated to affect wildlife habitat on an ongoing basis.

Decommissioning

During decommissioning, the removal of above-ground components and rehabilitation may directly alter wildlife habitat through ground disturbance. Similar to construction, indirect effects to wildlife habitat may result from all project decommissioning activities. In addition to the removal of above-ground components and rehabilitation, mobilization and staff presence, vehicle and equipment use, pipeline disconnection (isolate, purge, and cap off below grade), and clean-up and demobilization have the potential to cause sensory disturbances and displacement of wildlife, specifically birds and mammals.

8.5.1.3 Mitigation for change in wildlife habitat

Potential direct effects of the project on wildlife habitat have been reduced through routing the pipeline predominantly on developed agricultural land and making use of horizontal directional drilling to allow the pipeline to cross beneath certain features along the project route. These include areas providing wildlife habitat such as shelterbelts or small wooded areas on private land or along natural waterways such as Buffalo Creek, the Rosenheim Drain, and the Hespeler Drain.

In addition to pipeline routing and design, mitigation measures to reduce project-related changes to wildlife habitat include the following:

- Wildlife features (*e.g.,* stick nests) will be identified in the Construction Environmental Protection Plan (CEnvPP), and mitigation, such as buffers, will be applied.
- Environmentally sensitive sites, features, and areas will be identified and mapped before construction.

- Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation measures such as pre-construction nest searches.
- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.

8.5.1.4 Characterization of residual effects on wildlife habitat

The PDA traverses and therefore has the potential to directly alter a maximum of 3 ha of wildlife habitat, comprised entirely of deciduous forest. The PDA does not traverse any wetland per provincial land cover classification data. However, the actual area of wildlife habitat directly altered by the project is anticipated to be less than 3 ha. The crossing locations where the pipeline will be installed by horizontal directional drilling (Table 2-1) avoid the need to clear vegetation or disturb the ground in these areas, which include natural waterways such as Buffalo Creek, the Rosenheim Drain, and the Hespeler Drain. The precise area of wildlife habitat that will be retained because of the use of horizontal direction drilling will not be known until the drill design at each location is finalized. Therefore, this assessment only concludes that the area of wildlife habitat that will be directly altered will be less than 3 ha.

Mitigation measures including identifying wildlife features for inclusion in the CEnvPP, mapping out environmentally sensitive sites prior to construction, and developing and following an Access Management Plan are anticipated to further mitigate the potential for direct alteration of wildlife habitat. Working within reduced risk timing windows for wildlife species, where possible, or implementing additional mitigation measures where not possible, is anticipated to mitigate some indirect effects to wildlife habitat effectiveness through minimizing sensory disturbances from project activities during sensitive time periods for wildlife.

Following the implementation of mitigation measures described above, predicted residual effects on the change in wildlife habitat include:

- Potential reduced effectiveness of wildlife habitat and displacement of wildlife species due to project-related sensory disturbance
- Direct alteration of less than 3 ha of forest habitat resulting from clearing vegetation along the project right-of-way

Residual effects for change in wildlife habitat, after mitigation, are characterized as follows:

- Direction: adverse

- Magnitude: low during construction and decommissioning (*i.e.,* anticipated change in SOCC is unlikely to affect sustainability in the LAA and there are no predicted effects on listed species); negligible during operations and maintenance (*i.e.,* no measurable change in wildlife SOCC is predicted)
- Geographic extent: PDA for direct effects to wildlife habitat, LAA for indirect effects resulting from sensory disturbance
- Duration: long-term (*i.e.,* the residual effect extends for the life of the project)
- Frequency: continuous during construction and decommissioning, multiple irregular events during operations
- Reversibility: reversible

8.5.2 Change in mortality risk

8.5.2.1 Analytical assessment techniques

Project-related change in wildlife mortality risk is assessed through considering the amount of wildlife habitat in the PDA (ha of forests and wetlands) that may be directly altered as a result of the project, estimated project related traffic volumes, as well as qualitative assessment of the total duration and timing of project activities in relation to reduced risk timing windows for wildlife species.

8.5.2.2 Effects pathways

The effect pathways through which the project has the potential to result in change in wildlife mortality risk is through project activities that may result in harm or risk the survival or wildlife species through direct interactions or behavioural changes in wildlife that may result from increased activity.

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. At the peak of construction, it is anticipated that there will be approximately 100 project-related vehicles travelling to, from, and within the PDA.

Clearing vegetation and stripping topsoil to prepare the right-of-way also has the potential introduce greater mortality risk for birds, amphibians, reptiles, and small mammals that may unknowingly be present (or have nests) within the PDA.

The establishment and presence of the trench before the pipeline is lowered into place and backfilling of the trench after pipeline installation introduce risk for wildlife species to become entrapped within the trench.

Increased activity and the associated sensory changes (*e.g.,* noise, nighttime illumination) from construction may also cause an indirect increase in mortality risk by causing behavioural changes such as movement into new areas that increase chances of predation or human interaction. Small mammals or birds may move from cover because of disturbance from noise and vibration, putting them at greater risk of predation and mortality from exposure (Habib, Bayne and Boutin 2007). All construction activities have the potential to generate noise and alter the sensory experience for wildlife in the area in ways that may alter behaviour and increase mortality risk.

Operations

Similar to construction, the influx of project-related traffic (*i.e.,* vehicles and equipment) travelling to, from, and within the PDA during periodic maintenance activities, inspections, and vegetation management increases mortality risk associated with vehicle collisions. Similarly, maintenance activities that involve trenching/excavation introduced the risk of wildlife entrapment and sensory disturbance resulting from project activities may indirectly affect mortality risk through behavioural changes of wildlife species such as temporary displacement from habitat in the PDA.

Decommissioning

Similar to construction and operations, the influx of project-related traffic (*i.e.,* vehicles and equipment) travelling to, from, and within the PDA during decommissioning increases mortality risk associated with vehicle collisions. Excavation required to cap off the pipeline below grade and to remove above-ground components introduces increased risk of entrapment. Indirect affects to mortality risk may result during activities throughout decommissioning because the associated sensory disturbances may cause behavioural changes of wildlife species such as temporary displacement from habitat in the PDA.

8.5.2.3 Mitigation for change in mortality risk

Potential direct effects of the project on wildlife mortality have been reduced through making use of horizontal directional drilling, which reduces the risk of entrapment by eliminating the need for a trench in certain locations (Section 2.6.5, Crossings) and

reduces the area of wildlife habitat (*i.e.,* deciduous forest) that will need to be cleared. In addition to pipeline design (*i.e.,* horizontal directional drilling at certain locations), mitigation measures to reduce project-related changes to wildlife mortality include the following:

- Hunting and harvesting of wildlife, or possession of firearms by project staff, will not be permitted while working on project sites.
- Construction activities will be restricted to roads, trails and cleared construction areas in accordance with the Access Management Plan.
- Project-related vehicles will comply with all traffic rules, including speed limits and provincial and federal highway regulations.
- Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation.
- The trench will be inspected before backfilling to prevent amphibians or other wildlife from being inadvertently buried.

8.5.2.4 Characterization of residual effects on wildlife mortality risk

As stated in 8.5.1.4 (Characterization of residual effects on wildlife habitat), the project is anticipated to directly alter less than 3 ha of wildlife habitat, specifically deciduous forest.

The project is anticipated to result in up to 100 additional vehicles travelling to, from, and along the PDA at the peak of construction. PTHs north of the PDA are anticipated to provide the main daily travel routes to and from the project area. These highways, including PTHs 3, 14, and 30 have reported annual average daily traffic volumes ranging from 1,010 to 15,490 vehicles per day depending on the segment (Table 12-3). Traffic increases and strain on infrastructure are anticipated to be more notable on PRs, which generally report lower average daily traffic volumes.

Developing and following an Access Management Plan and project-related vehicles and equipment following relevant traffic rules are anticipated to mitigate the risk of wildlife collisions with vehicles, and the associated mortality risk. Working within reduced risk timing windows for wildlife species, where possible, or implementing additional mitigation measures where not possible, is anticipated to mitigate some direct and effect to mortality risk. It is not anticipated to be possible to work within all reduced risk timing windows for all wildlife species for all project activities. For example, pipeline installation (*i.e.,* trenching, HDD) are anticipated to take place under non-frozen ground conditions in the spring and summer months. 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. Therefore, additional mitigation may be required in the CEnvPP in environmentally sensitive sites that may provide habitat for amphibians.

Following the implementation of mitigation measures described above, predicted residual effects on wildlife mortality risk include:

- Potential increase in wildlife collisions with vehicles or entrapment in trenched areas
- Indirect increases in wildlife mortality risk resulting from project-related sensory disturbances and associated behaviour changes in wildlife species (*e.g.,* displacement from PDA)

Residual effects for change in wildlife mortality risk, after mitigation, are characterized as follows:

- Direction: adverse
- Magnitude: low during construction and operations, negligible in operations
- Geographic extent: PDA except for residual effects to wildlife mortality risk resulting from the potential for vehicle and equipment collisions, which extends to the RAA on access routes that will be travelled by project vehicles and machinery travelling to and from the PDA
- Duration: long-term (*i.e.,* the residual effect extends for the life of the project)
- Frequency: continuous during construction and decommissioning, irregular events during operations
- Reversibility: reversible

8.5.3 Summary of residual effects characterizations

Table 8-4 characterizes the residual effects on wildlife and wildlife habitat.

Table 8-4: Project residual effects on wildlife and wildlife habitat

Residual effects characterization						
Project phase	**Direction**	**Magnitude**	**Geographic extent**	**Duration**	**Frequency**	**Reversibility**
Change in wildlife habitat						
Construction	A	L	PDA/LAA	LT	C	R
Operation		NC			IR	
Decommissioning		L			C	
Change in mortality risk						
Construction	A	L	PDA-RAA	LT	C	R
Operation	N	NC	PDA-RAA		IR	
Decommissioning	A	L	PDA-RAA		C	

8.5.4 Cumulative effects

Where residual adverse effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out. Therefore, the assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has adverse 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 the assessment of project effects on wildlife and wildlife habitat both of above conditions exist and a cumulative effects assessment is therefore presented in this section.

8.5.4.1 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 to impact wildlife and wildlife habitat.

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**	
	Change in wildlife habitat	**Change in mortality risk**
Past and ongoing projects and activities		
Domestic resource use (*e.g.,* hunting, trapping, fishing, non-commercial agriculture)	-	✓
Recreational activities (*e.g.,* canoeing, snowmobiling, hiking)	✓	✓
Industrial and commercial resource use, including commercial agriculture	✓	✓
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Residential and institutional developments	✓	✓
Future projects and activities		
Dominion City to Altona gas transmission pipeline	✓	✓
RM of Stanley Regional Wastewater Collection System	✓	✓

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	
	Change in wildlife habitat	Change in mortality risk
Residential and commercial/industrial subdivisions (east of the City of Winkler and within the Town of Altona)	-	✓

✓ = 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.

8.5.4.2 Cumulative effect for change in wildlife habitat

Pathways for cumulative effect on wildlife habitat

Existing and ongoing projects and activities in Table 8-5, with the exception of domestic resource use, have contributed to a change in wildlife habitat, both direct and indirect. The primary pathways of these effects are through land clearing (*i.e.,* loss of wildlife habitat) and/or sensory disturbances (*e.g.,* noise) altering the effectiveness of wildlife habitat.

Within the RAA, industrial and commercial resource use, specifically commercial agriculture, has contributed notably to the modification and/or loss of wildlife habitat. The RAA is extensively developed for agriculture with agricultural land currently covering approximately 85% of the RAA. Existing infrastructure (Manitoba Hydro and non-Manitoba Hydro), residential and institutional developments, and recreational activities have contributed to the loss of native habitat in the RAA over time and continue to have the potential to affect remaining wildlife habitat through sensory pathways that may alter the effectiveness of wildlife habitat for certain species.

The proposed future Dominion City to Altona gas transmission pipeline is anticipated to contribute to a cumulative effect to wildlife habitat in the east part of the RAA, where the two projects' RAAs overlap. The new 36.6-kilometre, 8-inch steel natural gas transmission line will traverse land cover types that provide wildlife habitat. Based on the project's Environment Act Proposal, the project footprint will be located primarily on private property that is agricultural/developed land. Therefore, the project is anticipated to have a minimal effect on loss or disruption of wildlife habitat.

The sensory disturbances from project activities may interact cumulatively with those of the Altona to Winkler gas transmission project affecting the effectiveness of wildlife habitat in the easterly part of the RAA if any of the construction activities on the two projects overlap temporally.

The proposed future RM of Stanley Regional Wastewater Collection System is anticipated to contribute to cumulative effect to wildlife habitat. Upgrades to the regional wastewater collection system will include new lift stations and 45 km of new pipelines that will traverse land cover types that provide wildlife habitat. Based on the project's Environment Act Proposal, the project footprint will be located primarily on private property that is agricultural/developed land, with horizontal directional drilling in environmentally sensitive areas, such as watercourses. Therefore, the project is anticipated to have a minimal effect on loss or disruption of wildlife habitat. The sensory disturbances from project activities may interact cumulatively with those of the Altona to Winkler gas transmission project affecting the effectiveness of wildlife habitat in the RAA if any of the construction activities on the two projects overlap temporally.

The future proposed residential and commercial/industrial subdivisions east of the City of Winkler and within the Town of Altona are not anticipated to contribute to cumulative effects to wildlife habitat as the assumption, based on feedback, is that the developments will be located within pre-disturbed/developed areas, therefore it is not anticipated that wildlife habitat (forest and wetland) is likely to be altered.

Mitigation measures

The implementation of the mitigation measures identified above in Section 8.5.1.3 will also reduce the proposed project's contribution to cumulative effects on wildlife habitat. 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.

Residual cumulative effect

With the implementation of mitigation measures identified for change in wildlife habitat, this project, in combination with other ongoing and future projects and activities, is predicted to have a small contribution to cumulative effects on wildlife habitat with temporary wildlife displacement due to sensory effects like noise being the potential residual cumulative effect anticipated.

While the project will have a cumulative 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 an irregular basis when the activities of ongoing and future projects occur at the same time as the activities involved in the Altona to Winkler gas transmission project. Residual cumulative effects on wildlife habitat are anticipated to be most pronounced during the construction phases of the projects/activities and are anticipated to be reversible after decommissioning of the activities and projects with a cumulative interaction.

8.5.4.3 Cumulative effects on wildlife mortality risk

Pathways for cumulative effect on wildlife mortality risk

All ongoing and future projects and activities in Table 8-5 have the potential to interact cumulatively with the project's residual effects on wildlife mortality risk.

The primary pathways through which an ongoing or future project or activity may interact cumulatively with the project's effects on wildlife mortality risk are through the introduction of additional traffic (*i.e.,* vehicle and equipment use), vegetation clearing, ground disturbance, and sensory disturbances occurring in the RAA at the same time as the project.

In addition to wildlife mortality risks related to potential collisions between wildlife species and vehicles, certain existing infrastructure types introduce unique ongoing wildlife mortality risk such as bird-wire collision risks associated with electrical transmission lines. Domestic resource use poses a direct wildlife mortality risk based on the nature of the activities (*e.g.,* hunting, trapping, fishing).

The proposed future Dominion City to Altona gas transmission pipeline, the RM of Stanley Regional Wastewater Collection System, and the proposed residential and institutional developments are anticipated to have the potential to contribute to cumulative effects to wildlife mortality risk if they bring additional traffic to the RAA, involve ground disturbance, vegetation clearing, or generate sensory disturbances that may alter wildlife behaviour at times that overlap with the Altona to Winkler gas transmission project.

Mitigation measures

The implementation of the mitigation measures identified above in Section 8.5.2.3 will also reduce the proposed project's contribution to cumulative effects on wildlife mortality risk. 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.

Residual cumulative effect

With the implementation of mitigation measures identified for change in wildlife mortality risk, this project, in combination with other ongoing and future projects and activities, is predicted to have a small contribution to cumulative effects on wildlife mortality risk. The anticipated potential residual cumulative effects on wildlife mortality risk are a potential increase in wildlife collisions with vehicles or other project activities with direct mortality risks and potential indirect increases in wildlife mortality risk due to sensory disturbances that may affect behavioural changes in wildlife species.

While the project will have a cumulative effect, with the implementation of mitigation measures, cumulative effects are anticipated to be of low magnitude (*i.e.,* 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). Residual cumulative effects will extend into the RAA as it relates to the risk for wildlife-vehicle collisions as traffic related to ongoing and future projects and activities are likely to use the same travel routes. Cumulative effects will be short-term occurring on an irregular basis when the activities of ongoing and future projects occur at the same time as the activities involved in the Altona to Winkler gas transmission project. Residual cumulative effects on wildlife mortality risk are anticipated to be most pronounced during the construction phases of the projects/activities and are anticipated to be reversible after decommissioning of the activities and projects with a cumulative interaction.

8.5.5 Determination of significance

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

The project is not anticipated to result in a threat to the long-term persistence or viability of a wildlife species in the RAA.

8.5.6 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, and the anticipated 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.

8.5.7 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 16.0).

8.5.8 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).

Future climate for the project area is forecasted to be warmer with more precipitation, on average, during winter and spring seasons, and such changes could impact wildlife through a change in habitat availability and conditions, as well as mortality risk.

9.0 Commercial agriculture

Commercial agriculture refers to the for-profit production of crops and livestock. Given the location of the project in a prime agricultural region, project components and activities have the potential to 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), including field operations such as seeding, the application of inputs (*e.g.,* fertilizers, manure, soil amendments and pesticides) and harvesting.
- Raising of livestock and livestock grazing.
- Buildings and other structures used in support agricultural operations and activities.

9.1 Summary of conclusions

The Altona to Winkler gas transmission project is anticipated to have adverse residual project effects on commercial agriculture. The residual project effects include the following:

- A total of 80 ha (198 ac) of land will be temporarily lost from agricultural production during project construction. This includes 79 ha (195 ac) of annual cropland (row crops and cereal/oilseed) and 1 ha (2.5 ac) of natural hayland (range and grassland). However, compensation will be provided to affected agricultural producers to offset the effects of this temporary land loss.

- The presence of the above-ground control point near Plum Coulee throughout the lifetime of the project will result in the permanent loss of an estimated 0.040 ha (0.10 ac) of land from agricultural use. However, compensation will be provided to offset the effects of this permanent land loss to agricultural producers.
- With topsoil stripping and other construction mitigation measures, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. However, reductions in crop yield within the project development area may persist into the operations and maintenance phase.
- While the potential for conflict with agricultural activities may remain following mitigation, the magnitude of these effects and the extent over which they are experienced will be reduced. 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 impact on individual operations. 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.
- Portions of the project have been routed to parallel existing gas pipeline easement, which is intended to reduce overall project conflicts with agricultural activities.
- Adverse residual project and cumulative effects to commercial agriculture are anticipated to be not significant because the project is not anticipated to impair the capacity for agricultural productivity in the RAA.

9.2 Scope of the assessment

This chapter presents baseline or existing conditions for commercial agriculture and includes the assessment of potential effects of project construction, operations and maintenance, and decommissioning activities on commercial agriculture. An assessment of cumulative effects, considering the effects of other projects in conjunction with the current project, on commercial agriculture is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Dominion City to Altona and Neepawa gas transmission pipelines as well as electrical transmission projects (*e.g.,* Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, and Manitoba-Minnesota Transmission Project).

9.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2.0 (Project description).

9.2.2 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.

9.2.2.1 Provincial regulation and policy

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 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.

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. 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 directly 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.

9.2.2.2 Municipal guidance

Land use planning in the municipalities traversed by the project is guided under provincial land use policies and governed under *The Planning Act*. 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

Each of the 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 municipal zoning by-laws, the project is located on land zoned for agriculture. This zoning is intended to preserve these areas for agricultural land uses. Lands are mostly zoned for general agricultural uses (*i.e.,* Agricultural General Zone in

the Municipality of Rhineland and Agricultural Policy Area for much of the portion of the Rural Municipality (RM) of Stanley which the project predominantly traverses). These general agricultural zonings allow for public utilities as permitted and/or conditional uses. In the City of Winkler, at the northwestern end of the pipeline route, the project crosses through an area that is zoned Industrial and Development Reserve, although most of the lands which the project traverses within this area are currently still under agricultural land use.

Non-agricultural land uses are addressed in the land and resource use section of the assessment (see Section 5-10).

9.2.2.3 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 pests in agricultural soils by limiting soil movement between fields and across rights of way, and provides mitigation measures focused on cleaning techniques and reducing exposure to biosecurity risks (*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, on behalf of Centra Gas, 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 their operations, and direct and indirect effects on property use. Landowners and producers are compensated for these residual effects.

As indicated in the project description (Chapter 2.0), the conventional terms of the right-of-way easement agreement provide that:

- Centra Gas obtains the legal right to construct, operate, maintain, repair, and replace their transmission pipelines within a right-of-way. This right is obtained through easements on privately owned lands or by a Crown land reservation or pending easement for right of use on provincial Crown land.
- 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 Centra Gas.

Manitoba Hydro personnel are permitted to enter and use the right-of-way for construction, inspection, maintenance, repair, or replacement of the gas transmission pipeline facilities.

The following types of compensation are available to affected landowners:

1. Land compensation

Land compensation is a one-time payment to landowners for granting 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), and
- Easement compensation factor, which is determined based on the location of the infrastructure (*i.e.,* whether underground or above-ground). For underground gas

transmission lines, Centra Gas'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 the construction, operations, and maintenance of the pipeline. A one-time payment for construction damage is negotiated on a case-by-case basis. Centra Gas will:

- Compensate or be responsible for repairing, to the reasonable satisfaction of the landowner, any damage to a landowner's property.
- Compensate a landowner for any crop losses in areas affected by construction of the pipeline. This compensation generally considers the most recent average value of the harvested crop reported by Manitoba Agricultural Services Corporation.

3. Structure impact compensation

Structure impact compensation is a one-time payment to landowners for any above ground infrastructure placed on land classed as agricultural. Structure impact compensation considers:

- Lands permanently removed from production, determined by the size of structure constructed on the land
- Reduced productivity in an area of overlap around each structure
- Additional time required to manoeuvre farm machinery around each structure
- Double application of seed, fertilizer and weed control in the area of overlap around each structure

4. Ancillary damage compensation

Ancillary damage compensation is a one-time payment that applies where Centra Gas'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, drainage, and aerial spraying activities)
- constraint effects, such as restricted access to adjacent lands

9.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide project feedback related to commercial

agriculture. This included direct emails to the following agricultural producer groups and other potentially interested parties:

- Manitoba Agriculture's Sustainable Agriculture Branch
- Keystone Agricultural Producers
- Manitoba Beef Producers
- Dairy Farmers of Manitoba
- Manitoba Pork
- Manitoba Chicken Producers
- Manitoba Egg Farmers
- Manitoba Pulse and Soybean Growers
- Manitoba Beekeepers Association

In a letter to Manitoba Hydro, dated July 30, 2025, Manitoba Beef Producers provided information and comments about the beef industry, the project, and a few concerns related to potential effects from the project. A summary of their concerns are as follows:

- Biosecurity – Manitoba Beef Producers shared the importance of Manitoba Hydro and its contractors adhering to strict biosecurity protocols to help reduce the risk of disease transmission to livestock, or the transfer of noxious weeds, soil-borne pathogens and other soil-borne pests to lands used by beef producers. A critical case in point would be if soil disturbance resulted in anthrax spores being dug up during construction. This would pose a serious health threat to cattle as anthrax generally results in swift death for the affected animals. The presence of anthrax has led to cattle losses in a number of areas of Manitoba in the past, including in southeastern Manitoba.
- Weed management - Manitoba Beef Producers strongly stated the importance of plans to manage weeds throughout all stages of the project to reduce the adverse consequences for livestock, people, and livestock-related activities such as haying, grazing and cropping. They specifically noted concerns about invasive species including leafy spurge, water hemlock and waterhemp.
- Disruption to livestock operations – Manitoba Beef Producers shared concerns regarding disruption to livestock operations and suggested avoiding calving seasons, breeding seasons, and active livestock grazing areas. Similarly, there should be efforts to avoid activities that would interfere with planting or harvest activities, including hay production.
- Loss of land needed for pasture, forage or crop production - Manitoba Beef Producers shared the importance of reducing the amount of land that may be impacted by project construction, even if the associated haying and grazing lands

would be lost for a single growing season. They requested avoidance of the need for removal and relocation of corrals, handing systems, fences, barns, in-ground and above ground watering systems and other infrastructure critical to beef producers' operations. They stressed the importance of ask individual landowners if they have installed inground water infrastructure as it may not be linked to municipal/cooperative water systems and therefore may not be captured when the four-way utilities sweep mentioned on the virtual meetings is conducted.
- Compensation related to lost land or productivity due to the project - Manitoba Beef Producers asked that consideration be given to compensation related to loss of pasture and forage production highlighting that re-establishing lost forage production is a multi-year process, an aspect that needs to be factored into compensation discussion.

While not received specifically for this project, a letter provided by the Sustainable Agriculture Branch of Manitoba Agriculture, in October 2024, on the recent Dominion City to Altona Gas Transmission Project (Manitoba Hydro 2024) which is currently under regulatory review and located adjacent to this project and in similar land use, provides value in identifying agricultural considerations for the development of this project. A summary of key points from that letter is provided below:

- Only ~14% of Manitoba's land has agricultural potential; pipeline footprints including risers and meter stations permanently remove productive farmland and may impact production economics, especially in areas of high value production.
- Pipelines can restrict normal farm operations, including deep tillage, equipment access, manure application, and field traffic (*e.g.,* limits for pipeline crossing).
- Biosecurity risks are highest during construction, with potential spread of soil-borne pathogens (*e.g.,* clubroot, bacterial ring rot [potatoes], nematodes, verticillium wilt, blackleg), noxious weeds and other pests via equipment and personnel.
- Livestock operations face added risks, including disease transmission and disturbance of soils that may contain anthrax spores.
- Pipeline corridors may cause long-term soil compaction, mixing, drainage disruption, and yield loss, requiring compensation.
- Mitigation measure considerations include early landowner engagement, off-season construction, strict sanitation, soil segregation, low-impact equipment, and protection of tile drainage and irrigation systems.
- Coordination with landowners is essential to plan reroutes or repairs where conflicts cannot be avoided.

No other correspondence or comments were received from other producer groups or individual producers. However, the concerns outlined above, namely land loss, damage to land, interference and/or disruption to operations and biosecurity, reasonably capture issues previously raised by agricultural producers and organizations on similar past projects.

As described in Chapter 4 (Project engagement), feedback some of which pertained to commercial agriculture and is outlined below, was shared by members of the public during virtual and in-person project information sessions held for the project in July 2025.

- Concern about the presence of the pipeline negatively affecting existing or future tile drainage or other drainage options on their property.
- Concern about depth of cover not being adequate considering current or potential future farming and drainage practices.
- Concern about construction impacting natural drainage of the land, and whether there will be impacts to existing water lines on agricultural fields.
- Request from specific landowners for the gas transmission line to be installed at a greater depth on their properties to support potential future tile drainage development.

The above-outlined concerns from the public will be addressed through mitigation (see Section 9.5.2.3).

9.2.4 Potential effects, pathways, and measurable parameters

The identification of effects included in the assessment of project 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 and/or degradation 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.	Extent of temporary agricultural land loss (ha)
	The presence of above-ground structures remaining through operation (*e.g.,* valve sites) will result in **permanent** agricultural land loss.	Extent of permanent agricultural land loss (ha)
	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

Table 9-1: Potential effects, effects pathways, and measurable parameters for commercial agriculture

Potential effect	**Effect pathway**	**Measurable parameter(s) and units of measurement**
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)

9.2.5 Spatial boundaries

Three spatial boundaries are used to assess residual 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 consists of quarter sections of land traversed by the PDA. The quarter section was selected to define the LAA as this land survey/ownership unit generally encompasses the basic field management unit most commonly used in the project region. 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 administrative boundaries of the municipalities that are traversed by the PDA, namely the Municipality of Rhineland, RM of Stanley, as well as the City of Winkler.

- 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 9-1 illustrates the spatial boundaries for the assessment of project effects on commercial agriculture.

9.2.6 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 – estimated to take approximately 12 months, beginning in the summer of 2027
- Operation and 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

9.2.7 Residual effects characterization

Table 9-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on commercial agriculture.

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	**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. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to commercial agriculture relative to baseline. **Neutral –** no net change in measurable parameters for commercial agriculture relative to baseline.

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	**Quantitative measure or definition of qualitative categories**
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No Measurable Change –** no measurable change in the capacity for agriculture **Low –** a 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 predisturbance levels.
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 construction to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	**Quantitative measure or definition of qualitative categories**
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** – occurs one time **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

9.2.8 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 the local scale of an individual agricultural operation or agricultural field, may 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 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 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

9.3 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). Today, the RAA can generally be characterized as being predominantly under annual crop production, including some high-value production such as irrigated potatoes, with some limited livestock production.

Baseline information for 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
- A windshield survey completed within the LAA on June 19, 2025
- 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

9.3.1 Agricultural land cover and land use

The RAA is comprised largely of land under agricultural land use, with approximately 79.5% under annual crop production and 2.1% as forage crops (Table 9-3; Map 5-2). Approximately 8.7% of the RAA is characterized as range and grassland, 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 90.3% and 86.1%, respectively, under annual crop production. Forage crops occupy a minor portion of the LAA (0.7%) and PDA (1.8%). Similarly, range and grassland occupy a minor portion of the LAA (4.4%) and the PDA (4.7%). Deciduous forest occupies a minor portion of the LAA (1.5%) and the PDA (3.1%). In some cases, the deciduous forest comprises agricultural shelterbelts in place, at least in part, to provide protection against soil loss by wind erosion.

Table 9-3: Land cover types in the RAA, LAA and PDA for commercial agriculture

Crop Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Agriculture – annual cropping	143,889	79.5%	2,391	90.3%	82.1	86.1%
Agriculture – forage crops	3,725	2.1%	18	0.7%	1.7	1.8%
Conifer forest	0	0.0%	0	0.0%	0.0	0.0%
Cultural features	1,759	1.0%	0	0.0%	0.0	0.0%
Deciduous forest	8,186	4.5%	40	1.5%	3.0	3.1%
Open deciduous forest	444	0.2%	0	0.0%	0.0	0.0%
Range and grassland	15,697	8.7%	115	4.4%	4.5	4.7%
Roads trails rail lines	6,222	3.4%	71	2.7%	3.5	3.7%
Sand and gravel	139	0.1%	0	0.0%	0.0	0.0%
Water body	665	0.4%	13	0.5%	0.5	0.6%
Wetland - marsh	243	0.1%	0	0.0%	0.0	0.0%
N/A	55	0.0%	0	0.0%	0.0	0.0%
Totals	181,022	100.0%	2,648	100.0%	95.4	100.0%

Source: Manitoba Land Cover Classification, 2005-06, Province of Manitoba

9.3.2 Existing commercial agriculture operation types and farm sizes

Farm types within the RAA reporting agricultural activities (*i.e.,* Municipality of Rhineland, RM of Stanley, and part of the City of Winkler) are predominantly reported as oilseed and grain farming (56% of farms), with an additional 8% 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 19% of farms, with fewer farms reporting as hog and pig farming (2%), sheep and goat farming (3%), and poultry and egg farming (2%).

When compared to Manitoba overall, farming in the RAA is more heavily weighted to oilseed and grain farming, owing to the high 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 9.3.5 and Section 9.3.6, respectively.

There were five farms reporting as having 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, and the occurrence of organic production in the project area was not mentioned as part of feedback during engagement.

Table 9-4: Farm types reported in the RAA for commercial agriculture

Farm type	**In the RAA**		**Manitoba**	
	Number of farms	**%**	**Number of farms**	**%**
Oilseed and grain farming	412	56	6,749	46
Cattle ranching and farming	140	19	3,812	26
Other crop farming	61	8	1,898	13
Other animal production	41	6	1,015	7
Hog and pig farming	14	2	245	2
Sheep and goat farming	19	3	174	1
Poultry and egg production	13	2	263	2

Table 9-4: Farm types reported in the RAA for commercial agriculture

Farm type	In the RAA		Manitoba	
	Number of farms	%	Number of farms	%
Greenhouse, nursery and floriculture production	8	1	137	1
Fruit and tree nut farming	10	1	66	0
Vegetable and melon farming	18	2	184	1
Total number of farms	736	100	14,543	100

Source: Statistics Canada. 2021[a]. Table 32-10-0231-01 Farms classified by farm type, Census of Agriculture, 2021

The RAA includes Municipality of Rhineland, RM of Stanley and part of the City of Winkler.

With respect to manure management, manure was reported to be applied by 184 farms within the RAA, with 166 farms reporting solid or composted manure application and 36 reporting liquid manure application (Statistics Canada, 2021[c]). Manure application is an important practice in the region, with approximately 25% of farms across the RAA reporting manure application as an activity. Manure management within the LAA is discussed further in Section 9.3.6.

Nine farms within the RAA report 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 was confirmed to be a practice within the LAA based on an Orthoimagery review and observations from the June 19, 2025, windshield survey.

With respect to farm size, farms under 180 acres in size were the most reported, accounting for 40% of farms in the RAA (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, potentially leasing or renting out land to operators.

The next most reported farm sizes in the RAA are the over 1,120 acres class and the 180 to 560 acres class, accounting for 25% and 23% of farms respectively. Farms in these size classes likely best represent the typical commercial annual crop production

operation in the region. Farm size classes in the RAA are fairly similar to those reported for Manitoba overall.

Table 9-5: Farms sizes reported in the RAA for commercial agriculture

Farm size	**RAA**		**Manitoba**	
	Number of farms	**%**	**Number of farms**	**%**
Under 180.00 acres	292	40	3,996	27
180.00 to 559.99 acres	182	25	3,315	23
560.00 to 1,119.99 acres	100	14	2,485	17
1,120.00 to 3,519.99 acres	139	19	3,675	25
3,520.00 acres and over	23	3	1,072	7
Total number of farms	736	100	14,543	100

Source: Statistics Canada. 2021[d]. Table 32-10-0232-01 Farms classified by total farm area, Census of Agriculture, 2021.

The RAA includes the Municipality of Rhineland, RM of Stanley, and part of the City of Winkler.

9.3.3 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 (47.6%), Class 1 (23.2%) and Class 3 (19.4%) (see 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 (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 on Map 9-2.

Within the LAA, 95.4% of the land is characterized as Class 1, 2 and 3 with Class 1 (50.0%) being the most common (Table 9-7). The main limitation to agricultural capability in the LAA is excess water (subclass W, 35%) due to the combination of inherent drainage limitations and soil texture. A minor portion of the LAA is limited due to inundation (subclass I, 8%) due to overland flooding.

Similarly, the PDA has 98.6% of the area within Class 1, 2 and 3 (Table 9-7). The excess water limitation applies to 34% of the PDA while the inundation limitation affects 11% of the PDA.

Table 9-7: Agricultural capability in the RAA, LAA and PDA for commercial agriculture

Agricultural capability	RAA		LAA		PDA	
	Extent (ha)	Proportional extent (%)	Extent (ha)	Proportional extent (%)	Extent (ha)	Proportional extent (%)
1	41,997	23.2%	1,325	50.0%	50.5	53.0%
2	86,098	47.6%	817	30.8%	29.4	30.8%
3	35,188	19.4%	386	14.6%	14.1	14.8%
4	3,610	2.0%	12	0.5%	0.0	0.0%
5	5,999	3.3%	11	0.4%	0.4	0.4%
6	5,443	3.0%	0	0.0%	0.0	0.0%
7	9	0.0%	0	0.0%	0.0	0.0%
Organic	0	0.0%	0	0.0%	0.0	0.0%
Open water[1]	1	0.0%	0	0.0%	0.0	0.0%
Urban, modified or unclassified[2]	2,610	1.4%	98	3.7%	1.0	1.0%
Total[3]	180,955	100.0%	2,647	100.0%	95.4	100.0%

NOTES:

1 Open water = surface water features such as rivers, lakes and smaller open water bodies.

2 Urban, modified or unclassed lands are not assigned an agricultural capability class.

3 Values might not sum to totals shown because of rounding.

9.3.4 Soil compaction risk

Soil compaction 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 by be caused by 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 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 moderate to high compaction risk, owing to the prevalence of medium to moderately fine to fine soil textures in combination with imperfect drainage.

Compaction risk ratings are presented on 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 for commercial agriculture

Compaction risk	RAA		LAA		PDA	
	Extent (ha)	Proportional extent (%)	Extent (ha)	Proportional extent (%)	Extent (ha)	Proportional extent (%)
Low	33,057	18.3%	130	4.9%	1.1	1.1%
Moderate	59,659	33.0%	1,234	46.6%	52.2	54.8%
High	85,627	47.3%	1,185	44.8%	41.1	43.1%
Unclassified	2,611	1.4%	98	3.7%	1.0	1.0%
Total[2]	180,955	100.0%	2,647	100.0%	95.4	100.0%

Notes:

1 Unclassified - developed lands (disturbed, urban, etc.) and open water are not assigned a compaction risk rating.

2 Values might not sum to totals shown because of rounding.

9.3.5 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 and LAA 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) (see Table 9-10):

- Cereal/oilseed cropland covers 39.1% of the area under agriculture.
- Row cropland covers 47.3% of the area under agriculture.
- Natural hayland (grassland) covers 2.0% of the area under agriculture.
- Seeded hayland (pasture and forages) covers 0.9% of the area under agriculture.

Within the LAA, cropping agriculture is even more dominant (see Table 9-10):

- Cereal/oilseed cropland covers 34.9% of the area under agriculture.
- Row cropland covers 58.5% of the area under agriculture.
- Natural hayland covers 0.6% 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. As shown in Figure 9-1, cereal/oilseed cropland is predominantly under canola and spring wheat production, while row cropland is predominantly corn and soybeans.

Table 9-10: Crop types grown (2023) in the RAA, LAA and PDA for commercial agriculture

Crop type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Row crops[1]	85,697	47.3%	1,549	58.5%	50.9	53.4%
Cereal/ oilseed crops[2]	70,732	39.1%	924	34.9%	27.8	29.2%
Other crop types[3]	217	0.1%	0	0.0%	0.0	0.0%
Seeded hayland[4]	1,698	0.9%	0	0.0%	0.0	0.0%
Natural hayland[5]	3,678	2.0%	16	0.6%	1.0	1.0%
Non-agricultural	18,693	10.3%	159	6.0%	15.6	16.4%
Water	277	0.2%	1	0.0%	0.0	0.0%
Unclassified[6]	31	0.0%	0	0.0%	0.0	0.0%
Totals	181,022	100.0%	2,648	100.0%	95.4	100.0%

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 mustard, herbs, peas and millet are included in this category due to low reported acreages

4 Seeded hayland – includes forage crops and greenfeed

5 Natural hayland – includes grasslands

6 Unclassified – could not be classified due to cloud cover

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

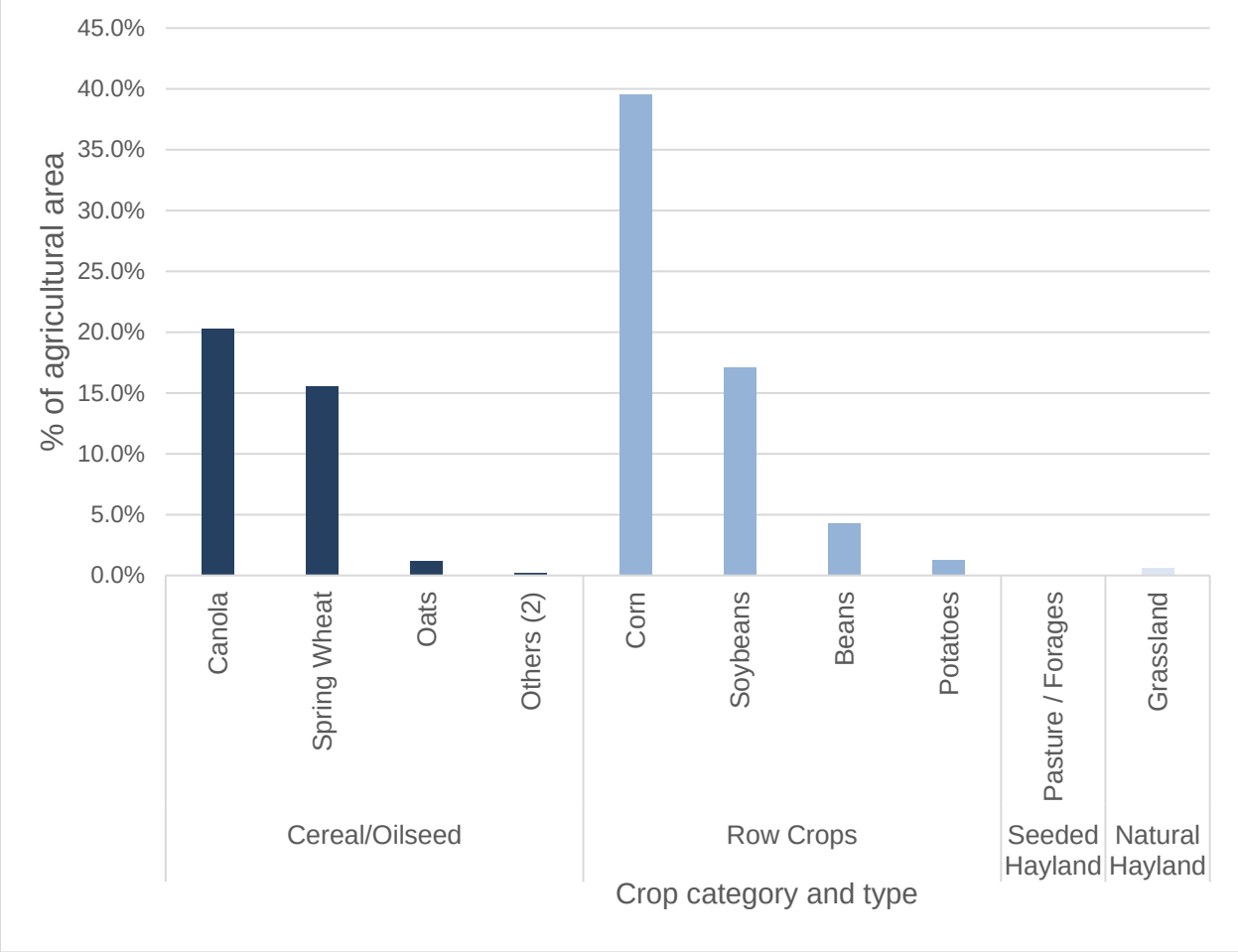


Figure 9-1: Crop types within the LAA for commercial agriculture (Source: modified from Government of Canada 2024.)

9.3.5.1 Irrigation

There was active irrigation (*i.e.,* irrigation pivot in place) observed in one quarter section within the LAA, at NW-26-2-3W1 approximately 3 km northeast of Blumengart, and aboveground irrigation pivot connections without active irrigation units observed in two other fields within the LAA (NW-27-2-3W1 and NE-30-2-3W1) north and northwest of Blumengart, during the windshield survey on June 19, 2025. Known buried irrigation pipelines cross the pipeline route at NW-19-2-3W1 and NE-22-2-2W1 (Blumengart Colony Farms and Ltd. PBS Water Engineering Ltd. 2020).

While there was no specific feedback during project engagement regarding parcels of land under irrigation or proposed for near-future irrigation development within the LAA, portions of a proposed irrigation project in the Municipality of Rhineland fall

within the LAA. This proposed irrigation project would consist of aboveground irrigation pivots and linear systems, off-stream storage reservoirs, a buried pipeline delivery system, buried electrical service to overhead irrigation units and pump works for filling the reservoir and delivering water to overhead irrigation units (Blumengart Colony Farms and Ltd. PBS Water Engineering Ltd. 2020). Aboveground irrigation units, including a combination of pivots and linear systems, are proposed within the LAA at W1/2-SW-25-2-3W1, N1/2-NW-24-2-3W1, NW-19-2-2W1 and NE-22-2-2W1, while proposed buried irrigation pipelines are proposed at pipeline route locations at SE-20-2-3W1, NE-19-2-3W1 and NE-22-2-2W1.

9.3.5.2 Drainage

Drainage is an important land improvement practice in the region 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, in the order of metres wide and deep, and typically collect water across regional areas and convey that water for long distances.

Local surface drains, typically developed and maintained by producers, are generally shallow, and used to convey water from low-lying areas of fields to municipal drainage ditches at the field edges. 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 (Figure 9-2). Such surface drains may have a very subtle appearance on the field surface (Photo 9-1).

Maintenance of the effectiveness of local and regional drains is of importance to producers within the LAA and across the RAA, respectively.

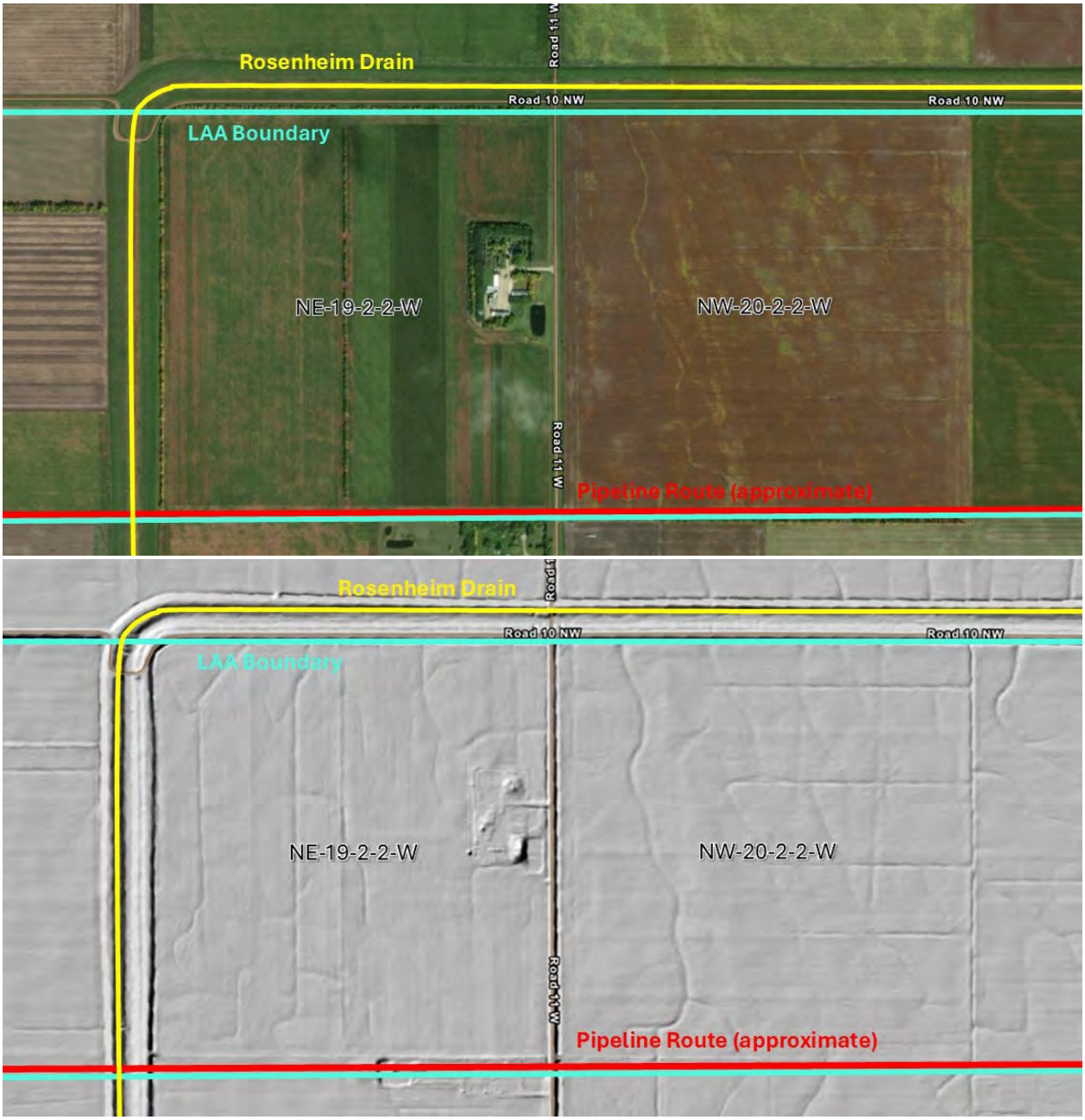


Figure 9-2: Orthoimagery and corresponding shaded relief showing a large, regional drain (Rosenheim Drain) and numerous local surface drains (Source: Manitoba AgriMaps 2025).



Photo 9-1: A local, field-scale shallow surface drain in NE-20-2-2W1

Tile drainage has emerged in recent years as a prominent practice in southern Manitoba as a means of managing excess water for annual crop production by producers. 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, typically into a ditch.

Tile drainage was visually confirmed in four quarter sections in the LAA (NW-26-2-3W1, NW-27-2-3W1, NW-29-2-3W1, and NE-23-2-4W1) during the June 19, 2025, windshield survey.

The installation of tile drainage 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. As previously indicated in Section 9.2.3, during project engagement, specific landowners requested for the gas transmission line to be installed at a greater depth on their properties to facilitate potential future tile drainage development land use changes. Mitigation to address this request has been included in Section 9.5.2.3.

9.3.5.3 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 (Canola Council of Canada 2024).

Currently, there are no economic 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).

The Municipality of Rhineland and RM of Stanley both have reported *Plasmodiophora brassicae* spores per gram of soil in the 1,000-10,000 range (Table 9-11; Figure 9-3; Manitoba Agriculture 2024[c]), while the City of Winkler is reported as Not tested. No municipalities 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

Municipality	Spores per gram of soil
Rhineland	1,000-10,000
Stanley	1,000-10,000

Table 9-11 Clubroot distribution in the RAA

Municipality	Spores per gram of soil
Winkler	Not tested

NOTES:

Clubroot symptoms are typically observed 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.

The Town of Altona is not reported on 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

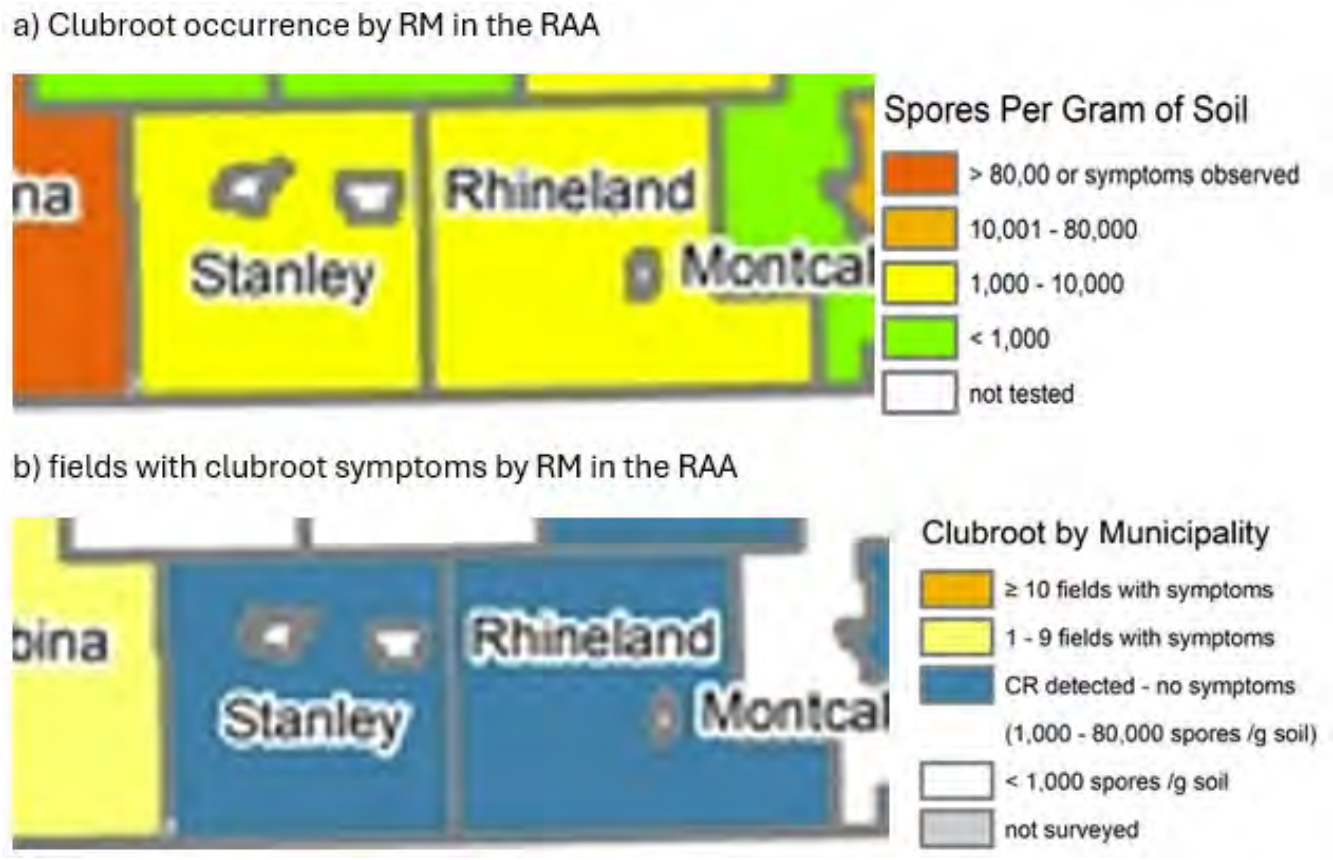


Figure 9-3: Clubroot occurrence within the RAA (modified from Manitoba Agriculture 2024[c])

In 2014, Verticillium wilt in canola caused by *Verticillium longisporum* was detected in Manitoba. 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 2023). 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 RM of Rhineland has confirmed cases of SCN, while the RM of Stanley was surveyed but did not have cases confirmed (Figure 9-4). Agricultural lands within the City of Winkler, City of Morden and Town of Altona were not surveyed according to the presented data.

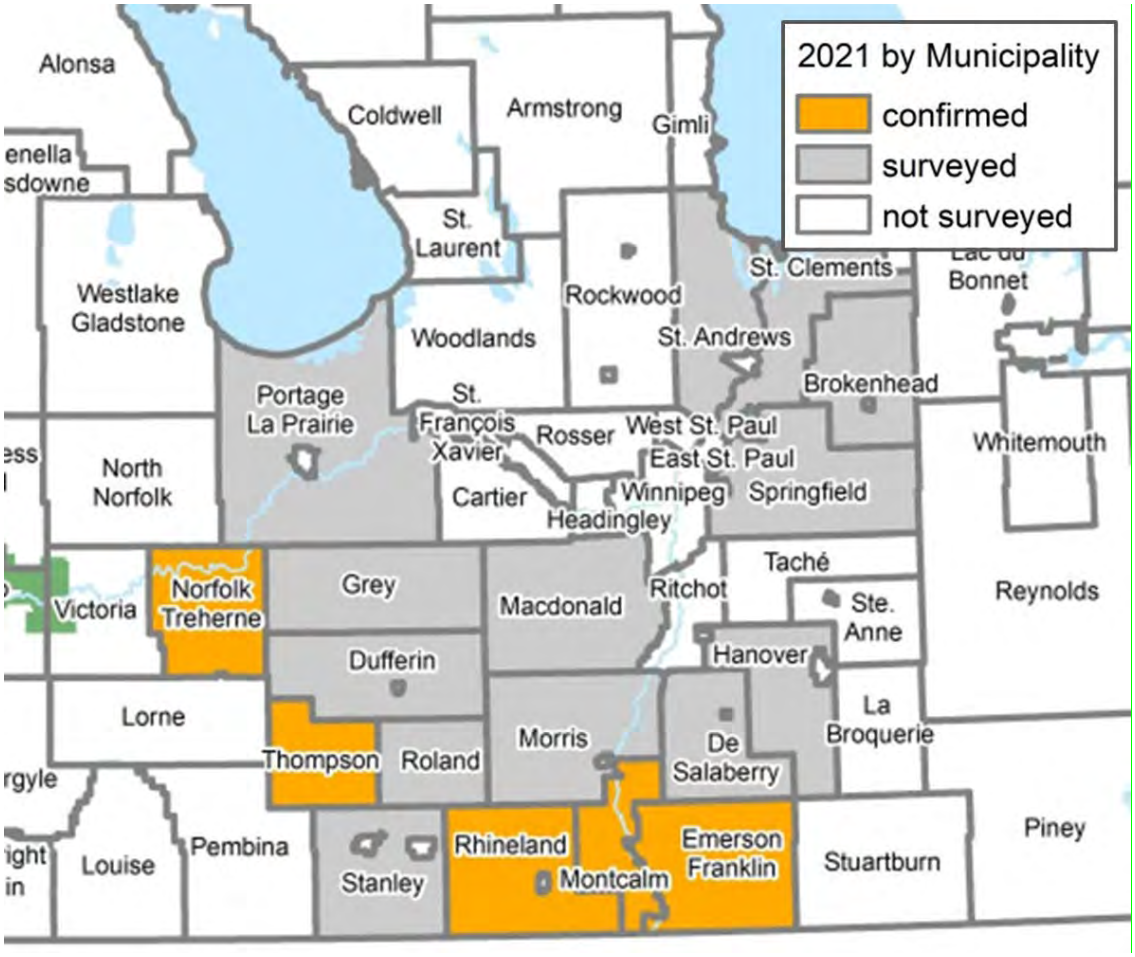


Figure 9-4 Soybean cyst nematode (modified from Manitoba Pulse & Soybean Growers 2023)

9.3.6 Livestock and other value-added operations

As discussed in Section 9.3.2, livestock production is a practice within the RAA. A windshield survey and orthoimagery review confirmed the presence of livestock operations within the LAA, although livestock is considered a minor practice relative to annual cropping within the LAA.

Livestock related activities and other value-added agricultural operations (*e.g.,* beekeeping/honey operation) within the LAA were confirmed through the windshield survey completed in June 2025. 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 small dairy operation was observed within the LAA, along with three other grain operations. Two sites with livestock production related infrastructure (*e.g.,* pens) were noted but no active livestock production activities were confirmed. A honey operation was also confirmed within the LAA. A landowner mentioned the presence of a strawberry farm that could fall within the LAA, northeast of Blumengart.

No other agricultural value-added operations were found within the LAA. An area of concentrated industrial development within the City of Winkler in the northwestern extent of the LAA, adjacent to the PDA, was not inventoried in detail due to the concentrated, commercial and industrial land use.

Table 9-12 Livestock, grain and other value-added operations within the LAA

Legal location	**Type of operation**	**Comment**
NW 17-2-1-W1	Grain & Specialty	Klassen Family Farm Buffalo Creek Honey
SE 19-2-1-W1	Dairy	Cattle in yard & honey for sale
NE 24-2-2-W1	Cattle	Likely former cattle operation, but does not appear to be active
NW 24-2-2-E1	Grain	R&E Farms Grain Yard
NW 23-2-2-E1	Livestock	Livestock pens, but no livestock observed in yard

Table 9-12 Livestock, grain and other value-added operations within the LAA

Legal location	**Type of operation**	**Comment**
SE 25-2-3-W1	Strawberry farm	Location based on desktop review, will be confirmed with landowner prior to construction.

9.3.6.1 Livestock biosecurity

The introduction or spread of diseases can be 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 an example of a disease of concern for livestock in the region and is a concern that was specifically raised by raised by Manitoba Beef Producers through project engagement. Anthrax is a disease that quickly kills cattle, sheep, and other grazing livestock (Canadian Food Inspection Agency 2024) and appears regularly in Manitoba. Conditions such as flooding, drought and recent digging can bring anthrax spores into close contact with grazing animals (Manitoba Agriculture 2024[e]). Therefore, activities resulting in soil disturbance, such as soil stripping and excavation, have the potential to disturb anthrax spores.

While active livestock operations are limited within the vicinity of the project, biosecurity is of importance in maintaining the integrity of the operations and health of livestock present in the vicinity of project work areas.

9.4 Project interactions with commercial agriculture

Table 9-13 identifies, for each potential effect, the physical activities that might interact with commercial agriculture and result in the identified effect.

Table 9-13 Project interactions with commercial agriculture

Project activities/components	**Loss and/or Degradation of agricultural land**	**Conflict with agricultural activities**
Construction of pipeline, control points, and Winkler (GS-140) gate station expansion		
Mobilization and staff presence	–	–
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas, *e.g.,* marshalling yards	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	–	✓
Pipe installation, *i.e.,* trenching and lowering	–	✓
Horizontal directional drilling	–	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	–	✓
Backfilling and contouring	✓	✓
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	–	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		

Table 9-13 Project interactions with commercial agriculture

Project activities/components	**Loss and/or Degradation of agricultural land**	**Conflict with agricultural activities**
Presence of pipeline and control points	✓	–
Vehicle and equipment use	✓	✓
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓
Valve operation checks (annually)	–	–
Vegetation management	–	–
Decommissioning of pipeline and control points		
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	✓	✓

9.5 Assessment of project effects

Although effects to commercial agriculture could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction. This is primarily because of the potential for construction activities to prevent access for field operations (*i.e.,* temporary land loss) and the potential for construction equipment operations to cause damage to soils and crops and disrupt livestock operations.

No effects to commercial agriculture are anticipated to result from certain project activities including mobilization and staff presence (construction and operation phases), annual valve operation checks and vegetation management.

All other project activities have potential pathways of effect that may result in changes to commercial agriculture including the following potential effects as previously identified.

- 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.

This section presents the assessment of residual project and cumulative effects for commercial agriculture. A sub-section covering the following topics is included for each of the potential effects on commercial agriculture:

- Analytical assessment techniques
- Effects pathways for construction, operations, and decommissioning phases
- Mitigation
- Characterization of residual effects

9.5.1 Loss and/or degradation of agricultural land

For the potential effect of loss of land for agricultural production and/or the degradation in capability or productivity of land for agricultural production due to the project, two types of land loss are considered:

- Temporary land loss associated with the construction phase of the project. Temporary land loss refers to lands currently under agricultural production, which

will not be available for production activities for all or a portion of a growing/production season during construction (*i.e.,* generally during May to October each year), due to project activities.
- Permanent land loss pertains to the operational phase of the project. Permanent land loss refers to lands currently under agricultural production which will no longer be available for production activities following construction and through to decommissioning of the project.

Degradation of land may include decreased land capability for agriculture and/or reduced soil productivity. Examples of when degradation may result in decreased land capability include loss of topsoil (*e.g.,* under-stripping, erosion loss, stockpile and handling mismanagement), mixing of topsoil with subsoil (*i.e.,* over-stripping) or mixing poor quality lower subsoil with better quality upper subsoil. Poor quality subsoils may consist of those with high concentrations of salts (*i.e.,* saline) or carbonates (*i.e.,* highly alkaline), highly contrasting textures (*e.g.,* clay underlying sand or sand underlying clay), high coarse fragment content (*e.g.,* gravelly, stony), or subsoils which are structureless and highly compacted. Reductions in soil productivity are generally characterised as shorter-term effects than decreased land capability and may include compaction from construction equipment or a change in nutrient or moisture status, typically due to dilution or change in soil texture due to admixing.

9.5.1.1 Analytical assessment techniques

The following analytical assessment techniques are used for temporary land loss, permanent land loss and degradation of agricultural land:

Temporary land loss estimation

Estimates for areas of temporary land loss during the construction phase assume that the entire portion of the PDA under agricultural land use will be unavailable for agricultural use and activities during the construction period.

Permanent land loss estimation

Permanent land loss refers to the area that will be occupied by project structures or permanently disturbed footprints (*e.g.,* footprint of control point near Plum Coulee) and 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 occupied by above-ground project structures and permanently

disturbed footprints, as provided in the project description (Chapter 2.0), which will not allow for existing agricultural production to continue.

Degradation of agricultural land

Analytical assessment techniques for degradation of agricultural land include the guidelines presented in Soil Capability Classification for Agriculture (The Canada Land Inventory 1969) for determining agricultural capability class and utilizing Manitoba soil series names and correlations to establish agricultural (soil) capability ratings, and site-specific assessments following construction as/if required based on issues or concerns raised by producers.

9.5.1.2 Effects pathways

Construction

During construction of the pipeline and control points, 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 95 ha, 79 ha (195 ac or 83% of the PDA) is under annual crop production (Table 9-10). Of this annual crop production area, approximately 65% was under high-value row crop production and 35% under cereal/oilseed production in the 2023 growing season. Only 1 ha (2.5 ac) of land within the PDA was classified as natural hayland (*i.e.,* range or grassland) and no area was classified as seeded hayland (or forage) during the 2023 growing season. Therefore, the total temporary loss of commercial agricultural land is estimated to be 80 ha (198 ac).

As shown in Table 9-7, the area of PDA under agricultural land use predominantly falls under Class 1 agricultural capability (53%), and with an appreciable portion considered Class 2 (31%) and Class 3 (15%). In other words, the majority of the PDA, which will be temporarily unavailable to producers during construction, is considered prime agricultural land.

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 (*i.e.,* mixing of topsoil with subsoil), and erosion. These effects can result in changes to land capability and soil productivity, and, in turn, 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 and 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 likely affect 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 footprint will be underground and land within the PDA would be returned to agricultural land use following construction, the presence of project structures is anticipated to have a minimal effect on land loss.

A potential expansion to the north of the existing Winkler GS-140 gate station would be within Centra Gas owned property and is not anticipated to extend into agricultural land.

An easement will be required at the Plum Coulee control point in NW-26-2-3-W1 for the above-grade structures including grade piping, valves and bollards to protect the control point. The easement is located within annual cropland and is assumed to occupy an area of 0.040 ha (400 m^2) for the purposes of this assessment, including for estimating permanent land loss. The actual structure assembly will likely occupy a smaller area than the easement. This is a conservative approach as some of the land within the easement area could still be available for agricultural use as the gravel pad surrounding the above-grade structures does not typically extend to the boundaries of the easement area. A typical above-grade control point assembly is shown in Photo 9-2.



Photo 9-2: Example of a typical above-grade control point assembly

Therefore, it is assumed the project will result in 0.040 ha (0.10 ac) of agricultural land under annual cropping being lost at the location of the new Plum Coulee control point installation within NW-26-2-3-W1. 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.

There is also the potential for soil disturbance / degradation to occur during operations and maintenance, albeit to a lesser degree and extent than during the construction phase. Degradation may occur during vehicle and equipment use, maintenance activities and ground pipeline patrols.

Decommissioning

Decommissioning will be required at the end of the project life, which is anticipated to be at least 50 years in the future. Decommissioning is estimated to occur within a one-year period once the project has reached the end of its serviceable life. While full details of project decommissioning are not yet developed, it is anticipated that

above-ground structures will be removed and land occupied by those structures is anticipated to be returned to pre-project land use. In other words, agricultural land considered to be a permanent land loss because of the project could be returned to agricultural land use following project decommissioning. It is anticipated that the buried pipeline will be left in place, and additional disturbance during decommissioning along the pipeline route, except for in areas of above-ground structures, will be negligible.

9.5.1.3 Mitigation for loss and/or degradation of agricultural land

Mitigation for permanent loss of agricultural land primarily involves compensation paid to producers for land permanently removed from agricultural use due to the presence of above-ground infrastructure. Manitoba Hydro's compensation policy (*i.e.,* the structure impact portion) takes into consideration agricultural land permanently removed from production 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 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 Invasive Species Management Plan. This plan will be developed before construction and would be part of the overall Environmental Protection Program, as described in Chapter 16.0.
- 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:

- A pre-construction soil survey will be undertaken along the pipeline route to facilitate development of project-specific topsoil stripping depth and soil handling recommendations.
- Effects of soil compaction and rutting will be mitigated by managing equipment traffic routes and activities for access development, temporary work area setup, right-of-way preparation, pipeline stringing and installation, and control point preparation. Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.

- 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 of compaction (*e.g.,* deep ripping or tillage)
- 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 considered to avoid compaction and admixing
- Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing of erosion protection and sediment control plans. The objective of these will be to limit adverse environmental effects of sediment releases on the aquatic environment. These will be developed in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.

9.5.1.4 Characterization of residual effects on loss and/or degradation of agricultural land

After mitigation, predicted residual effects on the loss and/or degradation of agricultural land include:

- Temporary land loss during the construction period in the amount of 80 ha (198 ac). However, compensation will be provided to offset the effects of this temporary land loss to agricultural producers.
- Permanent land loss through the operation and maintenance phase of the project in the amount of 0.040 ha (0.10 ac). However, compensation will be provided to offset the effects of this permanent land loss to agricultural producers.

With mitigation, the project is not anticipated to result in a loss in land capability. With topsoil stripping and other construction mitigations, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. However, reductions in crop yield within the PDA may persist into the operations and maintenance phase.

Following the implementation of mitigation measures described above, residual effects for loss and/or degradation of agricultural land are characterized as follows:

- Direction: Adverse to Neutral
- Magnitude: Low to Moderate
- Geographic extent: PDA
- Duration: Medium-term
- Frequency: Single event to Irregular

- Reversibility: Reversible

9.5.2 Conflict with agricultural activities

The project has the potential to result in conflict with agricultural activities during construction, operation, and decommissioning phases. As described in Section 9.2.3, during project engagement, landowners and a representative producer/commodity organization 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, drainage 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 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 applications (*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.

9.5.2.1 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.

9.5.2.2 Effects pathways

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), particularly if construction takes place 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 PDA, and buildings and structures within the PDA would have to be removed or relocated. No agricultural buildings have been identified within the PDA.

A feature that appears to be a human-made small water retention structure (*i.e.,* dugout) is partially located within the PDA at NW-27-2-3-W1; however, it is unknown if this dugout is actively used for agriculture or other purposes. If the dugout is confirmed to be for agricultural use during landowner engagement prior to construction, as mentioned in Section 9.5.2.3, Manitoba Hydro would discuss and determine the appropriate mitigation for effects to the dugout with the associated landowner.

The PDA traverses and parallels numerous shelterbelts, some of which have agricultural purpose (*i.e.,* protection of soil from wind erosion). Where the PDA

traverses shelterbelts, removal of the associated shelterbelt footprints could be needed during construction. As mentioned in Section 9.5.2.3, compensation would be provided as mitigation for removal of shelterbelts.

In fields where tile drainage has been installed, construction planning and activities must consider maintenance of functional operation of tile drains. This may include locating, cutting and capping tile lines at the construction trench during construction and reconnection of tile drain lines following construction. Alternate approaches may be suitable and could be determined in discussions with landowners.

In fields with irrigation systems and infrastructure (*e.g.,* buried pipelines, buried electrical service lines) in place, specific construction mitigation plans are required to avoid damage to infrastructure and provide assurance that systems will remain functional following construction of the project.

As mentioned in Section 9.5.2.3, landowners will be engaged with regarding construction and reclamation plans specific to existing irrigation and tile drainage installations as mitigation for effects to these features.

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 seedbed 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 the right-of-way and any construction activities taking place within the agricultural portions of the PDA and coinciding with agricultural operations. While not anticipated based on the available information about existing 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) 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 construction through the use of vehicles and equipment, and through project crews moving between fields. 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.

Adherence to Manitoba Hydro's agricultural biosecurity policy and implementation of Manitoba Hydro's agricultural biosecurity SOP which are both outlined in Section 9.2.2.3 is anticipated to adequately address potential additional biosecurity risks during project construction.

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 safety and property damage related risks inherent in completing field operations while other machinery and workers are in the field.

While the presence of new above-ground infrastructure is limited, these above-ground structures in cropping fields may create extra management effort for producers to work around structures. In addition, there are safety and property damage related risks inherent with operating farm machinery in proximity to the structures. It is the responsibility of farmers and operators to avoid structures while operating wide equipment and 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, and this was raised as a concern by some landowners who requested installation of the pipeline at a greater depth on their land, during project engagement (see Section 9.2.3). While the installation of tile drains following the project would still be an option to producers, the presence of the project may influence tile drainage system design.

Tile drainage design would have to consider the buried gas pipeline and the optimal tile depth and a layout that may have been appropriate 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 tile drainage layouts 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.

As indicated in Section 9.5.2.3, Manitoba Hydro will engage with landowners regarding construction and reclamation plans specific to existing irrigation and tile drainage installations, as mitigation to facilitate potential future tile drainage development.

Increased biosecurity risk

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 create 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.

Adherence to Manitoba Hydro's agricultural biosecurity policy and implementation of Manitoba Hydro's agricultural biosecurity SOP which are both outlined in Section 9.2.2.3 is anticipated to adequately address potential additional biosecurity risks due to project activities during operation and maintenance.

Decommissioning

Decommissioning will be required at the end of the project life, which is anticipated to be at least 50 years in the future. Decommissioning is estimated to occur within a

one-year period once the project has reached the end of its serviceable life. While full details of project decommissioning are not yet developed, it is anticipated that above-ground structures will be removed and that the buried pipeline will be left in place. Any decommissioning activity that overlaps with the crop growing season (*i.e.,* typically May to October) has the potential to interfere or cause conflict with agricultural activities. Scheduling decommissioning activities occurring in areas beyond the aboveground structures outside of the growing season would be preferable to reduce the potential for conflict with agricultural activities.

9.5.2.3 Mitigation for conflict with agricultural activities

Mitigation for conflict/interference with agricultural activities includes the following:

- 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.
- Landowners will be engaged with regarding construction and reclamation plans specific to existing and potential future irrigation and tile drainage installations, and surface drainage features, prior to construction.
- Where conflict and/or interference can't be avoided including where timing of project activities overlaps with producer activities during the growing season, Manitoba Hydro will pay compensation pursuant to the Landowner Compensation Program, as detailed below.
- Construction damage compensation is offered to landowners who experience damage to their property due to the construction, operation and maintenance of the pipeline. It will be provided to compensate a landowner for damages such as the reapplication or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the expertise of the landowner.
    - This will include damage to existing irrigation or drainage infrastructure, in the event this occurs.
- Structure Impact Compensation is a one-time payment to landowners for each structure placed on land classed as agricultural. Structure Impact Compensation will cover:
    - reduced productivity in an area of overlap around each structure
    - additional time required to maneuver farm machinery around each structure
    - double application of seed, fertilizer and weed control in the area of overlap around each structure

- Ancillary damage compensation is a one-time payment when Manitoba Hydro's use of the right-of-way directly or indirectly affects the use of the property. It will be provided for:
  - constraint effects such as restricted access to adjacent lands
  - traditional effects such as highest and best use of land
  - shelterbelt removal effects

Mitigation for increased biosecurity risk includes the following:

- Manitoba Hydro staff and contractors will be trained on Manitoba Hydro's corporate policy on biosecurity (Manitoba Hydro 2023a) and agricultural biosecurity SOP (Manitoba Hydro 2023b) and will follow this SOP during construction and operation and maintenance activities. Measures to be implemented in line with general considerations of the agricultural biosecurity SOP include:
  - Completion of a risk assessment to identify the perceived risk to agricultural land from maintenance and construction activities using frequency of activities and consequence levels (field conditions such as wet or frozen)
  - If existing farm level biosecurity measures exist, Manitoba Hydro staff and contractors will strive to meet the requirements of the agricultural operation when access is required
  - Where possible, regular operation and maintenance activities (including patrols) on agricultural lands will be scheduled after crops have been harvested and conducted primarily after freeze-up
  - Avoiding access through areas that may contain manure.
- Per the agricultural biosecurity SOP (Manitoba Hydro 2023b), Manitoba Hydro staff or contractors will complete the following requirements (detailed, scenario-based procedures will be followed by staff and contractors, as presented in the agricultural biosecurity SOP):
  - While working in livestock settings (*i.e.,* a property or portion of a property where livestock are kept):
    - Visually inspect, clean and disinfect tools and footwear before entering and leaving fields or identified controlled access zones (*e.g.,* a zone defined by a livestock producer to control entry onto their property).
    - Visually inspect and mechanically clean vehicles, if vehicles used in fields or identified controlled access zones. Pressure washing vehicles may be necessary if heavily soiled.
    - Record all actions and procedures followed.
    - Boot covers may be required in livestock settings in certain instances

    - While working in crop settings (*i.e.,* a property or portion of a property where crops such as corn, wheat or canola are grown):
        - Vehicles, equipment, tools and footwear should enter and exit fields in a clean condition.
        - Mechanically clean vehicles, equipment, tools and footwear.
        - If mechanical cleaning is not sufficient, one or both of the following is required: 1) disinfection of vehicles, equipment, footwear and tools for footwear is required, 2) washing (pressure or mobile) at the field approach or off site.
        - Record all actions and procedures followed.
- In addition, Manitoba Hydro will:
    - Discuss with landowners and/or producers ways to minimize effects to agricultural operations where construction or maintenance activities have the potential to interfere with field activities.
    - Ask producers or landowners to avoid spreading manure or pasturing livestock, if applicable, in the pipeline right-of-way prior to construction.
    - Require all equipment to arrive at the right-of-way or project site clean and free of soil or vegetative debris (including weed seeds).

9.5.2.4 Characterization of residual effects on conflict with agricultural activities

Following the application of mitigation, while the potential for conflict with agricultural activities remains, the magnitude of these effects and the extent over which they are experienced will be reduced. 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. 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.

With mitigation, the magnitude of the residual effects related to conflict with agricultural activities is anticipated to be low, with the exception of residual effects on future potential tile drainage installations, and the extent over which they will be experienced is anticipated to be limited to the LAA. Residual project effects 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).

Following the implementation of mitigation measures described above, residual effects for conflict with agricultural activities are characterized as follows:

- Direction: Adverse
- Magnitude: Low to moderate
- Geographic extent: LAA
- Duration: Short-term
- Frequency: Single event to irregular
- Reversibility: Reversible

9.5.3 Summary of residual effects characterizations

Table 9-14 characterizes the residual effects on commercial agriculture.

Table 9-14: 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

9.5.4 Cumulative effects

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

- the project has residual effects on the commercial agriculture, 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.

Adverse residual effects from the project on commercial agriculture are anticipated to be of low to moderate magnitude and reversible on project decommissioning. There is the potential for residual effects from the project to act cumulatively with residual effects of other past, present, or reasonably foreseeable future physical activities. As both of the above-stated conditions are met a cumulative effects assessment for commercial agriculture was completed and is presented below.

9.5.4.1 Project residual effects likely to interact cumulatively

Table 9-15 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact commercial agriculture.

Table 9-15: 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	–	–
Recreational activities	–	–
Industrial and commercial resource use, including commercial agriculture	✓	–
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Residential and institutional developments	✓	–
Potential future projects and activities		
Dominion City to Altona gas transmission pipeline (Manitoba Hydro 2024)	✓	✓
RM of Stanley Regional Wastewater Collection System (AECOM 2025)	–	–

Table 9-15: 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
Proposed residential developments	✓	–

✓ = 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.

9.5.4.2 Cumulative effect on loss and/or degradation of agricultural land

Pathways for cumulative effect

Past and present projects that were identified as having potential cumulative effects on commercial agriculture with the effects of this project include developments which have contributed to agricultural land loss throughout the RAA. These are primarily residential developments, non-Manitoba Hydro infrastructure such as roads, railways, water and wastewater facilities, and industrial and commercial resource use. These types of projects generally have a permanent land use change across the entire footprint of the project. If land use under these projects was commercial agriculture prior to development, these footprint areas constitute a permanent loss of land for commercial agriculture.

Other infrastructure projects including Manitoba Hydro hydroelectric transmission and natural gas projects, other pipelines, telecommunication lines generally have relatively small areas of permanent land loss, as most areas disturbed by these projects are returned to prior land use following project development, including to commercial agriculture (see Table 9-15).

An aspect for consideration with respect to cumulative effects to commercial agriculture is at least some of the existing/ongoing projects and activities have been developed to support the commercial agriculture sector in the RAA. For example, some of the existing development used at least partially to support commercial

agriculture are the municipal roads, provincial roads and highways, and rail lines. In other words, much of the built-up area within the RAA was necessary to support the development of commercial agriculture itself.

Mitigation measures

The implementation of mitigation measures described in Sections 9.5.1.3 and 9.5.2.3 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.

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 14 and Provincial Trunk Highway 32, provincial roads, buried pipelines and overhead transmission lines, and other non-linear infrastructure, including commercial and urban development for example, around Winkler, Reinfeld, and Altona. 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, 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.

9.5.4.3 Cumulative conflict with agricultural activities

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 including Manitoba Hydro hydroelectric and natural gas infrastructure, and other infrastructure such as telecommunications and pipelines (Table 9-15). These developments have contributed to conflict with agricultural activities throughout the RAA, due to the presence of aboveground infrastructure and facilities.

Mitigation measures

The implementation of mitigation measures described in Section 9.5.2.3 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.

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 9.5.2.2.

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.

9.5.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on commercial agriculture are predicted to be not significant. 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).

9.5.6 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 project engagement. A windshield survey was conducted to provide additional information on agricultural land use and buildings within the LAA. While some of the available desktop data are limited in scale, 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 9.5.1.3 and Section 9.5.2.3 are standard practice and have been implemented on previously completed transmission projects. Finally, the significance conclusion is based upon a well-founded understanding of 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.

9.5.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a valued component monitoring plan for commercial agriculture 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). Additionally, if producer concerns are raised during construction or operation and maintenance phases of the project, Manitoba Hydro is committed to follow-up as appropriate.

A planned follow-up activity is the completion of a soil survey along the pipeline route to inform soil stripping and handling recommendations to minimize the effects to agricultural land capability and soil productivity from project construction. It is anticipated this follow-up activity will be completed in 2026, prior to construction.

9.5.8 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.

Proposed Altona to Winkler Natural Gas Transmission Pipeline

Rosebank
Roland
Morris
Morden
Winkler
Osterwick
Reinland
Blumenort
Altona
St. Joseph
UNITED STATES OF AMERICA

338 336 422 330 23 246 75 428 332 217 3 432 306 14 426 32 30 201 421 243 521 524

Project Infrastructure

- Final Preferred Route

Assessment Area

- 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
- Marsh and Fens
- Open Decidious Forest
- Range and Grassland
- Water

Designated and Protected Lands

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

Landbase

- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- City/Town

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 5 10 Kilometres
0 3 6 Miles

1:225,000

Spatial Boundaries for Commercial Agriculture

Draft/Confidential: For Discussion Purposes Only

Map 9-1

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\wpdata\Tfos1\GIS\Orlen\PRJ_GAS\2025 AltonaWinkler\EAM\mxd\EAMaps\EAMaps.aprx

Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Assessment Area
- 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
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- City/Town

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Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

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Agricultural Capability in the Commercial Agriculture Assessment Areas

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Map 9-2

To request accessible formats visit hydro.mb.ca/accessibility

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Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Assessment Area
- Commercial Agriculture Local Assessment Area
- Commercial Agriculture Regional Assessment Area

Soil Compaction Risk Ratings
- H - High
- L - Low
- M - Moderate
- Unclassified

Landbase
- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- City/Town

Rosebank
Roland
Morris
Morden
Winkler
St. Joseph
Altona
Osterwick
Reinland
Blumenort
UNITED STATES OF AMERICA

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

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0 3 6 Miles

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Soil Compaction Risk Ratings

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Map 9-3

To request accessible formats visit hydro.mb.ca/accessibility

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Proposed Altona to Winkler Natural Gas Transmission Pipeline

Project Infrastructure
- Final Preferred Route

Assessment Area
- Commercial Agriculture Local Assessment Area
- Commercial Agriculture Regional Assessment Area

Crop Type Distribution
- Cereal/Oilseed
- Natural Hayland
- Non-Agriculture
- Other Crops
- Row Crops
- Seeded Hayland

Landbase
- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- City/Town

Rosebank
Roland
Morris
Morden
Winkler
St. Joseph
Altona
Osterwick
Reinland
Blumenort
UNITED STATES OF AMERICA

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 5 10 Kilometres
0 3 6 Miles

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Crop Type Distribution 2024

Draft/Confidential: For Discussion Purposes Only

Map 9-4

To request accessible formats visit hydro.mb.ca/accessibility

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10.0Human health risk

For the purposes of this assessment, human health risk refers to the potential for harm or adverse effects to the health of individuals and communities and considers potential changes to environmental conditions attributable to the project that can influence human health. Human health risk was included as a valued component (VC) because it has been assessed as part of other effects assessments for similar projects and has been a concern shared through project engagement on other Manitoba Hydro projects.

10.1 Summary of conclusions

The Altona to Winkler gas transmission project is anticipated to have adverse residual project effects on human health risk. The residual project effects include the following:

- A decrease in air quality resulting from vehicles and heavy machinery generating fugitive dust, particulate matter, and combustion products.
- An increase in noise levels resulting from the presence of staff, vehicles and equipment

The residual project effects on human health risk are anticipated to be the most pronounced during the construction phase because of the heaviest use of heavy equipment, machinery and vehicles, all of which can contribute to adverse effects on air quality and noise levels.

Adverse residual project and cumulative effects to human health risk are anticipated to be not significant because the project is not anticipated to contribute to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions that exceed the Canadian Ambient Air Quality Standards (CAAQS) red management level nor is it anticipated that project-related noise will exceed Manitoba's provincial noise guidelines for residential and commercial areas for daytime conditions and result in greater than five noise complaints to the province.

10.2 Scope of the assessment

This chapter assesses the effects of project activities during construction, operation, and decommissioning on human health risk.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent

Neepawa gas transmission project, the Dominion City to Altona gas transmission pipeline, and electrical transmission projects (*e.g.,* the Dorsey to Wash'ake Mayzoon transmission project and the Silver to Rosser tap transmission project).

10.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

10.2.2 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 human health risk.

- **Canadian Ambient Air Quality Standards:** Developed by the Canadian Council for Ministers of the Environment, the Canadian Ambient Air Quality Standards (CAAQS) set management levels for fine particulate matters, ozone, nitrogen dioxide and sulfur dioxide. The CAAQS also include recommended management actions to control pollutant levels (Canadian Council of Ministers of the Environment 2019). These standards are intended to protect both human health and the environment.
- **Manitoba Ambient Air Quality Standards and Objectives**: Regulatory requirements are in place for assessing potential project-related change to air quality by Manitoba Environment and Climate Change based on the Manitoba Ambient Air Quality Guidelines and Objectives (Government of Manitoba 2005).
- **Health Canada noise guidance**: Noise-induced outcomes are considered health effects by Health Canada, and 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, and provides a guidance document for evaluating human health impacts of noise through the environmental assessment process (Health Canada 2017).
- **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 provide a reference document for noise monitoring when handling noise complaints.

- **Municipal by-laws:** the Municipality of Rhineland By-Law No. 2025-04 and the City of Winkler By-Law No. 2139-15 include noise restrictions related to construction and excavation work, stating that no noise can occur between the hours of 11:00 p.m. and 6:00 a.m. except in the case of urgent necessary and permitted by Council. The Town of Altona By-Law 1831/2025 notes that any activities that create a noise nuisance within a residential district are limited to the hours of 7:00 a.m. and 11:00 p.m.

10.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide project-related feedback. To date, no concerns related to human health risk 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 human health risk have been based mostly around safety, specifically, increased traffic during construction, and safety procedures in place in the event of a pipeline leak or explosion.

10.2.4 Potential effects, pathways, and measurable parameters

The potential project effects on human health risk, along with effects pathways and measurable parameters are outlined in Table 10-1.

Table 10-1: Potential effects, effects pathways, and measurable parameters for human health risk

Potential effect	Effect pathway	Measurable parameter(s) and units of measurement
Decrease in air quality	Emission of dust and exhaust from vehicles and equipment, posing a potential increase in human health risk via inhalation of criteria air contaminants.	CAAQS levels for criteria air contaminants Qualitative assessment of whether exposure to criteria air contaminants represent potential human health risk
Increase in noise levels	Increased noise or change in the type of noise resulting from project activities.	Assessment of noise risk based on project activities, provincial guidelines and municipal by-laws

10.2.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on human health risk:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project description).
- **Local assessment area (LAA):** includes all components of the PDA and consists of a 1.5 km buffer around the PDA. This area represents properties that will be traversed and immediately adjacent to the project and are most likely to experience direct human health risks from the project.
- **Regional assessment area (RAA):** includes the PDA and LAA and includes the administrative boundaries of the RM of Stanley, the Municipality of Rhineland, the City of Winkler and the Town of Altona. The City of Morden is also included within the boundary of the RAA due to the city being surrounded by the RM of Stanley. This assessment area is sufficiently broad to encompass cumulative effects, including the incremental effects of the project. The RAA 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 10-1 illustrates the spatial boundaries for the assessment of project effects on human health risk.

10.2.6 Temporal boundaries

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

- Construction – estimated to take approximately 12 months, beginning in the summer of 2027
- Operation and 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

10.2.7 Residual effects characterization

Table 10-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on human health risk.

Table 10-2: Characterization of residual effects on human health risk

Characterization	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 human health risk relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to human health risk relative to baseline. **Neutral –** no net change in measurable parameters for human health risk relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No measurable change –** no discernable change to human health risk. **Low –** a change in human health risks or outcomes that can be measured, that is below regulatory benchmarks and not affecting daily activities. **Moderate –** a measurable change in human health risks or outcomes that is at or around regulatory

Table 10-2: Characterization of residual effects on human health risk

Characterization	Quantitative measure or definition of qualitative categories
	benchmarks and may moderately affect an individual's daily life and activities. **High –** a measurable change in human health 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 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 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

10.2.8 Significance definition

For this assessment:

- For changes in air quality, adverse residual effects are considered significant if the project contributes to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions from vehicles, equipment, or project activities that exceed the CAAQS red management level.
- For changes in noise level, adverse residual effects are considered significant when estimated audible noise exceeds Manitoba's provincial noise guidelines for residential and commercial areas for daytime 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.

10.3 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

10.3.1 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. Air quality in the province in more recent years has also been affected by smoke from forest fires and 2025 has been documented as the smokiest year on record in both Winnipeg and Thompson since Environment and Climate Change Canada began tracking in 1953 (CBC News 2025). Historically, air quality in northern Manitoba has been more impacted by wildfire smoke than in southern Manitoba (Manitoba Environment and Climate Change 2023). Transboundary flow of pollutants only impacts air quality in southern Manitoba.

As the RAA is primarily in an agricultural setting, air quality may also be affected by dust and other particulate matter emanating from agricultural activities like aerial

spraying of pesticides, application of fertilizers and manure, harvesting, and smoke generated by local crop burning programs (Government of Manitoba n.d.). The primary human health risk from crop burning and forest fire smoke is particulate matter of less than 2.5 µm or 2.5 parts per million ($PM_{2.5}$) (Health Canada 2024).

In 2012, the Canadian Council of Ministers of the Environment committed to implementing a national Air Quality Management System 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 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 n.d.).

$PM_{2.5}$ levels from the most recent 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).

10.3.2 Noise

Existing noise levels in the assessment areas will be typical of urban and rural settings. Noise levels in the urban areas around the Town of Altona, the Local Urban District of Plum Coulee, and the City of Winkler, may be higher than noise levels in the surrounding rural areas. Elevated noise levels 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.

10.3.3 Regional population health

The project falls within Zone 3 of the Southern Health–Santé Sud Regional Health Authority (RHA). The RHA includes 4 cities, 5 towns, 1 village, 7 First Nations, and 28 municipalities (Southern Health-Santé Sud 2024b). Over the last decade, the Southern Health–Santé Sud RHA has been the fastest growing RHA in the province, growing by 21.7% in comparison to the provincial average of 13.8%. The RHA is also experiencing a rapidly aging population, with individuals 65-74 growing by 49% in the last decade.

The Southern Health-Santé Sud RHA has lower levels of substance use disorders and smokers than the provincial averages (Southern Health–Santé Sud Regional Health Authority 2019). As the population ages, there are higher rates of people living with chronic diseases, including diabetes, total respiratory morbidity, and childhood asthma (Southern Health-Santé Sud 2024a). The region also experiences lower than provincial averages for several immunizations and screenings for certain types of cancers (Southern Health-Santé Sud 2024a).

10.3.4 Self-rated health and well-being

Although the intent of this environmental assessment is to quantify the effects of the project on the environment and communities, we recognize that individuals and different 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).

On previous Manitoba Hydro projects, engaged audiences have shared concerns related to potential and/or perceived effects from projects, and have noted that these concerns lead to an increase in stress. 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 been found to be linked to a greater risk of developing chronic physical conditions, including diabetes, heart disease and

stroke, respiratory conditions, and cancers (Canadian Mental Health Association, Ontario 2025).

During project engagement on the Dominion City to Altona gas transmission project (2024), participants shared concerns related to potential effects of the proposed transmission pipeline on health and well-being and the associated stress related to anticipating or potentially experiencing such effects. The concerns were based mostly around safety, specifically increased traffic during construction and safety procedures in place in the event of a pipeline leak or explosion. Accidents and malfunctions are covered in Chapter 15.0 of this report. Engagement feedback on previous projects warranted that the stress caused by potential effects be assessed as its own effects pathway. Although this feedback did not come up through project engagement on the Altona to Winkler gas transmission project and the pathway is therefore not carried forward for further assessment in this chapter, understanding the current perceived health status of individuals and communities in the RAA is helpful when considering potential project impacts on human health risk. 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 self-rated health categorizations 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 (2021-2022). 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. For men and women in the Southern Health-Santé Sud RHA, perceived life stress is slightly lower in comparison to the provincial and national average and the difference is statistically significant for women in comparison to the national average.

Table 10-3: Indicators for community well-being for the Southern Health-Santé Sud Regional Health Authority and provincial and national rates, 2021-2022

Geography	**Canada**		**Manitoba**				**Southern Health-Santé Sud RHA, Manitoba**					
Sex	**Males**	**Females**	**Males**		**Females**		**Males**			**Females**		
Characteristics	**Percent**	**Percent**	**Percent**	**Significantly different from the Canada rate**	**Percent**	**Significantly different from the Canada rate**	**Percent**	**Significantly different from the Canada rate**	**Significantly different from the provincial rate**	**Percent**	**Significantly different from the Canada rate**	**Significantly different from the provincial rate**
Perceived health, very good or excellent	58.8	56.2	56.6	0	56.3	0	64.2	0	–	60.4	0	–
Perceived health, fair or poor	12.0	13.2	11.1	0	12.1	0	11.2	0	–	9.3	-1	–
Perceived mental health, very good or excellent	61.2	52.8	59.7	0	51.0	0	60.8	0	–	55.3	0	–
Perceived mental health, fair or poor	11.3	14.9	11.0	0	15.4	0	8.9	0	–	15.3	0	–
Perceived life stress, most days quite a bit or extremely stressful	18.9	23.2	19.9	0	19.0	-1	18.5	0	–	17.4	-1	–
Sense of belonging to local community somewhat strong or very strong	66.8	67.20	69.3	1	69.0	0	72.5	1	–	73.4	1	–

All data is total population 12 years and older, for the 2021-2022 reference period (most recent available data) from the Canadian Community Health Survey

–: not available for the specific reference period

Source: Statistics Canada 2025.

10.4 Project interactions with human health risk

Table 10-4 identifies, for each potential effect, the physical activities that might interact with human health risk and result in the identified effect.

Table 10-4: Project interactions with human health risk

Project activities/components	**Decrease in air quality**	**Increase in noise levels**
Construction of pipeline, control points, and Winkler (GS-140) gate station expansion		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Access development	-	-
Temporary work areas (*e.g.,* marshalling yards, laydown 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	✓	-
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	-	-

Table 10-4: Project interactions with human health risk

Project activities/components	**Decrease in air quality**	**Increase in noise levels**
Clean-up and reclamation	-	-
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	-
Vehicle and equipment use	✓	✓
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	-	-
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	-
Valve operation checks (annually)	-	-
Vegetation management	✓	-
Decommissioning of pipeline and control points		
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	-	-

Table 10-4: Project interactions with human health risk

Project activities/components	Decrease in air quality	Increase in noise levels

✓= Potential interaction

– = No interaction

10.5 Assessment of project effects

As presented in Section 10.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on human health risk. These effects are anticipated to be most pronounced during the construction phase of the projects for each of the potential effects assessed:

- Decrease in air quality
- Increase in noise levels

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 10-4, proposed mitigation measures, and the characterization of residual project effects.

10.5.1 Decrease in air quality

10.5.1.1 Analytical assessment techniques

The assessment of potential effects on air quality from criteria air contaminants is based on the change in exposure experienced by an individual that is predicted to occur between baseline (existing) conditions and project conditions, and whether project activities will generate criteria air contaminants that exceed CAAQS levels.

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.

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.

10.5.1.2 Effects pathways

Construction

During construction, the activities that are anticipated to contribute to a decrease in air quality include vehicle and equipment use, right-of-way preparation, pipe installation (as the result of trenching), and backfilling and contouring.

Vehicle and equipment use are anticipated to be the main pathway related to a decrease in air quality through the emission of exhaust and the generation of dust from operation vehicles and equipment.

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.

Operations

During operations, vehicle and equipment use and vegetation management are the two main pathways that are anticipated to contribute to a decrease in air quality. Vehicle and equipment use will affect air quality to a lesser extent than during the construction phase due to 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.

Where in-line inspection or integrity excavations and repairs may be required during operations, purging of the pipeline would take place, which will alter air quality for a short duration in a very localized area.

Decommissioning

Vehicle and equipment use associated with project decommissioning activities are anticipated to contribute to a decrease in air quality, similar to construction and operation. The effects would be to a lesser extent than those during construction due to the smaller size crew required for decommissioning.

Purging during decommissioning will also alter air quality, but in a very localized area and the effects will be short term.

10.5.1.3 Mitigation for decrease in air quality

Mitigation for decrease in air quality involves the following:

- Dust and vehicle emissions will be managed in a manner that considers the safe and continuous public activities near construction sites, where applicable.
- Construction staff will be encouraged to carpool to reduce the amount of traffic in the area.

10.5.1.4 Characterization of residual effects on decrease in air quality

After mitigation, predicted residual effects on the decrease in air quality include temporary, short-term reductions in localized air quality at and immediately around work sites during construction, operations, and decommissioning. This is the result of vehicles and heavy machinery generating fugitive dust, particulate matter, and combustion products.

The magnitude of change in health risk from this decrease in air quality is expected to be negligible. The construction phase is anticipated to have the relative highest magnitude of impact given the larger workforce size, but the change in air quality is not anticipated to result in emissions exceeding Manitoba's Ambient Air Quality Guidelines.

Following the implementation of mitigation measures described above, residual effects for a decrease in air quality are characterized as follows:

- Direction: Adverse
- Magnitude: Negligible
- Geographic extent: PDA

- Duration: Short-term
- Frequency: Multiple irregular events
- Reversibility: Reversible

10.5.2 Increase in noise levels

10.5.2.1 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.

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 for a period of more than one year, and provincial noise regulations are available, Health Canada guidance was not used in this assessment.

Municipal by-laws outline restricted hours for noise from 11:00p.m. to 7:00a.m. Since project construction activities are not anticipated to take place between these hours, municipal by-laws were not used to evaluate the magnitude of impacts for this assessment.

10.5.2.2 Effects pathways

Construction

The effects pathway for an increase in noise during construction is the presence of staff, vehicles, and equipment, which have the potential to generate noise.

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 electrical 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 approximately 25 homes within 500 m of the PDA. These homes and residences are the most likely to experience elevated noise levels during construction activities.

Operations

The noise generated from the operation phase of the project is expected to be notably less than during the construction phase. The main source of noise during the operation phase of the project will be from the use of vehicles and equipment during maintenance activities, including inspections, and vegetation management. 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 staff presence and vehicle and equipment use but is anticipated to be less than during the construction phase given the smaller anticipated workforce.

10.5.2.3 Mitigation for increase in noise levels

Mitigation for an increase in noise levels includes the following:

- Construction activities will be conducted per applicable noise bylaws.
  - As specified by the municipal by-laws identified in Section 10.2.2, no construction activities that generate excessive noise will occur between 11:00 p.m. and 7:00 a.m.

10.5.2.4 Characterization of residual effects on increase in noise levels

After mitigation, predicted residual effects on the increase in noise levels 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. 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 similar to ambient noise levels, which includes noise generated by ongoing agricultural activities throughout the assessment area.

Similar adverse effects are anticipated during the operations and decommissioning phases of the project but at a lesser magnitude. Noise generated by vehicles and equipment during routine maintenance activities may be noticeable but infrequent and of short duration and are therefore deemed negligible.

Following the implementation of mitigation measures described above, residual effects for an increase in noise levels are characterized as follows:

- Direction: Adverse
- Magnitude: Low during construction and decommissioning, negligible during operations
- Geographic extent: LAA during construction and decommissioning, PDA during operation
- Duration: Long-term
- Frequency: Multiple regular events
- Reversibility: Reversible

10.5.3 Summary of residual effects characterizations

Table 10-5 characterizes the residual effects on human health risk.

Table 10-5: Project residual effects on human health risk

Residual effects characterization						
Project phase	**Direction**	**Magnitude**	**Geographic extent**	**Duration**	**Frequency**	**Reversibility**
Decrease in air quality						
Construction	A	NC	PDA	ST	IR	R
Operation						
Decommissioning						
Increase in noise levels						
Construction	A	L	LAA	LT	R	R
Operation		NC	PDA			
Decommissioning		L	LAA			

10.5.4 Cumulative effects

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

- the project has adverse 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 human health risk, both conditions are present. The project is anticipated to have adverse effects on air quality and noise. Each of the residual effects could interact with other past, present, or reasonably near future physical activities.

10.5.4.1 Project residual effects likely to interact cumulatively

Table 10-6 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact human health risk. 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 10-6: Potential cumulative effects on human health risk

Other projects and physical activities with potential for cumulative environmental effects	**Potential cumulative environmental effects**	
	Decrease in air quality	**Increase in noise levels**
Existing/ongoing projects and activities		
Domestic resource use activities	-	-
Recreational activities	-	-
Industrial and commercial resource use activities	✓	✓
Existing infrastructure (non-Manitoba Hydro)	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Residential and institutional developments	✓	✓
Potential future projects and activities		
Dominion City to Altona gas transmission pipeline (Manitoba Hydro 2024)	✓	✓
RM of Stanley Regional Wastewater Collection System (AECOM 2025)	✓	✓

Table 10-6: Potential cumulative effects on human health risk

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Decrease in air quality	Increase in noise levels
Proposed residential developments	✓	✓

✓ = 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.

10.5.4.2 Cumulative effect on decrease in air quality

10.5.4.3 Pathways for cumulative effect

The current projects and activities that may interact cumulatively to affect air quality include industrial and commercial resource use as well as infrastructure, including other Manitoba Hydro gas and electricity lines. 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 meets the CAAQS for PM2.5 and ozone (Manitoba Environment and Climate Change 2023).

The proposed future residential developments (east of the City of Winkler and in the vicinity of the Town of Altona), RM of Stanley Regional Wastewater Collection System, and Dominion City to Altona gas transmission project may also interact cumulatively with adverse residual effects of the project on air quality through the generation of fugitive dust, particulate matter, and other pollutants that may change ambient air quality. The RM of Stanley Regional Wastewater Collection System is the proposed future project anticipated to have the greatest potential to interact cumulatively with the project because its planned location is close to the project between the City of Winkler and Town of Reinfeld, crossing the project in the vicinity of the Hespeler Drain crossing in NW 26-2-4 WPM. Additionally, being that the RM of Stanley Wastewater Collection System project is also a pipeline installation project, it is anticipated that the types of project activities involved and their potential effects on air quality will be similar to those of the project.

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 10-6 may experience cumulative health risk from project-related changes in air quality. However, effects will only be cumulative if activities that generate air pollutants occur concurrently and in physical proximity to one another.

10.5.4.4 Mitigation measures

Implementation of the mitigation measures described in Section 10.5.1.3 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.

10.5.4.5 Residual cumulative effect

The projects and activities listed in Table 10-6 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.

10.5.4.6 Cumulative effect on increase in noise levels

10.5.4.7 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 in physical proximity to one another.

The RM of Stanley Regional Wastewater Collection System is anticipated to have the greatest potential to interact cumulatively with project effects on noise levels in the area between the City of Winkler and Town of Reinfeld and where the two projects cross one another in the vicinity of the Hespeler Drain crossing in NW 26-2-4 WPM.

10.5.4.8 Mitigation measures

Implementation of mitigation measures described in Section 10.5.2.3 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

10.5.4.9 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.

10.5.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on human health risk related to air quality and noise are predicted to be not significant.

The project is not anticipated to contribute to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions that exceed the CAAQS red management level nor is it anticipated that project-related noise will exceed Manitoba's provincial noise guidelines for residential and commercial areas for daytime conditions and result in greater than five noise complaints to the province.

10.5.6 Prediction confidence

Prediction confidence in the assessment of effects on human health risk is based on desktop-based data compilation, engagement feedback from this project and previous projects, and an understanding of the project activities, location and schedule.

The prediction confidence is high for impacts on human health risk, 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.

10.5.7 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 16.0).

10.5.8 Sensitivity to future climate change scenarios

Effects of climate change on human health risk 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 human health risk.

Proposed Altona to Winkler Natural Gas Transmission Pipeline

RM OF DUFFERIN
RM OF THOMPSON
RM OF ROLAND
RM OF MORRIS
RM OF STANLEY
RM OF MONTCALM
MUNICIPALITY OF RHINELAND
UNITED STATES OF AMERICA

Rosebank
Roland
Town of Morris
City of Morden
City of Winkler
Town of Altona
St. Joseph
Osterwick
Reinland
Blumenort
Pembina Valley Provincial Park

Morris River
Red River
Plum River
Pembina River

338 336 422 330 23 246 75 428 332 217 432 3 306 14 426 421 32 30 201 243 521 524

Project Infrastructure
- Final Preferred Route

Assessment Area
- Human Health Risk Local Assessment Area (1.5km buffer around PDA)
- Human Health Risk Regional Assessment Area

Landbase
- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- Wildlife Management Area
- Provincial Park
- City/Town
- Rural Municipality

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 5 10 Kilometres
0 3 6 Miles

1:225,000

Spatial Boundaries for Human Health Risk

Draft/Confidential: For Discussion Purposes Only

Map 10-1

To request accessible formats visit hydro.mb.ca/accessibility

File Location: W:\edata\Tier1\GIS\Orientia\PRJ_GAS\2025 Altona\Winkler\EAM\mxd\EAMmaps.aprx

11.0Economic opportunities

Economic opportunities refer to unique training, employment or business opportunities that enhance the economic status of individuals, communities, Indigenous Nations, and/or regions 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, First Nations, the Manitoba Métis Federation, and governments. Additionally, project-related employment and business opportunities are identified as themes of common interest during the project engagement process

This chapter presents a detailed assessment of the potential project effects on economic opportunities, including the scope/methods, baseline conditions, effect pathways, mitigation measures, and the analysis and characterization of residual project effects.

11.1 Summary of conclusions

The Altona to Winkler transmission project is anticipated to have positive residual project effects on economic opportunities. The residual project effects include the following:

- Increased direct and indirect/induced regional employment through hiring project workers and increased demand for goods and services to support project-related activities and the influx of the project workforce
- Increased regional business in the form of increased revenue resulting from the purchase of project-related goods and services from regional businesses and household spending by project workers at regional businesses
- Contributions to the regional economy through increased income taxes paid by project workers and consumption taxes resulting from project-related spending on goods and services, although effects on regional government revenue and the provincial or federal GDP are not anticipated to be measurable

The residual project effects on economic opportunities are anticipated to be the most pronounced during the construction phase, when the size of the workforce and project-related spending will be greater than during the operations and decommissioning phases.

With no adverse residual effects to economic activities anticipated, a significance determination is not required for this VC.

11.2 Scope of the assessment

For the purpose of this assessment, economic opportunities include 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

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 11.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on economic opportunities.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Neepawa gas transmission project, the Dominion City to Altona gas transmission pipeline, the Northwest Gas Transmission Project, and electrical transmission projects (*e.g.,* the Silver to Rosser tap transmission project).

11.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

11.2.2 Regulatory and policy setting

There are no laws, regulations, policies, or guidelines deemed relevant for the assessment of project effects on economic opportunities.

11.2.3 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.

During project engagement, feedback related to economic opportunities primarily included:

- Interest in potential business contracting and/or employment opportunities related to the construction of the pipeline
- Interest from local customers, particularly those from the agricultural sector, in having the ability to connect to Manitoba Hydro's natural gas supply as an economical energy source

11.2.4 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 area bordered by the administrative boundaries of the RMs of Rhineland and Stanley. The Town of Altona, the City of Winkler, and the City of Morden are included within this LAA. The LAA is intended to encompass the communities for which project may influence economic opportunities.
- **Regional assessment area (RAA):** the RAA is the same as the LAA for the assessment of project effects on economic opportunities because the area is deemed to encompass a sufficiently broad area for assessing cumulative effects. 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 11-1 illustrates the spatial boundaries for the assessment of project effects on economic opportunities.

The boundary of the Province of Manitoba is also relevant to the assessment of project effects on economic opportunities because some economic indicators considered in this assessment are only available on a provincial scale (*e.g.,* GDP).

11.2.5 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 – estimated to take approximately 12 months, beginning in the summer of 2027

- Operation and 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

11.2.6 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
Change in regional employment	Project activities requiring labour and creating job opportunities	Direct, indirect, and induced employment Labour force availability
Change in regional business	The purchase of project-related goods and services from regional businesses	Procurement of goods and services ($)
Change in regional economy	Tax revenue generated through spending related to project activities	Estimated government revenue ($) Estimated GDP ($)

For the purposes of this assessment, the term 'regional' relates to the LAA/RAA.

11.2.7 Residual effects characterization

Table 11-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on economic opportunities.

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	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

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	Quantitative measure or definition of qualitative categories
	baseline (*i.e.,* an increase in regional employment or economic activity) **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to economic opportunities relative to baseline (*i.e.,* a decrease in regional employment or economic activity) **Neutral –** no net change in measurable parameters for economic opportunities relative to baseline (*i.e.,* no change to regional employment or economic activity)
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No Measurable Change –** no perceptible change to economic opportunities is anticipated **Low –** a measurable change to economic opportunities that is not substantial compared to other existing economic contributors. **Moderate –** a measurable change to economic opportunities that is comparable to other existing economic contributors. **High –** a measurable change to economic opportunities that is substantial compared to other existing economic 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	**Short-term –** the residual effect is restricted to the construction phase

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	Quantitative measure or definition of qualitative categories
condition, or the residual effect can no longer be measured or otherwise perceived	**Medium-term –** the residual effect extends through to the 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

11.2.8 Significance definition

For this assessment, adverse residual effects on economic opportunities are considered significant if the proposed project results in adverse effects that are distinguishable from current economic conditions and trends for the region and cannot be managed or mitigated through adjustments to programs, policies, plans, or 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.

11.3 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

Information is presented for the Municipality of Rhineland, the RM of Stanley, the Town of Altona, the City of Winkler, and the City of Morden (*i.e.,* the municipal jurisdictions included in the LAA/RAA).

11.3.1 Regional economy

Agriculture is a dominant industry contributing to the regional economy. Many conventional and specialty crops are grown by agricultural producers in the LAA/RAA, including cereal grains, sunflowers, canola, corn, beans, field peas, potatoes, and other vegetable crops. Livestock operations are also present within the LAA/RAA (Rhineland Municipality 2025a, RM of Stanley 2025). Chapter 9.0 (Commercial agriculture) provides detailed information about the agricultural activities taking place and agricultural products being produced in the LAA/RAA and assesses the effects of the project on commercial agriculture.

Due to the prevalence of agricultural development, the region is also home to businesses that support the agriculture industry, including those that supply seed, fertilizers, and chemicals, as well as equipment and mechanical services. There are several agricultural sales and service centers located between Winkler and Morden (RM of Stanley 2025, Rhineland Municipality 2025b).

Although agriculture is a core industry, the LAA/RAA also supports a diverse range of other industries and types of businesses.

Within the Municipality of Rhineland, manufacturing is important, with small and medium-sized manufacturing firms existing in urbanized communities (Rhineland Municipality, 2025b). The Town of Altona hosts a 260-acre industrial park to promote business and economic development in the community (Town of Altona 2025). Altona and the Municipality of Rhineland are part of Altona Rhineland Economic Development Inc., which supports the Rhineland, Plum Coulee, Gretna and Altona region in promoting business and economic development (Altona Rhineland Economic Development Inc. 2025).

Similarly, the RM of Stanley and the City of Winkler are part of the Winkler Stanley Economic Development Corporation, which works with business, government, and community partners to collaboratively attract and promote business investment, trade, and workforce growth. The Winkler-Stanley Development Corporation hosts an incubator mall designed to help businesses during the start-up phase through the provision of graduated leasing arrangements across the first five years and annual

business strategy support (Winkler Stanley Economic Development Corporation 2025).

In the City of Morden, the Morden Community Development Corporation is a non-profit organization working to promote business and workforce growth and development. Its services include education and training initiatives, transition apartments for newcomers, and supporting community services such as helping safeguard accessible and affordable healthcare. The Corporation also owns and operates a 10-unit industrial business incubator mall, making space available for lease to new businesses. The City of Morden is home to commercial and industrial facilities owned by national and international businesses, including 3M Canada Company, Buhler Manufacturing, Huron Window Corporation, and Décor Cabinet Ltd. (Morden Community Development Corporation 2025).

11.3.1.1 Provincial economic trends

Gross domestic product (GDP) refers to the total gross value added by all resident producers in an economy (*i.e.,* province, territory, or nation) in a specific year. The change in GDP at a constant price, year over year, is widely used as an indicator of economic growth (The World Bank 2025). In 2023, Manitoba's GDP was 91,872 million Canadian dollars, which represented a 1.3% increase compared to the previous year. 2023 marked the third consecutive year of economic growth in Manitoba, although the growth was less than that experienced in 2021 and 2022 (Statistics Canada 2025, Province of Manitoba 2024).

GDP is not measured at a municipal or regional level.

11.3.2 Regional employment

The data used to understand regional employment comes from the 2021 Canadian Census of Population.

Table 11-3 shows the labour force characterization for the municipal jurisdictions in the LAA/RAA (Statistics Canada 2023).

Table 11-3: Labour force characterization for communities in the LAA/RAA for 2021

Labour force status	Municipality of Rhineland	Town of Altona	RM of Stanley	City of Winkler	City of Morden	LAA/RAA Totals
Total population aged 15 years and over	4,005	3,240	6,135	10,470	7,685	31,535
In the labour force*	2,710	2,015	4,415	6,715	4,960	20,815
Employed	2,630	1,905	4,200	6,440	4,575	19,750
Unemployed	75	105	215	280	385	1,060
Not in the labour force	1,300	1,225	1,720	3,755	2,730	10,730
Participation rate (%)	67.7	62.2	72	64.1	64.5	66.0
Employment rate (%)	65.7	58.8	68.5	61.5	59.5	62.6
Unemployment rate (%)	2.8	5.2	4.9	4.2	7.8	5.1

Source: Statistics Canada 2023
*The sum of reported employed and unemployed individuals may not exactly equal the reported population in the labour force. Data shown reflects the numbers reported by the source.

Per the 2021 census, the total labour force in the LAA/RAA is 20,815 across all sectors. The overall participation rate (*i.e.,* the percentage of individuals over 15 years of age who are participating in the labour force) is 66%, which is higher than the provincial participation rate of 64.4%. The RM of Stanley has the highest labour force participation rate in the LAA/RAA at 72%. Unemployment rates in the Municipality of Rhineland, Town of Altona, RM of Stanley, City of Winkler, and City of Morden were 2.8%, 5.2%, 4.9%, 4.2%, and 7.8% respectively, all of which are lower than the provincial unemployment rate of 8.3% (Statistics Canada 2023).

The industries that provide employment for the greatest proportion of the labour force in the LAA/RAA are as follows:

- Manufacturing: 19.5%
- Health care and social assistance: 12.6%
- Retail trade: 10.5%
- Construction 9.7%
- Agriculture, forestry, fishing and hunting: 8.5%

Cumulatively, these industries employ over half of the regional labour force.

Table 11-4 provides a detailed breakdown of the industries that employ the labour force in each of the municipal jurisdictions included in the LAA/RAA, as well as totals for the LAA/RAA. Although the industries providing the most employment are relatively consistent across the different jurisdictions, in the rural areas outside the town and city locales, a greater proportion of the labour force is employed under the agriculture, forestry, fishing, and hunting industry category. In the Municipality of Rhineland and the RM of Stanley, 17.4% and 12.9% of the labour force, respectively, are employed in this category (Statistics Canada 2023).

Table 11-4: Industry and workforce in Municipality of Rhineland, Town of Altona, RM of Stanley, City of Winkler, and City of Morden for 2021, North American Industry Classification System

Industry	Municipality of Rhineland		Town of Altona		RM of Stanley		City of Winkler		City of Morden		Totals for LAA/RAA	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Total – Labour force aged 15 years and over	2,705	100	2,010	100	4,415	100	6,720	100	4,960	100	20,810	100
Agriculture, forestry, fishing and hunting	470	17.4	130	6.5	570	12.9	405	6	185	3.7	1,760	8.5
Mining, quarrying, and oil and gas extraction	0	0	0	0	0	0	0	0	15	0.3	15	0.1
Utilities	15	0.6	10	0.5	10	0.2	20	0.3	10	0.2	65	0.3
Construction	365	13.5	135	6.7	545	12.3	565	8.4	400	8.1	2,010	9.7
Manufacturing	470	17.4	455	22.6	840	19	1,365	20.3	935	18.9	4,065	19.5
Wholesale trade	85	3.1	60	3	130	2.9	190	2.8	145	2.9	610	2.9
Retail trade	270	10	225	11.2	375	8.5	775	11.5	545	11	2,190	10.5
Transportation and warehousing	150	5.5	65	3.2	310	7	360	5.4	160	3.2	1,045	5.0
Information and cultural industries	15	0.6	40	2	30	0.7	90	1.3	60	1.2	235	1.1
Finance and insurance	40	1.5	60	3	15	0.3	135	2	130	2.6	380	1.8
Real estate and rental and leasing	10	0.4	15	0.7	30	0.7	60	0.9	25	0.5	140	0.7
Professional, scientific and technical services	40	1.5	50	2.5	125	2.8	210	3.1	200	4	625	3.0
Management of companies and enterprises	0	0	0	0	0	0	15	0.2	0	0	15	0.1
Administrative and support, waste management and remediation services	100	3.7	25	1.2	125	2.8	200	3	100	2	550	2.6
Educational services	175	6.5	220	10.9	280	6.3	440	6.5	430	8.7	1,545	7.4
Health care and social assistance	255	9.4	230	11.4	440	10	905	13.5	790	15.9	2,620	12.6

Table 11-4: Industry and workforce in Municipality of Rhineland, Town of Altona, RM of Stanley, City of Winkler, and City of Morden for 2021, North American Industry Classification System

Industry	**Municipality of Rhineland**		**Town of Altona**		**RM of Stanley**		**City of Winkler**		**City of Morden**		**Totals for LAA/RAA**	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Arts, entertainment and recreation	10	0.4	20	1	30	0.7	90	1.3	65	1.3	215	1.0
Accommodation and food services	50	1.8	55	2.7	215	4.9	430	6.4	230	4.6	980	4.7
Other services	150	5.5	110	5.5	225	5.1	285	4.2	215	4.3	985	4.7
Public administration	25	0.9	75	3.7	50	1.1	115	1.7	190	3.8	455	2.2

Source: Statistics Canada 2023

11.4 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	**Change in regional employment**	**Change in regional business**	**Change in regional economy**
Construction of pipeline, control points, and Winkler (GS-140) gate station expansion			
Mobilization and staff presence	✓	✓	✓
Vehicle and equipment use	-	✓	✓
Access development	-	-	-
Temporary work areas (*e.g.,* marshalling yards, laydown 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	-	-	-
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	-	-	-
Clean-up and reclamation	-	-	-
Operation and maintenance of pipeline and control points			
Presence of pipeline and control points	-	-	-

Table 11-5: Project interactions with economic opportunities

Project activities/components	**Change in regional employment**	**Change in regional business**	**Change in regional economy**
Vehicle and equipment use	✓	✓	✓
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-	-
Valve operation checks (annually)	-	-	-
Vegetation management	-	-	-
Decommissioning of pipeline and control points			
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

All project activities involve labour. For the purposes of this assessment, labour for all project activities during construction and decommissioning is considered under mobilization and staff presence, which includes general employment, the presence of the workforce, and their associated spending in the region. In the operations phase, these effect pathways are considered under maintenance activities, which also involve mobilization and the presence of workers in the region. Aside from vehicle and equipment use, other project activities are not anticipated to result in effects on economic opportunities.

11.5 Assessment of project effects

As presented in Section 11.1 (Summary of conclusions), the project is anticipated to result in positive residual effects on economic opportunities. These effects are anticipated to be most pronounced during the construction phase for each of the potential effects assessed:

- Change in regional employment
- Change in regional business
- Change in regional economy

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 11-5, proposed mitigation measures, and the characterization of residual project effects.

11.5.1 Change in regional employment

11.5.1.1 Analytical assessment techniques

The assessment of project-related effects on regional employment considers direct, indirect, and induced employment opportunities resulting from the project in relation to regional labour force availability.

11.5.1.2 Effects pathways

The primary pathway through which the project may lead to a change in regional employment is through project activities that require labour and create job opportunities.

Construction

Construction of the project has the potential to generate both direct and indirect employment opportunities for the regional labour force.

Direct employment opportunities during construction may be generated through the hiring of residents of the LAA/RAA by Manitoba Hydro or its contractors to fill project-related positions (*i.e.,* mobilization and staff presence).

Construction activities for the project 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. Based on the planned construction schedule, up to 200 workers are anticipated to work on the project during peak construction. Potentially, additional work opportunities for the construction of other pipeline projects proposed by Manitoba Hydro can extend the job term of local employees if the projects' timelines coincide.

Direct employment opportunities on the project may include:

- Management and supervisory personnel (*e.g.,* supervisor, foreperson)
- Pipeline inspection services (for signs of damage and potential risks to the 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)

Indirect and induced employment opportunities may result from the influx of the workforce into the LAA/RAA and project-related needs for goods (*i.e.,* materials) and services, which may place additional demands on existing businesses and potentially lead to increased hiring in response to those demands. Indirect employment may be generated within industries that supply intermediate components, such as raw materials. Induced employment, on the other hand, may be caused by an increase in household spending by direct and indirect workers coming from outside the LAA/RAA (*e.g.,* on consumer products or restaurant services).

Operations

The project's operation and maintenance phase will also generate a demand for labour with workforces being mobilized when maintenance activities take place. Operation and maintenance activities are typically short-term and infrequently require staffing on site. Where physical onsite activities are needed, up to 6 workers are typically required. Employment opportunities during operations may include staff positions, operators, mechanical technicians, maintenance workers, patrollers, and equipment operators, depending on the tasks.

Decommissioning

The decommissioning phase of the project will also generate a demand for labour, with direct employment opportunities similar in nature to those generated during construction, such as management and supervisory roles, inspection services, equipment operators, health and safety, trades, and semi-skilled and unskilled labour. The number of workers required is anticipated to be lower than during the construction phase.

11.5.1.3 Mitigation for change in regional employment

Given that the project has the potential to affect regional employment in a positive manner based on the pathways described above (Section 11.5.1.2), Manitoba Hydro has identified the following mitigation measures, which focus on enhancing the potential benefits where possible:

- Manitoba Hydro will contact local municipal authorities, First Nations and the Manitoba Métis Federation representatives, prior to project start-up, to provide details about the upcoming project and associated training, employment, and/or business opportunities.
- Manitoba Hydro will continue to engage with First Nations and the Manitoba Métis Federation to understand contextual considerations related to training, employment and business opportunities on the project.
- Manitoba Hydro will continue to meet with First Nations and the Manitoba Métis Federation to discuss multiple projects in the region to support longer-term employment and business opportunities.

11.5.1.4 Characterization of residual effects on regional employment

Based on the 2021 census data presented in Table 11-4, the participating regional workforce in industries that may be relevant to construction employment opportunities is approximately 7,810. This figure includes 2,010 workers in construction, 4,065 in manufacturing, 1,045 in transportation and warehousing, 625 in professional, scientific and technical services, and 65 in utilities. The number of workers employed in these industries is assumed to provide an indication of the regional availability of workers with skills that may be appropriate for construction employment on the project. Application of the 2021 unemployment rate for the LAA/RAA (5.1%, Table 11-3) suggests an available regional workforce of approximately 398 persons across the referenced industries.

At the peak of construction, there will be approximately 200 workers performing project activities within the LAA/RAA. The source of the labour force, including the

proportion that may be drawn from the regional labour force, remains uncertain until the procurement of construction contracting services has been completed. It is assumed that some of the skilled workforce required for the project will be filled by locals in the LAA/RAA, while another portion of the project's workforce will be comprised of non-local workers, particularly 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. As pipeline construction is likely to occur during unfrozen ground conditions, the number of people directly employed on the project is anticipated to be the largest in the late spring/summer.

The main intermediate component/material for the construction of the project is the 8-inch steel pipeline. It is anticipated that steel required for the pipeline will be purchased, manufactured into pipeline, and shipped in from outside the province, thereby not resulting in indirect employment within the LAA/RAA.

Induced employment related to the demand for services by the project workforce is most likely to cause increased demand for the retail trade and accommodation and food services industries, which account for 10.5% and 4.7% of the labour force in the LAA/RAA, respectively. The anticipated increase in demand for regional goods and services, along with the resulting benefits to employment, is expected to be greatest during construction, when the workforce and project spending are at their peak, and to occur to a lesser extent during operations and decommissioning.

The average workforce requirement during operations and maintenance activities is anticipated to be small. Depending on the nature of maintenance activities required, the number of workers may vary. Typically, up to six workers are required. Manitoba Hydro staff and contractors will be used, as required.

The residual project effects on regional employment are characterized as follows:

- Direction: Positive
- Magnitude:
  - Low to moderate during construction
  - No measurable change during operations
  - Low during decommissioning
- Geographic extent: LAA/RAA
- Duration:
  - Long-term during construction and decommissioning
  - Short-term during operations and maintenance

- Frequency:
  - Continuous during construction and decommissioning
  - Regular or irregular events during operations and maintenance, depending on the nature of the activities generating employment opportunities
- Reversibility: Reversible

11.5.2 Change in regional business

11.5.2.1 Analytical assessment techniques

Project-related effects on regional business are assessed by considering the types and values of goods and services that project activities will require, as well as the availability and opportunity for those goods and services to be procured from businesses within the LAA/RAA.

11.5.2.2 Effects pathways

The main pathway through which the project may lead to a change in regional business is through the purchase of project-related goods and services from regional businesses.

Construction

During the construction phase, potential opportunities for businesses in the LAA/RAA may include subcontracting and providing goods and services required for project activities or by the project workforce. Examples include the provision of accommodations, parts supplies, fuel, meals, and vehicle and equipment repair and/or rental. These business opportunities directly relate to mobilization and staff presence as well as vehicle and equipment use (*e.g.,* fuel, repairs).

Increased business revenue resulting from project spending in the region may support capital investment and hiring, thereby increasing capabilities and capacity within the LAA/RAA. Regional spending of wages by project workers will contribute to positive effects on regional business, primarily within the service sector, resulting in indirect economic benefits to businesses in the region.

Operations

On a smaller scale, there will also be purchases of goods and services to support project operations. These business opportunities will occur periodically during routine inspections and maintenance activities through the same effect pathways as

described for the construction phase (*i.e.,* procurement of goods and services for the project and spending by project workers at regional businesses).

Decommissioning

Similar to construction, project decommissioning may generate regional business opportunities through subcontracting and spending on goods and services from regional businesses, including accommodations, parts supply, and vehicle and equipment repair and/or rental for project activities. This will have a positive effect on regional businesses, primarily within the service sector, resulting in indirect economic benefits to businesses in the region.

11.5.2.3 Mitigation for change in regional business

The mitigation measures identified in Section 11.5.1.3 to enhance positive effects on regional employment are also expected to enhance the anticipated positive effects on regional business.

11.5.2.4 Characterization of residual effects on regional business

The project is expected to have a positive effect on regional businesses as a result of project expenditures in the LAA/RAA.

During construction, contracting or subcontracting opportunities related to right-of-way preparation and pipeline construction, as well as horizontal directional drilling, could result in short-term opportunities for businesses in the LAA/RAA. Although it is anticipated that the main material components required for the project, such as the steel for the pipeline, will be purchased and transported to the PDA from outside the region, service sector businesses operating in the LAA/RAA will experience induced economic benefits from the purchase of meals, fuel, and accommodation 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 for nearby businesses.

The industries anticipated to experience construction-related increases in business activity include retail trade, transportation and warehousing, accommodations and food services, and real estate, rental and leasing. According to Table 11-4, these four industries collectively employ approximately 21% of the regional workforce.

During the operations and maintenance phase and the decommissioning phase, increases in regional business are expected to continue, but at smaller magnitudes than during the construction phase, due to less extensive project activities, material needs, and workforce sizes. During operations, maintenance activities could include

short-term contracts for activities such as vegetation management, valve operation checks, or ground pipeline patrols.

The residual project effects on regional business are characterized as follows:

- Direction: Positive
- Magnitude:
  - Low during construction and decommissioning
  - No measurable change during operations
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency:
  - Continuous during construction and decommissioning
  - Regular or irregular events during operations and maintenance depending on the nature of the activities generating business opportunities
- Reversibility: Reversible

11.5.3 Change in regional economy

11.5.3.1 Analytical assessment techniques

Tax revenue is based on estimates of government tax revenue and contributions to the GDP resulting from the project.

11.5.3.2 Effects pathways

The main pathway through which the project may lead to a change in the regional economy is through the generation of government tax revenue.

Construction

Project expenditures during construction will lead to increased economic activity, including employment and procurement, as described in previous sections. The project's contribution to provincial and federal economies is measured by GDP (*i.e.,* value added after deducting the cost of intermediate goods and services). In addition to contributing to GDP, the project and its workers will be subject to varying levels of taxation, including income tax, provincial sales tax (PST), general sales tax (GST), and property tax, which contribute to government revenues.

Operations

Any project-related spending during the operation phase of the project will also support tax revenue for the regional, provincial, and national economies.

Decommissioning

Similar to the construction phase but on a smaller scale, expenditures related to decommissioning will result in increased economic activity, primarily through employment and procurement. In addition to contributing to GDP, the project and its workers will be subject to varying levels of taxation, including income tax, PST and GST, which contribute to government revenues.

11.5.3.3 Mitigation for change in regional economy

The mitigation measures identified in Section 11.5.1.3 to enhance positive effects on regional employment are also expected to enhance the anticipated positive effects on the regional economy.

11.5.3.4 Characterization of residual effects on regional economy

Quantitative estimates of the project's contributions to GDP are not available. However, considering the low magnitude of characterizations of the project's anticipated effects on regional employment and business, it's contribution to regional GDP is deemed to be low. At the provincial and federal levels, the project's contribution to GDP is considered to have no measurable change.

It is anticipated that the project will not have a measurable effect on regional government revenue. Indirectly, changes to property taxes are the pathway through which regional (*i.e.,* municipal) government revenues could be affected. Property tax revenues would only be affected if the project resulted in changes (*i.e.,* increases or decreases) in the assessed value of lands traversed by the project. 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 to affect assessed land values on which property tax amounts are based.

Benefits to provincial and federal tax revenues would occur when the taxable income of project workers increases, resulting in increased income tax revenue, as well as through the collection of PST and GST on goods and services during the project's activities. Given the workforce size and work duration, the project's effects on provincial and federal tax revenues are expected to result in no measurable change.

The residual project effects on regional economy are characterized as follows:

- Direction: Positive
- Magnitude: No measurable change
- Geographic Extent: LAA/RAA

- Duration: Long-term
- Frequency: Continuous
- Reversibility: Reversible

11.5.4 Summary of residual effects characterizations

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-M	LAA/RAA	LT	C	R
Operations		NC		ST	IR/R	
Decommissioning		L		LT	C	
Change in regional business						
Construction	P	L	LAA/RAA	LT	C	R
Operations		NC			IR/R	
Decommissioning		L			C	
Change in regional economy						
Construction	P	NC	LAA/RAA	LT	C	R
Operations						
Decommissioning						

11.5.5 Cumulative effects

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

- The project has adverse 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.

The project is only expected to have positive or neutral residual effects on regional employment, business, or economy. Since no adverse residual effects are anticipated, further assessment of cumulative effects is not warranted.

11.5.6 Determination of significance

As discussed in Section 11.1.8, a significance determination is only made if the project is anticipated to have adverse residual effects. As summarized in Table 11-6, after the application of mitigation measures, no adverse residual effects are predicted for economic opportunities; therefore, a determination of significance is not required.

11.5.7 Prediction confidence

The prediction confidence in the assessment of effects on economic opportunities is moderate to high, based on professional judgment, the quality of publicly available data, and the past effectiveness of proposed mitigation measures. Limitations applicable to the assessment include the limited availability of detailed project costs and the expected source and composition of the labour force.

11.5.8 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 EPP (see Chapter 16.0).

11.5.9 Sensitivity to future climate change scenarios

The effects of climate change on economic opportunities are expected to be related to the anticipated increase in temperature, changes in precipitation patterns, and

associated extreme weather events (*e.g.,* flooding), which may result in more frequent infrastructure damage. This may result in the need for more frequent repair and maintenance work on the pipeline and associated components, leading to increased regional economic opportunities through project employment and procurement opportunities for local businesses.

Proposed Altona to Winkler Natural Gas Transmission Pipeline

RM OF DUFFERIN
RM OF THOMPSON
RM OF ROLAND
RM OF MORRIS
RM OF STANLEY
MUNICIPALITY OF RHINELAND
RM OF MONTCALM
UNITED STATES OF AMERICA

Rosebank
Roland
Osterwick
Reinland
Blumenort
St. Joseph

City of Morden
City of Winkler
Town of Morris
Town of Altona

Pembina Valley Provincial Park

Morris River
Red River
Plum River
Pembina River

338 336 422 330 23 246 75 428 332 217 432 3 306 14 426 32 30 421 201 243 521 524

Project Infrastructure
- Final Preferred Route

Assessment Area
- Economic Opportunities and Infrastructure and Community Services Local and Regional Assessment Area

Landbase
- Community
- Railway
- Provincial Trunk Highway
- Provincial Road
- First Nation Reserve
- Wildlife Management Area
- Provincial Park
- City/Town
- Rural Municipality

Manitoba Hydro acknowledges that the Altona to Winkler gas transmission line is located on Treaty 1 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 13, 2026

N

0 5 10 Kilometres
0 3 6 Miles

1:225,000

Spatial Boundaries for Economic Opportunities, and Infrastructure and Community Services

Draft/Confidential: For Discussion Purposes Only

Map 11-1

To request accessible formats visit hydro.mb.ca/accessibility

File Location: \\pwdata\Tier1\GIS\Orion\aPRJ_GAS\2026 AltonaWinkler\EAMaps\EAMaps.aprx

12.0Infrastructure and community services

Infrastructure and community services refer to the physical structures and facilities (*e.g.,* highways, railways, water and wastewater systems) and services (*e.g.,* emergency response and health care) that are essential 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 Summary of conclusions

The Altona to Winkler gas transmission project is anticipated to have adverse residual project effects on infrastructure and community services. The residual project effects include the following:

- Reduced availability of accommodations through non-local project workers who may require temporary accommodations in the LAA/RAA.
- Increased traffic and strain on transportation infrastructure resulting from the transportation of workers, equipment and materials to the PDA.
- Strain on health and emergency response services due to the presence of temporary workers in the LAA/RAA who may need to access these services.
- Strain on waste management facilities through the generation of waste resulting from project activities and the influx of project workers in the LAA/RAA.

The residual project effects on infrastructure and services are anticipated to be the most pronounced during the construction phase when the workforce and intensity of project activities will be greater than in other phases.

Potential cumulative effects include decreased availability of short-term accommodations, increased traffic, and strain on transportation infrastructure, waste management facilities, and health and emergency services where the timelines for project activities overlap with those of other projects in the regional area.

Adverse residual project and cumulative effects to infrastructure and community services are anticipated to be not significant because the project is not anticipated to disrupt, restrict, or degrade present infrastructure and community services to a point where activities cannot continue at or near baseline levels and for a period of time that continues beyond the construction phase.

12.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 12.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on infrastructure and community services.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Dominion City to Altona gas transmission pipeline, the Neepawa gas transmission project, and electrical transmission projects (*e.g.,* the Silver to Rosser tap transmission project, the Pointe du Bois to Whiteshell transmission project, and the Dorsey to Wash'ake Mayzoon transmission project).

The assessment considers the following:

- Short-term accommodations
- Traffic and transportation
- Health and emergency response services
- Waste management facilities

12.2.1 The project

The proposed Altona to Winkler gas transmission project consists of construction, operation, and decommissioning of approximately 31 km of new 8-inch steel natural gas transmission pipeline, tie-ins at east and west limits of the project, and control points at approximately the mid-point and west limit of the project. The project components are described in more detail in Chapter 2 (Project description).

12.2.2 Regulatory and policy setting

The following provincial and municipal laws, and associated regulations, policies, and guidelines were considered for assessing project effects to infrastructure and community services.

12.2.2.1 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, vehicle and equipment standards, and prohibitions, offences, and penalties. Through this Act, Manitoba Transportation and Infrastructure reviews speed limit changes and applications for development permits

along provincial roadways. The Act also allows local governments (*i.e.,* municipalities and First Nations) to change speed limits on municipal and First Nation roads.

12.2.2.2 The Dangerous Goods Handling and Transportation Act

The Dangerous Goods Handling and Transportation Act and associated regulations outline 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 hazardous wastes related to the project.

12.2.2.3 The Public Health Act

The Collection and Disposal of Wastes Regulation (M.R. 321/88) under *The Public Health Act* describes requirements for sanitation of premises, sewage disposal, and public and private garbage collection, which will be applicable to wastes generated during project activities.

12.2.2.4 Municipal by-laws

By-laws relevant to the assessment of infrastructure and community services within the municipalities traversed by, and nearby to, the project include, but may not be limited to, the following:

Traffic and transportation:

- Municipality of Rhineland By-Law No. 2020-07, *Traffic and Parking By-Law*: provides for the regulation of traffic and parking of vehicles in the Municipality of Rhineland.
- Municipality of Rhineland By-Law No. 2024-07, *Speed Limits*: establishes speed limit regulations for highways and roadways within the Municipality of Rhineland, and the ability for the Municipality of Rhineland to adjust speed limits within their jurisdiction, if in the public interest.
- 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. 1763/2014, *Off-Road Vehicles By-Law*: regulates the operating of off-road vehicles within the Town of Altona.
- RM of Stanley By-Law No. 23-22, *Traffic By-Law*: prescribes maximum speed limits and regulates traffic control devices, parking, and construction zones on highways, or portions of highways, under the RM's administration.

- City of Winkler By-Law No. 2283-22, *Traffic and Parking By-Law*: regulates and controls vehicular and other traffic and parking in the City of Winkler
- City of Winkler By-Law No.2235-19, *Off-Road Vehicles By-Law*: regulating the use of off-road vehicles within the limits of the City of Winkler.
- City of Morden By-Law No. 07-2024, *Traffic Control By-Law*: regulates traffic within the City of Morden.
- City of Morden By-Law No. 10-2025, *Obstructions on Municipal Roads By-Law*: provides for the control and removal of certain obstructions, and repair and replacement on municipal roads, parks, and reserves.
- City of Morden By-Law No. 10-2013, *Off-Road Vehicles Act:* regulates the operating of off-road vehicles within the City of Morden.

Health and emergency response services:

- Town of Altona By-Law No. 1832/2025, *Fire Prevention and Emergency Service By-Law*: provides for the operation of rescue and emergency services, including inspection, fire prevention, suppression, and protection services, and regulates storage, and handling of flammable and combustible goods, hazardous substances, and wastes.
- RM of Stanley By-Law No.15-23, *Health Services*: supports provision of funding for the expansion of Boundary Trails Hospital in the RM of Stanley, the ALG Professional Centre (Clinic) in the City of Winkler, and the Menzie Medical Clinic in the City of Morden.
- RM of Stanley By-Law 16/21, *Protective Services*: establishes a rate for fire protection services provided by the City of Winkler and the City of Morden, 911 services, and emergency services.
- City of Morden By-Law No. 5-2004, *Fire Prevention and Emergency Services:* establishes standards for fire prevention, fire flighting, life safety, and the operation of emergency services.

Waste management:

- 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.
- City of Morden By-Law No. 18-2024, *Waste By-Law:* to prevent organic, compostable, recyclable, and hazardous material from going to landfill.
- City of Winkler By-Law No. 2227-19, *Waste Management By-Law*: regulates the collection, removal, and processing of waste, compost, and recycling material within the City of Winkler.

12.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide feedback. Feedback relevant to infrastructure and community services primarily related to interest in the ability to connect to natural gas service.

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, potential strain on community services, and an increased demand for local accommodations from staff and contractors that may require lodging during construction.

12.2.4 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. The PDA is described in detail in Chapter 2.0 (Project description). The total area of the PDA is 95.4 ha.
- **Local assessment area (LAA):** includes all components of the PDA and consists of the administrative boundaries of the municipalities traversed by the PDA, which includes the RMs of Rhineland and Stanley and the City of Winkler as well as the nearby Town of Altona and City of Morden. This area is intended to encompass the communities for which infrastructure and community services could be impacted due to the project.
- **Regional assessment area (RAA):** the RAA is the same as the LAA for the assessment of project effects on infrastructure and community services because the area is deemed to encompass a sufficiently broad area for assessing cumulative effects. The total area of the LAA/RAA is 181,022 ha.

12.2.5 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 – estimated to take approximately 12 months, beginning in the summer of 2027

- Operation and 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

12.2.6 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 project workers 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	Project-related traffic may increase the demand on transportation infrastructure, potentially increasing travel times, affecting road conditions, and collision risk.	Current capacity of highways and roads (PTHs and PRs) in the LAA/RAA Daily road traffic volume Anticipated project-related traffic volumes Qualitative assessment of the existing conditions of roads and highways, and the anticipated change due to heavy loads carried by trucks
Strain on health and emergency response services	Increased demand for health and emergency response services as a result of project activities and the influx of project workers.	Capacity of health care and emergency response services Number of workers for each project phase
Strain on waste management facilities	Increased pressure on waste facilities resulting from wastes generated by project activities.	Tonnage and types of waste materials generated by the project that will be disposed of in local/regional facilities Capacity of local/regional waste disposal facilities

12.2.7 Residual effects characterization

Table 12-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on infrastructure and community services after the implementation of mitigation measures identified in this chapter.

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	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 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 of 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 without strain. **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.
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

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	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

12.2.8 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 to a point where activities cannot continue at or near baseline levels and for a period of time that continues beyond the construction phase (*i.e.,* into operations and/or decommissioning).

12.3 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

12.3.1 Short-term accommodations

Based on a search of travel websites, there are seven hotels are located in the LAA/RAA, including three in Morden, three in Winkler, and one in Altona (Trivago 2025). According to Airbnb, as of August 2025, there are also approximately forty listings for accommodations in the LAA/RAA including apartments, condos, entire homes/cabins, and individual rooms. The Airbnb accommodations are mostly concentrated in or near to the Town of Altona, the City of Winkler, and the City of Morden (Airbnb 2025).

12.3.2 Transportation infrastructure

12.3.2.1 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. The highways and roads in the LAA/RAA are detailed below (Manitoba Government 2024, Manitoba Infrastructure and Transportation 2024).

One PR is crossed and partly parallelled by the PDA:

- PR 306 – partly Roads and Transportation Association of Canada (RTAC) route (south of PR 14), partly Class B1 provincial route (north of PR 14), running north-south in the LAA/RAA from the northern boundary of the Municipality of Rhineland, through Plum Coulee, ending to the south at PR 243. The PDA crosses PR 306 approximately 800 m south of the Plum Coulee control point.

The PDA does not traverse or parallel any PTHs.

There are several PTHs and PRs that traverse the LAA/RAA, but not the PDA including:

- PTH 14 – (RTAC route) located between approximately 800 m and 6.5 km north of the PDA, running east-west through the Municipality of Rhineland and through the part of the RM of Stanley east of PTH 3, including through the City of Winkler.
- PTH 30 – (part RTAC from PR 201 north, south of PR 201 is A1) running north-south from Rosenfeld, Manitoba to the United States border, east of the Town of Altona and approximately 850 m east of the easterly end of the PDA.
- PTH 3 – (RTAC route) located approximately 6.5 km west of the PDA with a portion running north-south between the northern boundary of the LAA/RAA and west of the City of Winkler then continuing east-west to the west boundary of the RM of Stanley, including through the City of Morden.
- PTH 32 – (A1) running north-south between the City of Winkler and the United States border through the RM of Stanley, located approximately 1.5 km west of the westerly end of the PDA.
- PR 243 – (B1) running east-west between PTH 30 and PTH 32 approximately 12 km south of the PDA
- PR 201 – (B1, running generally east-west through the LAA/RAA with the closest point to the PDA being located approximately 850 m east of the east end of the PDA
- PR 524 – (B1) approximately 12 km south of the PDA, running south from PR 201 in the Municipality of Rhineland and terminating just north of the United States border
- PR 421 – (B1), running east-west starting at PTH 30, approximately 6.5 km south of the east end of the PDA, and continuing east to the easterly boundary of the LAA/RAA
- PR 521 – (A1), short road located approximately 14.5 km south of the PDA, connecting PR 243 and PTH 32 through Rosengart, Manitoba.
- PR 332 – (B1), running north-south starting at the junction of PTH 30 and PTH 14, approximately 6.5 km north of the east end of the PDA, and continuing north to the northerly boundary of the LAA/RAA.
- PR 428 – (B1), running north-south starting in the City of Winkler, approximately 1.8 km northwest of the west end of the PDA, and continuing north to the northern boundary of the LAA/RAA.
- PR 432 – (B1), approximately 15 km west of the west end of the PDA, running generally north-south from the northern boundary of the LAA/RAA, through the City of Morden, and terminating at PR 201.

Route designations are based on maximum gross vehicle weight limits. The RTAC routes in the LAA/RAA have a maximum vehicle weight limit of 62,500 kg.

Class A1 highways permit a maximum vehicle weight of 56,500 kg and Class B1 routes have a vehicle weight limit 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 with 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 with monitoring sites

Road or highway	**Highway section/location**	**Current volume of vehicles/day for annual average daily traffic**
PR 306	Between 1.6 km north of PTH 14 and the junction with PR 243	210 – 1,350
PTH 14	Between 0.8 km east of PTH 30 and the junction with PTH 3	2,340 – 15,490
PTH 30	Between PTH 14 (south of Rosenfeld) and US border	1,010 - 3,040
PTH 3	Between the north boundary of the RM of Stanley (*i.e.,* the LAA/RAA) and the junction with PTH 31 and PR 240	2,460 – 13,550
PTH 32	Between PTH 14 and US Border	430 - 6,330
PR 243	From PTH 32 to 3.7 km east of PTH 30	130 - 560
PR 201	From west boundary of the RM of Stanley to junction with PR 426	80 – 2,060
PR 524	South of PR 243	140
PR 421	Between PTH 30 and PTH 75	400 - 1,010
PR 521	Between PTH 32 and PR 243	230
PR 332	1.9 km north of PTH 14	300

Table 12-3: Current traffic volumes on provincial trunk highways and provincial roads in the LAA/RAA with monitoring sites

Road or highway	**Highway section/location**	**Current volume of vehicles/day for annual average daily traffic**
PR 428	North of PTH 14	5,550
PR 432	Between PR 201 and 1.6 km north of the City of Morden (*i.e.,* the junction with PTH 3)	140 - 5,050

Source: University of Manitoba and Manitoba Transportation and Infrastructure. 2024 a) and b)

12.3.2.2 Rail transportation

There is one major rail lines that traverses the LAA/RAA. The Canadian Pacific Railway (CP Rail) La Riviere subdivision line runs north-south in the northern portion of the Municipality of Rhineland. At Rosenfeld, the line splits in two, one of which runs west through Plum Coulee, the City of Winkler, and the City of Morden at which point it continues east under the operation of Boundary Trail Railway. The other, referred to as the Gretna subdivision line, continues south to its termination point south of Altona. (Rail Association of Canada n.d., CN eBusiness n.d.)

The PDA traverses the rail line in the City of Winkler in SW 2-3-4 WPM, approximately 130 m south of the existing gate station (*i.e.* the western endpoint of the PDA). At the project's tie-in to the control point north of Altona (in NW 17-2-1 WPM), the Gretna subdivision line is located approximately 100 m to the east but is not traversed by the PDA.

The proposed project's activities (see Chapter 2.0) do not include the use of rail transportation infrastructure in the LAA/RAA.

12.3.2.3 Air transportation

There are three airports located in the LAA/RAA including:

- Altona Municipal Airport located in NE and SE 4-2-1 WPM, approximately 4 km south/southeast of the project's tie-in to the control point north of Altona (in NW 17-2-1 WPM)

- Winkler Airport located in 34-2-4 WPM, approximately 350 m west of the PDA at its closest point where the pipeline parallels Road 20W travelling north towards the tie-in at the existing gate station in Winkler
- Morden Regional Airport in the S ½ of 15-3-5 WPM and the N ½ of 10-3-5 WPM, approximately 10 km west of the PDA
  (OurAirports n.d.)

The proposed project's activities (see Chapter 2.0) do not include the use of air transportation infrastructure in the LAA/RAA.

12.3.3 Healthcare, emergency, and social services

The Southern Health – Sante Sud Regional Health Authority serves the LAA/RAA. There are two health centres that provide medical services, including emergency departments, in the LAA/RAA: the Boundary Trails Health Center in Winkler and the Altona Community Memorial Health Centre. Other medical facilities in the LAA/RAA include clinics in Altona, Morden, and Winkler as well as a mental health centre in Winkler (Southern Health-Santé Sud 2026).

In terms of fire protection services in the LAA/RAA, the RM of Stanley has agreements with the cities of Winkler and Morden, who provide fire and emergency services to RM of Stanley residents (RM of Stanley 2026a). The City of Winkler Fire Department provides fire and emergency response services to Winkler and Ward 1 of the RM of Stanley. Morden Fire and Rescue provides Morden and Ward 2 of the RM of Stanley with fire protection, education, and specialty rescue services (Winkler Fire Department 2026, Morden Fire and Rescue 2026).

In the Municipality of Rhineland, fire protection and certain emergency services are provided by Altona/Rhineland Emergency Services as well as volunteer fire departments in Gretna and Plum Coulee (Altona/Rhineland Emergency Services 2026, Municipality of Rhineland 2026).

Police services in the LAA/RAA are provided by the Morden and Carman detachments of the Royal Canadian Mounted Police (RCMP) as well as the local Altona Police Service (serving the Town of Altona and Local Urban District of Plum Coulee), Winkler Police Service, and Morden Police Service (Municipality of Rhineland 2026, Town of Altona 2026, Winkler Police Service 2026, Morden Police Service 2026).

12.3.4 Waste management

12.3.4.1 Solid waste disposal facilities

Within the RAA, there are three solid waste sites registered with the Waste Reduction and Recycling Support Program (Manitoba Government 2022):

- The Altona-Municipality of Rhineland-Gretna Landfill located northeast of the Town of Altona in SE 27-2-1 WPM, approximately 4 km northeast of the project's east tie-in
- The Plum Coulee Waste Disposal Ground located in NE 11-3-3 WPM, approximately 4 km north of the PDA at the Plum Coulee control point
- The Solid Waste Area Management Project (SWAMP) located in NW 36-3-4 WPM, approximately 8 km north of the project's west tie-in. SWAMP is a regional landfill site supported by the RM of Stanley, the City of Winkler, and the City of Morden (RM of Stanley 2026).

There is also one waste transfer site located west of the Town of Morden in SE 10-3-6 WPM, approximately 20 km west of the PDA.

12.3.4.2 Wastewater treatment facilities

Based on data available though Manitoba Land Initiative (Government of Manitoba 2022), there are approximately ten wastewater treatment facilities located within the LAA/RAA. Based on data limitations, it is assumed that there may be additional wastewater treatment facilities that are not documented geospatially.

The wastewater treatment facilities closest to the PDA include:

- Town of Altona Lagoon located approximately 2 km southeast of the project's east tie-in point
- Town of Plum Coulee Wastewater Treatment Lagoon located approximately 3.5 km north of the Plum Coulee control point
- City of Winkler Wastewater Treatment Facility located approximately 4 km north of the project's west tie-in

The RM of Stanley and the City of Winkler are partnering on construction of a new sewer wastewater project, including a wastewater collection system in the Villages of Reinfeld and Schanzenfeld and a force-main line to pipe the wastewater for treatment at the Winkler lagoon (RM of Stanley 2025). This proposed project is considered in the cumulative effects assessment sections of this report as a future project that has

the potential interact cumulatively with residual adverse effects of the Altona to Winkler gas transmission project (Table 3-3).

12.4 Project interactions with infrastructure and community services

Table 12-4 identifies, for each potential effect, the physical activities that might interact with infrastructure and community services 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 infrastructure	Strain on health and emergency response services	Strain on waste management facilities
Construction of pipeline, control points, and Winkler (GS-140) gate station expansion				
Mobilization and staff presence	✓	✓	✓	✓
Vehicle and equipment use	–	✓	✓	-
Access development	–	-	-	-
Temporary work areas (*e.g.,* marshalling yards, laydown 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	–	-	-	-
Control point development and gate station expansion (including temporary bypass and hot tap installations, fencing, compaction of subsoil, gravel application, and valve connections)	–	-	-	-
Clean-up and reclamation	–	-	-	✓
Operation and maintenance of pipeline and control points				

Table 12-4: Project interactions with infrastructure and community services

Project activities/components	**Reduced availability of accommodations**	**Increased traffic and strain on transportation infrastructure**	**Strain on health and emergency response services**	**Strain on waste management facilities**
Presence of pipeline and control points	–	-	-	-
Vehicle and equipment use	–	✓	✓	-
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	-	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	–	-	-	-
Valve operation checks (annually)	–	-	-	-
Vegetation management	–	-	-	-
Decommissioning of pipeline and control points				
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				

Mobilization and staff presence, and vehicle and equipment use, are the primary project activities understood to have the potential to interact with infrastructure and community services because they represent influxes of people (*i.e.,* workers) and traffic into the LAA/RAA. Specific project activities known to result in the production of waste and are also understood to result in potential interactions. All other project activities are not anticipated to result in potential interactions or associated effects on infrastructure and community services.

12.5 Assessment of project effects

As presented in Section 12.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on infrastructure and community services. These residual effects are anticipated to be negligible (*i.e.,* no measurable change) to low in magnitude and most pronounced during the construction phase of the project for each of the potential effects assessed:

- Reduced availability of accommodations
- Increased traffic and strain on transportation infrastructure
- Strain on health and emergency response services
- Strain on waste management facilities

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 12-4, proposed mitigation measures, and the characterization of residual project effects.

12.5.1 Reduced availability of short-term accommodations

12.5.1.1 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.

12.5.1.2 Effects pathways

Construction

During construction, the influx of project workers and contractors may increase demand for short-term accommodations through patronage if workers are non-local and staying in the project area overnight rather than commuting to worksites each

day, thereby reducing the availability of temporary accommodations for local and non-local individuals (*e.g.,* tourists) in the LAA/RAA.

Operations

The availability of accommodations may also be reduced during the operational phase of the project, primarily during maintenance and inspection activities, if more than one day of work is required and workers must stay overnight in the LAA/RAA.

Decommissioning

The availability of accommodations may also be reduced during decommissioning due to the mobilization and presence of staff and contractors working on decommissioning activities.

12.5.1.3 Mitigation for reduced availability of accommodations

Mitigation for reduced availability of accommodations involves:

- If the demand for short-term accommodations exceeds the availability in the LAA/RAA, Manitoba Hydro will work with the contractor to identify alternative solutions, such as seeking accommodations in neighbouring or nearby municipalities, towns, or cities with availability.

12.5.1.4 Characterization of residual effects on reduced availability of accommodations

As discussed in Section 12.3.1, there are approximately 47 temporary accommodations in the LAA/RAA (hotels and Airbnb listings). The estimated workforce at peak construction is 200 workers.

Given that tourism is not a major economic driver in the LAA/RAA (Chapter 11.0, Economic opportunities), it is not anticipated that there will be a high level of competition for temporary accommodations in the LAA/RAA.

The need for short-term accommodations will be better understood after a contractor has been hired and the distribution of the workforce (local vs. non-local) is known.

The workforces during the operations and decommissioning phases are expected to be smaller than during construction, resulting in a lower demand for short-term accommodations during decommissioning compared to construction.

Following the implementation of mitigation measures described above, residual effects for reduced availability of accommodations are characterized as follows:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular events, as different work crews may mobilize for different project activities of varying durations
- Reversibility: Reversible

12.5.2 Increased traffic and strain on transportation infrastructure

12.5.2.1 Analytical assessment techniques

Project-related increases to traffic and strain on transportation infrastructure are assessed by quantitative consideration of the current capacity of PTHs and PRs in the LAA/RAA, their daily traffic volumes in relation to anticipated project-related traffic volumes, 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.

12.5.2.2 Effects pathways

Construction

During construction, increases to traffic and strain on transportation infrastructure in the LAA/RAA will result from the movement of workers, materials, and equipment to and from the project site along PTHs and PRs described in Section 12.3.2.

Project construction is anticipated to directly increase road traffic with the presence of up to 100 project-related vehicles per day (*i.e.,* up to one vehicle per two workers at the peak of construction), including cars, pickup trucks, heavy trucks, and equipment that will be needed to transport people (*i.e.,* project workers/contractors and service providers), materials, and equipment to, from, and throughout the PDA.

Adverse impacts on road infrastructure could occur due to:

- An increase in vehicles travelling on the roads in the LAA/RAA
- 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

The project crosses PR 306 approximately 800 m south of the Plum Coulee control point (Section12.3.2.1), where the pipeline will be installed by horizontal directional drilling (Table 2-1, Crossings). The project also crosses a rail line in the City of Winkler in SW 2-3-4 WPM, approximately 130 m south of the existing gate station (*i.e.* the western endpoint of the PDA) (Section 12.3.2.2).

Operations

Operations will also involve project-related traffic travelling in the LAA/RAA and have the potential to result in the same impacts to road infrastructure as during the construction phase. However, due to the smaller workforce and infrequent activities during the operation phase of the project, only a small number of vehicles and equipment (approximately 2 – 4) will be in the LAA/RAA for short, isolated periods of time.

During project engagement, a participant inquired whether new roads and ditches could be built over the easement area once the pipeline has been installed. Manitoba Hydro shared that roadways cannot be built along the easement, but may be able to cross it, depending on weight restrictions and the purpose of the roadway. Considerations, including relevant safe work practices, would be determined at the time of construction of a roadway over the easement.

Decommissioning

Similar to construction and operations, project-related traffic required for project activities during the decommissioning phase will increase traffic and strain on transportation infrastructure. The workforce is anticipated to be smaller than the constructions phase, requiring less project-related vehicles and machinery, which are anticipated to be in the LAA/RAA for short, isolated periods of time.

12.5.2.3 Mitigation for increased traffic and strain on transportation infrastructure

Installation of the pipeline by horizontal direction drilling at identified crossings (Table 2-1), including the crossing of PR 306 south of the Plum Coulee control point, provides mitigation of potential effects to existing transportation infrastructure at crossing locations through avoiding direct disturbance. Additional mitigation related to increased traffic and strain on transportation infrastructure includes:

- 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 labelling in accordance with provincial legislation and Manitoba Hydro guidelines.
- Manitoba Hydro will work with local authorities to address any damage to roads that occurs because of the project.

Manitoba Hydro will also obtain the following permits, as applicable, from Manitoba Transportation and Infrastructure, as per the *Traffic and Transportation Modernization Act*, which may include the following:

- Permit for construction above or below ground that falls within 250 feet of a PTH or 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.

12.5.2.4 Characterization of residual effects on increased traffic and strain on transportation infrastructure

Following mitigation, residual effects of the project on increased traffic and strain on transportation infrastructure in the LAA/RAA are anticipated to be most notable on roads closest to the PDA, especially in rural areas further away from population centers such as the City of Winkler, City of Morden, and the Town of Altona.

PTHs north of the PDA are anticipated to provide the main daily travel routes to and from the project area. These highways, including PTHs 3, 14, and 30 have reported annual average daily traffic volumes ranging from 1,010 to 15,490 vehicles per day depending on the segment (Table 12-3). Therefore, the project is anticipated to result in a maximum increase in daily traffic between 0.6 – 9.9% along PTHs at the peak of construction when there will be an estimated maximum of 100 project-related vehicles present in the LAA/RAA. It is unlikely, however, that all project-related vehicles will travel to site on the same highway on the same day.

Traffic increases and strain on infrastructure are anticipated to be more notable on PRs, which generally report lower average daily traffic volumes. On PR 306, which is traversed and partly parallelled by the project south of the Plum Coulee control point, the current annual average daily traffic volume is 1,350 vehicles per day along the paralleled/traversed segment.

The residual project effects to increases in traffic and strain on transportation infrastructure will be most pronounced during construction when the project workforce and number of project-related vehicles are the largest. During the operations and decommissioning phases, traffic volumes are anticipated to be notably smaller (approximately 2 – 4 vehicles/equipment for most maintenance activities) and within the LAA/RAA for shorter, isolated periods of time.

Following the implementation of mitigation measures described above, residual effects for increased traffic and strain on transportation infrastructure are characterized as follows:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular events, as different work crews may mobilize for different project activities of varying durations
- Reversibility: Reversible

12.5.3 Strain on health and emergency response services

12.5.3.1 Analytical assessment techniques

Project-related increases in the strain on health and emergency response services are assessed by considering the number of workers that the project will bring to the area during construction, operations, and decommissioning, as well as the current capacity of healthcare and emergency response services in the LAA/RAA.

12.5.3.2 Effects pathways

Construction

The influx of a temporary workforce has the potential to place additional demand (*i.e.,* strain) on the available capacity of local health and emergency response services

in the LAA/RAA. 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.

It is anticipated that up to 200 workers will be present during the peak of construction. 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.

Operations

During operations, periodic influxes of non-local workers into the LAA/RAA and their use of vehicles and equipment to undertake maintenance activities have the potential to result in strain on health and emergency response services due to the inherent risk for injuries, illnesses, and or accidents.

Decommissioning

There is potential for the workforce during the decommissioning phase to place additional strain on health and emergency response services in the LAA/RAA, similar to the construction phase, but to a lesser extent, given the smaller workforce.

12.5.3.3 Mitigation for strain on health and emergency response services

Mitigation measures for strain on health and emergency response services include:

- An Emergency Response Plan will be developed. As part of the development and implementation, Manitoba Hydro will collaborate with local emergency responders to ensure timely 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 to provide services to project workers/contractors.
- As part of ongoing project engagement, Manitoba Hydro will continue to engage with and share project information with local governments.

12.5.3.4 Characterization of residual effects on strain on health and emergency response services

Based on the estimated increase in the number of project workers in the area (up to 200) in comparison to the population currently serviced by the health and emergency response services in the area (Section 5.9, Communities and population), it is anticipated that health and emergency services in the area (Section 12.3.3) will be able to accommodate the increased demand that may result from the project. It is anticipated that some of the workforce will be local, meaning people who already use the health and emergency response services in the area.

The potential for strain on health and emergency response services is anticipated to be the most pronounced during construction, as this phase will bring the highest number of temporary workers into the LAA/RAA.

After the application of mitigation measures, the residual effects of the project on health and emergency response services are predicted to be:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular events
- Reversibility: Reversible

12.5.4 Strain on waste management facilities

12.5.4.1 Analytical assessment techniques

The assessment of potential strain on waste management facilities focuses on the quantity and types of waste generated by the project that will be disposed of in local/regional disposal facilities, as well as the capacity of these facilities.

12.5.4.2 Effects pathways

Construction

During the construction phase, the project-related influx of workers, materials, and equipment to the LAA/RAA is anticipated to result in increased consumption of goods and materials as well as associated waste generation, which could strain the existing waste management facilities in the LAA/RAA (Section 12.3.4). In addition to

the mobilization and presence of staff, project activities that may generate waste during construction include horizontal directional drilling, pipe stringing, hydrostatic testing, and clean-up and demobilization. Drilling fluid waste will be produced during horizontal directional drilling and construction of the pipeline will also involve the production of steel shavings and pieces of steel pipe as waste during pipe stringing. Hydrostatic testing also generates water, which will be disposed of per Standard 620.05 and Manitoba Hydro's Environmental Protection Plan (EPP) for the project.

Potential generation of hazardous wastes due to the project may result from project-related accidents and malfunctions such as hydrocarbon spills (Chapter 15.0).

Operations

During operations, the presence of the project workforce, maintenance activities, and vegetation management will generate solid waste, which will ultimately be disposed of at local waste disposal facilities (Section 12.3.4).

Decommissioning

The decommissioning phase is anticipated to have similar effects on waste management facilities to the construction phase. Additionally, the removal of above-ground components (*e.g.,* control points) is likely to generate waste that may be disposed of in the LAA/RAA, resulting in the strain/demand on existing waste management facilities (Section 12.3.4).

12.5.4.3 Mitigation for strain on waste management facilities

Mitigation for the strain on waste management facilities involves:

- 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 outlines policies related to reducing the amount of solid waste generated, facilitating recycling wherever possible, and storing, transporting, and disposing of solid waste at designated 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.

- Subject to suitable soil conditions and drainage, and in compliance with *The Public Health Act* and/or *The Environment Act*, wastewater will be transported to an appropriate wastewater facility.

12.5.4.4 Characterization of residual effects on 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, use of the greatest volume of materials, and the most activities that may generate waste.

After the application of mitigation measures, the residual effects of the project on waste management facilities are predicted to be:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.5.5 Summary of residual effects characterizations

Table 12-5 characterizes the residual effects on infrastructure and community services.

Table 12-5: Project residual effects on infrastructure and community services

Residual effects characterization

Project phase	Direction	Magnitude	Geographic extent	Duration	Frequency	Reversibility
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				
Increased strain on health and emergency response services						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				
Increased strain on waste management facilities						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				

12.5.6 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 the assessment of project effects on infrastructure and community services, both above conditions exist, and a cumulative effects assessment is therefore presented in this section.

12.5.6.1 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 community 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 accommodations	**Increased traffic and strain on transportation infrastructure**	**Strain on health and emergency response services**	**Strain on waste management facilities**
Past and ongoing projects and activities				
Domestic resource use activities	-	-	-	-
Recreational activities	-	-	-	-
Industrial and commercial resource use activities	-	-	-	-
Existing infrastructure (non-Manitoba Hydro)	-	-	-	-
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	-	-	-	-
Residential and institutional developments	-	-	-	-
Future projects and activities				
Dominion City to Altona gas transmission pipeline (Manitoba Hydro 2024)	✓	✓	✓	✓
RM of Stanley Regional Wastewater Collection System (AECOM 2025)	✓	✓	✓	✓
Proposed residential developments	✓	✓	✓	✓

✓ = 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 residual project effects are not anticipated to cumulatively interact with ongoing projects and activities because the ongoing activities are understood to be accounted for within the current capacity of infrastructure and community services in the LAA/RAA.

12.5.6.2 Cumulative effect on reduced availability of short-term accommodations

Pathways for cumulative effect

The proposed future residential developments, RM of Stanley Regional Wastewater Collection System, and Dominion City to Altona gas transmission project are anticipated to interact cumulatively with adverse residual effects of the project on the availability of short-term accommodations through generating an influx of non-local individuals (*e.g.,* workers) requiring overnight accommodations into the LAA/RAA at the same time that the project brings non-local workers into the LAA/RAA.

Mitigation measures

The mitigation measures identified in the section 12.5.1.3 will also apply to the cumulative effects on reduced availability of short-term accommodations.

Residual cumulative effect

With the implementation of identified mitigation measures, the project is anticipated to contribute minimal cumulative effects to reduced availability of short-term accommodations. The anticipated cumulative effects are anticipated to be non-measurable in magnitude, will be long-term (during the project's lifespan), and occur on a continuous basis throughout the LAA/RAA while project activities overlap but will be reversible after decommissioning. Cumulative effects are anticipated to primarily occur where the projects' construction phases overlap and the number of non-local people brought to the LAA/RAA are the largest.

12.5.6.3 Cumulative effect on increased traffic and strain on transportation infrastructure

Pathways for cumulative effect

The proposed future residential developments, RM of Stanley Regional Wastewater Collection System, and Dominion City to Altona gas transmission project are anticipated to interact cumulatively with adverse residual effects of the project on

traffic and strain on transportation infrastructure through bringing additional vehicles and equipment onto the roads within the LAA/RAA. Cumulative effects will only take place if the individual projects are bringing influxes of traffic into the LAA/RAA in the same time periods.

The RM of Stanley Regional Wastewater Collection System is anticipated to have the greatest potential to interact cumulatively with the project on traffic and strain on transportation infrastructure due to its proximity with the west end of the PDA, which will bring project-related traffic the same local area and travel routes.

Mitigation measures

The mitigation measures identified in the section 12.5.2.3 will also apply to the cumulative effects of traffic and transportation infrastructure.

Residual cumulative effect

With the implementation of identified mitigation measures, the project is anticipated to contribute minimal cumulative effects to traffic and strain on transportation infrastructure. The anticipated cumulative effects are anticipated to be non-measurable in magnitude, will be long-term (during the project's lifespan), and occur on a continuous basis throughout the LAA/RAA while activities/project activities overlap but will be reversible after decommissioning.

Cumulative effects are anticipated to primarily occur where the project's construction phases overlap and the amount of project-related traffic (*i.e.,* vehicles and equipment) in the LAA/RAA are the largest.

12.5.6.4 Cumulative effect on strain on health and emergency services

Pathways for cumulative effect

The proposed future residential developments, RM of Stanley Regional Wastewater Collection System, and Dominion City to Altona gas transmission project are anticipated to interact cumulatively with adverse residual effects of the project on strain on health and emergency services through bringing non-local individuals (*e.g.,* workers) into the LAA/RAA at the same time that the project brings non-local workers into the LAA/RAA. The influx of non-local workers and inherent risks associated with the anticipated types of project activities involved in the future projects identified in Table 12-6 may result in illnesses, injuries, and accidents that require the support of health and emergency services in the LAA/RAA.

Mitigation measures

The mitigation measures identified in the Section 12.5.3.3 will also apply to the cumulative effects on strain on health and emergency services.

Residual cumulative effect

With the implementation of identified mitigation measures, the project is anticipated to contribute minimal cumulative effects to strain to health and emergency services. The anticipated cumulative effects are anticipated to be non-measurable in magnitude, will be long-term (during the project's lifespan), and occur in irregular events while activities/project activities overlap, but will be reversible after decommissioning. Cumulative effects are anticipated to primarily occur where the projects' construction phases overlap and the influx of non-local individuals and intensity of project activities are the highest.

12.5.6.5 Cumulative effect on strain on waste management facilities

Pathways for cumulative effect

The proposed future residential developments, RM of Stanley Regional Wastewater Collection System, and Dominion City to Altona gas transmission project are anticipated to interact cumulatively with adverse residual effects of the project resulting in strain on waste management facilities through the generation of solid wastes or wastewater requiring disposal within the LAA/RAA. Cumulative effects will only take place if the individual projects are generating wastes and requiring services of regional waste management facilities (Section 12.3.4) in overlapping temporal periods.

The proposed Dominion City to Altona gas transmission pipeline and the RM of Stanley Regional Wastewater Collection System are anticipated to generate similar types of waste to the project, being pipeline projects requiring similar project activities.

Mitigation measures

The mitigation measures identified in the section 12.5.4.3 apply to the cumulative effects of the strain on waste management facilities.

Residual cumulative effect

With the implementation of identified mitigation measures, the project is anticipated to contribute minimal cumulative effects to strain on waste management facilities in the LAA/RAA. The anticipated cumulative effects are anticipated to be non-measurable in magnitude, will be long-term (during the project's lifespan), potentially affecting waste management services throughout the LAA/RAA, and occur in irregular events while activities/project activities overlap, but will be reversible after decommissioning. Cumulative effects are anticipated to primarily occur on a continuous basis when project schedules overlap but be reversible after decommissioning.

12.5.7 Determination of significance

With mitigation and environmental protection measures, the residual effects on infrastructure and community services are predicted to be not significant. The proposed project is not anticipated to disrupt, restrict, or degrade existing infrastructure and community services to a point where activities cannot continue at or near baseline levels for a period that extends beyond the construction phase (*i.e.,* into operations and/or decommissioning).

12.5.8 Prediction confidence

The prediction confidence in the assessment of effects on infrastructure and community services is moderate, based on the data collected for this assessment and an understanding of project pathways and effects from comparable past projects. Prediction confidence is based on the information compiled during desktop-based data compilation, engagement feedback, and an understanding of project activities, location, and schedule.

12.5.9 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 will be undertaken in pursuit of appropriate rehabilitation, as per the EPP (see Chapter 16.0).

12.5.10 Sensitivity to future climate change scenarios

The effects of climate change on infrastructure and community services are expected to be related 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, buildings, and other critical infrastructure may suffer from increased deterioration and damage due to flooding, erosion, and freeze-thaw cycles. Altered precipitation patterns can also potentially affect water treatment and supply systems.

Extreme weather events, including heatwaves, storms, and wildfires, can strain healthcare facilities and emergency response services and potentially affect the human health risk of individuals and communities (Chapter 10.0).

13.0Greenhouse gases and climate change

This chapter and associated Appendix D (Greenhouse gas assessment report) address Manitoba Environment and Climate (2023)'s requirement for the description of potential effects of the development encompassing climate change implications, including a greenhouse gas (GHG) inventory calculated in alignment with the GHG Protocol's Project GHG Accounting Protocol.

Manitoba Hydro remains committed to continuing our work on climate change and adapting our processes to ensure Manitobans' energy expectations are met in both the near-term and long-term. Over 99% of the electricity Manitoba Hydro produces is from non-fossil generation sources and our electrical system will be required to support additional electrification in Manitoba. While reducing fossil fuel use is necessary, a key learning from Manitoba Hydro's integrated resource planning is that the strategic use of natural gas, by both industry and for home heating, supports a more affordable pathway to net-zero in Manitoba. The proposed project consists of the construction and operation of an approximately 31 km, 8-inch steel natural gas pipeline and two control points, one north of Altona and the other within an expanded footprint of the existing Winkler GS-140 gate station. The project's objective is to provide natural gas transmission capacity to meet growing customer demand in the Altona-Winkler area.

The following sections outline projections of how climate in the area may change in the future and provide a summary of the GHG assessment undertaken for the project. Chapter 5.0 (Environmental setting) includes a description of historic climate conditions. In addition, each valued component (VC)'s assessment chapter includes a discussion about sensitivity to climate change scenarios (see Sections 6.5.7 (Important sites); 7.5.8 (Vegetation); 8.5.8 (Wildlife and wildlife habitat); 9.5.8 (Commercial agriculture); 10.5.8 (Human health risk); 11.5.9 (Economic opportunities); and 12.5.10 (Infrastructure and community services)). There was no feedback related to climate change and GHGs during project engagement.

13.1 Future climate

In summary, there is reasonable agreement among simulations that the future climate for the project area will be warmer than historic conditions, with more precipitation, on average, during winter and spring seasons. Although there is also some agreement regarding changes in other climatic variables (*e.g.,* reduced mean annual wind speeds), there is generally lower scientific confidence regarding these changes.

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 14 GCMs and three GHG emission scenarios (Shared Socioeconomic Pathways; SSP2-4.5, SSP3-7.0, SSP5-8.5; Riahi et al., 2017) provide the basis for the assessment herein which utilize the latest GCM datasets (*i.e.,* from the Coupled Model Intercomparison Project phase 6; CMIP6; Eyring et al., 2016). For temperature and precipitation projections, we rely on an ensemble of simulations known as ESPO-G6-R2 (Lavoie et al., 2024) which have been downscaled and bias-adjusted by the Ouranos Consortium. For other variables (evaporation, runoff, windspeed, and soil moisture), we rely on projected changes derived from the raw CMIP6 GCM data. 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 time 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 (often referred to as deltas; Δ) 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. Note that Table 13-1 and Table 13-2 present projected changes for precipitation, wind speed, and soil moisture in terms of percentages (% change) as opposed to absolute change (*e.g.,* mm/month or km/h).

Table 13-1: *Median projected change (Δ) from two sources (ESPO-G6-R2 and raw CMIP6 GCMs) of GCM simulations for a Global Warming Level of +1.19°C above 1981-2020 at the grid point nearest Altona, MB. Cell colours reflect ensemble agreement on the direction of change. In accordance with the agreement terminology defined in Gutiérrez et al. (2021), dark green indicates high model agreement (i.e., ≥80% of models) that an increase or decrease will occur. Non-coloured cells depict cases when there is low model agreement (i.e., <80% agree on the sign of change).*

	ESPO-G6-R2				raw CMIP6 GCMs			
	Tmin (°C)	**Tmean (°C)**	**Tmax (°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: *Same as Table 13-1, but for a Global Warming Level of +2.19°C above 1981-2020. Note only 27 of the 42 simulations reach this level of warming.*

	ESPO-G6-R2				raw CMIP6 GCMs			
	Tmin (°C)	**Tmean (°C)**	**Tmax (°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

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, are described in Sagan et al. (2025). For the Red River at Emerson site (05OC001), which represents a drainage basin of 102,000 km^2, the ensemble median projects increased average flows in all seasons with strong agreement in winter, summer, and annual scales. For the Pembina River at Neche site (05OC004), which represents a nearby, more local, drainage basin of 8,480 km^2, the ensemble median also projects increased average flows in all seasons. Compared to the Red River at Emerson site, Pembina River at Neche is subject to smaller relative (*i.e.,* percent) changes annually, as well as in spring and summer seasons, similar relative changes in winter, and a greater relative increase in the fall, however the Pembina River site is subject to lower ensemble agreement on the direction of change. 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 deltas presented in this section, results may require special interpretation. For example, the deltas calculated 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
2. Potential market responses

Recognizing project infrastructure as being the primary focus of this environmental assessment, the GHG assessment focused on the first category – project infrastructure. A GHG life cycle assessment (GHG 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 GHG LCA emissions for the project are estimated to be 419.67 tonnes of CO2e per pipeline km (t CO2e/km), or 12,968 tonnes of CO2e (t CO2e), for the entire pipeline over the 50-year assumed lifespan of the project. When the full profile of GHG 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 43% of the total considered GHG LCA emissions. For context, 2023 operating emissions along Manitoba Hydro's existing Natural Gas Distribution System were 40,800 tonnes CO2e (Manitoba Hydro 2024), approximately 3 times the 50-year GHG LCA emissions of the project.

Table 13-3: GHG LCA Emissions Summary Table

Activity	**t CO_2e/km**	**t CO_2e**	**% of total**
Construction: Material Supply Chain	110.63	3,419	26%
Construction: On-Site Energy	94.55	2,922	23%
Construction: Worker Transportation	13.57	419	3%
Construction: Land Use Change	15.33	474	4%
Construction: Project Commissioning	0.02	1	0%
Post Construction: Pipeline Operations	182.42	5,637	43%
Post Construction: Pipeline Decommissioning	3.14	97	1%
Total	**419.67**	**12,968**	100%

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 availability, the GHG assessment of potential market response effects were 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.,* internal Manitoba Hydro 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 direct and indirect natural gas emissions, decrease diesel and propane related emissions, and decrease

regional electricity generation 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 D.

13.3 Mitigation for greenhouse gas emissions

Based on the GHG assessment conducted for the project, project infrastructure related GHG emissions are anticipated to be most pronounced during the construction phase of the project.

As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work. Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction activities:

- Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline.
- Encouraging the productive use of wood/timber removed during clearing activities.
- Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency.
- Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical.
- Encouraging vans/shuttle buses and/or carpooling of workers when practical.
- Using electric and/or hybrid vehicles to the extent practical.
- Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical.
- Planning work activities to reduce the distance of travel, *e.g.,* using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical.

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, 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.

The most likely anticipated effects of the environment on the Altona to Winkler gas transmission project are short-term disruptions in construction and maintenance activities and the economic costs of repair. Considering project-specific mitigation, the residual effects associated with such effects are anticipated to be most pronounced during the operational phase and inconsequential.

14.1 Effects analysis

Effects of the environment on the project could occur during all phases of the project, *i.e.,* construction, operation, and decommissioning. However, they are anticipated to have the greatest likelihood of occurring during operations, because the anticipated duration of operations is at least 50 years, which provides the greatest likelihood for environmental forces to interact with the project and project activities.

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, diminished pipeline and above-ground structure (*i.e.,* control point) integrity, and reduction of soil cover above the pipeline (Kelly WM Scott & Associates 2011; Stantec 2014, Abegaz et. al. 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.

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 increased risk of rupture or separation of the pipe.

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).

Reduction in the depth of soil cover overlying the pipeline would trigger the need to undertake maintenance activities to restore 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).

Drainage and flooding are major concerns for all areas in the Rhineland, Plum Coulee, Gretna, Altona (RPGA) Planning District and the Morden, Stanley, Thompson, Winkler (MSTW) Planning District. The area traversed by the project is outside the Red River Valley designated flood area boundary (Manitoba Government, 1998) and has generally low to moderate flood susceptibility based on a national map of flood

susceptibility or flood prone areas made available by Natural Resources Canada (Government of Canada 2025).

14.1.1.2 Fires

There is the potential for grass fires to occur in the ditches along roads traversed and adjacent to the final preferred route 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.

A loss of control of a crop residue burn could result in damage to above-ground infrastructure components of the project.

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 municipalities traversed by the project. Published records confirm that tornadoes have been documented in the area (Environment and Climate Change Canada 2015 & Western University Northern Tornadoes Project

2025). More recently, a tornado was sighted west of the project area, near Darlingford in the RM of Pembina, in 2024 (Sumner, 2024). In addition, severe thunderstorm warnings including for the Winkler, Morden, and Altona areas have been issued by Environment Canada in 2024, highlighting a broader pattern of significant storm activity in the RAA, which brought in hail, strong wind gusts, and resulted in overland flooding in some areas (PembinaValleyOnline, 2024).

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 not frozen. Thunderstorms are more likely to overlap with planned project activities. Reduced visibility during thunderstorms 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 be present along roadsides traversed by the PDA. Extreme rainfall events during construction and maintenance activities could result in water pooling in the pipeline trench and cause a delay in the completion of these activities.

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 texture (*i.e.,* proportions of silt, clay, and sand particles in soil) and moisture. Within the project area, typical winter temperatures are sufficient to cause seasonal freezing in the upper layers of the soil profile. Frost heaving in the vicinity of pipelines may result from 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 (Government of Canada, n.d.), which reduces the potential for frost heaving. The project area experiences a temperate climate with warm summers and long, cold winters, where the ground rarely remains frozen throughout the year.

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 Canadian Standards Association (CSA) standards including CSA Z662:23, as well as Manitoba Hydro natural gas standards (*e.g.,* Manitoba Hydro Natural Gas Standard Depth of Cover - Pipeline 510.02)
- 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 16.0), 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 (*i.e.,* control points) of the project during floods, fires, or other extreme weather that may physically interact with above-ground structures

The most likely effects of the environment on the project are short-term disruptions in construction and maintenance activities and the economic costs of repair.

The residual effects of the environment on the project are anticipated to be 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 inconsequential.

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 of Canada 2025). 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 protect the integrity of the pipeline system. Regular inspections, maintenance, and emergency response plans are crucial in mitigating the potential likelihood and impact of accidents or malfunctions. Emergency responders and pipeline operators work together to address and resolve incidents promptly to protect public safety and the environment.

15.1 Summary of conclusions

The likelihood of the accidents and malfunctions assessed in this chapter taking place on the Altona to Winkler gas transmission project is anticipated to be low, given the measures that will be undertaken to prevent their occurrence. As a result, residual effects of accidents and malfunctions on the environment (*i.e.,* on the valued components assessed in this report) are anticipated to be low in magnitude and are anticipated to be not significant because they are not anticipated to result in human mortality or affect one or more valued components (VCs) in a manner that would meet the VC-specific definition for significance used within this report.

If an accident or malfunction does occur, it is anticipated that it would happen at a low frequency, be of a short duration, and/or affect a limited geographic extent such that major residual adverse environmental effects would be unlikely.

15.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 15.1), including discussion of potential accidents and malfunctions associated with the project that could result in appreciable adverse

environmental effects, mitigation measures reducing the likelihood and severity of their occurrence, and characterization of the anticipated residual effects following mitigation.

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. 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 with similar projects 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

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 potential 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.

For the purposes of this assessment, the characterization of residual effects of accidents and malfunctions consider the valued component (VC)-specific thresholds used to characterize residual project and cumulative effects provided in each VC chapter within this report (see Chapters 6.0 – 12.0).

Additionally, residual effects of accidents and malfunctions are considered significant if an event is anticipated to result in human mortality or affects one or more valued components in a manner that would meet the VC-specific definition for significance provided in each of the seven VC chapters within this report.

15.3 Effects assessment for accidents and malfunctions

This section describes the ways each potential accident or malfunction may affect the VCs assessed in this report.

Table 15-1 presents the potential interactions between the assessed VCs and potential accidents or malfunctions. Following the table, there is a section assessing the project and cumulative effects of each potential accident or malfunction, including discussion of the VC interactions identified in Table 15-1, mitigation in place to manage the risk of each potential accident or malfunction, and a characterization of the potential residual effects following mitigation.

Table 15-1: Potential interactions between accidents and malfunctions and assessed valued components

Potential accidents and malfunctions	**Important sites**	**Vegetation**	**Wildlife and wildlife habitat**	**Commercial agriculture**	**Human health risk**	**Infrastructure and community services**	**Economic opportunities**
Worker accident	-	-	-	-	✓	✓	-
Hazardous material spills	✓	✓	✓	✓	✓	✓	-
Fire and explosions	✓	✓	✓	✓	✓	✓	-
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.

15.3.1 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 associated regulations.

Workers will be trained in practices to prevent workplace accidents including Workplace Hazardous Materials Information System (WHMIS), first aid, and other applicable training. These trainings and associated 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.

15.3.2 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, release fumes that may cause inhalation risk (human health and well-being, wildlife and wildlife habitat)
- Contaminate soil (important sites, commercial agriculture, vegetation, wildlife and wildlife habitat, human health and well-being)
- Strain waste disposal and emergency and healthcare services (infrastructure and services)

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 16.0) will result in minimal potential effects through accidental releases.

Effects due to hazardous material spills will be mitigated through the following:

- Prior to commencing construction activities, the contractor shall develop a spill response plan that must be submitted to Manitoba Hydro for review and acceptance.
- 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.

15.3.3 Fire and explosions

A fire may arise from the use of equipment during construction or maintenance activities (*e.g.,* machinery sparks) as well as the ignition of spilled materials. When a gas line ruptures, the released natural gas can accumulate in enclosed or low-lying areas, creating a highly combustible environment, and even a small spark, *e.g.,* from match, electrical switch, or static electricity, can ignite an explosion.

Potential effects caused by fires and explosions include:

- Safety risks and exposure to diminished air quality for workers and the public (human health and well-being)
- Need for emergency response and medical services (infrastructure and community services)
- Loss of 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)
- Production of carbon dioxide from combustion of methane would contribute to GHG emissions

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 to result from the project because of planned mitigation and prevention measures. The potential residual environmental effects of a fire are therefore considered not significant.

15.3.4 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 and/or disrupt access to communities in the area in the event of a prolonged highway closure (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 when project related traffic (vehicles and machinery) is travelling to, from, and along the project development area. The likelihood of a vehicle accident is greatest during construction when the number of project-related vehicles in the PDA will be at its peak, of up to 100 project-related vehicles per day (assuming 2 workers per vehicle).

Effects due to vehicle accidents will be mitigated through the following:

- Project-related vehicles will observe 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 relatively small increase in traffic volumes (Chapter 12.0), the potential residual environmental effects of a vehicle accident are considered not significant.

15.3.5 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 (important sites). Should the encounter of a heritage site or object occur on or near land utilized for commercial agricultural activities, it would have the potential to disrupt ongoing agricultural activities (commercial agriculture) and could cause stress for the associated landowners (human health and well-being).

Effects associated with the encounter of a heritage site or object will be mitigated through the following:

- The heritage potential of the PDA is analyzed during the environmental assessment. In areas identified as having high potential for heritage resources, a preconstruction archaeological survey may be conducted.

- Areas of potential heritage concern along the proposed project location have been identified for pre-construction archaeological field surveys by a qualified archaeologist as detailed in Chapter 6.0 and Appendix E.
- If a heritage site or object is encountered, project work will cease around the object and the project archaeologist will be contacted. Work in the area will continue only when approval is received from the project archaeologist or the Historic Resources Branch.
- Should the encounter of a heritage site or object occur on land used for commercial agriculture and preclude use of that land for typical agricultural operations/activities, Manitoba Hydro may consider compensating the producer for ancillary damages on a case-by-case basis.

Additional mitigation for the protection of heritage sites or objects is outlined in the Culture and Heritage Resource Protection Plan (CHRPP) (Appendix E). The CHRPP provides 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 outlines processes for ongoing protection

Given the planned mitigation and precautions related to heritage resources, the potential residual effects are considered not significant.

15.3.6 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 2024). 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 such as corrosion inhibitors and anti-freeze agents (commercial agriculture, vegetation, wildlife and wildlife habitat, human health and well-being)

- Safety risks to workers and the public from fires and explosions should there be sources of ignition in the vicinity of the gas leak or rupture (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
- Unintentional methane releases from leaks or ruptures would contribute to greenhouse gas emissions

Effects due to pipeline leak or rupture will be mitigated through the following:

- 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.
- As part of the Click Before You Dig MB program, Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.

If a pipeline leak or rupture were to occur, the potential effects identified above would be anticipated to be of short duration. Because of planned mitigation and prevention measures, however, pipeline leaks or ruptures are not anticipated, and the potential residual environmental effects of gas leaks and ruptures are therefore considered not significant.

15.3.7 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 other examples of third-party interference where individuals or organizations conduct deliberate acts of vandalism or sabotage that result in damage to pipeline infrastructure. Since the pipeline is in an area with a lower population density, the risk of deliberate third-party interference is likely reduced (Wang 2014). 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 deliberate third-party interference (human health and well-being)
- Loss of service affecting end-users
- Financial losses from shutdowns (economic opportunities)
- Strain on health and emergency response services (infrastructure and community services)

Effects due to third-party interference will be mitigated through the following:

- Pipeline surveys and inspections will be done on a regular basis, helping to protect against deliberate third-party interference.
- Landowners will be aware of the location of the pipeline on their land (*i.e.,* depth of cover surveys) to mitigate accidental third-party interference (from excavation and agricultural activities).
- Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.
- The pipeline will be marked with signs at each mile road and where the pipeline crosses waterways or other service roads.

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.

15.4 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 accidents or malfunctions were

to occur, it is anticipated that they would occur at a low frequency and that the effects would be of a short duration and of 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. The residual effects of accidents and malfunctions are not anticipated to result in human mortality or affect one or more VCs in a manner that would meet the VC-specific definition for significance provided in each of the seven VC chapters within this report.

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, management and monitoring 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 develops 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 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

16.2 Environmental management

Manitoba Hydro is proceeding with 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 that includes the 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. Maintaining self-verification under the ISO standard promotes 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

16.4 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. 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 the varying aspects of protecting the environment during the pre-construction, construction, operation and decommissioning phases of the project.

Figure 16-1 illustrates the components of the EPP. The following sections describe each component in further detail.

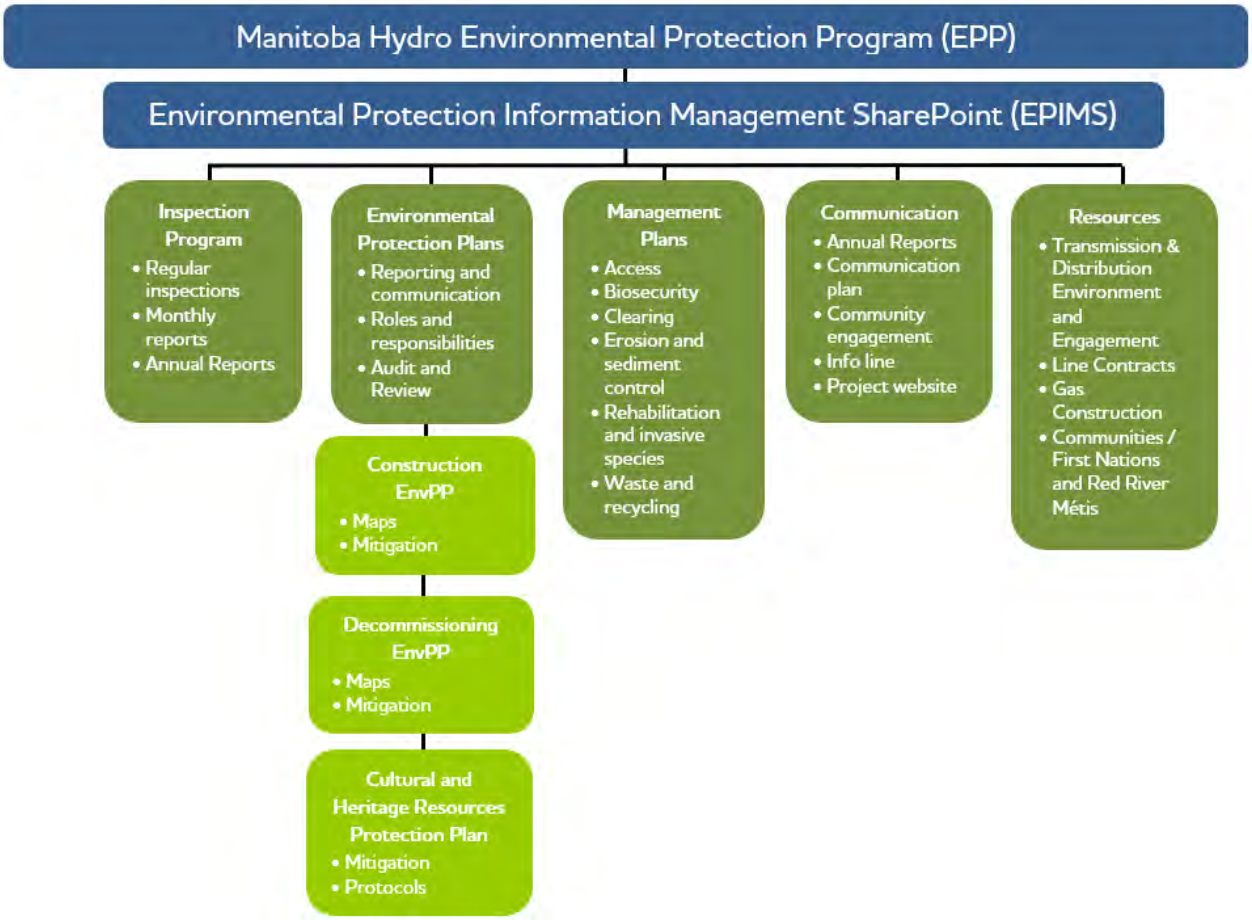


Figure 16-1: Environmental protection program components

16.5 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 project 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.

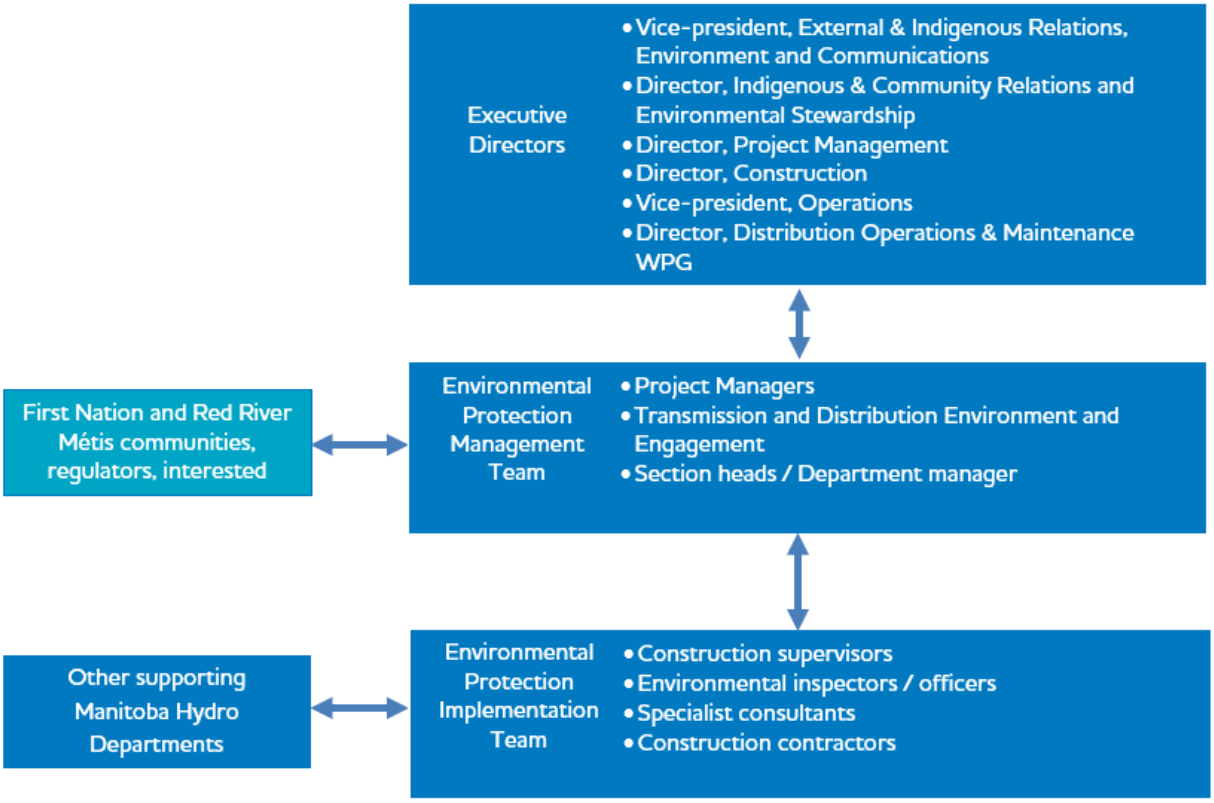


Figure 16-2: Environmental protection program organizational structure

16.5.1 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.

16.5.2 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 project 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.

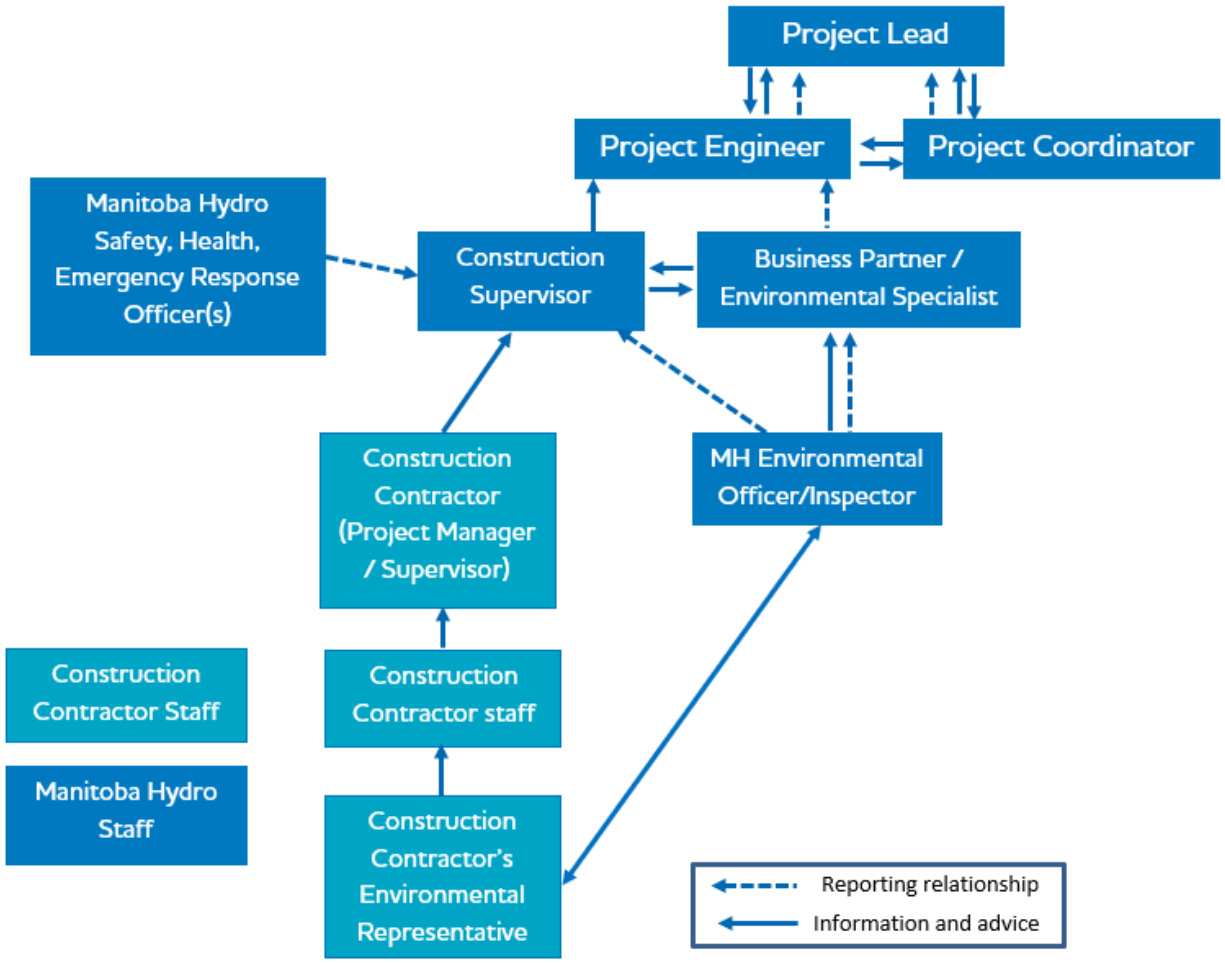


Figure 16-3: Typical organizational lines or reporting and communications

16.5.3 Communication and reporting

Manitoba Hydro personnel will maintain ongoing communication with Manitoba Environment and Climate Change, other provincial and federal departments, engaged First Nations, the Manitoba Métis Federation, and organizations regarding implementation of the environmental protection plan. The construction supervisor and environmental inspectors will maintain ongoing communication 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.

16.5.4 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 designs 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 organizes 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.

16.5.4.1 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 project 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 project engagement and assessment activities. Environmentally sensitive sites are locations, features, areas, activities, or facilities along or immediately adjacent to the transmission line corridor 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 (e.g. topsoil stripping depth and handling, heritage resources, waterbodies) that can be implemented, managed, evaluated, and reported on in the field.

16.5.4.2 Operation and maintenance

Contractor Environmental Responsibility Bulletins (Appendix F) articulate the standard mitigation measures that will be implemented during operations and maintenance activities. A specific operation and maintenance environmental protection plan is not planned at this time.

16.5.4.3 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.

16.5.4.4 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 E) 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.

16.5.5 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
- Clearing
- Erosion protection and sediment control
- Rehabilitation and invasive species
- Waste and recycling

Environmental inspectors / officers will conduct regular inspections during construction to ensure adherence to the plans. The following sections describe each plan.

16.5.5.1 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, cultura,l and heritage sites / objects

16.5.5.2 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.

16.5.5.3 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:

- Ground protection measures
- Establishment of buffer zones
- Avoidance of sensitive areas
- Use of bioengineering techniques

16.5.5.4 Rehabilitation and invasive species

Prior to the start of construction, Manitoba Hydro will prepare a rehabilitation and invasive species 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 mobilizing to the project site
- Weed management at construction sites
- Restoring and re-vegetating disturbed sites

16.5.5.5 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

16.6 Follow-up and monitoring

Follow-up and monitoring are intended 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. Where required, Manitoba Hydro implements the follow-up and monitoring activity using two programs called inspection and environmental monitoring, which are discussed further in the sections below.

16.6.1 Inspection program

An inspection is a type of monitoring and/or follow-up and monitoring activity that includes documenting observations and evaluations of a construction or maintenance project and related work activities to verify conformance with specified requirements, drawings, and standards. 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 which have elevated environmental risk such as clearing and excavation. Manitoba Hydro's approach to environmental inspection includes:

- Compliance with regulatory approvals
- Adherence to environmental protection plans
- Qualified environmental inspectors
- Environmental support and guidance
- Scheduled monitoring and inspection during construction
- Interaction with contractors (*e.g.,* pre-construction meeting, regular meetings)
- Review of inspection and monitoring information
- Quick response to incidents or changing conditions
- Monthly summary reports
- Reporting to regulators
- Notification to 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 when appropriate the applicable regulatory authority
- Report incidents including accidents and malfunctions (*e.g.,* material spills, fires, and explosions) and associated environmental damage to the construction supervisor and applicable regulatory authority, if required
- 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.

16.6.2 Valued component monitoring program

Due to the well-understood and limited potential effects to the area traversed by the final preferred route; a VC-specific monitoring plan has not been prepared for this project. Should environmental inspections discover unexpected VC-specific effects or damage (*e.g.,* damage to wildlife habitat), a VC-focused monitoring plan that outlines monitoring steps to ensure appropriate rehabilitation and follow-up, may be developed.

16.6.3 Environmental protection information management SharePoint (EPIMS)

An environmental protection information management SharePoint (EPIMS) is a tool that is used monitor, track and report on environmental protection implementation and performance, regulatory compliance, and incident reporting.

The environmental protection information management SharePoint (EPIMS) functions as an 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

16.7 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 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 management plan, 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 receive orientation on environmental protection requirements.

16.8 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 at specific sites in the event of an environmental accident, extreme weather event, or if suspected human remains are discovered. 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 or modify work 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.

16.9 Review and updating

16.9.1 Incident reviews

The 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.

16.9.2 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.

16.9.3 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.

16.10 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 plans are also identified.

17.0Conclusion

This report outlined the environmental assessment of potential biophysical and socio-economic effects of the proposed Altona to Winkler gas transmission project.

The environmental assessment was focused on seven valued components, namely important sites, vegetation, wildlife and wildlife habitat, commercial agriculture, human health risk, economic opportunities, and infrastructure and services.

Detailed conclusions related to predicted residual effects and the characterization of those effects are included in each valued component assessment chapter (Chapters 6.0 – 12.0). A summary of conclusions is included at the beginning of each of these chapters.

To summarize at a high-level, the conclusions of the assessment of anticipated residual environmental effects of the Altona to Winkler gas transmission project include, but are not limited to, the following:

- Potential project effects are anticipated to be most pronounced during the construction phase of the project.
- The proposed project traverses approximately 0.9 ha of Crown land, which is comprised entirely of water crossings/drains.
- Potential effects on the natural environment are limited as most of the proposed project development area is previously disturbed and developed. The project development area traverses predominantly agricultural land (>85%).
- The project is anticipated to directly alter less than 3.0 ha of forest.
- The project is not anticipated to alter wetlands.
- The proposed project has low potential to affect species of conservation concern.
- The project has potential to adversely affect important sites, including heritage resources and cultural sites or features, through ground disturbance.
- Cultural experiences in the area may be affected due to changes to the sensory experience and access.
- A total of 80 ha (198 ac) of land will be temporarily lost from agricultural production and there will be a short-term disruption to agricultural activities during construction.
- There will be permanent loss of an estimated 0.04 ha (0.10 ac) of land from agricultural use, which will be occupied by the above-ground control point near Plum Coulee throughout the lifetime of the project.
- Agricultural land capabilities along the pipeline route are anticipated to return to pre-disturbance levels.

- Anticipated residual effects related to human health risk include a temporary increase in noise levels. Project-related effects on air quality are anticipated to be negligible.
- An increase in traffic in the assessment area is anticipated as well as potential for small increases in strain on the availability of short-term accommodations, transportation infrastructure, health and emergency response services, and waste management facilities.
- The project is anticipated to result in positive outcomes for economic opportunities, including potential opportunities for employment and local spending on goods and services.
- The total considered life cycle GHG emissions for the project are estimated to be 419.67 tonnes of CO2e per pipeline km (t CO2e/km), or 12,968 tonnes of CO2e (t CO2e), for the entire pipeline over the 50-year assumed lifespan.
- 'Post Construction: Pipeline Operations' is the single largest GHG emission category over the 50-year assumed lifespan, accounting for 43% of the total considered life cycle assessment emissions.

Manitoba Hydro understands that the severity of residual project effects may be 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. Certain mitigations have been built into project design. Routing the pipeline to parallel an existing natural gas pipeline for approximately 3 km of the proposed route has reduced overall project conflicts with agricultural activities, while locating the project predominantly on agricultural land (>85%) and using horizontal directional drilling to install the pipeline beneath certain areas, including Buffalo Creen, the Rosenheim Drain, and the Hespeler Drain, mitigates effects to natural vegetation, wildlife habitat, and species of conservation concern.

Table 17-1 at the end of this chapter, provides a comprehensive record of additional project-specific mitigation measures identified throughout this report. The mitigation measures in Table 17-1 represent Manitoba Hydro's commitments related to the proposed project, if approved.

With the implementation of the mitigation built into project design as described in Chapter 2.0 and the mitigation measures identified in Table 17-1 to reduce and manage potential adverse effects on the biophysical and socioeconomic environment, the residual effects of the Altona to Winkler gas transmission project are predicted to be **not significant**.

The project will provide a benefit to Manitobans, bringing energy to life.

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
After filing this environmental assessment report with Manitoba Environment and Climate Change, Manitoba Hydro will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the municipalities, and interested parties of the submission and provide a link to this report.	Chapter 4.0 (Project engagement)
Following Manitoba Environment and Climate Change's decision regarding the Altona to Winkler gas transmission project, Manitoba Hydro will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the municipalities, and interested parties of the outcome of the decision. If we are granted a licence, we will keep our engaged audiences informed of construction schedules, activities, and associated training, employment, and/or business opportunities.	4.0
Manitoba Hydro will reach out to First Nation and Métis audiences to discuss interest in holding a ceremony or ceremonies at project milestones.	4.0
If a licence is received, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.	4.0
Manitoba Hydro will remain open and responsive to any questions or concerns that may arise from engaged audiences through the project's construction and operation.	4.0
The project webpage will continue to be updated as the project progresses through the regulatory review process and, if a licence is received, through project construction, and the toll-free phone	4.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
number (1-877-343-1631) and project engagement email address (projects@hydro.mb.ca) will remain available.	
Manitoba Hydro plans to engage in further discussions about culture and heritage related opportunities with engaged First Nations and the Manitoba Métis Federation.	4.0
Manitoba Hydro will implement the Manitoba Hydro biosecurity policy and procedures to mitigate biosecurity risks.	4.0
Where possible, Manitoba Hydro will work with landowners to minimize disruption to farming operations and confirm locations of in-ground infrastructure to prevent damage.	4.0
A pre-construction survey of areas with heritage potential will be conducted. A total of nine areas of elevated heritage concern (AOCs) have been identified, including a major historic trail, relict channels, and areas in proximity to known 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 • examining input from the HRB • examining input from engaged nations that participated in the September 11, 2025 site visit • windshield surveys	6.0 (Important sites)
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	6.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
consultants, encounter 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.	
Manitoba Hydro will work to notify engaged First Nations and the Manitoba Métis Federation about archaeological finds.	6.0
Manitoba Hydro remains open to engaged First Nations and the Manitoba Métis Federation identifying sensitive sites, including important sites, to help inform the environmental protection program for the project.	6.0
Identified cultural and heritage sites will be incorporated into environmental protection plans prior to construction.	6.0
Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	6.0
Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.	6.0
Manitoba Hydro will provide notification to engaged First Nations and the Manitoba Métis Federation and relevant interested parties prior to the start of construction.	6.0
Indigenous Cultural Awareness Training will be required for project workers (i.e., both Manitoba Hydro staff and contractors)	6.0
Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be	6.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
guided by each nation's cultural practices, protocols, and preferences.	
Manitoba Hydro will continue to consider feedback related to mitigation for how the project contributes cumulatively to effects to important sites in the RAA for important sites (Chapter 6.0).	6.0
SAR will be protected in accordance with provincial and federal legislation and provincial and federal guidelines.	7.0 (Vegetation)
A 30 m buffer will be applied to known SAR.	7.0
Setbacks and buffers along the right-of-way (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.	7.0
If previously unidentified plant SAR are found on the right-of-way prior to or during construction, the occurrences will be flagged for avoidance.	7.0
Access shall be restricted to established roads and trails and cleared construction areas.	7.0
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.	7.0
All equipment must arrive at the right-of-way or project site clean and free of soil or vegetation debris.	7.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
Weed control along access roads and trails will be conducted in accordance with the Rehabilitation and Invasive Species Management Plan.	7.0
Equipment will be cleaned before moving from locations with identified invasive weed infestation.	7.0
Wildlife features (*e.g.*, stick nests) will be identified in the Construction Environmental Protection Plan (CEnvPP), and mitigation, such as buffers, will be applied.	8.0 (Wildlife and wildlife habitat)
Environmentally sensitive sites, features, and areas will be identified and mapped before construction.	8.0
Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation measures such as pre-construction nest searches.	8.0
Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	8.0
Hunting and harvesting of wildlife, or possession of firearms by project staff, will not be permitted while working on project sites.	8.0
Construction activities will be restricted to roads, trails and cleared construction areas in accordance with the Access Management Plan.	8.0
Project-related vehicles will comply with all traffic rules, including speed limits and provincial and federal highway regulations.	8.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation.	8.0
The trench will be inspected before backfilling to prevent amphibians or other wildlife from being inadvertently buried.	8.0
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.	9.0 (Commercial agriculture)
Compensation will be provided to landowners for: • damage to property, any relocation of incompatible agricultural buildings • temporary loss of agricultural land	9.0
Areas of temporary soil disturbance on agricultural lands will be rehabilitated in accordance with the Rehabilitation and Invasive Species Management Plan. This plan will be developed before construction and would be part of the overall Environmental Protection Program, as described in Chapter 16.0.	9.0
Manitoba Hydro will contact directly-affected landowners to discuss how to reduce effects on their agriculture activities.	9.0
A pre-construction soil survey will be undertaken along the pipeline route to facilitate development of project-specific topsoil stripping depth and soil handling recommendations.	9.0
Effects of soil compaction and rutting will be mitigated by managing equipment traffic routes and activities for access development, temporary work area setup, right-of-way preparation, pipeline stringing and installation, and control point	9.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
preparation. Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	
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 of compaction (*e.g.,* deep ripping or tillage)	9.0
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 considered to avoid compaction and admixing	9.0
Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing of erosion protection and sediment control plans. The objective of these will be to limit adverse environmental effects of sediment releases on the aquatic environment. These will be developed in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.	9.0
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.	9.0
Landowners will be engaged with regarding construction and reclamation plans specific to existing and potential future irrigation and tile drainage installations, and surface drainage features, prior to construction.	9.0
Where conflict and/or interference can't be avoided including where timing of project activities overlaps with producer activities	9.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
during the growing season, Manitoba Hydro will pay compensation pursuant to the Landowner Compensation Program.	
Construction damage compensation is offered to landowners who experience damage to their property due to the construction, operation and maintenance of the pipeline. It will be provided to compensate a landowner for damages such as the reapplication or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the expertise of the landowner. This will include damage to existing irrigation or drainage infrastructure, in the event this occurs.	9.0
Structure Impact Compensation is a one-time payment to landowners for each structure placed on land classed as agricultural. Structure Impact Compensation will cover: • reduced productivity in an area of overlap around each structure • additional time required to maneuver farm machinery around each structure • double application of seed, fertilizer and weed control in the area of overlap around each structure	9.0
Ancillary damage compensation is a one-time payment when Manitoba Hydro's use of the right-of-way directly or indirectly affects the use of the property. It will be provided for: • constraint effects such as restricted access to adjacent lands • traditional effects such as highest and best use of land	9.0
Manitoba Hydro staff and contractors will be trained on Manitoba Hydro's corporate policy on biosecurity (Manitoba Hydro 2023a) and agricultural biosecurity SOP (Manitoba Hydro 2023b) and will follow this SOP during construction and operation and	9.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
maintenance activities. Measures to be implemented in line with general considerations of the agricultural biosecurity SOP include: • completion of a risk assessment to identify the perceived risk to agricultural land from maintenance and construction activities using frequency of activities and consequence levels (field conditions such as wet or frozen) • if existing farm level biosecurity measures exist, Manitoba Hydro staff and contractors will strive to meet the requirements of the agricultural operation when access is required • Where possible, regular operation and maintenance activities (including patrols) on agricultural lands will be scheduled after crops have been harvested and conducted primarily after freeze-up • Avoiding access through areas that may contain manure.	
Per the agricultural biosecurity SOP (Manitoba Hydro 2023b), Manitoba Hydro staff or contractors will complete the following requirements (detailed, scenario-based procedures will be followed by staff and contractors, as presented in the agricultural biosecurity SOP): • While working in livestock settings (i.e., a property or portion of a property where livestock are kept): o Visually inspect, clean and disinfect tools and footwear before entering and leaving fields or identified controlled access zones (e.g., a zone defined by a livestock producer to control entry onto their property). o Visually inspect and mechanically clean vehicles, if vehicles used in fields or identified controlled access zones. Pressure washing vehicles may be necessary if heavily soiled. o Record all actions and procedures followed.	9.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
o Boot covers may be required in livestock settings in certain instances • While working in crop settings (i.e., a property or portion of a property where crops such as corn, wheat or canola are grown): o Vehicles, equipment, tools and footwear should enter and exit fields in a clean condition. o Mechanically clean vehicles, equipment, tools and footwear. o If mechanical cleaning is not sufficient, one or both of the following is required: 1) disinfection of vehicles, equipment, footwear and tools for footwear is required, 2) washing (pressure or mobile) at the field approach or off site. o Record all actions and procedures followed.	
Manitoba Hydro will discuss with landowners and/or producers ways to minimize effects to agricultural operations where construction or maintenance activities have the potential to interfere with field activities.	9.0
Manitoba Hydro will ask producers or landowners to avoid spreading manure or pasturing livestock, if applicable, in the pipeline ROW prior to construction.	9.0
Manitoba Hydro will require all equipment to arrive at the ROW or project site clean and free of soil or vegetative debris (including weed seeds).	9.0
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.	9.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
Dust and vehicle emissions will be managed in a manner that considers the safe and continuous public activities near construction sites, where applicable.	10.0 (Human health risk)
Construction staff will be encouraged to carpool to reduce the amount of traffic in the area.	10.0
Construction activities will be conducted per applicable noise bylaws. As specified by the municipal by-laws identified in Section 10.2.2, no construction activities that generate excessive noise will occur between 11:00 p.m. and 7:00 a.m.	10.0
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.	10.0
Manitoba Hydro will contact local municipal authorities, First Nations and the Manitoba Métis Federation representatives, prior to project start-up, to provide details about the upcoming project and associated training, employment, and/or business opportunities.	11.0 (Economic opportunities)
Manitoba Hydro will continue to engage with First Nations and the Manitoba Métis Federation to understand contextual considerations related to training, employment and business opportunities on the project.	11.0
Manitoba Hydro will continue to meet with First Nations and the Manitoba Métis Federation to discuss multiple projects in the region to support longer-term employment and business opportunities.	11.0
If the demand for short-term accommodations exceeds the availability in the RAA, Manitoba Hydro will work with the contractor to identify alternative solutions, such as seeking accommodations in neighbouring or nearby municipalities, towns, or cities with availability.	12.0 (Infrastructure and community services)

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
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.	12.0
Vehicles transporting dangerous goods or hazardous products will display required placards and labelling in accordance with provincial legislation and Manitoba Hydro guidelines.	12.0
Manitoba Hydro will work with local authorities to address any damage to roads that occurs because of the project.	12.0
Manitoba Hydro will obtain the applicable permits from Manitoba Transportation and Infrastructure as per the *Traffic and Transportation Modernization Act*.	12.0
An Emergency Response Plan will be developed. As part of the development and implementation, Manitoba Hydro will collaborate with local emergency responders to ensure timely 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.	12.0
Project contractors will have first aid at project sites to provide services to project workers/contractors.	12.0
As part of ongoing project engagement, Manitoba Hydro will continue to engage with and share project information with local governments.	12.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
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 outlines policies related to reducing the amount of solid waste generated, facilitating recycling wherever possible, and storing, transporting, and disposing of solid waste at designated facilities.	12.0
Drilling fluid waste will be managed in accordance with Manitoba Hydro's contractor environmental responsibilities (CER) related to directional drilling (see Appendix F).	12.0
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.	12.0
As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work.	13.0 (Greenhouse gases and climate)
Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction activities: • Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline. • Encouraging the productive use of wood/timber removed during clearing activities. • Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency.	13.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
• Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical. • Encouraging vans/shuttle buses and/or carpooling of workers when practical. • Using electric and/or hybrid vehicles to the extent practical. • Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical. • Planning work activities to reduce the distance of travel, e.g., using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical.	
Workers will be trained in practices to prevent workplace accidents including Workplace Hazardous Materials Information System (WHMIS), first aid, and other applicable training.	15.0 (Accidents and malfunctions)
Prior to commencing construction activities, the contractor shall develop a spill response plan that must be submitted to Manitoba Hydro for review and acceptance.	15.0
The contractor will be required to provide environmental training, as well as training in spill prevention and response, to construction personnel.	15.0
Prior to the commencement of construction activities, Manitoba Hydro will ensure that spill response equipment is readily available.	15.0
Spills will be contained, cleaned, and reported to applicable authorities as follows: • Contaminated material or potentially hazardous material will be contained.	15.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
• 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.	15.0
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.	15.0
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.	15.0
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.	15.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	Chapter reference
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.	15.0
Project-related vehicles will observe traffic rules and provincial and federal highway regulations.	15.0
Trucking activity will observe speed limits and weight restrictions.	15.0
The heritage potential of the PDA is analyzed during the environmental assessment. In areas identified as having high potential for heritage resources, a preconstruction archaeological survey may be conducted.	15.0
Areas of potential heritage concern along the proposed project location have been identified for pre-construction archaeological field surveys by a qualified archaeologist as detailed in Chapter 6.0 and Appendix E.	15.0
If a heritage site or object is encountered, project work will cease around the object and the project archaeologist will be contacted. Work in the area will continue only when approval is received from the project archaeologist or the Historic Resources Branch.	15.0
Should the encounter of a heritage site or object occur on land used for commercial agriculture and preclude use of that land for typical agricultural operations/activities, Manitoba Hydro may consider compensating the producer for ancillary damages on a case-by-case basis.	15.0
Manitoba Hydro will regularly carry out maintenance and inspection activities to assess and identify areas of potential concern.	15.0

Table 17-1: Comprehensive mitigation list for the Altona to Winkler gas transmission project

Mitigation measure	**Chapter reference**
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.	15.0
As part of the Click Before You Dig MB program, Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.	15.0
Pipeline surveys and inspections during operations will be done on a regular basis, to help protect against deliberate third-party interference.	15.0
Landowners will be aware of the location of the pipeline on their land (i.e., depth of cover surveys) to mitigate accidental third-party interference (from excavation and agricultural activities).	15.0
The pipeline will be marked with signs at each mile road and where the pipeline crosses waterways or other service roads.	15.0

18.0References

Abegaz, R., Xu, J., Wang, F. and Huang, J. 2024. Impact of flooding events on buried infrastructures: a review. Front. Built Environ. 10: 1357741. doi: 10.3389/fbuil.2024.1357741

AECOM. 2025. Rural Municipality of Stanley Regional Wastewater Conveyance System. Environment Act Proposal. Available at https://www.gov.mb.ca/sd/eal/registries/6248/eap.pdf.

Airbnb. 2025. "Vacation Rentals" in the Municipality of Rhineland, RM of Stanley, City of Winkler, and City of Morden. Accessed August 11, 2025.

Alberta Energy Regulator. 2024. Industry Performance. Accessed December 2025. https://www.aer.ca/data-and-performance-reports/industry-performance/pipeline-performance/metrics

Altona Rhineland Economic Development Inc. 2025. About Us. Accessed September 2025. https://ared-rpga.com/why-rpga/

Altona/Rhineland Emergency Services. 2026. About Us. Accessed January 8, 2026. Available at https://www.altona.ca/m/altona-rhineland-emergency-services/about-us

Archibald, D.J., W.B. Wiltshire, D.M. Morris, and B.D. Batchelor. 1997. Forest management guidelines for the protection of the physical environment. Version 1. Report MNR #51032. Ontario Ministry of Natural Resources. Queen's Printer for Ontario, Toronto, ON.

Baldwin, C., and P. Rawstorne. 2019. Public understanding of risk in health impact assessment: a psychosocial approach. *Impact Assessment and Project Appraisal, 37*(5), 382–396. https://doi.org/10.1080/14615517.2018.1535952

Bell, S.E., M. Hughes, G. Tuttle, R. Chisholm, S. Gerus, D. R. Mullins, C. Baller, K. Scarff, R. Spector, and D. S. Nalamalapu. 2024. Pipelines and power: Psychological distress, political alienation, and the breakdown of environmental justice in government agencies' public participation processes. *Energy Research & Social Science 109*, 103406, https://doi.org/10.1016/j.erss.2023.103406.

Betcher, R., G. Grove, and C. Pupp. 1995. Groundwater in Manitoba: Hydrogeology, Quality Concerns, Management. 47 pp.

Betley, E. C., A. Sigouin, P. Pascua, S. H. Cheng, K. I. MacDonald, F. Arengo, Y. Aumeeruddy-Thomas, S. Caillon, M. E. Isaac, S. D. Jupiter, A. Mawyer, M. Meija, A. C. Moore, D. Renard, L. Sebastien, N. Gazit and E. J. Sterling. 2023.

Assessing human well-being constructs with environmental and equity aspects: A review of the landscape. *People and Nature*, 5:1756–1773. https://doi.org/10.1002/pan3.10293

Bird Studies Canada. 2025. Manitoba Breeding Bird Atlas. Accessed November 2025. Available at https://www.birdatlas.mb.ca/index_en.jsp

British Columbia Ministry of Forests. 1999. Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook. 2nd Edition. Version 2.1. For. Prac. Br., B.C. Min. For., Victoria, British Columbia.

Brunner, E., and M. G. Marmot. 2006. Social Organization, Stress, and Health. In M. G. Marmot & R. G. Wilkinson (Eds.), Social Determinants of Health (pp. 6-30). Oxford: Oxford University Press

Canadian Council of Ministers of the Environment. 2019. "Guidance Document on Air Zone Management". Accessed July 28, 2025. https://ccme.ca/en/res/guidancedocumentonairzonemanagement_secured.pdf

Canadian Council of Ministers of the Environment. 2017. Canadian water quality guidelines for the protection of aquatic life: CCME Water Quality Index, User's Manual – 2017 Update. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Canadian Food Inspection Agency. 2024. Anthrax - Fact sheet. Accessed September 2024 at: https://inspection.canada.ca/en/animal-health/terrestrial-animals/diseases/reportable/anthrax/fact-sheet

Canadian Food Inspection Agency. 2008. Invasive Alien Plants in Canada. Ottawa, ON. 72 pp.

Canadian Index of Wellbeing. What is Wellbeing? University of Waterloo. Accessed November 2024. https://uwaterloo.ca/canadian-index-wellbeing/what-wellbeing

Canadian Mental Health Association, Ontario. 2025. The Relationship between Mental Health, Mental Illness and Chronic Physical Conditions. Accessed August 2025. https://ontario.cmha.ca/documents/the-relationship-between-mental-health-mental-illness-and-chronic-physical-conditions/

Canadian Wildlife Federation. 2025. Best Practices for Bird-friendly Farming. Accessed November 2025. Available at https://blog.cwf-fcf.org/index.php/en/best-practices-for-bird-friendly-farming/

Canola Council of Canada. 2024. Clubroot. Accessed September 2024 at: https://www.canolacouncil.org/canola-encyclopedia/diseases/clubroot/#affected-regions

Carlson, E. B., and M.A. Caretta. 2021. Living with natural gas pipelines: Appalachian landowners describe fear, anxiety and loss. The Conversation. https://theconversation.com/living-with-natural-gas-pipelines-appalachian-landowners-describe-fear-anxiety-and-loss-152586

CBC News. 2025. "Summer 2025 blows past record as Winnipeg's smokiest on record". Accessed august 5, 2025. https://www.cbc.ca/news/canada/manitoba/winnipeg-wildfire-smoke-record-environment-canada-1.7600812

City of Selkirk Museum. 2025. Walking the Path of History. Accessed November 2025. https://selkirkmuseum.ca/news/heritage-highlights/walking-the-path-of-history/

Clayton, S. 2020. Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders 74*:1-7

CN eBusiness. CN – Network Map. Accessed November 2024. https://cnebusiness.geomapguide.ca/

COSEWIC. 2024. Committee on the Status of Endangered Wildlife in Canada. http://www.cosewic.ca/index.php/en-ca/

Energy East Pipeline Project. 2016 Consolidated Application. NEB Hearing Order OH-002-2016: Prepared by TransCanada PipeLines Limited (TransCanada)

Ens, Gerhard. 1984. The Rural Municipality of Rhineland, Volost & Municipality 1884-1984. Published by the R.M. of Rhineland. Accessed November 2025. https://digitalcollections.lib.umanitoba.ca/islandora/object/uofm%3A2224252#page/5/mode/2up

Deveson, M. 2007. The History of Agriculture in Manitoba (1812-2007). Accessed May 2024 at: https://www.manitobaaghalloffame.com/wp-content/uploads/2016/03/MAHF-History-of-Ag-in-MB.pdf

Earth Observation for Sustainable Development-Natural Resources Canada. 2001. Federal Land Cover Classification.

Environment and Climate Change Canada (ECCC). 2025. Canadian Climate Normals. Environment and Climate Change Canada. Accessed December 2025. https://climate.weather.gc.ca/climate_normals/index_e.html

Environment Defense Fund. 2023. Methane emissions from U.S. gas pipeline leaks. Accessed November 2024. https://www.edf.org/sites/default/files/documents/Pipeline%20Methane%20Leaks%20Report.pdf

ECCC. 2025. Canadian Climate Normals. Environment and Climate Change Canada (ECCC). Retrieved from: https://climate.weather.gc.ca/climate_normals/index_e.html (Accessed July 16, 2025).

Environment and Climate Change Canada, Canadian Environmental Sustainability Indicators. 2019. Water Quality: Red River Downstream of Winnipeg, Manitoba. Natural Resources Canada, Open Science and Data Platform. https://osdp-psdo.canada.ca/dp/en/search/metadata/ECCC-CESI-WATER-1-MB05OJS074

Environment and Climate Change Canada. 2015. *Canadian National Tornado Database: Verified Events (1980–2009)* [KML file]. Open Government Portal. Accessed December 2025, from https://data-donnees.az.ec.gc.ca/data/weather/products/canadian-national-tornado-database-verified-events-1980-2009-public/CanadianNationalTornadoDatabase_1980-2009.kml

Eyring, V., Bony, S., Meehl, G. A., Senior, C. A., Stevens, B., Stouffer, R. J., & Taylor, K. E. (2016). Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organization. Geoscientific Model Development, 9(5), 1937–1958. https://doi.org/10.5194/gmd-9-1937-2016.

Gomm, S. and T. Bernauer. 2023. Are actual and perceived environmental conditions associated with variation in mental health? *Environmental Research 223,* 115398. https://doi.org/10.1016/j.envres.2023.115398.

Government of Canada. Species at Risk Act. (S.C. 2002, c 29).

Government of Canada. Migratory Birds Convention Act (1994) and Migratory Birds Regulations, 2022 (SOR/2022)

Government of Canada. 2025. Flood susceptibility index. Canadian Geospatial Platform. Accessed December 2025, from https://canadian-geospatial-platform.github.io/geo.ca/flood-mapping/flood-map-gallery/flood-susceptibility-index/

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

Government of Canada. 2024. Species at Risk Public Registry Species List. Accessed November 2025 at https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Government of Canada. 2024. The Constitution Acts, 1867 to 1982 (Consolidation current to January 1, 2024). Minister of Justice. https://laws-lois.justice.gc.ca/PDF/Const_TRD.pdf

Government of Canada. 2023. Policy Framework for Assessing Cumulative Effects under the *Impact Assessment Act*. Available at https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/policy-framework-assessing-cumulative-effects-under-impact-assessment-act.html. Accessed November 5, 2025.

Government of Canada. 2023. Greenhouse gas emissions: inventories and reporting. Accessed January 13, 2026. Available at https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions.html.

Government of Canada. 2021. Species at Risk species search. Accessed August 2025. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Government of Canada. 2002. Species at Risk Act. Accessed August 2025. https://laws.justice.gc.ca/eng/acts/s-15.3/

Government of Canada. (n.d.). [Interactive map of Canada with specified content]. Open Government Portal. Accessed December 2025, from https://search.open.canada.ca/openmap/d1e2048b-ccff-5852-aaa5-b861bd55c367

Government of Manitoba. 2023. Information Bulletin – Environment Act Proposal Report guidelines. Available at: https://www.gov.mb.ca/sd/pubs/environmental-approvals/eap_report_guidelines.pdf. Accessed January 15, 2026.

Government of Manitoba. 2022. Manitoba Land Initiative – Wastewater Treatment Facilities. Accessed January 8, 2026. Available at https://mli.gov.mb.ca/environment/index.html

Government of Manitoba. 2011. How will climate change affect Manitoba? Manitoba Aboriginal and Northern Affairs. Accessed September 2024. https://www.gov.mb.ca/mr/northern/pubs/community_newsletter/community_contact/2011_fall_issue.pdf

Government of Manitoba. 2005. Manitoba Ambient Air Quality Criteria. Accessed July 2025. https://www.gov.mb.ca/sd/envprograms/airquality/pdf/criteria_table_update_july_2005.pdf

Government of Manitoba. n.d. Manitoba's Controlled Crop Residue Burning Program. Accessed August 5, 2025. https://www.gov.mb.ca/agriculture/crops/crop-residue-burning-program/index.html

Greenhouse Gas Protocol. 2005. GHG Project Protocol for Project Accounting. Accessed January 13, 2026. Available at https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf.

Guo, X., Zhang, L., Liang, W. and Haugen, S. 2018. Risk identification of third-party damage on oil and gas pipelines through the Bayesian network. Journal of Loss Prevention in the Process Industries. Volume 54. Pages 163-178. ISSN 0950-4230

Gutiérrez, J.M., R.G. Jones, G.T. Narisma, L.M. Alves, M. Amjad, I.V. Gorodetskaya, M. Grose, N.A.B. Klutse, S. Krakovska, J. Li, D. Martínez-Castro, L.O. Mearns, S.H. Mernild, T. Ngo-Duc, B. van den Hurk, and J.-H. Yoon, (2021). Atlas. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1927–2058, doi:10.1017/9781009157896.021.

GWDrill Database. 2018. Province of Manitoba. Groundwater Management

Habib, L., E.M. Bayne, and S. Boutin. 2007. Chronic industrial noise affects pairing success and age structure of ovenbirds Seiurus aurocapilla. Journal of Applied Ecology 44:176-184

Health Canada. 2024. Wildfire smoke and your health. Pub.: 240140. Accessed August 2025. https://www.canada.ca/content/dam/hc-sc/documents/services/publications/healthy-living/wildfire-smoke-health/wildfire-smoke-health.pdf

Health Canada. 2021. Health impacts of air pollution in Canada: Estimates of morbidity and premature mortality outcomes – 2021 report. Accessed July 2025. https://www.canada.ca/content/dam/hc-sc/documents/services/publications/healthy-living/2021-health-effects-indoor-air-pollution/hia-report-eng.pdf

Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Pub.: 160331. January 2017. Ottawa, ON. https://iaac-aeic.gc.ca/050/documents/p80054/119378E.pdf

Health Canada. 2010. Useful information for environmental assessment. Government of Canada Publications. Accessed July 2025. https://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf

Heritage Resources Act. 1986. (C.C.S.M. c. H39.1). Province of Manitoba Accessed December 2025 at https://web2.gov.mb.ca/laws/statutes/ccsm/_pdf.php?cap=h39.1

Hersbach, H., Bell, B., Berrisford, P., Biavati, G., Horányi, A., Muñoz Sabater, J., Nicolas, J., Peubey, C., Radu, R., Rozum, I., Schepers, D., Simmons, A., Soci, C., Dee, D., Thépaut, J-N. 2023: ERA5 monthly averaged data on single levels from 1940 to present. Copernicus Climate Change Service (C3S) Climate Data Store (CDS), DOI: 10.24381/cds.f17050d7 (Accessed on 12-04-2024)

Impact Assessment Agency of Canada. 2025. Section 22 – Factors to be considered descriptions. Accessed December 2025 at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/section-22-factors-considered-descriptions.html

Indigenous Services Canada. 2025. *Treaty Land Entitlements in Manitoba*. Government of Canda. Retrieved December 9, 2025, from https://www.sac-isc.gc.ca/eng/1305306991615/1611939771671.

Indigenous Services Canada. 2024. About the Community Well-Being index. *https://www.sac-isc.gc.ca/eng/1421245446858/1557321415997*

Indigenous Services Canada. 2017. Treaty Land Entitlements in Manitoba. Accessed July 29, 2025: https://www.sac-isc.gc.ca/eng/1305306991615/1611939771671

Intergovernmental Panel on Climate Change Task Force on National Greenhouse Gas Inventories. n.d. Publications. Accessed January 13, 2026. Available at https://www.ipcc-nggip.iges.or.jp/public/index.html.

Invasive Species Council of Manitoba. 2025. Invasive Plants and Animals in Manitoba. http://invasivespeciesmanitoba.com/site

Kelly WM Scott & Associates. 2011. Environmental Assessment NGL Pipeline Project Manitoba. Prepared for Provident Energy Ltd. Accessed November 2025 at https://www.gov.mb.ca/sd/eal/registries/5526provident/index.html.

Klippenstein, Lawrence. 1975. Manitoba Settlement and the Mennonite West Reserve (1875-1876). Published by the Manitoba Historical Society Archives. Accessed August 13th, 2025: https://www.mhs.mb.ca/docs/pageant/21/mennonitewestreserve.shtml

Laciak, M., Wlodek, T., Kozakiewicz, T, and Liszka, K. 2020. Impact of flood water on the technical condition of natural gas transmission pipeline valves. Journal of Loss Prevention in the Process Industry. Volume 63: 103998. ISSN 0950-4230. https://doi.org/10.1016/j.jlp.2019.103998

Lavoie, J., Bourgault, P., Smith, T.J. et al. An ensemble of bias-adjusted CMIP6 climate simulations based on a high-resolution North American reanalysis. (2024). Sci Data 11, 64. https://doi.org/10.1038/s41597-023-02855-z

Little, J. 1980a. Groundwater Availability Study, Winnipeg Area. Figure 3 – Bedrock Topography. Water Resources Branch, Department of Natural Resources, Province of Manitoba.

Little, J. 1980b. Groundwater Availability Study, Winnipeg Area. Figure 2 – Drift Thickness. Water Resources Branch, Department of Natural Resources, Province of Manitoba.

Lyon, D.M. 2015a. Altona. Published by the Canadian Encyclopedia. Accessed August 13th, 2025: https://thecanadianencyclopedia.ca/en/article/altona#:~:text=The%20town%20site%20was%20established,)%2C%203709%20(2006c).

Lyon, D.M. 2015b. Winker. Published by the Canadian Encyclopedia. Accessed August 13th, 2025: https://thecanadianencyclopedia.ca/en/article/winkler

Manitoba Agriculture. 2024[a]. Biosecurity in Crop Production. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/biosecurity.html

Manitoba Agriculture. 2024[b]. Biosecurity Management on Agricultural Land for the Energy and Transportation Industries. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/biosecurity-energy-and-transportation.html

Manitoba Agriculture. 2024[c]. Clubroot Distribution in Manitoba, 2022. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/plant-diseases/clubroot-distribution-in-manitoba.html

Manitoba Agriculture. 2024[d]. Plant Diseases. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/plant-diseases/index.html

Manitoba Agriculture. 2024[e]. Anthrax – Animal Health and Welfare Management. Accessed September 2024 at: https://www.gov.mb.ca/agriculture/animal-health-and-welfare/animal-health/pubs/anthrax-fs.pdf

Manitoba Agriculture, Food and Rural Initiatives. 2008. Soil Management Guide. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/environment/soil-management/soil-management-guide/pubs/soil-management-guide.pdf

Manitoba Clean Environment Commission. 2013. Bipole III Transmission Project Report on Public Hearing. Accessed December 2025. Available at: https://www.cecmanitoba.ca/hearings/biopole-III-mb-hydro/doc/FinalReport/FINAL_WEB_Bipole_III_Transmission_Project_WEB3.pdf

Manitoba Conservation Data Centre (MBCDC). 2025. Species of conservation concern data request. March 2025

Manitoba Energy and Mines. 1990. Bedrock Geology Compilation Map Series. Winnipeg, NTS 62H. 1:250,000.

Manitoba Energy and Mines. 1988. Aggregate Resources Compilation Map Series. MAP AR99-1-2 Winnipeg NTS 62H.

Manitoba Environment and Climate Change. 2023. 2020 Manitoba Air Quality Report (2017-2019) – Fine Particulate Matter and Ozone. Accessed August 2025. https://www.gov.mb.ca/sd/pubs/environmental-approvals/2020_mb_aq_report_en.pdf

Manitoba Environment and Climate Change. n.d. Air Quality Monitoring. Accessed August 5, 2025. https://www.gov.mb.ca/sd/environment_and_biodiversity/air_quality/air-quality-monitoring/index.html

Manitoba Forestry Association. 2015. "Private Land Resource Planning program" http://www.thinktrees.org/Private_Land_Resource_Planning.aspx

Manitoba Government. 2024. Manitoba Road Network 2023 on Data MB. Accessed January 8, 2026. Available at: https://geoportal.gov.mb.ca/datasets/manitoba::manitoba-road-network-2023/explore?location=53.869817%2C-95.499214%2C5.69

Manitoba Government. 2022. Manitoba Solid Waste Sites on Data MB. Accessed January 8, 2026. Available at https://geoportal.gov.mb.ca/datasets/manitoba::manitoba-solid-waste-sites/about

Manitoba Government. 2021/2022. "Annual Report of Manitoba Environment, Climate and Parks." Winnipeg. Accessed December 2025.

Manitoba Government. 2009. Pembina River Watershed Water Quality Report. Winnipeg. Accessed December 2025. https://www.gov.mb.ca/sd/water/watershed/iwmp/pembina_river/documentation/water_quality_pembina.pdf

Manitoba Government. 1998. Red River Valley – Designated flood area boundary. https://www.gov.mb.ca/mti/wms/permit/pdf/rrvdfa_boundary.pdf

Manitoba Government. n.d. (no date). Planning Resource Guide – Planning for Agriculture. Accessed September 2024 at: https://www.gov.mb.ca/mr/land_use_dev/pubs/prg_agri.pdf

Manitoba Habitat Conservancy. 2012. Langford Community Pasture. Accessed November 2025. Available at https://mbhabitat.ca/the-langford-community-pasture/.

Manitoba Habitat Heritage Corporation. 2024. Tall-grass Prairie. Manitoba Species at Risk. https://mbhabitat.ca/wp-content/uploads/2018/07/TallGrassPrairie_FS-1.pdf

Manitoba Herp Atlas. 2021. Manitoba Herp Atlas Project – Final Maps. Accessed November 2025. Available at http://www.naturenorth.com/Herps/MHA_Final_Maps.html.

Manitoba Hydro. 2024. Greenhouse gas emissions. Our GHG emission summary for 2023. Available at https://www.hydro.mb.ca/environment/greenhouse-gas/.

Manitoba Hydro. 2024. Standards for natural gas. 510.02 Depth of cover – pipeline. 2024 06 24.

Manitoba Hydro. 2024. Dominion City to Altona Gas Transmission Project. Environmental Assessment Report. December 2024. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2024. Radisson to Henday (R44H) Transmission Project Environmental Assessment Report. January 2024. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2023. Pointe du Bois to Whiteshell (PW75) Transmission Project Environmental Assessment Report. November 2022. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2023. Indigenous relations commitment statement. Accessed December 2025. Available at: https://www.hydro.mb.ca/docs/community/commitment_statement.pdf.

Manitoba Hydro. 2022. Dorsey to Wash'ake Mayzoon (D83W) Transmission Project Environmental Assessment Report. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2020. Manitoba Hydro Environmental Management Policy. Accessed January 15, 2026. Available at https://www.hydro.mb.ca/docs/corporate/ems_policy.pdf

Manitoba Hydro. 2020. Climate Change Report. 96pp. Retrieved from: https://www.hydro.mb.ca/environment/pdf/climate_change_report_2020.pdf (Accessed Feb 22, 2023).

Manitoba Hydro. 2015. Northwest Gas Transmission Project Environmental Assessment Report. August 2015. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2014. St. Vital Transmission Complex Environmental Assessment Report. May 2014. Prepared by Manitoba Hydro. Winnipeg, MB.

Manitoba Hydro. 2012. Keeyask Transmission Project Chapter 4 - environmental setting. Manitoba Sustainable Development Public Registry 5614.00 - Manitoba Hydro – Keeyask Transmission Project. Accessed September 2024. https://www.gov.mb.ca/sd/eal/registries/5614keeyask_transmission/eap/chapt4_envirosetting.pdf.

Manitoba Infrastructure and Transportation. 2024. Truck Weight Limit Map and Information Guide. Accessed January 8, 2026. Available at: https://www.gov.mb.ca/mti/mcd/resources/twlm.html.

Manitoba Natural Resources and Indigenous Futures. 2025a.Conservation Data Centre. Accessed November 2025. Available at https://www.gov.mb.ca/nrnd/fish-wildlife/cdc/index.html

Manitoba Natural Resources and Indigenous Futures. 2025. Wildlife Lands Map. Accessed November 2025. Available at https://www.arcgis.com/apps/webappviewer/index.html?id=d67c565bcfd7401cb78a25f03f2d6c86&mobileBreakPoint=300

Manitoba Pulse & Soybean Growers. 2023. Soybean cyst nematode. Accessed May 2024 at: https://www.manitobapulse.ca/2019/03/soybean-cyst-nematode/

Manitoba Snowman Inc. 2025. Provincial Riding Map. Accessed December 2025. https://snoman.mb.ca/

Manitoba Trapping Guide. 2024-2025. Accessed September 2025. https://www.gov.mb.ca/nrnd/fish-wildlife/pubs/fish_wildlife/trapping_guide.pdf

Matile, G.L.D. and Keller, G.R. 2004. Surficial geology of the Neepawa map sheet (NTS 62J), Manitoba. Surficial geology compilation series. Manitoba Industry, Economic Development and Mines, Manitoba Geological Survey.

Mekis, É. and Vincent, L.A. 2011. An overview of the second generation adjusted daily precipitation dataset for trend analysis in Canada. Atmosphere-Ocean, 49(2), 163-177.

Mikkonen, J., and D. Raphael. 2010. Social Determinants of Health: The Canadian Facts. Toronto: York University, School of Health Policy, and Management. Accessed July 2025. https://thecanadianfacts.org/The_Canadian_Facts.pdf

Milani, D.W. 2013. Fish community and fish habitat inventory of streams and constructed drains throughout agricultural areas of Manitoba (2002-2006). Can. Data Rep. Fish. Aquat. Sci. 1247: xvi + 6,153 p

Morden Community Development Corporation. 2025. Industrial Incubator. Accessed September 2025. *https://mordencdc.ca/industrial-incubator*

Morden Fire and Rescue. 2026. Accessed January 8, 2026. Available at https://mordenfire.com/

Morden Police Service. 2026. Accessed January 8, 2026. Available at https://mordenpolice.com/

Morden Stanley Thompson Winkler (MSTW) Planning District. 2015. MSTW Development Plan – Strong Together. Prepared by WSP, Dillon Consulting, September 2015. https://stanleymb2020.municipalwebsites.ca/ckfinder/connector?command=Proxy&lang=en&type=Files&currentFolder=%2FLand%20Use%20and%20Planning%2F&hash=c245c263ce0eced480effe66bbede6b4d46c15ae&fileName=MSTW-Development-Plan-2015.pdf (accessed November 2025)

Municipality of Rhineland. 2026. Municipal Services. Accessed January 8, 2026. Available at https://www.rmofrhineland.com/p/municipal-services

Natural Resources Canada. 2020. Land Cover. Accessed December 2025. https://natural-resources.canada.ca/maps-tools-publications/satellite-elevation-air-photos/satelite-imagery/land-cover

Nature Conservancy, n.d. Help protect our lands from invasive species. Accessed October 2024. https://adkinvasives.com/data/files/Documents/Fill%20BMP%20FactSheet_FINAL.pdf

NaturServe Explorer. 2025. NatureServe global conservation status ranks. Accessed August 2025. https://explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories

OurAirports. n.d. "Airports" in Manitoba, Canada. Accessed January 9, 2026. Available at https://ourairports.com/countries/CA/MB/

Peek M.K., M.P. Cutchin, D. Freeman, R.P. Stowe, and J.S. Goodwin. 2009. Environmental hazards and stress: evidence from the Texas City Stress and Health Study. *Journal of Epidemiology & Community Health 63*(10):792-8. doi: 10.1136/jech.2008.079806

PembinaValleyOnline. (2024, September 24). *Late-season severe thunderstorm warnings issued for Winkler, Morden, and Altona areas*. https://www.pembinavalleyonline.com/articles/late-season-severe-thunderstorm-warnings-issued-for-winkler-morden-and-altona-areas

Podolsky, G. 1991. Soils of the Rural Municipality of Rhineland. Canada-Manitoba Soil Survey. Soils Report No. D76.

Preston, W. 1982. The Amphibians and Reptiles of Manitoba. Manitoba Museum of Man and Nature. 128 pages.

Province of Manitoba. The Wildlife Act. (C.C.S.M. c. W130)

Province of Manitoba. The Endangered Species and Ecosystems Act (C.C.S.M. c. E111; 2018)

Province of Manitoba. 2025. Trapping Guide. Accessed November 2025. Available at https://www.gov.mb.ca/nrnd/fish-wildlife/pubs/fish_wildlife/trapping_guide.pdf

Province of Manitoba. 2025. The Noxious Weeds Act. http://web2.gov.mb.ca/laws/statutes/ccsm/n110e.php

Province of Manitoba. 2025. Controlling Noxious Weeds - FAQ. Accessed August 2025. https://www.gov.mb.ca/agriculture/crops/weeds/pubs/controlling-noxious-weeds.pdf

Province of Manitoba. 2024. Annual Report and Public Accounts For the year ended March 31, 2024. Accessed September 2025. https://www.gov.mb.ca/asset_library/en/proactive/20232024/publicaccounts/AnnualReportPublicAccounts2023-2024.pdf

Province of Manitoba. 2023. The Endangered Species and Ecosystems Act FAQs. Accessed September 2024. https://gov.mb.ca/sd/pubs/conservation-data_centre/esea.pdf.

Province of Manitoba. 1992. Guidelines for Sound Pollution prepared by the Environmental Management Division, Province of Manitoba.

Province of Manitoba. n.d. Species and Ecosystems at Risk. Accessed November 2025. Available at https://www.manitoba.ca/nrnd/fish-wildlife/wildlife/ecosystems/index.html

Province of Manitoba. n.d. The Endangered Species and Ecosystems Act FAQs. Accessed November 2025. Available at https://www.gov.mb.ca/sd/pubs/conservation-data-centre/esea.pdf

Rail Association of Canada (RAC). n.d. RAC Canadian Rail Atlas. Accessed January 9, 2026. Available at https://rac.jmaponline.net/canadianrailatlas/.

Rhineland Municipality. 2025a. Community. Accessed September 2025. https://www.rmofrhineland.com/p/community

Rhineland Municipality, 2025b. Economic incentives. Accessed September 2025. https://www.rmofrhineland.com/p/economic-incentives

Rhineland Municipality. N.d. Come Explore the Municipality of Rhineland. Accessed November 2025. Available at https://www.rmofrhineland.com/

Riahi, K., van Vuuren, D.P., Kriegler, E., Edmonds, J., O'Neill, B.C., Fujimori, S., Bauer, N., Calvin, K., Dellink, R., Fricko, O., Lutz, W., Popp, A., Cuaresma, J.C., KC, S., Leimbach, M., Jiang, L., Kram, T., Rao, S., Emmerling, J., Ebi, K., Hasegawa, T., Havlik, P., Humpenöder, F., Da Silva, L.A., Smith, S., Stehfest, E., Bosetti, V., Eom, J., Gernaat, D., Masui, T., Rogelj, J., Strefler, J., Drouet, L., Krey, V., Luderer, G., Harmsen, M., Takahashi, K., Baumstark, L., Doelman, J.C., Kainuma, M., Klimont, Z., Marangoni, G., Lotze-Campen, H., Obersteiner, M., Tabeau, A., Tavoni, M. (2017). The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview, Global Environmental Change, 42, 153-168.

RPGA Planning District. 2012. RPGA Planning District Development Plan – Working Across Boundaries 2012-2040. Prepared by Dillon Consulting. October 2012.

https://rmofrhineland.com/Home/DownloadDocument?docId=f1129667-c017-49c4-8fa7-7fa97e06c517

Rural Municipality (RM) of Stanley. 2026. Fire and Emergency Services. Accessed January 8, 2026. Available at https://rmofstanley.ca/p/fire-and-emergency-services

RM of Stanley. 2026. Garbage and Recycling. Accessed January 8, 2026. Available at https://rmofstanley.ca/p/garbage-and-recycling

RM of Stanley. 2025. Village Low Pressure Sewer Project Frequently Asked Questions. Accessed January 8, 2026. Available at https://stanleymb2020.municipalwebsites.ca/UploadFiles/Docs/20250227LPSQuestions1606_jwBlHQ.pdf.

RM of Stanley. 2025. Economic. Accessed September 2025. https://www.rmofstanley.ca/p/economic

Rowe, J.S. 1959. Forest Regions of Canada. Department of Northern Affairs and National Resources, Forestry Branch. Ottawa, ON. Bulletin 123.

Royer F. and Dickinson R. 1999. Weeds of Canada and the Northern United States. The University of Alberta Press and Lone Pine Publishing, Edmonton, AB. pp. 36–37.

Rutulis, M. 1987a. Aquifer Maps of Southern Manitoba. Map 1 of 2 – Sand and Gravel Aquifers. Water Resources Branch, Department of Natural Resources, Province of Manitoba.

Rutulis, M. 1987b. Aquifer Maps of Southern Manitoba. Map 2 of 2 – Bedrock Aquifers. Water Resources Branch, Department of Natural Resources, Province of Manitoba.

Sagan, K., Smith, A., Zhen, L., Vieira, M., Gervais, M., Wong, K., Andreychuk, L., and Wruth, S. 2025. Development of future streamflow scenarios in the WATFLOOD hydrologic model. Canadian Society for Civil Engineering (CSCE) Hydrotechnical Specialty Conference. Winnipeg, Manitoba, May 28-30, 2025. HT-399-1 – HT-399-10.

Sen, P. K. 1968. Estimates of the regression coefficient based on Kendall's tau. Journal of the American Statistical Association, 63(324), 1379–1389. https://doi.org/10.1080/01621459.1968.10480934

Smith, R.E. and Michalyna, W. 1973. Soils of the Morden – Winkler Area. Manitoba Soil Survey. Soils Report No. 18.

Smith, R.E., H. Veldhuis, G.F. Mills, R.G. Eilers, W.R. Fraser, and G.W. Lelyk. 1998. Terrestrial Ecozones, Ecoregions, and Ecodistricts of Manitoba: An Ecological Stratification of Manitoba's Natural Landscapes. Land Resource Unit, Brandon Research Centre, Research Branch, Agriculture and Agri-Food Canada. Research Branch. Technical Bulletin 1998-9E.

Snoman Inc. 2025. All Trails in Manitoba: Snoman Provincial Map. Accessed December 2025 at https://snoman.mb.ca/map-downloads/

Southern Health-Santé Sud 2026. Accessed January 9, 2026. Available at https://southernhealth.ca/.

Southern Health–Santé Sud Regional Health Authority. 2024a. "Thriving Together: Annual Report 2023-24". Accessed July 2025. https://southernhealth.ca/wp-content/uploads/SH-SS-Annual-Report-2023-24.pdf

Southern Health–Santé Sud Regional Health Authority. 2024b. "Population Statistics: 2024". Accessed July 2025. https://southernhealth.ca/wp-content/uploads/SHSS_Population2024_English.pdf

Southern Health–Santé Sud Regional Health Authority. 2019. "Community Health Assessment: 2019". Accessed July 2025. https://southernhealth.ca/wp-content/uploads/2019-Community-Health-Assessement.pdf

Stantec Consulting Ltd. 2015. "Manitoba-Minnesota transmission project technical data report - noise." Manitoba Minnesota transmission project. Accessed July 2025. https://www.hydro.mb.ca/docs/projects/mmtp/eis/mmtp_tdr_biophys_noise.pdf

Stantec Consulting Ltd. 2014. Energy East Pipeline Project Volume 5: Effects of the environment on the project. Prepared for Energy East Pipeline Ltd.

Statistics Canada. 2025. Table: 13-10-0113-01. Health characteristics, two-year period estimates. Accessed October 2025: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1310011301

Statistics Canada. 2025. Provincial and territorial economic accounts: Interactive tool. Accessed September 2025. https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2019022-eng.htm

Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population – Stanley (RM), Rhineland (MU), Altona (T), Winkler (CY), Morden (CY). Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. Accessed September 15, 2025. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E

Statistics Canada. 2023a. (table). Census Profile. 2021 Census of Population. Rhineland, Rural municipality (RM). Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Accessed November 2025. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Rhineland&DGUIDlist=2021A00054603041&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0

Statistics Canada. 2023b. (table). Census Profile. 2021 Census of Population. Altona, Town. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Altona&DGUIDlist=2021S05100011&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0 (accessed November 2025)

Statistics Canada. 2023c. (table). Census Profile. 2021 Census of Population. Stanley, Rural municipality (RM). Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=stanley&DGUIDlist=2021A00054603047&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0 (accessed November 2025)

Statistics Canada. 2023d. (table). Census Profile. 2021 Census of Population. Winkler, City. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/Page.cfm?Lang=E&SearchText=winkler&DGUIDlist=2021A00054603050&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0 (accessed November 2025)

Statistics Canada. 2023e. (table). Census Profile. 2021 Census of Population. Morden, City. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/Page.cfm?Lang=E&SearchText=morden&DGUIDlist=2021A00054603053&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0 (accessed November 2025)

Statistics Canada. 2021[a]. Table 32-10-0231-01 Farms classified by farm type, Census of Agriculture, 2023

Statistics Canada. 2021[b]. Table 32-10-0363-01 Organic products, Census of Agriculture, 2023

Statistics Canada. 2021[c]. Table 32-10-0368-01 Land inputs, manure and irrigation, Census of Agriculture, 2023

Statistics Canada. 2021[d]. Table 32-10-0232-01 Farms classified by total farm area, Census of Agriculture, 202

Stewart, Mackenzie. n.d. Walking the Path of History. The City of Selkirk Museum. Accessed August 21, 2025. Available at: https://selkirkmuseum.ca/news/news-updates/walking-the-path-of-history/

Sumner, C. (2024, June 12). *Tornado captured on video near Darlingford*. Pembina Valley Online. https://www.pembinavalleyonline.com/articles/tornado-captured-on-video-near-darlingford

Tetratech, 2012. Dorsey -Portage South Transmission Line Project Wildlife Technical Report. Accessed November 2025. Available at https://www.gov.mb.ca/sd/eal/registries/5611dorsey/section3.pdf

The Canada Land Inventory, 1969. Soil Capability Classification for Agriculture. Report no. 2.

The World Bank. 2025. World Development Indicators – Themes – Economy. Accessed September 2025. https://datatopics.worldbank.org/world-development-indicators/themes/economy.html

Tip of the Mitt Watershed Council. n.d. Pipeline Risks. Accessed December 2025. https://watershedcouncil.org/policy-advocacy/state/pipelines/pipeline-risks/

Town of Altona. 2026. Altona Police Service. Accessed January 8, 2026. Available at https://www.altona.ca/m/altona-police-service

Town of Altona. 2025. Business Park. Accessed September 2025. https://altona.ca/p/industrial-park

Transportation Safety Board of Canada. 2024. External Corrosion led to 2022 gas pipeline rupture and fire near Fox Creek, Alberta. Accessed December 2025. https://www.tsb.gc.ca/eng/medias-media/communiques/pipeline/2024/p22h0023-20240109.html

Trivago. 2025. "Hotels" in the Municipality of Rhineland, RM of Stanley, City of Winkler, and City of Morden. Accessed August 14, 2025.

UNESCO. 2023. What is intangible culture? Accessed November 2024 at https://ich.unesco.org/en/what-is-intangible-heritage-00003.

University of Manitoba and Manitoba Transportation and Infrastructure. 2024(a). "Traffic on Manitoba Highways." Accessed January 2026. Available at: https://www.manitoba.ca/mti/traffic/mhtis/traffic_report_2024.pdf.

University of Manitoba and Manitoba Transportation and Infrastructure. 2024(b). Manitoba Highway Traffic Information System Web App. Accessed January 8, 2026. Available at https://univmb.maps.arcgis.com/apps/webappviewer/index.html?id=bc528943383c41939c4d1ecb97be1bc6

U.S. Department of Transportation. 2018. Pipeline Failure Causes. Pipeline and Hazardous Materials Safety Administration. Accessed December 2025. https://www.phmsa.dot.gov/incident-reporting/accident-investigation-division/pipeline-failure-causes

U.S. Geological Survey 2025. _National Water Information System data available on the World Wide Web (USGS Water Data for the Nation). doi:10.5066/F7P55KJN <https://doi.org/10.5066/F7P55KJN>. Accessed July 2025.

Vincent, L.A., Hartwell, M.M. and Wang X.L. 2020. A Third Generation of Homogenized Temperature for Trend Analysis and Monitoring Changes in Canada's Climate. Atmosphere-Ocean, 58(3), 173-191 https://doi.org/10.1080/07055900.2020.1765728

Wan, H., Spassiani, A. C., & Vincent, L. A. 2025. Canada's Fourth Generation of Homogenized Surface Air Temperature and its Trends for 1948–2023. Atmosphere-Ocean, 63(4), 223–240. https://doi.org/10.1080/07055900.2025.2516796

Wan, H., Wang, X. L. and Swail, V. R. 2010. Homogenization and trend analysis of Canadian near-surface wind speeds. Journal of Climate, 23, 1209-1225.

Wang, D., G. Wang, Q, Tan, and C. Wen. 2024. Research on the effectiveness of measures to reduce frost heave in oil and gas pipelines. E3S Web of Conferences 561, 01016 (2024)

Wang, H and Duncan, I.J. 2014. Likelihood, causes, and consequences of focused leakage and rupture of U.S. natural gas transmission pipelines. Journal of Loss Prevention in the Process Industries. Volume 30. Pages 177-187. ISSN: 0950-4230.

Water Survey of Canada (2025). National Water Data Archive: HYDAT. Water Survey of Canada (WSC). Retrieved from: https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/monitoring/survey/data-

products-services/national-archive-hydat.html (Accessed September 24, 2024).

Western University Northern Tornadoes Project. 2025. Northern Tornadoes Project – Event dashboard [ArcGIS dashboard]. ArcGIS. Accessed December 2025, from https://westernu.maps.arcgis.com/apps/dashboards/19460b79cf24493680e5792f5247f46d

Winkler Aquifer Management Plan, 1997. Winkler Aquifer Management Plan, Planning for the Future of the Winkler Aquifer. A report submitted by the Winkler Aquifer Management Plan round table to Manitoba Water Resources Branch. March, 1997

Winkler Fire Department. 2026. Services. Accessed January 8, 2026. Available at https://www.winklerfire.com/services

Winkler Police Service. 2026. Accessed January 8, 2026. Available at https://winklerpolice.ca/

Winkler Stanley Economic Development Corp. 2025. About Us. Accessed September 2025. https://wsedc.ca/about-us/

Zhang, X., Vincent, L. A., Hogg, W. D., & Niitsoo, A. 2000. Temperature and precipitation trends in Canada during the 20th century. Atmosphere-Ocean, 38(3), 395–429. https://doi.org/10.1080/07055900.2000.9649654

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