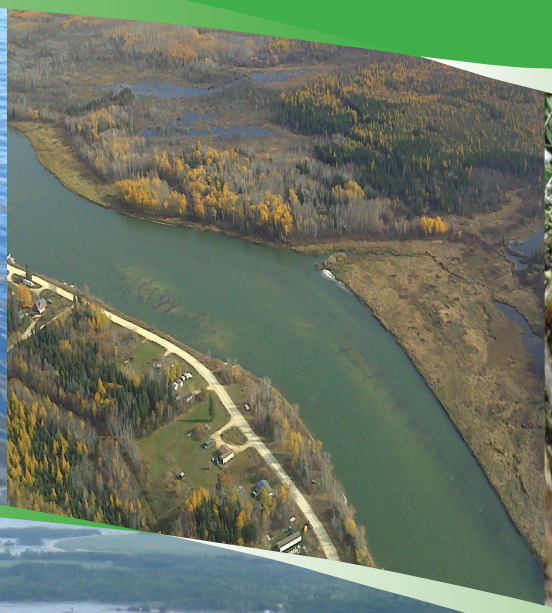
LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS PROJECT EIS

Manitoba



VOLUME 4:
Socio-economic
Effects Assessment

9.0 - Human Environment
10.0 - Indigenous Peoples

March 2020

Manitoba

LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS PROJECT
Environmental Impact Statement

CHAPTER 9

SOCIO-ECONOMIC EFFECTS ASSESSMENT ON HUMAN ENVIRONMENT

March 2020

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

9.0 ASSESSMENT OF POTENTIAL EFFECTS ON HUMAN ENVIRONMENT

9.1 OVERVIEW OF CHAPTER

This chapter discusses the human environment setting and the potential effects that the Project will have on the human environment. Section 7.1 of the Canadian Environmental Assessment Agency Environmental Impact Statement (EIS) Guidelines for the Project (CEAA 2018) indicate that Project baseline conditions should be documented for aspects potentially affected by the Project, including rural and urban settings, federal lands, current use of all waterways and water bodies, residences or camps, health and socio-economic conditions, including the functioning and health of the socio-economic environment and sectors and economies that support the local and regional communities, goods and services, physical and cultural heritage, and potentially affected population size. Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) submitted to Manitoba Sustainable Development indicates that the human environmental setting will include discussion on non-Indigenous communities, including population and services, resource use, economic activities, and heritage and cultural resources.

In order to characterize these changes and effects in a structured way, the following human environment valued components (VCs) are assessed:

- land and resource use
  - property and residences
  - agricultural land use
  - designated lands and protected areas, recreation and tourism
  - other resource use
  - groundwater and surface water use
- infrastructure and services
  - population
  - temporary accommodations
  - community infrastructure and services
- economy
  - provincial economy

  - regional economy
  - labour
  - goods and services
- health
- heritage resources

Information is provided on the scope of assessment, existing conditions, Project interactions, assessment of residual environmental effects, determination of significance, effects to federal lands, and any follow up and monitoring requirements.

9.2 LAND AND RESOURCE USE

9.2.1 Scope of the Assessment

This land and resource use environment assessment is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) indicates that the EIS will describe socioeconomic attributes such as land and resource use, and include parks and designated protected areas, tourism and recreation. Section 3.4.2 indicates that the EIS will provide information on resource use, including hunting, fishing and trapping, and activities such as agriculture.

Chapter 4 (Section 4.4.1) of this EIS describes VCs as features that may be affected by the Project as related to the role of the VC in the ecosystem and the value people place on it. Land and resource use is a VC because of regulatory considerations and its importance to communities, property owners, resource users (e.g., hunters, trappers, farmers, commercial operators and the general public, and other stakeholders. Components of land and resource use are protected or otherwise regulated under various legislation, including, but not limited to the *Crown Lands Act*, the *Provincial Parks Act*, the *Forest Act*, the *Wildlife Act*, and the *Mines and Minerals Act*. The effects from Project activities during construction (e.g., channel excavation) and the presence of the Project have the potential to reduce the amount of land available for agriculture and interfere with agricultural activities. Land and resource use is linked with other VCs, including wildlife and wildlife habitat, aquatic environment, health, and traditional land and resource use.

Land and resource use consist of the following topic areas:

- Property and residences refers to development and zoning controls, land tenure and property ownership (e.g., private, Crown land, Crown-leased land, municipal land, land survey patterns

[section-township-range]), residential development and proposed residential development, and industrial developments.

- Agricultural land use refers to production of agricultural crops and raising of livestock (e.g., hogs, cattle, poultry).
- Designated lands and protected areas refers to protected areas, proposed protected areas, areas of special interest (ASIs), ecological reserves, provincial parks, provincial forests, wildlife management areas (WMAs), community pastures, important bird areas, wildlife refuges, non-governmental conservation lands, First Nation reserves and treaty land entitlements.
- Resource use refers to mining (quarry and aggregate sites/leases, permits, withdrawal areas, peat sites/leases); forestry (productive forest land, high value forest sites, private woodlots, shelterbelts); hunting and trapping (non-Indigenous) comprising activities in game hunting areas, game bird hunting zones, open trapping zones and registered traplines, commercial fishing and sport/recreational fishing.
- Groundwater and surface water use refers to licence use, groundwater wells, flowing and high-water wells.

9.2.1.1 Regulatory and Policy Setting

A list of various regulatory requirements that were considered in developing this environmental impact statement (EIS) can be found in the Introduction (Section 1.5 and Appendix 1A). Particular consideration was given to the following federal and provincial legislation, policies and guidelines in the preparation of this environmental assessment.

Federal Regulations and Policy

The Navigation Protection Act

The Project is of potential interest to Transport Canada because of its mandate to protect navigation rights under the *Navigation Protection Act* (NPA). The purpose of the NPA is to regulate works and obstructions that risk interfering with the public right of navigation in scheduled navigable waters. Lake Manitoba and Lake Winnipeg are both scheduled waterbodies under the NPA. Navigation is also protected in Canada for non-scheduled navigable waters not listed in the Act (i.e., the right to use navigable waters as a highway).

Provincial Regulations and Policy

The Forest Act

Administered by the Manitoba Sustainable Development (MSD) Forestry Branch, this Act was established to manage provincial Crown forests. The forest damage appraisal and valuation (FDAV) policy also

applies to the Project. It outlines the parameters for calculating financial compensation to the Crown due to (i) the removal for the removal of timber and (ii) the effect on high value silviculture investments on productive Crown forestlands.

The Mines and Minerals Act

Administered by the Mineral Resources Branch of Manitoba Enterprise, Growth and Trade, this Act governs the disposition of mineral rights (permits, claims and leases), exploration, development and production of the province's non-fuel mineral resources and the rehabilitation of mines and quarries.

The Peatlands Stewardship and Related Amendments Act

Administered by MSD, this Act takes over the administration of Crown peat and peatlands from *The Mines and Minerals Act*. There are no mineral peat areas within the PDA.

The Provincial Parks Act

Administered by the Parks and Natural Areas Branch of MSD, this Act was established to protect natural lands and the quality of life; manage existing and future provincial parks so representative examples of natural and cultural heritage are conserved; and allow economic opportunities to contribute to the protection of the province's natural regions.

The Groundwater and Water Well Act and Related Amendments Act

Administered by MSD Water Science and Management Branch, this Act protects groundwater resources.

The Crown Lands Act

Administered by MSD Lands Branch, this Act identifies the requirements for issuance of leases, permits, easements and rights-of-way for specified works on provincial Crown lands. Work permits will be required for the Project.

The Planning Act and Provincial Planning Regulation

Administered in cooperation by Manitoba Intergovernmental Relations and the associated municipal councils, this Act provides a framework for land use planning strategies at the provincial, regional and local scale. Requirements of *The Planning Act* and its regulations do not apply to the Crown or Crown agencies.

The Conservation Districts Act

Administered by MSD, the Watershed Planning & Programs Section, this Act provides for the conservation, control, and prudent use of resources through the establishment of conservation districts

and the protection of correlative rights of owners. Conservation districts can also be designated as a water planning authority in Manitoba.

The Water Protection Act

Administered by MSD Water Science and Management Branch, this Act provides for the protection of Manitoba's water resources and aquatic ecosystems.

The Water Rights Act

Administered by MSD, Drainage and Water Rights Licensing, this Act identifies rights and use of water in Manitoba and prohibitions against diversion of water or operation of water works and set requirements for permitting and protection of aquatic ecosystems. Licenses may be required for drainage or bridge works.

The Water Resources Administration Act

Administered by Manitoba Infrastructure, this Act outlines a framework for authorizing the use and administration of water control works on designated Provincial Waterways under Ministerial approval. Authorizations under this Act will be required for the Project.

The Wildlife Act

Administered by MSD, Wildlife and Fisheries Branch, this Act designates provincial wildlife lands, regulates licensed harvest of wildlife, and identifies other protections for wildlife in Manitoba.

The Noxious Weeds Act and Noxious Weeds Regulation

Administered by Manitoba Agriculture, this Act presents the designation of noxious weeds that may adversely impact Manitoba's environment and economy, and outlines responsibilities to control or destroy such weeds (i.e., biosecurity). It addresses one component of agricultural biosecurity, the controlling and preventing the spread of noxious weeds. There is no legislation directly governing additional biosecurity concerns (e.g., soil-borne pathogens and diseases, livestock disease) in Manitoba. However, Manitoba Agriculture has developed biosecurity protocols for crop production (Manitoba Agriculture 2019a), including for energy, construction, water management, transportation industry and municipal work on agricultural land (Manitoba Agriculture 2019b). Its 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 ROWs.

The Expropriation Act

Administered by the Crown in the right of Manitoba, this Act applies wherever an authority (i.e., any person, including the Crown in right of Manitoba, who under an Act of the legislature has power to acquire land) expropriates land or exercises a lawful power causing an injurious affection of land, for which compensation will be determined subject to the provisions of the Act. The Crown is bound by this Act.

Provincial Land Acquisition Policy

Manitoba Infrastructure, in conjunction with the Crown Land and Property Agency, have identified a land acquisition approach for the Project which can involve two types of processes: mutual agreement and acquisition. Mutual agreement is the preferred option for obtaining land. It is the intent with land acquisition that the landowner is not to be in worse condition following land purchase. The actual process of acquiring land requires Minister sign-off and Cabinet approval for the issuance of an Order-in-Council. Once complete, a letter is sent to landowners stating land acquisition has been declared and the province will be purchasing their land for the Project. The province has 120 days to make an initial offer to purchase. Landowners have the right to take an initial offer and later appeal the final compensation.

Provincial Permits

The following provincial work permits are likely to be required for the Project:

- A work permit under *The Crown Lands Act* for construction, and camp development on provincial Crown lands will be secured prior to construction for activities outside of the ROW.
- Casual quarry permits required under Subsection 133(1) of *The Mines and Minerals Act* will be acquired prior to quarry development.
- Burning permits required under Section 19(1) of *The Wildfires Act* will be secured as needed.
- Permits for petroleum storage tanks over 5,000 litres (L) on Crown land are required under *The Dangerous Goods Handling and Transportation Act* (*Storage and Handling of Petroleum Products and Allied Products Regulation*) and will also be secured as needed.
- A licence or authorization may be required under *The Water Rights Act* prior to the construction of proposed water control works.
- Authorization for constructing a work across a designated Provincial Waterway will be required under *The Water Resources Administration Act*.
- A water use license under *The Water Rights Act* is not expected to be required as water use (e.g., dust control, use at concrete batch plants for bridge construction) is not expected to exceed the

controls based on applicable development plans and zoning by-laws are described further in Section 9.2.2.2.

Policies are in place in municipal jurisdictions to deal with issues of surface water and hazard lands flooding and erosion. Development in areas subject to physical hazards is generally limited to agricultural or open space uses under a development plan. The Policies governing development in such areas are usually implemented by a variety of means such as zoning by-law, conditions, subdivision approval, the issuance of development permits and building permits, development agreements and such programs as determined by Planning District Boards or Council.

9.2.1.2 Engagement and Key Concerns

A discussion of the Indigenous and public engagement process (IPEP) is provided in Chapter 5: Indigenous and Public Engagement. Additional land and resource use information was collected through key person interviews (KPIs) with representative stakeholders and groups. The engagement process on land and resource issues also involved discussions with regulators. Indigenous input and community concerns contributed to selecting the channel routes for the Project, including avoiding areas described as important, such as the Johnson Beach area Buffalo Lake. Key issues regarding land and resource use identified through the IPEP (and the sections of the EIS where they are addressed) are summarized in the following sub-sections.

Public Engagement Process

Manitoba Infrastructure received numerous comments about land and resource use during four rounds of the IPEP (i.e., open houses, meetings). Detailed information on the IPEP is provided in Chapter 5. Information is also available in the supporting IPEP summary reports and appendices. The following subheadings summarize the feedback received regarding interests and concerns with respect to land and resource use.

Land Use

- concern about past losses associated with flooding affecting private development
- concern about managing and restricting public access to, and use of, the channels
- concern about effects on property, loss of trees, land values and loss of tax base, land acquisition and fragmentation of land
- question on provincial land use policy related to cottage lot development, protection of shorelands, and development in flood prone areas
- concern about potential nuisance effects on local residences related to noise, dust and public safety
- concern about effects of PR 239 realignment on property, residences, septic system functioning, access, longer travel distances and land drainage

The potential impacts to land use and property are addressed in Section 9.2.4.2.

Agriculture

- concern about loss of valuable farmland for cropping and grazing (e.g., operations most valuable or productive land will be lost to the channel, loss of land and access for calving), loss of income for next generation
- concern about financial aspects of loss of property (loss of income, tax implications, reduced borrowing ability), reduced value following splitting farms, increasing land values (future losses), compensation for recent improvements made to land (e.g., clearing, fencing, drainage)
- concern about loss of facilities and infrastructure (hydro power, barns, fencing, corrals, wells, dugouts), replacement on re-located land for livestock (grazing, feeding); cost and labour time to re-build
- concern about increased management effort and time associated with accessing land cut-off by channel (e.g., increase transit time and distance for moving equipment) for field operations (reduced efficiency in fields broken up or reduced in size), checking on crops and livestock
- concern about loss of access to grazing fields for livestock, requiring moving livestock over bridges to access land across the channel (safety issue, increased hauling of cattle) and/or facilities improvement (corrals, feeding areas)
- concern about feasibility and safety associated with moving large farm machinery across bridges and control structures
- concern about management within the ROW - weed spread from ROW onto adjacent agricultural land and grass fires
- concern about controlling public access to and along proposed access roads for farmers along channel
- concern about effects on well water for livestock (contamination, supply) and channel paralleling feedlot and other livestock activities
- concern about alterations to drainage, including flooding land, drying up surface water bodies, but some opportunity for improvement noted if drainage could flow into channel
- concern about ability for landowners to access ROW and soil spoil piles for haying
- concern about effects on bees and associated production
- concern about construction activity related to weed control (construction crews leaving livestock gates open, damage to land)

- concern about timing of work in relation to growing season (e.g., a landowner suggested no work from May 1 to November 1 due to cereal crop production)
- concern about the need for adequate notification prior to construction activities and expropriation, to support planning, moving livestock, etc. (e.g., one-year notice required to appropriately pasture cattle)

The potential impacts to agriculture are addressed in Section 9.2.4.3.

Parks, Recreation and Tourism

- concerns with effects on provincial parks, beaches
- concern with effects on cottaging and cottage development and conservation property
- concern with effects on snowmobile trails (i.e., SnoMan), waterways, and other travelways
- concern with effects on recreation and tourism in the RM (e.g., usage of Watchorn Provincial Park) and the economy
- interest in potential opportunities for recreating along the outlet channels (i.e., navigation, fishing)
- concern with effects of construction delays associated with PR 239 realignment (e.g., accessing Steep Rock)

Potential effects on parks, recreation and tourism are addressed in Section 9.2.4.4. Concerns addressed in routing the final outlet channels included Manitoba Infrastructure adjusting Route D (the LMOC between Lake Manitoba and Lake St. Martin) to move farther away from Birch Creek.

Resource Use

- concern about past (and potentially ongoing) flooding impacts on hunting, trapping and fishing
- concern with effects to resource use related to aggregate resources (depletion) for road maintenance
- concern with effects to resource use related to commercial fishing, hunting and trapping, and groundwater
- concern with loss of livelihood, impacts to commercial fishing, hunter/outfitter/fishing guides
- concern with effects on groundwater use, water quality degradation/contamination of wells
- concern about groundwater/surface water interactions
- concern with compensation for fishing loss
- concern with effects to trapping and furbearers, waterfowl and upland game bird hunting

- concern with enforcement issues related to hunting and fishing

Potential effects on hunting, trapping, fishing, mining, forestry and groundwater use are addressed in Section 9.2.4.5. The Project will result in the loss of private property of resource value (i.e., waterfowl hunting) and use of the channel lands will be restricted.

Indigenous Engagement Process

Throughout the Indigenous and Public Engagement Process (IPEP), Manitoba Infrastructure received comments about land and resource use. A summary of key interests and concerns received in feedback with respect to traditional land and resource use is provided in Chapter 5 along with the assessment of effects on traditional land and resource use.

Indigenous groups were provided opportunities to share their knowledge to help inform routing of the channel and the environmental assessment through the IPEP. Indigenous groups raised specific issues about potential Project effects related to use of unoccupied Crown land and traditional land use activities during the IPEP and traditional knowledge studies (TKS). The input provided by Indigenous groups through the IPEP added to the understanding of the existing land and resource use conditions and baseline conditions, supported the scope of issues assessed, and provided input into the mitigation process. A summary of the feedback received from the IPEP is provided in Chapter 5.

The following summarize the feedback received regarding interests and concerns with respect to Indigenous issues.

Land Use

- concern about the presence of permanent infrastructure bisecting land
- concern with effects from changes in water level regulation impacting governance and decision-making with land and water use

Agriculture

- concern with loss of farmland, namely hay land, due to flooding on Lake St. Martin by multiple Indigenous communities, including Lake St. Martin First Nation, Little Saskatchewan River First Nation and Pinaymootang. This loss of hay land has resulted in effects to the agricultural economy

Parks, Recreation and Tourism

- concern with impact on designation of Crown lands for environmental protection
- concern with impact on resource-based tourism business and resource tourism expansion plans
- concern with impact on recreational development initiatives (wilderness experience), cottage lot and RV campground development

- concern with effects on access restrictions related to navigation along the channels

Resource Use

- concern with potential impacts to commercial fisheries, livelihood, including equipment
- concern with effects on hunting and trapping (grouse, rabbit, beaver, muskrat), including access
- concern with need for compensation for adverse effects on resource-based industries, including commercial fishing, trapping and forestry
- concern with potential impacts on traditional land and resource use

The potential effects of the Project on land use are addressed in Section 9.2.4.2 and potential effects on parks, recreation and tourism are addressed in Section 9.2.4.4. Potential effects on resource-based industries, including fishing, trapping and forestry are addressed in Section 9.2.4.5 of the EIS. The process of designating Crown lands for parks and environmental protection purposes under a provincial park system network or some other protected areas network is outside the scope of the EIS.

Regulatory Engagement Process

Manitoba Sustainable Development (i.e., Water Stewardship & Biodiversity, Parks & Regional Services, Environmental Stewardship, Finance and Crown Lands, Lands), Manitoba Agriculture, Growth Enterprise and Trade, and Health, Seniors and Active Living were contacted as part of the IPEP and attended Project meetings, information sessions, and specific group discussions in 2018. Specific questionnaires were developed and facilitated between Manitoba Infrastructure and various focus groups looking at lands, socio-economics, policy, terrestrial, water, fish, aquatics, and wildlife.

Comments received from provincial staff during Project meetings consisted of the following:

- the need for and type of collection of socio-economic baseline data
- concerns about the outlet channel location north of Watchorn Provincial Recreation Park
- concern with the potential for snowmobile accidents along the outlet channels and Project design to prevent such incidents
- the need to limit access at the water control structures
- the procedure for decommissioning wells to prevent contamination of the underlying aquifer
- potential adverse effects on commercial fishers by sediment releases from the use of the Emergency Outlet Channel (EOC)
- access management, site rehabilitation following construction, and moose hunting

- nature of wildlife movements in the area (i.e., large ungulates, furbearers), trapping efforts, furbearer lifecycles, and current trapping success
- use of multi-year construction sequencing leaving untouched corridors for trapping (e.g., marten)

The potential effects of the Project on land use are addressed in Section 9.2.4.2 and potential effects on parks, recreation and tourism are addressed in Section 9.2.4.4. Potential effects on resource-based industries, including fishing, trapping and forestry are addressed in Section 9.2.4.5 of the EIS.

9.2.1.3 Potential Effects, Pathways and Measurable Parameters

The following Project-related effects were identified by considering potential interactions between Project components and land and resource use:

- temporary or permanent removal of residences or degradation of property and disturbance and nuisance effects from noise/dust
- temporary or permanent removal or degradation of industrial land uses
- temporary or permanent removal or degradation of parks, recreation areas, special features (conservation lands, campgrounds, picnic sites, trails) or unique sites
- temporary or permanent removal or degradation of designated lands or protected areas, including proposed candidate protected areas (areas of special interest)
- permanent agricultural land loss—because of the presence of Project structures and other areas of the ROW that are inaccessible, and areas of expropriated privately-held land, and Crown lease land conversions outside of the ROW—will result in permanent removal or loss of agricultural land. Changes to lake levels and flooding may result in effects on agricultural land along the shoreline of Lake St. Martin.
- temporary agricultural land loss and/or land degradation from construction activities at Project components (i.e., rock quarries, borrow sites, marshalling yards, temporary construction camps) may result in temporary removal of agricultural lands prior to reclamation following their use in supporting construction. There is also a potential for degradation of agricultural lands by reducing their agricultural capability class due to compaction or improper soil handling. Effects on soil that may result in a change in agricultural capability class are addressed in the soil assessment (Chapter 6, Section 6.3.2) as a pathway component for evaluating the effects on agricultural land use.
- conflict with agricultural activities from construction activities (e.g., clearing of the ROW, creation of access routes, construction traffic) and Project operation (i.e., presence of infrastructure) will cause conflict with agricultural activities (e.g., access limitations, disrupted field operations, increased management effort and production cost) and may reduce production levels, increase production costs, or increase labour, equipment or facilities requirements

- temporary or permanent removal or degradation of lands used for consumptive commercial resource use (hunting, trapping, mining, forestry, fishing), consumptive recreation and livelihood (hunting, fishing), and non-consumptive recreation (sport fishing)

Other environmental and socio-economic VCs may influence or may be affected by changes in land and resource use. Examples of linkages between environmental and socio-economic VCs and land and resource use include:

- aquatic environment could be affected by potential effects on vegetation cover and surface water quality may affect fish resource use (i.e., harvesting of resources)
- terrestrial environment could be affected by altered habitat and access may affect wildlife resource use (i.e., harvesting of resources)
- human health risk could itself affect land use
- agriculture (agricultural capability and production levels) are determined largely by soil and landscape factors; therefore, effects on soil are a pathway for effects on agricultural capability and production

Table 9.2-1 summarizes the potential effects of the Project on land and resource use, effects pathways, and measurable parameters for evaluating effects. Potential effects and measurable parameters were selected based on consideration of feedback from engagement, professional judgment, and review of recent environmental assessments for linear features and water diversion projects elsewhere in Manitoba and Canada (i.e., Manitoba Hydro 2015; Alberta Transportation 2018).

Table 9.2-1 Potential Effects, Effect Pathways and Measurable Parameters for Land and Resource Use

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in land use	Temporary or permanent removal of residences or degradation of property Disturbance and nuisance effects from noise/dust Change in access	• Change in Municipal/Crown land designations along PDA • Number of properties affected • Number of residences affected • Number of access restrictions
Change in agricultural land use	Permanent land loss – areas of the channel and highway ROWs that are inaccessible and areas of expropriated privately-held land and Crown lease land conversions outside of the ROWs will result in permanent removal or loss of agricultural land; changes to lake levels and flooding may result in effects to agricultural land along the shoreline of Lake St. Martin	• Extent of permanent agricultural land loss (ha)

Table 9.2-1 Potential Effects, Effect Pathways and Measurable Parameters for Land and Resource Use

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
	Temporary land loss and/or land degradation – construction activities at temporary Project components, including rock quarries, borrow material sites, temporary construction camps and staging areas, may result in temporary removal or degradation of agricultural lands	• Extent of lands affected by temporary land loss and/or subject to degradation (ha)
	Conflict with agricultural activities – construction activities and Project operation (i.e., presence of infrastructure) will cause conflict with agricultural activities and may reduce production levels, increase production costs or increase labour, equipment or facilities requirements	• Description of farming activities and determination of potential conflicts
Change in parks, recreation and tourism	Temporary or permanent removal or degradation of parks and protected areas, including proposed protected areas (candidate areas) Temporary or permanent removal or degradation of unique sites or special features Change in access	• Area of park affected (ha) • Area of unique site/special feature affected (ha) • Number of park, protected area, recreational use feature (e.g., campground, picnic site) in proximity • Number of access restrictions
Change in resource use	Temporary or permanent removal or degradation of lands used for consumptive commercial resource use (hunting, trapping, mining, forestry, fishing), consumptive recreation and livelihood (hunting, fishing), and non-consumptive recreation (sport fishing)	• Area of consumptive land and resource uses affected • Attributes of land and resource uses affected • Number of access restrictions

9.2.1.4 Boundaries

Spatial Boundaries

The Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on land and resource use are shown in (Appendix 9A, Figure 9.2A-1). and described below. Federal lands within these boundaries consist of reserve lands associated with the Indigenous communities. Traditional land and resource use and Indigenous resource-based activities are presented in Chapter 10.

Project Development Area

The Project development area (PDA) encompasses the Project footprint and is the area of physical disturbance in which the Project components (main works) and associated works and activities are located. The PDA is an area of 2,099 ha, or 21.0 km^2. The primary PDA components are the Lake Manitoba Outlet Channel (LMOC), PR 239 and municipal alignments (the LMOC PDA), and the Lake St. Martin Outlet Channel (LSMOC) (the LSMOC PDA). The LMOC PDA is approximately 24.1 km in length and occupies approximately 1,022 ha. The LSMOC PDA is approximately 23.8 km in length and occupies approximately 993 ha.

There are no Federal lands within the PDA.

Local Assessment Area

The LAA for the assessment of effects on land and resource use includes the PDA and a 1 km buffer around the PDA, plus the LAA for aquatic environment (for commercial fishing areas), which comprises the addition of Watchorn Bay on Lake Manitoba and Sturgeon Bay on Lake Winnipeg. The LAA for the outlet channels covers an area where direct and indirect effects on land and resource use are likely to be most prevalent based on assessment scoping for land use and property, agricultural land use, resource use, and parks and recreation lands.

The LAA for Lake St. Martin is a 1 km buffer of the Lake St. Martin shoreline to include changes to lake levels from Project operations. This area overlaps parts of the Indigenous communities of Little Saskatchewan River First Nation, Lake St. Martin First Nation and Pinaymootang First Nation. The LAA consists of an area of approximately 104,744 ha.

Federal lands within the LAA include reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation. These are located along the eastern shoreline of Lake St. Martin within the land and resource use LAA for the LSMOC.

Regional Assessment Area

The RAA for the assessment of effects on land and resource use includes the PDA and the land and resource use LAA, the boundaries of rural municipalities affected by the Project (i.e., RMs of Grahamdale and West Interlake), the boundaries of a named unorganized territory bordering Lake St. Martin (i.e., Lake St. Martin area), a 10 km buffer of the LSMOC PDA plus the RAA for aquatic environment (for commercial fishing areas), which includes the water bodies of Lake Winnipeg and Lake Manitoba. The RAA provides context for the assessment of significance and encompasses an area within which cumulative effects on land and resources may occur, as described in Chapter 11.

Federal Lands within the RAA consist of the reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Dauphin River First Nation, and Lake Manitoba First Nation.

Administrative Boundaries

Some of the baseline data related to land and resource use, including geospatial data and attribute information is organized by administrative boundaries. Therefore, consideration was given to the following provincial and municipal administrative boundaries to gather baseline information for the assessment on land and resource use.

- the rural municipalities of Grahamdale and West Interlake (see Section 9.2.2.2)
- the unorganized territory of the Lake St. Martin area (see Section 9.2.2.2)
- provincial planning district boundary of West Interlake (see Section 9.2.2.2)
- municipal development plan designations and zoning by-law zones, as set out in municipal development plans and zoning by-laws and the Provincial Land Use Policies (Provincial Planning Regulation 81/2011) related to Crown lands (see Section 9.2.2.2)
- administrative park boundary plan for Watchorn Provincial Recreation Park (see Section 9.2.2.2)
- crown land permit and lease data provided by the Central Region Parks and Regional Services Division of MSD (see Section 9.2.2.2)
- Interlake Forest Section, Forest Management Units (FMU) 41, 42, 43 and 45 boundaries, provincial park boundaries, protected areas and Areas of Special Interest (ASI) boundaries, and wildlife management area boundaries established by the Province through regulation and Director Plans of Survey (see Section 9.2.2.2)
- Province of Manitoba Open Trapping Zone areas (species trapping data unavailable for open trapping zones in the Province) and Gypsumville Registered Trapline Area boundary (species trapping data) (see Section 9.2.2.2)
- Province of Manitoba Game Hunting Area boundaries or portions thereof (GHAs 16, 19B, 20, 21, 25, 25A), Game Bird Hunting Zone (GBHZ) 3 and 4 or portions thereof (no regional game bird hunting data is available within RAA as the information is only presented on a provincial scale (i.e., central/southern Manitoba) (see Section 9.2.2.2)
- individual outfitter allocation areas in southern Manitoba are not available from MSD due to privacy concerns (see Section 9.2.2.2)

Temporal Boundary

The temporal boundary for the assessment of effects on land and resource use covers the duration of the construction and operation phases of the Project. The construction duration is estimated to occur over 2.5 to 3 years with approximately 1-2 years for post construction-related works. During construction, land and resource use will be affected by access restrictions within construction areas as well as the presence of

the workforce noise associated with operating heavy equipment. The Project will affect some land and resource uses throughout operation and maintenance because of permanent take up of lands used for channel construction and associated works. The operation and maintenance phase of the Project is expected to be indefinite.

9.2.1.5 Residual Effects Characterization

Table-9.2-2 presents definitions for the characterization of residual environmental effects on land and resource use. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table-9.2-2 Characterization of Residual Effects on Land and Resource Use

Characterization	Range of Criteria	Level of Effect and Definition
Direction of change (type of effect)	Neutral	No measurable change on land and resource use.
	Adverse	Net loss (adverse or undesirable change) on the land and resource use.
	Positive	Net benefit (or desirable change) on land and resource use.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of 2.5 to 3 years).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities (i.e., 3 to 5 years).
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project (i.e., a timeframe of greater than 5 years).
Magnitude (degree or intensity of the change)	Negligible or Low	Negligible – no measurable change in land or resource use and capacity from baseline conditions Low – a small, measurable change in land and resource use and capacity but activities and production can take place at or near similar levels as under baseline conditions
	Moderate	Measurable change in land and resource use and capacity from baseline conditions. While the impairment of capacity for activities and production is measurable, activities and production can take place at similar levels as under baseline conditions
	High	Measurable change in land and resource use and capacity, such that activities and production cannot take place at similar levels as under baseline conditions
Timing	No Sensitivity	No effect on land and resource use related to timing.
	Moderate Sensitivity	Effect on land and resource use seasonality (i.e., hunting/trapping, fishing, annual cropping or livestock grazing) may occur during a lower sensitivity timing period (e.g., in-active season).

Table-9.2-2 Characterization of Residual Effects on Land and Resource Use

Characterization	Range of Criteria	Level of Effect and Definition
	High Sensitivity	Effect on land and resource use seasonality (i.e., hunting/trapping, fishing, annual cropping or livestock grazing) occurs during a higher sensitivity timing period (e.g., active seasons).
Extent (Spatial Boundary)	PDA	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities (e.g., borrow pits and quarries).
	LAA	Area within which potential Project effects are measurable and extending beyond the PDA to, but not beyond, the LAA.
	RAA	The anticipated regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA.
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project (e.g., blasting at quarries; site-specific construction equipment noise from channel excavation).
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project (e.g., groundwater seepage along PDA).
Reversibility (the degree of permanence)	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (< than five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> than five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
Social Context (resilience of a VC to adapt to changes as a result of the Project)	Resilient	Land and resource use is able to accommodate changes in land base or disturbances to environmental conditions and/or is of high capacity to adapt to or recover from change.
	Not Resilient	Land and resource use is unable to accommodate changes in land base or disturbances to environmental conditions and/or is low capacity to adapt to or recover from change.

9.2.1.6 Significance Definition

A determination of significance is made for the Project residual effects on land and resource use after the implementation of mitigation measures. There are no specific provincial or federal regulations that set thresholds for determining the significance of effects on land and resource use. As such, the study team developed appropriate thresholds to evaluate the capacity for land and resource use to continue through construction and operation of the Project.

Significance thresholds for land and resource use are as follows:

- Effects on land and resource are considered to be significant if the Project results in degradation, restriction or disruption of present land and resource uses in the LAA to a point where these activities and production cannot continue at or near baseline levels or cannot be adequately compensated.
- Effects on agricultural land use are considered to be significant if the Project results in a loss of agricultural land, loss of agricultural capability, or interference with agricultural operations and/or activities such that existing agricultural production cannot continue at pre-Project levels for extended periods of time (beyond the construction phase) or cannot be adequately compensated.

9.2.2 Existing Conditions for Land and Resource Use

9.2.2.1 Methods

Information on existing conditions for land and resource use was obtained through primary and secondary research. Secondary research included a desktop review of statistical sources, previous studies, research findings, and other environmental assessments, where applicable. Primary data were collected from records of public engagement activities undertaken as part of the IPEP for the Project (i.e., open houses, stakeholder meetings), and key person interviews (KPIs) with identified stakeholders. The following sections present additional information on the sources used to characterize baseline conditions and how the information was interpreted and analyzed.

Existing Data

The sources and types of information used to characterize the baseline conditions for land and resource use are summarized in Table 9.2-3.

Table 9.2-3 Desktop Data Sources

Source	Description
Manitoba Government Agencies	Published reports from government agencies related to land and resource use
Lake St. Martin Access Road Environmental Assessment Report	Previously completed environmental impact assessment and information from past research conducted in the region
Manitoba Infrastructure	Indigenous and public engagement process
Rural Municipalities of Grahamdale and West Interlake	Municipal government development plans and zoning by-laws for development controls and zoning, including the assignment of aggregate development potential[1]; and including the assignment of aggregate

[1] The RM of Grahamdale in their development plan assigned development potential (i.e., high-medium potential) to aggregate deposits within the rural municipality. Deposits with a high rating indicates land with a known valuable mineral, quarry mineral, metallic mineral or sand or gravel deposit, and where only non-conflicting land uses should be allowed. Areas with a medium rating identifies land with mineral, sand or gravel deposits, the full potential of

Table 9.2-3 Desktop Data Sources

Source	Description
	development status[2] (i.e., "Stop-Caution-Go" categorization with respect to the value of aggregate deposits) in municipal planning and zoning documents
Manitoba Municipal Relations Web Application	Manitoba land use and development web application on development plan designations, zoning by-laws, property assessment information, and municipal boundaries
Manitoba Government Websites	Publicly available information from Manitoba Protected Areas Initiative; MSD Parks and Protected Spaces Branch) on provincial forestland, WMAs, wildlife refuges, provincial parks/national parks, provincial Crown lands, private conservation lands, ecological reserves (including proposed areas), protected areas (including proposed areas) and ASIs
Manitoba Provincial, Municipal and Organization Websites	Trails Manitoba, SnoMAN) and municipal planning and zoning documents and Travel Manitoba website to gather land use and spatial data on high value use areas (e.g., campgrounds and resorts), recreational areas, wildlife viewing, hiking trails, ATV trails and snowmobile trails and shelters
Manitoba Forestry and Peatlands Management Branch	Five-year report on the status of forestry for information on provincial Crown productive forestland, including sustainable harvest levels (SHL) based on current utilization, softwood and hardwood harvest volumes by Forest Section, including reported volumes timber return, quota, commercial and personal use timber permits (2016); forest fire data, and high value forest sites consisting of research and monitoring sites (tree improvement sites, permanent sample plots), forest regeneration planting sites; timber supply areas, and past personal permit areas. Data on the latest composite of provincial Forest Resource Inventory (FRI) and the Forest Lands Inventory (FLI). The provincial Forest Resource Inventory (FRI) and Forest Land Inventory[3] (FLI) was last updated by the Forestry and Peatlands Management Branch in 2016 for the Interlake FS that includes FMUs 41, 43 and 45 (MSD 2016b).
Manitoba Mineral Resources Branch	For land use and spatial data on mineral dispositions, including mineral leases, quarry leases, quarry permits, mining locations and aggregate resources, provincial aggregate inventory reports, including the identification of aggregate deposits and assignment of status with respect pits and quarries (i.e., active/inactive private sand and gravel pit, active/inactive Crown sand and gravel pit, bedrock quarry);
Manitoba Sustainable Development, Travel Manitoba	For data and mapping on trapping, hunting, guiding and outfitters locations in southern/central Manitoba.

which is not proven, or the quality of which is not high, but has been recognized as of value to the municipality. Conflicting land uses may be permitted with appropriate approval.

[2] The Province of Manitoba Mines Branch assigns development status (i.e., "Stop-Caution-Go" categorization with respect to the value of the deposit) to aggregate deposits within rural municipalities and updates the status of deposits as further information becomes available. The intent of the stop development designation is to protect the resource from conflicting surface land uses. The caution development status indicates deposits that are of a lower quality and have not been adequately proven for use but are recognized as of value. "Go" status implies a deposit that is of no recognized value as an aggregate resource where land uses are not restricted.

[3] Formerly known as the Forest Resource Inventory (FRI).

Table 9.2-3 Desktop Data Sources

Source	Description
Manitoba Sustainable Development	For land use and spatial data on surface water and groundwater licences and allocations, purpose/type of use (i.e., industrial, agricultural, domestic, other), groundwater wells (GW Drill database), flowing wells, springs and aquifers. Other literature used to gather this information included water management plans, historical MCWS provincial reports and flowing well areas and springs mapping (i.e., artesian groundwater conditions).
MLI [Manitoba Land Initiative] 2019)	Existing soil resource information was obtained from provincial soil survey data. This provides basic soil information and associated interpretation provide are discussed further in the assessment of soil (Chapter 6, Section 6.3.2).
CanSIS [Canadian Soil Information System] 2019)	Existing soil resource information was obtained from federal soil survey data. This provides basic soil information and associated interpretation provide are discussed further in the assessment of soil (Chapter 6 Section 6.3.2).
AAFC (Agriculture and Agri-Food Canada AAFC) 2019	Crop type distribution inventory for 2018.
Statistics Canada 2019 (2019a, 2019b, 2019c)	Agriculture farm and agricultural land use statistics for 2016 from Census of Agriculture data for Manitoba. This includes farms within the RM of Grahamdale and RM of West Interlake but does not include information on farms and land use in reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Pinaymootang First Nation and Little Saskatchewan First Nation.
Manitoba Infrastructure 2018; Google Earth Pro (2019)	Ortho-imagery review for agricultural land use and operations. Project-specific, high-resolution imagery was collected for LMOC and LSMOC PDA areas by Manitoba Infrastructure (2019). Google Earth Pro imagery was used for interpretation of agricultural areas within the LAA not covered by the Project-specific imagery.

Desktop and GIS Analysis

Baseline data sources and available secondary sources were used to describe land and resource use existing conditions. Land and resource use metrics informed the characterization of land and resource use, from the human environment perspective. Geospatial data were plotted using GIS software to determine the spatial distribution, nature, intensity of overlapping land-uses along the outlet channels. By using GIS overlay mapping, interactions of the Project on other land uses were quantified, as summarized in Table 9.2-4.

Table 9.2-4 GIS Analysis

Topic Area	Metric Unit
Land use	the number of dwellings and rural properties intersected by the Project in the RAA
Parks, recreation and tourism	the number of interactions or conflict with high value use areas *(e.g.,* campgrounds and resorts), recreational areas, canoe routes, hiking trails, ATV trails and snowmobile trails in the RAA
Designated lands and protected areas	the number of potential interactions or conflict with provincial forests, WMAs, provincial parks, provincial Crown lands, private conservation lands (e.g., Ducks Unlimited), Nature Conservancy of Canada), ecological reserves (including proposed areas), protected area lands (including proposed areas) and areas of speciai interest in the RAA
Resource use	the extent of interaction with provincial open trapping area zones and game hunting areas in the RAA
	the number of interactions, conflict or interference with mineral dispositions (e.g., mineral leases, quarry leases, quarry permits, quarry withdrawal areas, mining areas, aggregate resources) in the RAA
	the number of interactions, conflict with, reduction or loss of productive forestland, high value forest sites, including enhanced silviculture sites, research and monitoring sites in the RAA
	the extent of interactions with groundwater wells, groundwater and surface water use license areas, flowing and high-water level wells quantity in wells
Agricultural land use	agricultural capability ratings were used to evaluate the inherent capability of the land to support agricultural production and was used to assess agricultural potential in areas not currently under agricultural land use (CLI 1969; Leeson et al. 1969; Podolsky 1981)
	permanent agricultural land loss area was determined as the total area of the PDA traversing agricultural land uses (i.e., representing the area occupied by Project structures and ROW that will be unavailable for agriculture) and other agricultural lands being taken out of production due to the Project (i.e., privately-owned land being expropriated or crown lease land being returned to the crown) for the operation phase of the Project
	Agricultural crop type distribution mapping data for 2018 was acquired from AAFC (2019)

Key Person Interviews

Key person interviews (KPIs) were conducted with representatives identified from various groups in the environment, recreation and resource group sectors to supplement baseline information (e.g., important features, usage and types of activities). KPIs undertaken to supplement the description of land-use baseline conditions included the following organizations:

- RM of Grahamdale Council and consultants
- RM of West Interlake

- landowners
- Graymont Western Canada Inc.
- Moosehorn Hotel
- Adamson's Outfitting and Guide Service

Personal communications were conducted with representatives of provincial government agencies to obtain information on productive forestland and high value forest sites, surface water and groundwater licenses and usage, and furbearer trapping data and permit holders.

Field Studies

No field studies were conducted for land and resource use to generate primary information.

9.2.2.2 Overview

Land and resource use is organized into

- land use and property (i.e., Crown and public lands, industrial land use, development and zoning, including provincial land use policies)
- designated lands, protected areas, and federal lands
- agricultural land use (i.e., capability, production), parks, recreation and tourism (including current use of waterways and waterbodies)
- resource use (i.e., hunting, trapping, fishing, mining/aggregates, forestry, and groundwater and surface water use [including major aquifers and water quality, groundwater and surface water supply, flowing wetlands and springs, use of water resources)

Most land in the LAA is a mix of private and municipal ownership with a few remaining areas of Crown land. As noted above, the RAA consists of the RMs of Grahamdale and West Interlake and the communities of Moosehorn, Gypsumville, Ashern and Eriksdale. Smaller settlement centres consist of Camper, Faulkner, Fairford, Grahamdale, Hilbre, St. Martin, and Steep Rock, in the RM of Grahamdale and Lake Manitoba Narrows, Vogar, Mulvihill, and Deerhorn in the RM of West Interlake (Appendix 9A, Figure 9.2A-2).

Land along the LSMOC in the LAA is provincial Crown Land. Within the LAA, land use activities consist mainly of agriculture, snowmobiling and other recreational activities, hunting, and fishing.

The Lake St. Martin area, unorganized territory [4], is also located in the RAA. Appendix 9A, Figure 9.2A-2 shows the land ownership and tenure in the LAA and RAA. There are no communities or settlement centres in this unorganized territory. Several First Nation communities are located in the RAA and surrounding area, namely Lake Manitoba First Nation, Pinaymootang First Nation, Little Saskatchewan First Nation, Lake St. Martin First Nation, and Dauphin River First Nation. Fisher River First Nation, Peguis First Nation, and Kinonjeoshtegon First Nation are located outside the RAA.

The land and resource use in RM of Grahamdale (within the RAA) consists of economic activities including farming, ranching and fishing. There are also industries such as Continental Lime Ltd. (Graymont Western), Lehigh Cement, quarrying and forestry. The RM of West Interlake supports agriculture, recreation and tourism industries, fishing, and mineral extraction.

The RAA includes infrastructure such as roadways (PTHs, PRs, and municipal roads), waste disposal sites, an abandoned railway line and Manitoba Hydro transmission lines.

Land Use

Lands in the RMs of Grahamdale and West Interlake are predominantly privately-owned, while lands outside the RMs (i.e., in the Lake St. Martin area north and east of the RM of Grahamdale) are primarily Crown-owned or leased (see Appendix 9A, Figure 9.2A-2). Forty-four private property parcels are located within the LMOC PDA in the RM of Grahamdale. There are no private properties within the LSMOC PDA. The LSMOC will pass exclusively across Crown land.

Property ownership patterns in the RMs and Lake St. Martin area were largely influenced by the Dominion Land Survey that used the section-township-range system to delineate lands. The type, location and proximity of permanent, seasonal, or temporary residences, or camps to the Project is described herein. Appendix 9A, Figure 9.2A-3 shows the location of buildings and communities in the RAA. Buildings along the LMOC are shown in Appendix 9A, Figure 9.2A-4. The community of Moosehorn is located approximately 10.9 km from the LMOC.

Rural buildings occur throughout the RMs. Four rural buildings are located within the LMOC PDA in the RM of Grahamdale. There are no rural buildings in the Lake St. Martin area.

Table 9.2-5 shows data on occupied private dwellings in the RMs of Grahamdale and West Interlake from 2006 to 2016. The RM of Grahamdale had more than a 30% increase in the number of private dwellings between 2006 and 2016. The population density in the RM has remained steady at 0.6 people per km^2.

[4] Unorganized territory refers to any geographic region in Canada that does not form part of a municipality or First Nation Reserve. In these areas, the lowest level of government is provincial or territorial.

Table 9.2-5 Occupied Private Dwellings in the RMs of Grahamdale and West Interlake, 2006 to 2016

	Year	Total Private Dwellings	Average Number of Rooms/ Dwelling	Population Density Per km^2
RM of Grahamdale	2016	1,125	6.4	0.6
	2011	891	-	0.6
	2006	864	6.1	0.6
RM of West Interlake[1]	2016	1,323	6.1	1.3

[1] The RM of West Interlake was formed on January 1, 2015 comprising the RMs of Siglunes and Eriksdale. Census numbers do not exist for the RM of West Interlake for the 2011 and 2006 censuses.

Source: Statistics Canada. 2017a; Statistics Canada. 2012; Statistics Canada. 2007; Statistics Canada 2017b.

Crown and Public Lands

Crown lands within the RAA include protected areas, WMAs and provincial parks. The land acquired for the LMOC PDA will intersect one Crown property and a further six Crown-leased properties located in the LAA for the LMOC, but outside the PDA. The Lake St. Martin area (unorganized territory) encompasses predominantly Crown and Crown-leased land. The LSMOC incorporates unencumbered Crown land in unorganized territory. Ownership of mineral rights is expected to be vested in the Crown.

Parcels of encumbered Crown land (i.e., land with active permits and leases) within the LAA are located in the RM of Grahamdale (Appendix 9A, Figure 9.2A-2). Crown land encumbrance types within the larger RAA consist of agricultural leases (forage and hay), Ducks Unlimited Canada sites, permits/leases for residences, snowmobile shelters (SnoMan), access roads, cottages, boat launches and docks, waste disposal sites, a campground, a wayside park, a recreation site, an outcamp, a fish camp, and a recreational trail (Kowalchuk, 2019 pers. comm.). There are 44 active agricultural Crown-leases or permits on lands in the RAA consisting of forage leases, cropping leases, renewable haying permits and renewable grazing permits (Gillis 2019, pers. comm.). Parcels of municipal-owned land also occur within both the RMs of Grahamdale and West Interlake in the RAA.

Industrial Land Use

Graymont Western Canada Inc. limestone and gypsum quarries and processing plant is located on PR 239 between the communities of Steep Rock and Faulkner. The plant can produce up to 117,000 metric tonnes of lime per year. Seven silos provide 2,240 tonnes of storage for pebbled, pulverized and crushed quicklime or dolomitic lime. The plant can also produce 80,000 tonnes per year of calcium carbonate (Graymont Limited 2019). Lehigh Cement is a leading supplier of cement, aggregates, concrete and heavy building products across the prairie provinces with a plant located in Winnipeg (Concrete Manitoba 2016). Lehigh Cement holds quarry leases in the vicinity of Steep Rock west of Faulkner.

Development and Zoning Controls

The RM of Grahamdale Development Plan (By-law No. 936/2005, RM of Grahamdale, 2006) designates the majority of lands in the RM as “Agriculture Rural Area” (Appendix 9A, Figure 9.2A-5). Other designations include “Agriculture Restricted Area”, “General Development Area”, “Recreation Area”, “Rural Residential Area” and “Wildlife Management Area” (WMAs). There are parcels of land designated as “Agricultural Restricted Area” around Moosehorn and Steep Rock, the latter being located along Lake Manitoba. Communities in the RM are designated as “General Development Area”.

Under the RM of Grahamdale Zoning By-Law (No. 937/2005, RM of Grahamdale, 2005), most of the RM is zoned “Agriculture General Zone”. The Steep Rock area is zoned “Seasonal Recreation Resort Zone”. Communities in the RM are zoned “General Development Zone” with lands zoned “Agriculture Restricted Zone” surrounding them.

The RM of West Interlake (formerly the RM of Siglunes and RM of Eriksdale) is located in the RAA. The RM has a development plan (RM of Western Interlake Development Plan 2/04) (Appendix 9A, Figure 9.2A-5). Under the development plan, most of the RM is designated as “Rural Agricultural Area”. Other land use designations in the RM of West Interlake consists of “Agricultural Restricted Area”, “Rural Residential”, “Parks, Recreation and Open Space”, and “Industrial Area”.

The community of Ashern, located within the RM of West Interlake, is a local urban district (LUD) and is designated as “Residential Area”, “Parks and Recreation Area”, “Central Commercial Area”, and “Institutional Area”. Lands along PTH 6 and PR 325 are designated as “Highway Commercial Area” and “Industrial Area”. A “Park and Recreation Area” is located south of Ashern where PTH 6 and Railway Avenue merge together. The community of Eriksdale is also a Local Urban District (LUD) with similar land use designations as Ashern (Manitoba Municipal Relations 2017b).

The existing zoning by-laws for the RMs of Siglunes and Eriksdale still apply under the amalgamated municipality of West Interlake. Under the RM of Siglunes Zoning By-law No. 6/05, most of the land is zoned “Agricultural General Zone”. “Agricultural Restricted Zones” occur around Ashern, Steep Rock, the Narrows and at Vogar. A “Seasonal Recreation Resort Zone” is located at Steep Rock. Under the RM of Eriksdale Zoning By-law No. 7/05, most of the land in the RM is also zoned “Agricultural General Zone”. The community of Eriksdale in the RM has an “Agricultural Restricted Zone” around it. An “Agricultural Restricted Zone” and a “Seasonal Recreation Zone” border along Lake Manitoba at the southwest corner of the RM.

Areas of aggregate potential were identified in the RM of Grahamdale Development Plan Zoning By-law No. 936-2005. Areas of “Medium” aggregate potential are widespread throughout the RM, while areas of ‘High” aggregate potential are limited to west of Hilbre and at Steep Rock. Development constraints identified in the Western Interlake Planning District Development Plan By-law No. 2/04 (involving the RMs of Siglunes and Eriksdale, now the RM of West Interlake) includes a few widely scattered “Caution” quarry mineral deposit areas (i.e., lower quality deposits, unproven but of value) around Dog Lake and along PTH 68, and more substantial groundwater pollution hazard areas (along the shoreline of Lake Manitoba and across the eastern third of the RM of Siglunes (the northern part of the RM of West

Interlake) and located across the central portion of the RM of Eriksdale (the southern part of the RM of West Interlake) with small pockets to the northwest along PR 417 and PTH 68.

Flooding occurs along the shorelines of lakes and rivers in the region, particularly on Lake Manitoba, Lake St. Martin, Pineimuta Lake, and Fairford River. Flooding is also problematic in areas due to local ponding from inadequate drainage (Rural Municipality of Grahamdale 2006; WIPD 2004). Policies and zoning by-law regulations related to surface water, hazard lands and flooding and erosion are in place to manage developments in susceptible areas, with use restricted to agriculture and open space recreational uses. According to the Rural Municipality of Grahamdale's Surface Water, Hazard Lands, Flooding and Erosion policy, lands subject to flooding must be provided with flood protection. The design flood may be the 100-year flood, or a flood of a magnitude specified by the Province for areas protected by flood control works (WIPD 2004; Rural Municipality of Grahamdale 2006).

Provincial Land Use Policies

Provincial land use policies (PLUPs) under the Provincial Planning Regulation No. 81/2011 reflect the provincial government's interest in land and resource use and sustainable development. The PLUPS apply to all lands subject to *The Planning Act* and in the absence of adopted development plans. PLUPs are also given full consideration when undertaking planning activities and land use decision-making on Crown lands. The provincial land use policies, as set out in Schedule Part 3, includes Policy Area 1: General Development that expresses the provincial interest in land use and development (Manitoba Municipal Relations 2017c). The province supports sustainable development practices that are reflective of communities, is compatible and avoids land use conflicts, and ensures the sustainable use of land and resources.

Designated Lands and Protected Areas

Manitoba's Protected Areas Initiative (PAI) is dedicated to developing and managing land to protect Manitoba's enduring features and biodiversity, in terrestrial, marine and freshwater environments (MSD 2017e). In Manitoba, protected areas fall under one of several designations and levels of protection including areas of special interest (ASI), ecological reserves, parks and park reserves, wildlife management areas (WMAs), community pastures, and game bird refuges (see Appendix 9A, Figure 9.2A-6). Ecological reserves are established to preserve unique and rare natural (biological and geological) features of the province and examples of natural and modified ecosystems. Proposed protected areas have not yet been given permanent protection status by the province.

WMAs are designated and managed by the Province of Manitoba. There are no WMAs in the LAA, but there are eight WMAs in the RAA: Grahamdale, Hilbre, Dog Lake, Mantagao Lake, Gypsumville, Moosehorn, Little Birch, and Sleeve Lake WMAs (Appendix 9A, Figure 9.2A-6). The Sleeve Lake Game Bird Refuge borders the Sleeve Lake WMA on the north side in the RM of Grahamdale. Dog Lake, Moosehorn, and Little Birch WMAs have "protected area" status under the PAI. Only a small portion of the Mantagao Lake and Dog Lake WMAs are in the RAA. The southern section of a former forestry road is located within the Mantagao Lake WMA. The WMA border parallels the west side of the existing forestry

road for several km and extends eastward and southward beyond the LAA to Mantagao Lake. The section of the former forestry road in the WMA is outside of the RAA. The Lake St. Martin Islands Important Bird Area (IBA) is located on Lake St. Martin in the LAA. Other IBAs in the RAA are Dog Lake, Duck Island, Sand Reef Islands, and Kinosoa-Leifur.

Community pastures in the province are operated by the Association of Manitoba Community Pastures (AMCP) in partnership with the Manitoba Government (AMCP 2016) and can form part of the province's protected areas network. There are no community pastures in the LAA and one community pasture in the RAA. The Mulvihill Community Pasture is located in the southern portion of the RM of Grahamdale east of PTH 6 near the community of Mulvihill.

Areas of special interest are candidate protected areas selected under Manitoba's PAI to represent enduring features found within a region that still need to be captured in Manitoba's protected areas network. There are portions of three ASIs within the LAA (Sturgeon Bay, Lynx Bay, and Idylewild). Within the RAA, there are seven ASIs: Belanger River ASI, Berens Island ASI, Lynx Bay ASI, Sturgeon Bay ASI, Gypsum Lake ASI, Idylewild ASI, and Kinwow Bay ASI. The Reindeer Island Ecological Reserve is located north of Sturgeon Bay in Lake Winnipeg and is part of the RAA. The Dog Lake Islands Game Bird Refuge and proposed Ecological Reserve is located in the RAA. There are two Provincial Parks located within the RAA, Sturgeon Bay Provincial Park (designated as a Wilderness Park) and Watchorn Provincial Park, a Recreation Park (Appendix 9A, Figure 9.2A-6). There are no designated lands, protected areas, parks or recreational land use areas along the proposed realignment of PR 239.

Federal Lands

Three First Nation reserves are located in the LAA, namely Pinaymootang First Nation, Little Saskatchewan First Nation, and Lake St. Martin First Nation. Several other First Nation reserves are located within the RAA, including Lake Manitoba First Nation and Dauphin River First Nation. The closest First Nation Reserve to the LMOC is Pinaymootang FN (Fairford 50) on the west side of Lake St. Martin, approximately 8 km to the northwest. The closest First Nation Reserve to the LSMOC is Dauphin River First Nation (Dauphin River 48A), approximately 4.4 km west of the LSMOC on Sturgeon Bay (Lake Winnipeg). The closest First Nation Reserve to the proposed distribution line is Lake St. Martin First Nation (Narrows 49A) at approximately 11.4 km west of the LSMOC on Lake St. Martin. Finally, the closest First Nation Reserve to the PR 239 realignment is Pinaymootang FN (Fairford 50), approximately 13.7 km to the northwest, on Lake St. Martin. Other First Nations in the surrounding area include Fisher River First Nation, Peguis First Nation, and Kinonjeoshtegon First Nation. A portion of the Peguis Notice Area is located within the RAA, but not the LAA. Within this area the Province of Manitoba is obligated to notify Peguis First Nation of any proposed dispositions of Crown land.

Current Use of Waterways and Waterbodies

Travel routes are important to the communities in the RAA and provide recreation and activities such as fishing. Lakes and rivers in the RAA are used by residents and tourists for activities such as recreational boating, windsurfing, sailing, canoeing, kayaking, swimming and the use of jet skis. During the winter, the

frozen lakes provide access for snowmobiles and other vehicles. Travel routes in the LAA and RAA include open-water and frozen waterways.

The Project outlet channels will affect both Lake Manitoba and Lake Winnipeg, both “Scheduled Waterbodies” under the federal *Navigation Protection Act* (NPA). The NPA protects the public right to navigation in scheduled navigable waters through the regulation of works and obstructions that risk interfering with navigation. The construction of levees and groynes around the inlets and outlets in lakes Manitoba and Winnipeg will require NPA approval because they will create structures that could interfere with navigation. Manitoba Infrastructure will post signs indicating that the use of the LMOC and LSMOC for unauthorized access for travel is not permitted.

Agricultural Land Use

Within the RAA, most of the agricultural land use occurs within the RM of Grahamdale and the RM of West Interlake; however, some occurs in the federal lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan Frist Nation and Pinaymootang First Nation. As previously noted, a large portion of the land in the RAA is designated for agricultural use, including in the vicinity of LMOC. Agricultural land use topics include agricultural capability, agricultural production, and agricultural land ownership.

Within the LAA, agricultural land use is limited to the LMOC portion of the LAA and the southern and western shorelines of the Lake St. Martin shoreline portion of the LAA. There is no agricultural land use within the LSMOC portion of the LAA, and areas within this portion of the LAA are not rated for agricultural capability. Therefore, the LSMOC portion of the LAA is not discussed in the existing conditions, below. For the purposes of existing conditions and subsequent assessment, the LMOC portion of the LAA and the Lake St. Martin shoreline portion of the LAA subcomponents of the LAA area are discussed. Further, the major water bodies, including Lake St. Martin, Watchorn Bay or Sturgeon Bay, are not included in the existing conditions discussion and proportional analysis of the Lake St. Martin shoreline subcomponent of the LAA, as these areas of water are not relevant to the assessment of agriculture.

Agricultural Capability

Agricultural capability provides a class rating of the inherent capability of the land to support agriculture, irrespective of current land use. Therefore, this classification provides insight into the ability of the land to support annual crop production, hay and forage production, and pasture for livestock grazing. The class rating is a function of climatic, topographic and soil conditions for a given parcel of land. The definitions of agricultural capability classes are given in Table 9.2-6.

Table 9.2-6 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. These soils are marginal for sustained arable agriculture.
5	Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible (i.e., improved permanent pasture and hayland)
6	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible (i.e., limited to native pasture)
7	Soils in this class have no capability for arable culture or permanent pasture
O	Organic soils are rated based on potential agricultural capability recognizing that most organic soils have little or no value for agriculture in their native state and their potential is only achieved through reclamation or development implemented with varying degrees of difficulty
Notes: Sources: CLI 1969; Podolsky 1981; Leeson et al. 1969.	

Agricultural Capability in the RAA

A summary of areas within each agricultural capability class within the RAA is in Table 9.2-7 and classes are presented in Appendix 9A, Figure 9.2A-7. In the existing conditions summary in Table 9.2-7 and in the discussion below, the areas of water have been removed. Water occupies 82% of the 3,088,379 ha area of the land and resource use RAA, including Lake Winnipeg, Lake Manitoba and Lake St. Martin.

Within the RAA, the predominant agricultural capability class is Class 4 (36.6%), which has severe limitations and is considered marginal for sustained arable agriculture. A minor portion of the RAA is Class 5 (9.0%), which is generally considered suitable for improved permanent pasture and hay production. A substantial portion of the RAA is Class 6 (19.9%) and considered only capable of producing perennial forage crops and improvement practices are not feasible. A minor portion of the RAA is rated as Classes 1 to 3 (3.5%), which are generally considered prime agricultural lands suitable for production of most annual crops grown in Manitoba.

Approximately 24% of the RAA is composed of soils that are not rated for agricultural capability in the existing provincial (MLI 2019) and federal (CanSIS 2019) soil resource information. These soils are located north of the areas of existing agricultural land use, generally east and north of Lake St. Martin.

Table 9.2-7 Agricultural Capability in the RAA

Agricultural Capability Class	Summary of Areas (only includes land areas[1])		
	km²	ha	% area
Class 1	0	0	0
Class 2	97	9,710	1.7
Class 3	4	433	0.1
Class 4	2,038	203,792	36.6
Class 5	502	50,217	9.0
Class 6	1,107	110,735	19.9
Class 7	105	10,549	1.9
Organic Soils	335	33,515	6.0
Not Rated[2]	1,338	133,780	24.0
Unclassified[3]	42	4,236	0.8
Totals	5,570	556,967	100

Notes:

Areas and proportions may not add up to totals due to rounding

1. Water occupies 2,531,413 ha or 82.0% of the RAA and includes Lake Winnipeg, Lake Manitoba and Lake St. Martin and other large water bodies. This area has been removed from the RAA area for the interpretation of agricultural capability

2. Not rated includes soil polygons that don't have an agricultural capability rating in the existing provincial (MLI 2019) and federal (CanSIS 2019) soil databases. These are comprised of organic and mineral soils located north of areas of existing agricultural land uses

3. Unclassified consists of soil polygons that have no soil classification information and are generally islands in large water bodies

Agricultural Capability in the LAA

Agricultural capability classes within the agricultural areas of the LAA are summarized in Table 9.2-8. For this summary and discussion below, the areas of land and resource use LAA that are not currently under agricultural land use and do not have agricultural capability ratings in existing soil resource inventory are not included. Water occupies a large proportion of the land and resource use LAA, primarily due to the presence of Lake St. Martin. Areas not rated for agricultural capability occupy a considerable portion of the LAA, along most of the eastern and northern shorelines of Lake St. Martin and the entire LSMOC portion of the LAA. The resultant areas of the LAA being evaluated for agriculture consist of the LMOC portion of the LAA and the agricultural areas of the Lake St. Martin shoreline portion of the LAA, and do not include the eastern and northern shorelines of the Lake St. Martin shoreline portion of the LAA or the LSMOC portion of the LAA.

LMOC

Classes for the LMOC portion of the LAA are displayed in Appendix 9A, Figure 9.2A-8. Within the LMOC portion of the LAA, the predominant agricultural capability class is Class 4 (60.3%), which has severe

limitations and is considered marginal for sustained arable agriculture. These soils have limitations due to structure and permeability (D) and stoniness (P). A substantial portion of the LMOC portion of the LAA is Class 6 (24.3%) and is considered only capable of producing perennial forage crops and improvement practices are not feasible. Limitations in these soils are due to excess water (W). A minor portion of the LMOC portion of the LAA is rated as Class 7 (4.6%) and is considered to have no capability for arable agriculture or permanent pasture due to excess water (W) and moisture limitations (M). Organic soils occupy 10.6% of the LMOC portion of the LAA and are rated as Class O3W and O5WD with severe limitations for agriculture due to wetness (W) and structural and permeability (D). No areas within the LMOC portion of the LAA are rated as Class 1 to 3, which are generally considered prime agricultural land.

Areas of limitations to agricultural capability within the LMOC portion of the LAA are as follows:

- structure and permeability (D), 70.9% of the LAA
- stoniness (P), 60.5% of the LAA
- excess water (W), 38.7% of the LAA
- moisture limitations (M), 0.8% of the LAA
- consolidated bedrock (R), 0.1% of the LAA

Lake St. Martin Shoreline

Classes for the Lake St. Martin shoreline portion of the LAA are displayed in Appendix 9A, Figure 9.2A-9. Within the Lake St. Martin shoreline portion of the LAA, the predominant agricultural capability class is Class 4 (54.2%), which has severe limitations and is considered marginal for sustained arable agriculture. These soils have limitations due to structure and permeability (D), stoniness (P) and salinity (N). A substantial portion of the Lake St. Martin shoreline portion of the LAA is Class 6 (26.5%) and is considered only capable of producing perennial forage crops and improvement practices are not feasible. Limitations in these soils are due to excess water (W). Organic soils occupy 7.5% of the Lake St. Martin shoreline portion of the LAA and are rated as Class O3W and O5WD with severe limitations for agriculture due to wetness (W) and structural and permeability (D). A minor portion of the Lake St. Martin shoreline portion of the LAA is rated as Class 7 (5.7%) and is considered to have no capability for arable agriculture or permanent pasture due to moisture limitations (M), excess water (W) and exposed or shallow bedrock (R). A minor portion of the Lake St. Martin shoreline portion of the LAA is rated as Class 1 to 3 (3.4%), which is generally considered prime agricultural land. Moderately to moderately severe limitations in these soils include excess wetness (W), stoniness (P), slope (T) and structure and permeability (D).

Areas of limitations to agricultural capability in the Lake St. Martin shoreline portion of the LAA are as follows:

- stoniness (P), 54.5% of the LAA
- structure and permeability (D), 52.1% of the LAA
- excess water (W), 37.9% of the LAA
- moisture limitations (M), 4.2% of the LAA
- inundation (I), 0.7% of the LAA
- slope (T), 0.5% of the LAA
- consolidated bedrock (R), 0.5% of the LAA

Table 9.2-8 Agricultural Capability in the LMOC and Lake St. Martin Shoreline Portions of the LAA

Agricultural Capability Class	Agricultural Capability Class and Subclass	Summary of Areas (only includes land areas[1])			
		LMOC Portion of the LAA		Lake St. Martin Shoreline Portion of the LAA	
		ha	% area	ha	% area
Class 1	**Total of Class 1**	0	**0.0**	0	**0.0**
Class 2	**Total of Class 2**	**3**	**0.0**	**169**	**2.9**
	2TD	0	0.0	28	0.5
	2W	3	0.0	57	1.0
	2WP	0	0.0	84	1.5
Class 3	**Total of Class 3**	**0**	**0.0**	**27**	**0.5**
	3I	0	0.0	27	0.5
Class 4	**Total of Class 4**	**4,693**	**60.3**	**3,111**	**54.2**
	4DP	4,693	60.3	2,904	50.6
	4N	0	0.0	207	3.6
Class 5	**Total of Class 5**	**13**	**0.2**	**152**	**2.6**
	5P	3	0.0	124	2.2
	5RP	9	0.1	16	0.3
	5WI	0	0.0	12	0.2
Class 6	**Total of Class 6**	**1,892**	**24.3**	**1,519**	**26.5**
	6W	1,892	24.3	1,519	26.5

Table 9.2-8 Agricultural Capability in the LMOC and Lake St. Martin Shoreline Portions of the LAA

Agricultural Capability Class	Agricultural Capability Class and Subclass	Summary of Areas (only includes land areas[1])			
		LMOC Portion of the LAA		Lake St. Martin Shoreline Portion of the LAA	
		ha	% area	ha	% area
Class 7	**Total of Class 7**	**356**	**4.6**	**326**	**5.7**
	7M	62	0.8	244	4.2
	7R	0	0.0	11	0.2
	7W	293	3.8	72	1.2
Organic soils	**Total of Organic soils**	**824**	**10.6**	**433**	**7.5**
	O3W	0	0.0	376	6.6
	O5WD	824	10.6	57	1.0
Unclassified[2]		0	0.0	3	0.1
Totals		**7,780**	**100.0**	**5,740**	**100.0**

Notes:

Areas and proportions may not add up to totals due to rounding

1. Water occupies 229.3 ha or 3.8% of the Lake St. Martin shoreline portion of the LAA and 146.3 ha or 1.8% of the LMOC portion of the LAA. This area has been removed from the LAA area for the interpretation of agricultural capability

2. Unclassified consists of soil polygons that have no soil classification information in existing provincial (MLI 2019) and federal (CanSIS 2019) soil resource information and are generally comprised of islands in water bodies.

Agricultural Production

Farm Size and Production Types in the RAA

Within the RAA, a total of 311 farms reported during the 2016 agricultural census (Statistics Canada 2019a). The farms reported were within the RMs of Grahamdale and West Interlake. A small proportion of these farms occupied an area under 53 hectares, which would be considered very small operations for a conventional production farm in Manitoba. Most farms (74%) were between 53 and 1,165 hectares (Figure 9.2-1), while 19% were reported to be above 1,165 ha. Approximately half of the farms in the RAA were larger or smaller than 453 hectares in area.

Production in the RAA is characterized as predominantly livestock and mixed farming. Of farms reporting in 2016, 209 operations (67%) were considered primarily livestock production, 62 operations (20%) primarily hay production, and 28 operations (9%) as primarily grain production (Table 9.2-9; Statistics Canada 2019b). A small proportion of operations (12 farms or 4%) were considered miscellaneous crop farming. No specialty farms were identified in the RAA.

For crop production operations in the RAA, forage crops were found to be the predominant crop type with over 44,000 ha of land (77.4% of the RAA) under alfalfa and other hay and forage seed crops (Table 9.2-10; Statistics Canada 2019c). For annual crop production, cereals occupied 7,880 ha (13.6% of the RAA) and oilseeds occupied 4,464 ha (7.7% of the RAA). Cereals were predominantly oats and wheat with some barley and mixed grains. Oilseeds included canola and soybeans. A very small portion of the land within the RAA was under corn production (1.3%), likely produced for silage and/or feed corn.

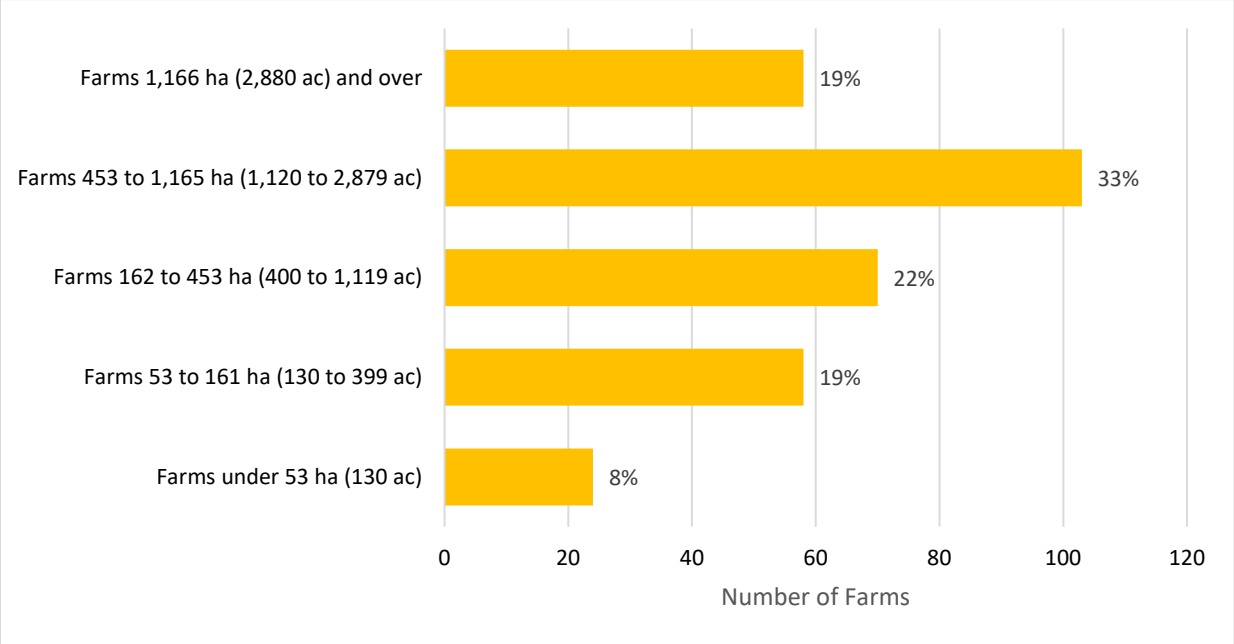


Figure 9.2-1 Number of Farms by Farm Area in 2016 in the RAA

Table 9.2-9 Agricultural Operation Type in 2016 in the RAA

Operation Type	Number of reporting farms	% of reporting farms
Livestock	209	67.2
Hay farming	62	19.9
Grain crops	28	9.0
All other miscellaneous crop farming	12	3.9
Speciality farms (vegetable, fruit, greenhouse, nursery)	0	0.0
Total agricultural operations	**311**	**100.0**

Notes:
Source: Statistics Canada. 2019. 2016 Census, Farms classified by farm type, Table 32-10-0403-01. Accessed at: https://www150.statcan.gc.ca/n1//en/type/data?MM=1#tables (accessed July 6, 2019).

Table 9.2-10 Farm Areas by Crop Type in 2016 in the RAA

Crop Category	Crop Type	Number of farms reporting	Hectares	% of reported acres
Cereal	Oats	93	4,040	7.0
	Wheat	24	2,309	4.0
	Barley	17	663	1.1
	Mixed grains	14	868	1.5
	Total cereals		**7,880**	**13.6**
Corn	Total corn	14	755	1.3
	Total corn		**755**	**1.3**
Oilseed	Canola	25	3,148	5.4
	Soybeans	12	1,316	2.3
	Total oilseed		**4,464**	**7.7**
Forage	Alfalfa and alfalfa mixtures	200	29,122	50.3
	All other tame hay and fodder crops	96	13,154	22.7
	Forage seed for seed	18	2,476	4.3
	Total forage		**44,752**	**77.4**
	Totals		**57,851**	100.0

Notes:
Source: Statistics Canada. 2019. 2016 Census, Hay and field crops, Table 32-10-0416-01. Accessed at: https://www150.statcan.gc.ca/n1//en/type/data?MM=1#tables; accessed July 6, 2019.

For livestock production operations in the RAA, beef cattle ranching, farming and feedlots were the dominant production system representing 174 of 209 (or 83.3%) of operations reporting in 2016 (Table 9.2-11; Statistics Canada 2019b). Horses and equine production comprised a minor portion of livestock operations the RAA, with 17 farms (8.1% of farms reporting in the RAA). The remaining 8.6% of livestock operations in the RAA included a few sheep and goat, apiculture (bees), dairy cattle, poultry, hog and other animal production systems.

Table 9.2-11 Livestock Operation Types in 2016 in the RAA

Livestock Operation Type	Number of reporting farms	% of reporting farms
Beef cattle ranching and farming, including feedlots	174	83.3
Horse and equine production	17	8.1
Sheep and goat farming	4	1.9
Apiculture	4	1.9
Dairy cattle and milk production	3	1.4
Poultry and egg production	2	1.0

Table 9.2-11 Livestock Operation Types in 2016 in the RAA

Livestock Operation Type	Number of reporting farms	% of reporting farms
Hog and pig farming	1	0.5
Other animal production	4	1.9
Total livestock operations	**209**	**100.0**

Notes:
Source: Statistics Canada. 2019. 2016 Census of Agriculture, Farms classified by farm type, Table 32-10-0403-01
Accessed at: https://www150.statcan.gc.ca/n1//en/type/data?MM=1#tables; accessed in July 2019.

Agricultural Land Use and Production in the LAA

While statistics on farm types are not available at the scale of the LAA and PDA, a characterization of farming operations is provided below based on a review crop inventory data (AAFC 2019), landowner-provided information from the IPEP and a review of ortho-imagery (Manitoba Infrastructure 2018; Google Earth Pro 2019). Characterizations are provided for the LMOC portion of the LAA and the Lake St. Martin portion of the LAA. As no agricultural land use occurs in the LSMOC portion of the LAA, no characterization is provided for the LSMOC subcomponent of the LAA.

LMOC

Farming along the LMOC area is characterized as predominantly cattle and mixed farming operations, consisting of cattle production, forage for hay production, pastures for grazing and annual crop production. Annual cropping includes such crop types as oats, barley, canola, beans, soybeans. Alfalfa and other forage species (e.g., trefoil) are baled for feeding cattle. Alfalfa seed production also occurs within the LAA and is supported by leaf-cutter bees for pollination. Honey is also produced in the LAA; therefore, beehives are present. Due to the prevalence of cattle production, manure application is an important practice in the LMOC area.

Agricultural crop type distribution within the LAA in 2018 was predominantly hay, pasture and grasses (42.6%) used to support livestock production (Appendix 9A, Figure 9.2A-3, Table 9.2-12). Agricultural crop type distribution within the LAA in 2018 was predominantly hay, pasture and grasses (42.6%) used to support livestock production (Appendix 9A, Figure 9.2A-10; Table 9.2-12). Approximately 11.7% of the LAA was under annual crop production, including canola (4.5%), soybeans (3.7%), spring wheat (3.3%) and miscellaneous crop (0.2%). The remaining 45.7% of the LAA was considered non-agriculture and composed of forest and shrubland, wetland, open water, exposed/bare land and developed land.

Manitoba Agricultural Services Corporation (MASC 2019) publishes information annually for the purposes of agricultural insurance coverage, including identification of soil risk areas and zones, and probable yields and coverage rates (based on commodity prices). The soil risk areas and zones are used by MASC to provide a relative measure of productivity throughout agricultural Manitoba and to assign insurance coverage values; however, further definition of these areas and zones are not provided. The LAA is found

within soil risk area 15 and, quarter sections are predominantly considered soil zones G and H, with some rated as soil zone I and a few rated as soil zone F (MASC [Manitoba Agricultural Services Corporation] 2019). Areas in proximity to Lake Manitoba and Lake St. Martin shorelines are rated as J. Probable yields and coverage levels are highest in zone F and decrease from G to J. For forage and pasture production the LAA is in forage region Area 6.

Based on review of Project ortho-imagery (Manitoba Infrastructure 2018; Google Earth 2019), there are 14 apparent cattle feedlots within the LAA. Of these, two are located within the PDA, one is located immediately adjacent to the PR 239 alignment and two more are located in close proximity to the alignment.

Lake St. Martin Shoreline

Farming along the Lake St. Martin shoreline is characterized as predominantly forage for hay production, and pastures for grazing cattle. According to Traverse (1999), the Lake St. Martin area was primarily used for hay and cattle, although some fields would have annual crops, such as oats, barley and flax. According to LMRRAC [Lake Manitoba Regulation Review Board] (2003), since regulation, locals have indicated that cattle ranching in the three Indigenous communities on Lake St. Martin has declined and was no longer a prevalent activity. However, during IPEP Little Saskatchewan, Lake St. Martin and Pinaymootang Indigenous communities all indicated the loss of hay lands due to flooding remains an important issue on the Reserve lands.

Agricultural crop type distribution in 2018 is predominantly hay, pasture and grasses (31.9%), composed almost completely of grasslands (Appendix 9A. Figure 9.2A-9; Table 9.2-12). Agricultural crop type distribution in 2018 was predominantly hay, pasture and grasses (31.9%), composed almost completely of grasslands (Appendix 9A, Figure 9.2A-11; Table 9.2-12). Only 0.2% (15 ha) of the LAA was under annual crop production. The remaining 67.8% of the Lake St. Martin shoreline is considered non-agriculture and is comprised of forest and shrubland, wetland, open water, exposed/bare land and developed land.

The LAA is within soil risk Area 15, and quarter sections are predominantly considered soil zones J and I, with some rated as soil zone H (MASC 2019). Probable yields and coverage levels are highest in zone H and decrease from I to J. For forage and pasture production the LMOC area is in forage region Area 3 and Area 6.

Based on review of ortho-imagery (Google Earth Pro 2019), there are four apparent cattle feedlots within the LAA for the LMOC.

Table 9.2-12 Crop Type Distribution in the LMOC and Lake St. Martin Portions of the LAA

Crop Category	Crop Type	LMOC portion of the LAA		Lake St. Martin shoreline portion of the LAA for the LMOC		All agricultural portions of LAA for the LMOC	
		ha	% of LAA	ha	% of LAA	ha	% of LAA
Cereal		**266**	**3.4**	**7**	**0.1**	**273**	**2.0**
	Spring wheat	264	3.3	7	0.1	272	2.0
	Oats	2	0.0		0.0	2	0.0
Oilseed		**353**	**4.5**	**8**	**0.1**	**362**	**2.6**
	Canola	353	4.5	8	0.1	362	2.6
Pulses		**293**	**3.7**	**0**	**0.0**	**293**	**2.1**
	Soybeans	293	3.7		0.0	293	2.1
Miscellaneous Crop		**13**	**0.2**	**0**	**0.0**	**13**	**0.1**
Hay, Pasture and Grasses		**3,377**	**42.6**	**1,906**	**31.9**	**5,282**	**38.0**
	Pasture/forages	322	4.1	9	0.2	331	2.4
	Grassland	3,055	38.5	1,897	31.8	4,952	35.6
Non-agriculture		**3,625**	**45.7**	**4,048**	**67.8**	**7,673**	**55.2**
	Developed	198	2.5	135	2.3	334	2.4
	Exposed/bare land	712	9.0	360	6.0	1,071	7.7
	Forest	1,158	14.6	1,221	20.5	2,380	17.1
	Shrubland	267	3.4	114	1.9	381	2.7
	Water	234	3.0	1,177	19.7	1,411	10.2
	Wetland	1,056	13.3	1,040	17.4	2,096	15.1
Total		**7,927**	**100.0**	**5,969**	**100.0**	**13,896**	**100.0**

Notes:

Source: AAFC (2019)

Areas and proportions may not add up to totals due to rounding

These portions of the land and resource use LAA represent areas under agricultural land use and with agricultural capability ratings in existing provincial (MLI 2019) and federal (CanSIS 2019) soil resource inventory

Agricultural Land Ownership

Agricultural land within the LMOC portion of the LAA and PDA is a combination of privately-owned and Crown land being used by landowners under lease and permit. Crown land leases are generally for cropping and forage, while Crown permits are for renewable haying and renewable grazing. Agricultural land within the Lake St. Martin shoreline portion of the LAA includes a combination of privately-owned

lands, Crown land under lease and permit and Federal lands associated with the Indigenous communities of Pinaymootang First Nation, Little Saskatchewan First Nation, and Lake St. Martin First Nation. An overview of land tenure and ownership is provided in Appendix 9A, Figure 9.2A-2.

Privately-held agricultural lands within the PDA will be expropriated for the Project and will not be available for agricultural land use as a result of the Project. In addition, access to some agricultural lands outside of the PDA will be cut-off by the Project. These include a combination of privately-held agricultural land and Crown lands being used by agricultural landowners under leases and permits. As a result, these agricultural lands outside of the PDA that will have access cut-off will not be available for agricultural land use as a result of the Project and are presented as “other agricultural land conversion areas” in the context of agricultural capability in Appendix 9A, Figure 9.2A-8 and crop type distribution in Figure 9.2A-10.

Parks, Recreation and Tourism

The Watchorn Provincial Park Campground located west of Moosehorn is located in the LAA for the LMOC. There are four campgrounds in the RAA: Benson’s Big Rock Camp and Campground on the north shore of Lake St. Martin near the entrance to Dauphin River, the Roviera Resort and Campsite at Fairford, the Steep Rock Beach Park Campsite at Steep Rock, the Elm Point Campground south of Faulkner on the east shore of Lake Manitoba Appendix 9A, Figure 9.2A-12 provides an overview of the recreational trails and campgrounds identified in the LAA and RAA.

Watchorn Provincial Park is located on the eastern shore of Lake Manitoba approximately 400 m to the southeast of the LMOC inlet. Watchorn Provincial Park has a Recreational Development Land Use Classification, which accommodates development such as campgrounds, beach and playgrounds. The campground has 25 basic camping sites and 22 electrical sites. As well, there is a boat launch located north of the campground at Watchorn Creek. The park has a picnic area and is adjacent to Watchorn Creek (Manitoba Conservation and Water Stewardship 2013; MSD 2017f). A swimming beach is located near the outlet channel at Watchorn Provincial Park. Three beaches and three boat launches are also located within the LAA for the LMOC in the RM of Grahamdale. The outlet channel routes do not traverse campgrounds, resort areas or cottages. There are two cottage developments to the west of the LMOC on Watchorn Bay in the LAA. The closest cottage developments to the LMOC PDA are approximately 4.9 km to the west (at Daytons Bay) on Lake Manitoba.

Sturgeon Bay Provincial Park lies within the northeast section of the RAA on the western shore of Lake Winnipeg, approximately 4 km to the east of the LSMOC outlet. The park is designated as a wilderness camping area with no road access or facilities located on park land, and there are no plans for development (Forster et. al. 2016). The park is currently closed to hunting due to moose hunting restrictions in the region.

Steep Rock Beach Park is located off PR 239 on the northeast shore of Lake Manitoba. It is a non-profit family campground. The campground has 250 campsites and one cabin, a beach, playground, general store, café, pavilion, boat launch, laundry facilities and showers. The park is open from April 15 to October 15 (RM of Grahamdale 2018).

The lakes and large rivers in the RAA are used by residents and tourists in the area for several water-related activities such as recreational boating (i.e., boat launches), windsurfing, sailing, canoeing, kayaking, swimming and the use of jet skis. During the winter, the frozen lakes provide access for snowmobiles and other vehicles (Forster et. al. 2016).

Recreational trails/features are crossed by the proposed LMOC PDA at four locations, including: a snowmobile trail just north of Watchorn Bay and Watchorn Provincial; a snowmobile trail (east of Faulkner along existing PR 239 and railway line from Steep Rock Junction at PTH 6); and a snowmobile trail at Birch Bay south of the LMOC to Lake St. Martin. In addition, five snowmobile trails are crossed within the LAA. One snowmobile shelter (Mike's Siding) is affected by the LMOC PDA in the RM of Grahamdale (GoTrekkers 2015). There are many more recreational and snowmobile trails located within the RAA in the vicinity of Gypsumville, Grahamdale, Moosehorn, and Ashern, and in proximity to PTH 6. There are no designated SnoMan Trails in the vicinity of the LSMOC in the northern part of the RAA. SnoMan also has shelters in the RAA. Recreational trails along the proposed PR 239 road realignment include a snowmobile trail in the RM of Grahamdale. There are no formal recreational activities along the new distribution line route for the LSMOC.

There are cottage developments on the eastern shores of Lake Manitoba in the RM of Grahamdale (Appendix 9A, Figure 9.2A-12). The largest are in the vicinity of Steep Rock along PR 239 where there are three developments. Lots are currently available for sale in two of the developments. In addition, there are two cottage developments to the south along PR 237 to the west of PTH 6 and the community of Moosehorn on Watchorn Bay in the LAA.

One private land wildlife area located in the RM of Grahamdale (east half 17-27-8W and SE20-27-8W) owned by the Moosehorn Duck Club Inc. will be crossed by the channel as well as one to the north of Portage Bay (north of Steep Rock) in the RAA which is not crossed by the channel.

The location of lodges and outfitters in the RAA are shown in Appendix 9A, Figure 9.2A-12. There are six lodges or outfitters identified: Adamson's Outfitting and Guide Service at Gypsumville; Bear Track Outfitters, northeast of Gypsumville; Benson's Big Rock Camp & Campground at Gypsumville, Davis Point Lodge and Outfitters Ltd. on Portage Bay, Steep Rock Canoe and Kayak, at Steep Rock; and Wildwood Outfitters near Moosehorn (Travel Manitoba 2018). One tourism operator outfitter, Benson's Big Rock Camp and Campground, is located in the LSMOC portion of the LAA. Two resource outfitters are located within or immediately adjacent to the LAA on Lake St. Martin (Bloom 2019, pers. comm.).

Resource Use

Hunting

MSD is responsible for the allocation and regulation of wildlife resources for recreational purposes. Regulations are reviewed annually, and include the establishment of season dates, bag limits and vehicle restrictions. There is annual review of non-resident big game hunting quotas and area allocations for lodges and outfitters as non-residents of Canada must utilize the services of a lodge or outfitter. MSD

also restricts lodge and outfitter big game allocations to specific areas where no conflicts with First Nations or resident hunters exist.

All non-Indigenous/licensed hunters must obtain a Province of Manitoba hunting license for the game hunting area (GHA) and species under *The Wildlife Act* (Manitoba) in order to harvest animals. The current seasons bag limits for resident and non-resident hunters have remained relatively constant from year to year. An overview of GHAs located within the RAA is shown in Appendix 9A, Figure 9.2A-13. The GHAs located within the RAA include GHAs 16, 20, 21, 25 and 25A. Parts of GHAs 21 and 25 are in the LAA for both channels. Table 9.2-13 highlights information on big game hunting licences and species by GHAs. Of note is that moose hunting is closed in affected GHAs.

Table 9.2-13 Game Hunting Licences and Seasons in RAA GHAs

Big Game Species	Big Game Seasons	Bag Limit
Moose	Closed	n/a
Elk	GHAs 20, 21 and 25 season dates are late-September to mid-October in general rifle draw (resident only). GHAs 21 and 25 also have a mid to late December season for one elk by general (rifle) draw (resident only). The archery draw in GHAs 20, 21, 25, and 25A is from late August to mid-September.	One bull elk
White-tailed deer	An archery season for resident, non-resident and foreign resident hunters is open for August and September and again in late October to early November for the GHAs. A general rifle season for white-tailed deer in Zones B and C for resident, non-resident, and foreign resident hunters is open from mid-November to early December.	One deer
Black Bear	GHAs 16, 20 and 21 are part of black bear hunting Zone B with licensed hunting between late April to end of June and late August to early October. GHAs 25 and 25A are part of Zone C with licensed hunting between late April to the end of June and then again from late August to early October.	One adult (no female with cubs)
Wolf and Coyote	GHAs 16, 20 and 21 are part of grey wolf and coyote Zone B for licensed-based hunting between late August and late March. GHAs 25 and 25A are part of Zone C for grey wolf and coyote season between the same dates. Coyote licenses for hunters can be purchased in GHAs 16, 20, 21, 25 and 25A from end of August to end of February and during the fall big game hunting season	One wolf One coyote
Game Birds	Hunting season between the beginning of September and early January. GHA 25A is part of GBHZ 4 which allows for grouse and gray (Hungarian) partridge hunting as well as spruce and sharp-tailed grouse between early September and early January.	Limit 8 to 12 (grouse, gray partridge)
Migratory Birds	Migratory bird seasons are from early September to early December for resident and non-resident hunters (all migratory birds), mid-September to early December for foreign residents (late September to early December for foreign resident white geese), and mid-March to end of May for conservation geese (i.e., Snow, Blue, Ross's) for resident, non-resident and foreign resident	Limit 24 No limit (white geese, conservation geese) Limit 15 (sandhill crane)
Source: MSD 2018a.		

Moose are important big game animals for hunting within the RAA. Moose are valued for licensed hunting and rights-based subsistence hunting. Currently, licensed moose hunting is closed in GHA 21 as the population is lower than desired levels (MSD 2018a). Elk are valued for rights-based subsistence harvesting and licenses for recreational hunters can be purchased from MSD during certain times of year for GHAs 20, 21 and 25 (MSD 2018a). Chapter 10 provides more discussion on existing conditions of Indigenous subsistence hunting.

White-tailed deer are valued for rights-based subsistence harvesting and licenses for recreational hunters can be purchased from the MSD for Zone B, which is open to deer harvest during certain times of year for GHA 16, GHA 21, GHA 25, GHA 25A for Zone E, and Zone C for GHA 16 (MSD 2018a). Further information on Indigenous subsistence hunting is provided in Chapter 10.

MSD licenses hunters for resident and non-resident bear hunting, along with registered outfitters for foreign resident bear hunting in GHAs 16, 20, 21 and GHA 25 and 25A (MSD 2018a). MSD licenses hunters for resident, non-resident, and foreign resident wolf hunting in GHAs 16, 20, 21, 25 and 25A (MSD 2018a). Coyotes have been designated for recreational hunting by MSD.

GHAs 16, 20, 21 and 25 are a part of Game Bird hunting Zone 3 (GBHZ3) which has a grouse hunt (ruffed grouse, spruce grouse, and sharp-tailed grouse). Other birds that can be hunted within GBHZ3 and GBHZ4 include ducks such as mallard, coots such as American coot, snipe, such as the common snipe, woodcock, and geese such as the Canada goose, white geese, and sandhill crane (M. Forster et. al. 2016; MSD 2018a).

MSD enforces vehicle restrictions to increase the quality of the hunting experience, decrease illegal hunting from vehicles and provide undisturbed areas for big game animals (MSD 2018a). Vehicles may not be used while hunting elk, moose or white-tailed deer, except to travel to or from a hunting area, or to retrieve a kill by the most direct route. GHA 16 lies within the ‘Northern Zone’, and therefore the use of off-road vehicles as transportation from one hunting site to another is allowed. GHAs 20, 21, 25, and 25A are within the ‘Roads, Trails and Waterways Zone’, where all vehicles operated by elk, moose or white-tailed deer hunters are restricted to roads, established trails and waterways. For example, an off-road vehicle may be used to access a hunting area along an established trail, but hunters may not establish their own trails or venture off existing trails.

There are numerous outfitters operating in the land and resource use RAA, mostly for black bear and white-tailed deer hunting. Hunting licenses sold for foreign resident big game was collected for GHAs in the RAA. Recent enquiry of black bear licenses sold totaled 305, while 200 deer licenses were issued (Bloom 2018; 2019 pers. comm.). Along with the outfitters, there are several hunting shacks and a hunting camp located in the RAA (see Appendix 9A, Figure 9.2A-12). More information on the wildlife species hunted in GHAs can be found in Chapter 8 of the EIS.

Trapping

Commercial trapping of furbearers is administered by MSD through the Registered Trap Line (RTL) system. The RAA lies within the Interlake RTL District 7 intersecting a small portion of the Gypsumville

RTL section in the northeast area of the RAA (Appendix 9A, Figure 9.2A-14). A portion of the Waterhen RTL section is located on the west side of the RAA north of Lake Manitoba. The RAA is also encompassed within the Open Trapping Area Zone 3 (MSD 2018b). The LAA is within Open Trapping Area Zone 3 and the Gypsumville RTL.

Animals trapped within the RAA include badger, beaver, coyote, cross fox, fisher, lynx, marten, mink, muskrat, otter, raccoon, red fox, squirrel, weasel, and wolf. For the period 2010 to 2018, muskrat and marten were the most trapped species within the Gypsumville RTL. The number of permit holders in the Gypsumville RTL peaked at 12 in the 2013/2014 trapping year (Berezanski 2019, pers. comm.). MSD tracks trapping production in the RTLs but does not track production or licenses within an open trapping area zone (Berezanski 2019, pers. comm.). More information on furbearers trapped can be found in Chapter 8, Section 8.3.

Fishing

Commercial, subsistence and recreational fishing take place in the LAA and RAA in Lake Manitoba, Lake St. Martin, Dauphin River, Mantagao River, Sturgeon Bay and some tributaries to Lake Manitoba, Lake St. Martin and Sturgeon Bay. Lake Manitoba, Lake St. Martin and Lake Winnipeg provide fisheries resources and/or income to Indigenous communities, permanent and seasonal residents, tourists, farmers, and recreational and commercial fishermen within the region.

In the Western Interlake Planning District, aside from Lake Manitoba, Dog Lake, Swan Lake, and North Shoal Lake contain fish populations. Spawning takes place in Swan and Vogar Creek, and the Moosehorn Lakes. Many rivers, intermittent creeks and drainage ditches along the shoreline of Lake Manitoba in the RM of Grahamdale and Western Interlake can be used for fish spawning if water levels are high enough (RM of Grahamdale 2006; Western Interlake Planning District 2004). The Swan Creek walleye hatchery is located in the district (Western Interlake Planning District 2004). More information on the aquatic environment can be found in Chapter 7 of the EIS.

Commercial, subsistence and recreational fishing takes place in the open water and winter seasons. Fish species of commercial and domestic importance known to occur in Lake St. Martin include northern pike, walleye, and lake whitefish; with common carp, goldeye, burbot, longnose sucker, white sucker, yellow perch, sauger and cisco composing a smaller portion of the Lake St. Martin commercial fishery (North/South Consultants Inc. 2012). Lake St. Martin supports a winter commercial fishery for walleye, lake whitefish, and sauger; and a year round fishery for rough fish (carp and suckers only) (North/South Consultants 2012). Lake Manitoba is commercially harvested for suckers, carp, walleye, and yellow perch. Commercial fish species harvested in Lake Winnipeg include walleye, sauger, lake whitefish, and some suckers and northern pike (see Chapter 7). Within the LMOC portion of the LAA, commercial fishing for white suckers is also practiced in Birch Creek, Mercer Creek and Watchorn Creek during the open water season (Forster et. al. 2016).

Dauphin River supports commercial, domestic and sports fishing in the area; commercial and domestic fish species captured include mainly lake whitefish, walleye and cisco, as well as common carp, northern pike, sauger, and yellow perch (North/South Consultant 2012). The construction of the road to Anama

Bay in the mid 1960s likely stimulated the growth of commercial and sport fisheries in the Dauphin River by the early 1970s. Commercial fishing in Sturgeon Bay has been the most important source of income to the residents of Dauphin River, as well as providing employment to residents of other nearby communities. In Lake Winnipeg, there are two open water fisheries (summer and fall) and a winter fishery (North/South Consultants 2012). A bait fishery is also prominent on Lake Winnipeg.

Local knowledge on fishing activities in the RAA was collected from a series of meetings held as part of the IPEP undertaken by Manitoba Infrastructure, Aboriginal Affairs and Northern Development Canada, and Manitoba Aboriginal and Northern Affairs (North/South Consultants 2013). Meeting attendees indicated that fishing for carp, lake whitefish, walleye and yellow perch took place in several areas of Lake St. Martin including areas south of the Fairford River outlet, areas south of the islands below the Fairford River outlet; areas south of the Narrows adjacent to the north shoreline; areas north of the Narrows; areas near the mouths of Beardy Creek and Bear Creek; and near the inlet to Dauphin River (North South Consultants 2013). In Sturgeon Bay, attendees indicated that lake whitefish, walleye and yellow perch were captured in areas adjacent to the shoreline west of Willow Point, and lake whitefish and walleye were captured in areas of Mantagao Bay north of the Mantagao River (North/South Consultants 2013).

Commercial fishing on Lake Manitoba remains a major source of income for some residents in the RMs of Grahamdale, West Interlake and Indigenous communities. The Ashern Fisheries Co-operative Ltd. acts as a regional marketing agent for the Freshwater Fish Marketing Corporation.

The RAA is located within the Southern Fishing Division of Manitoba's Fishing Divisions (MSD 2019a). Watercourses in the RAA where sport fishing occurs include Lake Manitoba, Lake St. Martin, Sturgeon Bay (Lake Winnipeg), and Dauphin River, Recreational sport fish species present include: burbot, northern pike, small-mouth bass, walleye (stocked), yellow perch, and whitefish (Mussio Ventures Ltd. 2018). Some areas of Lake Manitoba, Lake St. Martin and the large rivers (i.e., Dauphin, Fairford, Mantagao) in the RAA are also popular recreational fishing areas with angling for freshwater drum (also referred to as silver bass), sauger, and bow fishing for carp in the spring (Forster et. al. 2016).

Mineral and Aggregate Resources

Locations of quarry and aggregate activity in the LAA and RAA as of 2018 are illustrated in Appendix 9A, Figure 9.2A-15. The map shows that there are many existing quarrying sites in the RAA, with the majority being quarry withdrawal areas (e.g., at Dauphin River, in the vicinity of Gypsumville, south of Steep Rock and Faulkner, and south between Moosehorn and Ashern) and the remainder are quarry lease, private quarry permit, mining claims and casual quarry permits. Within the LMOC portion of the LAA, there are two quarry withdrawals, one quarry lease and one casual quarry permit. The quarry lease is located west of the community of Hilbre and along PTH 6. Mining claims are situated west of Hilbre and PTH 6 and along PR 325 east of Ashern. There is no quarry and mining activity along the LSMOC portion of the LAA. In the RAA, there are 8,128 mineral dispositions (Appendix 9A, Figure 9.2A-15).

Limestone, dolomite and gypsum have been mined in the area since the early 1900s, producing materials for applications such as building foundations, building structures, and aggregate materials (RM of Grahamdale 2019; Manitoba Growth, Enterprise and Trade 2017a). The Graymont Limited quarries and processing plant are located on PR 239 between the communities of Steep Rock and Faulkner. Several quarries and gravel pits along PTH 6 were opened for construction of the highway and date back to the 1960s and 1970s. All the aggregate quarries are under quarry lease, most for aggregate production. Two quarries leases are producing, one is a past-producer and one quarry is inactive (Manitoba Industry, Economic Development and Mines 2006).

The dolomitic limestone of the Selkirk Member of the Red River Formation was quarried further south (Garson, MB) as building and ornamental stone called the “Tyndall Stone™”.

There were no metal, fossil fuel or other mining activities (including brine) identified in the area. An orphaned and abandoned metal mine (Moose Horn [Ballast] Mine) is located in the vicinity of PTH 6 south of Moosehorn (Manitoba Growth, Enterprise and Trade n.d.).

Aggregate resource deposits in the Gypsumville area (between Portage Bay on Lake Manitoba to Lake St. Martin and between Sturgeon Bay and Moosehorn) consist of littoral sand and gravel deposits comprising beach and offshore deposits attributed to glacial Lake Agassiz (Nielsen and Matile 1984). There are 12 large quarries in the RM of Grahamdale; all are located very close to PTH 6 (Groom 2006). Numerous bedrock quarries and inactive and/or depleted Crown and private sand and gravel pits are located throughout the RMs of Grahamdale and West Interlake in the RAA (Manitoba Energy and Mines 1988a). A few active private sand and gravel pits are located in the southern port of West Interlake in the vicinity of Eriksdale (Manitoba Energy and Mines 1988b).

Aggregate resources in the RM of Grahamdale are derived from shoreline gravel deposits and near surface dolomitic limestone bedrock (Rural Municipality of Grahamdale 2006; Manitoba Growth, Enterprise and Trade 2017a). The RM of Grahamdale has assigned development potential to aggregate deposits within the municipal boundaries in their development plan (i.e., high-medium development potential). Two areas of medium development potential are located in a north-south alignment between the community of Grahamdale down to PR 237 to the west of of Moosehorn, straddling a section of PTH 6 (Rural Municipality of Grahamdale 2006). A second medium potential area encompasses the southern shoreline of Lake St. Martin, stretching east-west from Lake St. Martin to Lake Manitoba (Manitoba Intergovernmental Affairs and Trade 2005). There is one large gravel deposit with high quality reserves in the RM, located northeast of Moosehorn (Manitoba Industry, Economic Development and Mines 2006).

Aggregate sources in the Western Interlake Planning District are derived from gravel deposits and near surface dolomitic limestone bedrock. Near surface limestone bedrock is more prevalent in the northern part of the District (RM of Siglunes, now northern part of the RM of West Interlake). The District has also assigned development potential to aggregate deposits within member municipal boundaries (i.e., Stop-Caution-Go) in the RMs of Siglunes and Eriksdale under the development plan. Two “Caution” quarry mineral deposits (i.e., deposits that are of lower quality and have not been adequately but are of value) are located along the northern boundary with the RM of Grahamdale, just south of PTH 68. Three

"Caution" quarry mineral deposits are located in the RM of Eriksdale, bordering PR 325 near Lake Manitoba and one just south of Dog Lake in the southeast part of the RM (Western Interlake Planning District 2004).

There is no peat mining within the LAA or RAA. There are peat mining lease blocks in the vicinity on the west side of Lake Winnipeg between Sturgeon Bay and Kinwow Bay (IISD 2015). Current peat harvest licences (as of 2017) are in the vicinity of the Jackhead River and in Moose Creek Provincial Forest, outside of the RAA (MSD 2017c).

Forestry

The Province of Manitoba manages and regulates forestry activities in Manitoba through the establishment of administrative boundaries such as forest sections (FS), forest management units (FMUs) and integrated supply areas (ISAs), which are used to delineate and manage harvestable timber areas and wood supply areas. Manitoba Sustainable Development (MSD), Forestry and Peatlands Management Branch maintains a Forest Resource Inventory (FRI) and forest lands inventory (FLI) for forest management planning and maintenance of sustainable harvest levels. Information includes commercial forest operations through timber sales and timber permits, including fuelwood harvesting areas (MSD 2017a, b).

The LAA and RAA is located within the Interlake FS. FMUs as part of the Interlake FS located within the LAA include FMUs 41, 42, 43 and 45; the RAA also includes a small portion of FMU 10 (Appendix 9A, Figure 9.2A-16). Within the Interlake FS, the now defunct Pine Falls Paper Company had previously been given the first right of refusal for timber that was not allocated to quota holders in the FS. The allocation was under the annual allowable cut levels for the area (Forster et. al. 2016). There are two quota holders with operations in the RAA, one involving the selective harvest of commercial tamarack for log buildings and a small sawmill out of Ashern utilizing pine along PR 513. Three timber supply areas are located in the RAA along with numerous past personal permit areas and several small pieces for forest regeneration areas. One provincial permanent sample plot is located within the RAA. Harvest quotas are currently being planned in the RAA for 2020-2025 (Harapiak 2018, pers. comm.). The RAA is not expected to contain a lot of merchantable timber, as defined by the Forestry and Peatlands Management Branch. To be considered merchantable, the timber would need to be 8 feet or larger. A forest damage appraisal and valuation (FDAV) would be required for the Project area to determine how much merchantable timber is in the area (Harapiak 2018, pers. comm.).

Sustainable harvest levels (SHL) for the entire Interlake FS (which encompasses these three FMUs) totalled 264,600 m^3/y of softwoods and 74,220 m^3/y of hardwoods (MSD 2016). Timber volumes harvested in the Interlake FS for the year 2015-2016 consisted of 18,271 m^3 of softwood and 2,843 m^3 of hardwood, for a total of 21,114 m^3 (MSD 2016a).

The Manitoba Wildfire Program is responsible for the prevention, detection and suppression of wildfires. For the 2019 active fire season to June 2019, there were 31 reported fires in the RMs of Grahamdale and West Interlake, ranging in size from 2.0 ha to 900 ha. Only one of these reported fires was in the RM of West Interlake. All recorded fires have been extinguished (MSD 2019b).

There have been no fires within the PDA since the late 1980s. Because this region experiences a 40 to 50-year fire-cycle, it may be susceptible to forest fire because of build-up of dead trees (Harapiak 2018, pers. comm.). Manitoba Sustainable Development conducts reforestation, standing tending activities and silvicultural treatments on high value forest sites to control growth, composition health and quality of forests. Chapter 8, Section 8.2 provides additional information related to fire history.

Groundwater and Surface Water Use

Major Aquifers and Water Quality

Groundwater resources are discussed in Chapter 6 (Section 6.4). The main bedrock aquifer underlying the LAA and RAA is the Carbonate Aquifer (Rutulis 1986a). This aquifer is the largest freshwater aquifer in Manitoba and stretches from north of The Pas, Manitoba, southward through the Interlake Region and along the east side of the Red and Rat rivers into Minnesota (Betcher et. al. 1995). The Interlake Region is an important freshwater recharge area for this aquifer (Betcher 1986; Betcher 1997) because of the relatively high permeability tills that underlie the area.

Groundwater quality in the Interlake Region of Manitoba, including the Western Interlake Planning District (WIPD), is generally acceptable for most purposes, although it becomes more saline in a small area south of Vogar (Rutulis 1987). Groundwater tends to be of good to excellent quality within the upper part of the Carbonate (limestone and dolostone) rock aquifer (Rutulis 1987; WIPD 2004). Some residences relying on well water may prefer to treat household water to deal with hardness and iron concentrations. The only area where water quality is affected by highly mineralized groundwater flow is a narrow zone southwest of Dog Lake south of Vogar along Lake Manitoba (Rutulis 1987). There is an adequate supply of good quality groundwater in most parts of the RM of Grahamdale. Most of the water supply is taken from the carbonate aquifer, made up of limestone and dolostone bedrock with the exception of the Gypsumville area. Here, potable water is obtained from other types of bedrock aquifers (Rural Municipality of Grahamdale 2006). MSD has provincially maintained observation water wells located within the RAA.

Groundwater and Surface Water Supply

Groundwater wells are an important source of fresh water for many uses, including domestic, agricultural (livestock and irrigation), air conditioning and geothermal, municipal, industrial, and others (MSD 2017g). Surface and groundwater resources are managed under an Integrated Watershed Management Planning process in Manitoba. It is a joint partnership between the province and local municipalities to manage land and water resources on a watershed basis over the long term. The Water Stewardship Division of MSD designates Conservation Districts under the Conservation Districts Program as water planning authorities to undertake integrated watershed management planning in the province (MSD 2017d). Integrated watershed planning has been undertaken for one area, the West Interlake Watershed (Western Interlake Watershed Conservation District) that includes the RMs of Grahamdale, West Interlake, Coldwell, St. Laurent, and parts of the RMs of Armstrong and Woodlands. A long-term plan to manage land, water and related resources on a watershed basis was initiated in 2013 for the Southwest Interlake area of the conservation district (i.e., Eriksdale and south to Woodlands). Groundwater

resources in the Western Interlake Planning District were appraised as part of a study to provide general knowledge of the groundwater resources in the District and development considerations (Rutulis 1987). The District comprises the RMs of Siglunes and Coldwell (since amalgamated to form the RM of West Interlake), Eriksdale, and St. Laurent. Groundwater was reported as being readily available throughout the District for present and future requirements with the quality of the groundwater characterized as generally good to excellent, with several areas indicating aquifer conditions suitable for high capacity wells. Extensive groundwater pollution hazard areas were noted as common within the northern part of the District (Rutulis 1987).

Use of Water Resources

Generally, if water is used in volumes of greater than 25,000 L/day then a water use licence from MSD allocating a certain volume of water for that individual or corporation's use is required (MSD 2017h).

The licensed groundwater supply wells in the RAA, in the RMs of Grahamdale and West Interlake, are for municipal, industrial, and other purposes (Appendix 9A. Figure 9.2A-17). The RM of Grahamadale has two licensed groundwater supply wells for municipal (distribution system) and industrial (mining) wells (maximum annual volume of 78 cubic decametres [dam^3] to 115 dam^3). Two groundwater exploration permits are in process and one application is on hold in the RM of Grahamdale. The RM of West Interlake has one groundwater exploration permit for other geothermal purposes. No surface water use licences are active within the RAA (Wiseman 2019, pers. comm.).

Flowing Wells and Springs

Flowing and high water level (artesian) wells (i.e., more than 3 m above ground surface [m ags] and between ground surface and 3 m ags) are common in the RAA (Hempel and Iqbal 2016). There are 60 flowing and high water well areas located in the land and resource use LAA and 1,028 within the land and resource use RAA. Almost the entire northern portion of the Western Interlake Planning District is a flowing and high-water level well area, along with scattered areas in the RM of Grahamdale (Rutulis 1987; Hempel and Iqbal 2016). The flowing and high water level wells along the LMOC range from more than 3 m below ground surface (m bgs) to more than 3 m above ground surface (m ags); depth of flowing and high water wells along the LSMOC was limited to between ground surface and 3 m bgs (see Appendix 9A, Figure 9.2A-18). The depth of flowing and high-water wells along the PR 239 realignment ranges from more than 3 m ags to more than 3 m bgs.

The Project will not be using surface water; therefore, it will not require surface water use licence. Permits for dewatering and depressurization for groundwater will be confirmed from MSD because it is very likely that 25,000 L/day would be exceeded during Project construction. Project effects on groundwater and surface water are addressed further in Chapter 6 (Section 6.4).

The highest density of groundwater wells within the RAA is along a line between Lake St. Martin and Lake Manitoba in the RM of Grahamdale down to the Dog Lake area and Eriksdale in the RM of West Interlake (Appendix 9A, Figure 9.2A-19). A higher density of groundwater wells can be seen in areas west

of Lake St. Martin, between Lake St. Martin and Watchorn Bay on Lake Manitoba, in the vicinity of Grahamdale and Moosehorn in the RM of Grahamdale and in the southern half of the RAA in the RM of West Interlake.

General groundwater wells in the LAA for the outlet channels are used primarily for domestic and livestock purposes (96 wells), followed by one test well (Appendix 9A, Figure 9.2A-19; Table 9.2-14). One groundwater well in the PDA for the LMOC is used primarily for domestic purposes.

Table 9.2-14 Groundwater Well Use in the LAA and RAA

Rural Municipality/ Unorganized Territory	Total Wells	Domestic	Municipal	Livestock	Industrial	Other
Grahamdale	1,709	1,277	1	232	4	188
West Interlake	1,756	1,462	7	228	1	9
Lake St. Martin Area	39	37	0	0	0	2
Unorganized Crown Land	1,163	435	3	9	1	715
Grand Total	4,667	3,211	11	469	6	914

NOTES:
Agriculture water use includes irrigation and livestock. Other water use includes geothermal, air conditioning, dewatering, observation, recharge, test wells and other/unknown. Some wells have multiple uses.

9.2.3 Project Interactions with Land and Resource Use

Table 9.2-15 identifies the Project components and physical activities that might interact with land and resource use during construction and operations and maintenance and result in the identified environmental effect. These interactions are identified by check marks and are discussed in detail in 9.2.4 in the context of effects pathways, standard and project-specific mitigation and residual effects. A justification for no effect is provided following the table.

Table 9.2-15 Project-Environment Interactions with Land and Resource Use During Construction and Operations

Project Components and Physical Activities	Environmental Effects			
	Change in Land Use	Change in Agricultural Land Use	Change in Parks, Recreation & Tourism	Change in Resource Use
Construction				
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure,				

Table 9.2-15 Project-Environment Interactions with Land and Resource Use During Construction and Operations

Project Components and Physical Activities	Environmental Effects			
	Change in Land Use	Change in Agricultural Land Use	Change in Parks, Recreation & Tourism	Change in Resource Use
vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])				
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	–	–		–
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)				
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])				
Water development and control (dewatering and realignment of existing water works)				
Reclamation (for construction of Project components)				
Operation and Maintenance				
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure [e.g., water control structures] are either actively conveying water or are non-operational)				
Operation and maintenance of other Project components[1] (normal operations conditions associated with PR 239 and municipal road realignments, distribution line, and bridges and culverts)	–	–	–	–
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)		–	–	–
Operation, maintenance, and reclamation of quarries				

NOTES:

indicates a potential interaction.

– indicates no potential interactions are expected.

[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas.

Project construction has the potential to cause disturbance or disruption to residences, restrict property access, create nuisance, damage property or affect property value. Project construction has the potential to conflict with, disturb, or result in the loss of designated lands and protected areas. There is potential to affect productive forestland and disturb high value forest sites. Channel excavation has the potential to disrupt or interfere with mining/aggregate potential and operations with respect to access. Project construction can disrupt or disturb other resource uses, such as hunting, trapping, and fishing, and has the potential to affect groundwater and surface water use and quality from channel excavation and depressurization. Project construction can disrupt recreation and tourism activities by restricting or changing access and because of nuisance from noise or dust emissions.

During operation and maintenance, operation, maintenance and reclamation of quarries has the potential for disturbance to land and resource uses.

The realignment of PR 239 as part of the LMOC and construction of a new distribution line as part of the LSMOC would have their own disturbance associated with them.

Construction of the new distribution line will not affect agricultural land use because there is no agricultural use between Lake St. Martin and Lake Winnipeg. The route of the ROW for the line is expected to cross provincial Crown Land in unorganized territory along the alignment shown in Appendix 9A, Figure 9.2A-1. A third party, Manitoba Hydro, will construct the distribution line for the Project.

The following additional components or activities are not anticipated to interact with land and resource use.

- Project-related transportation

  The movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA will not affect land use and property, agricultural land use, and resource use activities during construction because vehicles will primarily use the existing road network and will not affect these resources.

- Construction of Project Components (utilities)

  Construction of the distribution line will not interact with agricultural land use as there is no agricultural land in the area between Lake St. Martin and Lake Winnipeg.

- Operation and Maintenance of other Project Components

  Normal operations conditions associated with PR 239 and municipal road realignments, and bridges and culverts will not interact with land and resource use activities as there will be no further disturbance during these operations.

Temporary construction areas and associated works and activities (e.g., temporary construction camps, staging areas) are required to facilitate the Project. Their footprint and area of land required (ha) has not been determined at this time. It is anticipated that these areas, works/activities will be located on

previously disturbed lands where feasible. These works will necessitate the use of land and resource use lands for the period of construction. Project-related effects on hunting and trapping, forestry, mining/aggregate and groundwater/surface water use may also occur, depending on location.

9.2.4 Assessment of Residual Environmental Effects on Land and Resource Use

9.2.4.1 Analytical Assessment Techniques

Potential environmental effects on land use, designated lands and protected areas, parks, recreation and tourism areas, resource use (*e.g.*, forestry, minerals and quarrying; surface water and groundwater use; and trapping, guiding and hunting activities) were quantified through geospatial analysis using GIS and analysis of metadata related to land and resource use (e.g., land area or usage). Provincial data and input gathered through stakeholder interviews and public open house feedback were used in the assessment of effects.

Land and resource use data were collected based on sources identified in Section 9.2.2.1 and supplemented through public engagement, key person interviews and the IPEP. Analysis of these data consisted of overlaying the data with the overall LAA, the final outlet channel routes and other Project components to determine the number of interaction points and the spatial extent of overlap with land and resource use data. This information was used as part of the baseline, for analysis and subsequent assessment of Project effects.

Land Use

The assessment of change in land use considers effects on displacement of dwellings, landowner concerns related to nuisance effects (e.g., audible noise), property damage, and property values.

GIS spatial data analyses were used to determine the number of dwellings and distance from the PDA; residential developments in proximity to the outlet channel routes; the amount of land within each RM traversed by the channels; and the number of Crown parcels (encumbrances) and private parcels located within the PDA.

Development plans and zoning bylaws were reviewed to evaluate development potential and controls within the RAA. Development plan land use designations were summarized and mapped according to one of four categories: general agricultural; agricultural restricted other than general uses; rural residential, recreational, commercial or industrial; and general development area (Appendix 9A, Figure 9.2A5). Zones identified from applicable zoning by-laws were also reviewed. Several areas were not identified or included in the applicable land use designations or zones, and they generally consist of wildlife management areas and development potential or constraint areas (i.e., aggregate development potential, quarry mineral deposit status, and groundwater pollution hazard areas).

A review of development policies related to surface water, hazard lands and flooding and erosion, shoreland recreation areas, recreational subdivisions and aggregate potential was undertaken on both

the RM of Grahamdale's and the Western Interlake Planning District's development plans. This review was undertaken to complement the review on development potential.

Agricultural Land Use

Permanent land loss refers to the areas of agricultural land that will be occupied by Project infrastructure, located within Project rights-of-way, or otherwise altered, such that it will become not available for agriculture as a result of the Project. This includes areas of land under current agricultural land use or with agricultural potential (i.e., not under agricultural land use but rated for agricultural capability with the potential to be developed for agriculture).

Temporary agricultural land loss and potential land degradation includes areas of current or potential agricultural land use under temporary Project components, such as rock quarries, borrow sites, temporary construction camps and staging areas. This represents areas that will be taken out of agricultural production for temporary periods and that will potentially experience a reduction in agricultural capability class upon reclamation and return to current or potential agricultural land use. A reduction in capability class may occur due to construction activities resulting in soil compaction, loss of soil due to improper soil excavation and handling, wind erosion or water erosion, and/or changes to drainage (see Chapter 6, Section 6.3 Geology and Soils). Temporary land loss and/or degradation was evaluated qualitatively for areas remaining under agricultural land use following construction of the Project.

Parks, Recreation and Tourism

The assessment of change in parks, recreation and tourism including designated lands and protected areas considered the physical presence of the Project and overall development and potential for future protected lands. GIS spatial data analysis was used to determine the interaction with parks, recreation and tourism sites, including designated lands and protected areas (and proposed protected areas [candidate sites]), change in area of current land use and the number of areas/sites located in proximity to the Project.

Resource Use

The assessment of change in hunting and trapping considered the effects from disruption to hunting and trapping activities and the potential for damage to equipment and structures (e.g., traps, bait stations, shacks). GIS spatial data analysis was undertaken to identify and describe the number of hunting lodges and associated outcamps in game hunting areas, and registered traplines and open trapping areas overlapped by the PDA. The assessment of Project effects considers excavation of the channels, the disruption of access which can cause disruption to harvesting success or lead to increased pressure on resources, and the presence of channels which can result in interference effects. Information presented in Chapter 8 related to the terrestrial environment was used to determine how wildlife resources may be affected.

The assessment of change in commercial fishing considered the effects from disruption to commercial fishing activities and the potential to damage equipment (e.g., boats, nets). GIS spatial data analysis was undertaken to determine the change or disruption to commercial fishing activities and fish harvesting areas affected by Project activities. The assessment of Project effects considers excavation of channels, the change in access, which can alter the fisher's access to lakes and the presence of the channels, which can interfere with fisheries. Information presented in Chapter 7 related to the aquatic environment was used to determine how fishery resources themselves may be affected.

The assessment of change in minerals and aggregate considered the effects from the disruption to mineral quarrying and aggregate activities and interference with operations. GIS spatial data analysis was used to determine the potential interaction with mineral dispositions or sites located in proximity to, or crossed by, the PDA. The assessment of Project effects considered the related change in mineral or aggregate resource use from disruption to areas (excavation of the outlet channels) from disruption effects on access and from the presence of channels that can result in change in access to resources and removal of resources because of the Project presence.

The assessment of change in forested areas considered effects on productive forestland and high value forest sites using GIS spatial data analysis. The updated FRI and FLI were used to quantify productive forest parameters and to assess potential effects of the PDA on productive forest area. Data on timber supply areas and past personal permit areas were obtained from MSD to analyze Project effects on the removal of productive forestland from FMUs 41, 43 and 45.

High value forest site data, including data on research and monitoring sites (tree improvement sites, permanent sample plots), were collected and analyzed in terms of silviculture areas affected and number of sites affected.

The assessment of change in groundwater and surface water use considered the potential effects on groundwater well quantity (levels) and disturbance to groundwater (aquifer) and surface water. MSD supplied a data set of groundwater and surface water use license locations within the RAA. The data were mapped by type of water usage and maximum annual allowed capacity of the licensed groundwater supply wells.

MSD also provided the provincial GWDrill groundwater well database for registered wells that are located within the RAA (MSD 2017g). The data provided included well identification number, location, status and water use. The well data locations were generally centred in a quarter section of land, section of land or river lot. Well locations were then mapped according to their water use category (i.e., air conditioning/geothermal, domestic, industrial, irrigation, livestock, municipal, or unknown/other). Some wells have multiple uses and, therefore, were displayed as multi-use wells. The extent of overlap with wells located within the LAA was assessed using GIS analysis by selecting wells that were contained within a quarter section or section that intersected with the PDA and LAA. Methods for assessing groundwater are addressed further in Chapter 6, Section 6.4.

Data on groundwater and surface water use licences was obtained from MSD. The extent of overlap with water use licences contained within a quarter section or section that intersected with the PDA and the LAA was assessed using GIS analysis.

An additional data set was received from MSD that contained information on flowing and high water well locations. This data was presented using GIS to determine the maximum recorded flowing and high-water level conditions for wells based on section, quarter section, or GPS coordinates. The flowing and high-water levels for groundwater was mapped for analysis of physical overlap (i.e., locations in the PDA).

9.2.4.2 Change in Land Use

Project Pathways

The assessment of change in land use (property, residences) focuses on three potential effects:

- disturbance and nuisance effects (e.g., construction noise, dust, audible noise emission, disruption of access along the PDA) during Project construction, operation and maintenance
- change in property during construction (e.g., degradation/damage to property, including adjacent) and presence during operation and maintenance (e.g., value, aesthetics)
- change to development potential of land due to Project construction and presence of the Project during operation and maintenance

Construction

Channel excavation, access to the channel, and Project-related interference on roads, through realignment and modifications, and community infrastructure (see Section 9.2) are the primary pathways for direct change to land use. Noise disturbance and dust has the potential to affect land use and degrade or damage property.

There is some potential to affect receptors sensitive to noise and dust, including residences and places of ceremonial worship (i.e., cemeteries) through the creation of new access to the channels and from the PR 239 realignment. Noise sources within the PDA are anticipated to be typical of construction activities in rural areas and will include some temporary noise disturbances (e.g., movement of equipment, excavated materials). Operation of heavy equipment has the potential to affect nearby rural residents. The Project may result in a change in access to and from some rural properties along the LMOC PDA due to land severance. However, severed lands will belong to MI through an expropriation process, so the need for ongoing access to these lands will no longer be necessary. In addition, the issue of altering access routes and access points will be addressed through the development and implementation of an Access Management Plan.

There is one area of medium aggregate potential in the RM of Grahamdale, at the southern end of Lake St. Martin, that would be affected by PDA construction. Municipal Policies related to mineral resources for medium aggregate potential areas are to be applied in the RM of Grahamdale. Conflicting land uses on

lands with medium potential may be permitted with appropriate approval under the RM of Grahamdale's development plan. This policy with respect to aggregate resources and quarry minerals is to be implemented through or by the assistance of the Mines Branch, zoning by-laws, subdivision control procedures, issuance of conditional use and development permits, and sustainable development principles and guidelines outlined under the provincial land use policies.

The requirement for aggregate and quarry development could potentially affect municipal supplies and development potential for aggregate resources related to mineral disposition plans. Manitoba Infrastructure has yet to identify specific locations of aggregate and/or borrow sources, although it is expected that existing sources will be located in already disturbed areas. Contractors may develop new sites in accordance with applicable provincial Acts and regulations. The volumes required for channel construction are unknown at this time. Lands under the aggregate deposits or dispositions developed for the Project would be altered from current uses, depending on the location.

Access Roads

Temporary access routes may be required for access to the channel location, quarries and borrow areas, laydown areas and any other areas required for the LMOC. Access would include temporary access roads developed during construction along the channel and associated temporary access routes required during Project construction. Access roads constructed in the PDA for the LMOC would be temporary and will be removed following construction if not required for ongoing maintenance.

As part of construction of the LMOC, PR 239 will be realigned on a new route approximately 4 km south of its existing location, commencing at a point off PTH 6 at the community of Grahamdale, before rejoining its existing alignment approximately 3 km east of Faulkner. A new bridge crossing will be constructed for PR 239 over the LMOC. The total length of the road realignment is approximately 10 km. Restrictions during construction of road realignments and modifications may affect property owners' ability to access private property. Land users in the LAA may experience changes to access during construction of the road realignment, including longer traveling distances for rural residents These issues will be addressed through an Access Management Plan. Manitoba Infrastructure has also indicated that the intent of access plans along the LMOC is to not landlock landowners but to permit access in proximity to the channel and ancillary facilities. Access to the LSMOC channel will be provided by the Lake St. Martin access road to the EOC. Access along the LSMOC PDA will be provided via the dikes on either side of the channel or temporary construction access roads within the PDA during construction.

Temporary Construction Areas

Temporary construction areas and associated works and activities (e.g., temporary construction camps, staging areas) are required to facilitate the Project. The footprint and area of land required for temporary works has not been determined at this time. These works will necessitate the use of lands for the period of construction. It is anticipated that these areas and associated works and activities will be located on disturbed land (see Section 3.4).

Distribution Line

Construction of a new distribution line as part of the LSMOC would have its own potential to affect land use through degradation of land. The alignment will be designed and determined by Manitoba Hydro and is expected to cross provincial Crown land in unorganized territory. Power is also expected to be provided to a LMOC water control structure by a very short tap from nearby lines.

Operation and Maintenance

Project operation and maintenance has the potential to affect residents and property owners through visual aesthetic changes from the presence of the channels and landscape changes, including property value and development potential.

Property Value

Public concerns were expressed during the IPEP and KPIs related to effects on property value, including: a decrease in tax base, use of expropriation, need for fair compensation based on land value, and resident tax increase and land devaluation from channel development in RM of Grahamdale. The physical presence of the LMOC and associated infrastructure could affect the aesthetics of property near the PDA during operation and maintenance. Possible factors that could influence property related to change in value could be associated with change in aesthetics, real or perceived nuisances and safety risks, real or perceived change in the use and enjoyment of the property, and distance from the property to the Project.

The beneficial effects of flood protection with an associated lower flooding risk could result in the improvement of property values. This benefit could extend beyond the LAA, to include other areas around Lake Manitoba, which will benefit from the Project's flood control function.

Land Use Development

The Project will fragment lands and create remnant pieces of land (due to land severance) along the LMOC PDA, which could reduce development potential of these lands for agriculture rural subdivision. The presence of the LMOC could also result in less interest from those wanting to buy land or build a residence near the channel because of presence and proximity to the Project, thus lowering the development potential of land or land nearby. These changes could influence development in localized areas adjacent to the Project or potentially affect the location of future developments within the RAA.

Similarly, the beneficial effects of flood protection with its associated lower flooding risk could potentially, make some areas more attractive to development

Mitigation

During construction, Manitoba Infrastructure will provide property owners information and updates on ongoing and planned construction activities. Manitoba Infrastructure will acquire lands for Project construction through expropriation, which is governed by the *Expropriation Act*.

Mitigation measures of potential Project effects on change in land use, related to residences and property, include the following:

- The acquisition of lands for the Project will be conducted through expropriation and governed by the *Expropriation Act*.
- Manitoba Infrastructure will provide Project development information on their website.
- Construction activities and equipment will be managed to avoid damage and disturbance to adjacent properties, structures and operations.
- Channel excavation will be limited to defined rights-of-way and associated access routes.
- Existing roads, road allowances, trails, portages and other travel ways shall not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users.
- There shall be no entry of personnel or equipment, or work conducted on private property without proper authority.
- All work shall be conducted in a manner that minimizes the raising of dust from construction or maintenance operations.
- Only water or approved dust suppressants shall be used for dust control. The use of waste petroleum or petroleum by-products as dust suppressants is not allowed.
- All construction equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- Noise by-laws of the adjacent communities and municipal authorities shall be complied with.
- Any operation of construction equipment beyond dates or times as specified or regulated by applicable by-laws or adjacent communities or municipal authorities shall require an exemption in writing.
- The Contractor shall possess all required blasting permits and certificates. Advanced notification shall be given to affected parties including site employees and the local general public prior to each blasting event.
- The Contractor shall restore access roads not required for on-going maintenance to their original condition.
- Manitoba Infrastructure will implement a Dust Control Plan that will outline products to use and methods for their application on PR 239 and other access roads used during construction.
- Manitoba Infrastructure will implement an Access Management Plan, which may include control measures such as gating approaches to Project access roads to restrict public access to the PDA.
- Access will be maintained into yard sites where possible for PR 239 road realignment.
- Signs directing traffic to detours will be installed during construction of the realignment of PR 239 to

address public safety.

- Construction, operation and maintenance personnel will undertake activities in such a way to avoid affecting neighbouring properties, structures or operations.
- Manitoba Hydro to determine and undertake the regulatory and permitting requirements for distribution line development, construction, and operation/maintenance.
- All designated areas shall be leveled to natural or pre-existing grade and slope as part of decommissioning. Stockpiled topsoil and other organic matter that had been removed from the site shall be spread to promote natural re-establishment of vegetation.
- Access routes not required for ongoing maintenance will be leveled to natural or pre-existing grade and slope as part of decommissioning.
- Where seeding is not required, temporary site locations shall be left in a manner which promotes natural re-vegetation of the site.
- In cases where seeding is required, and where conditions permit, it shall commence immediately upon completion of grading, capping and trimming operations.
- Reclamation of temporary construction areas and aggregate/quarry sites would occur following the completion of construction once the sites are no longer needed for operation and maintenance and would be expected to follow those measures in place at the time of remediation/decommissioning and in full compliance with legislation and regulatory standards.

Project Residual Effects

Construction Phase

Property and Residences

The PDA for LMOC and LSMOC occupies 1.9% of the total LAA land area. About 90% of the LMOC consists of private land, with the balance Crown land in the LAA. The LSMOC occurs exclusively on provincial Crown land in the LAA. The amount of land by percentage and hectare occupied by the PDA is presented in Table 9.2-16.

Table 9.2-16 Percent and Total Land Area Occupied by PDA in the LAA and RAA

Assessment Areas	Area of PDA (%)	Total Area (ha)
Local assessment area	1.9	104,744
Regional assessment area[1]	<0.1	3,088,379

NOTE:
[1] includes the RMs of Grahamdale, West Interlake, Lake St. Martin Area Unorganized Territory and provincial Crown land

The land along the LMOC is composed of privately-owned parcels, Crown land, and Crown-lease parcels. From Lake Manitoba to Lake St. Martin, the PDA will interact with 44 properties involving approximately 31 landowners. One Crown and five Crown-lease lands will be affected.

Thirty-two parcels of private land are proposed to be acquired for the LMOC outside the channel ROW. Nine Crown-lease land parcels and four Crown land parcels identified adjacent to the LMOC PDA will have a water control encumbrance placed on them for outlet channel purposes. An additional 45 parcels are to be acquired adjacent to the LMOC PDA (see Appendix 9A, Figure 9.2A-20). These parcels will become severed/isolated (i.e., road access is cut-off) due the Project alignment. As access to these parcels will be cut-off, Manitoba Infrastructure will also acquire them

Fifty-one parcels of Crown land comprise the LSMOC PDA between Lake St. Martin and Lake Winnipeg. The number of buildings from within the PDAs and within 1 km of the outlet channels is provided in Table 9.2-17.

Table 9.2-17 Number of Buildings in the PDA and Within 1 km

Distance	LMOC	LSMOC
Within PDA	4	0
Within 1 km	53	0
Total	**59**	**0**
Source: Government of Canada, National Topographic Database Merge File 1:50,000 scale tiles (tiles by various years)		

There are four buildings located within the LMOC PDA that will require removal (see Figure 9.2A-4). Manitoba Infrastructure is in the process of reaching land acquisition agreements with affected property owners. Three additional dwellings are located within 100 m of the LMOC PDA. Dwellings located within 100 m of the PDA have higher potential to be affected through noise disturbance by the Project due to close physical proximity to the channel ROW. An additional 53 dwellings are located within 1 km of the LMOC PDA, within the RM of Grahamdale and have lower potential to be affected through noise disturbance based on proximity. There are no residences within 1 km of the LSMOC PDA.

The LMOC route occurs within an agricultural/rural area designation and zoning under the applicable development plan and zoning by-law. The LMOC route affects parcels of land where there is presumably low potential for residential development based on the agricultural/rural designation and zoning. There are no specific municipal development controls associated with the LSMOC route, given its location in unorganized territory. However, the provincial land use policies (PLUPs) would apply to this segment (see Section 9.2.2.2). Lands along the LSMOC are distant from communities, and are not road accessible, so they are also considered to have low development potential. Therefore, the Project will have a low effect on land use related to overall land development potential and land use patterns.

There are no current or planned private or Crown land subdivision applications within the land and resource use LAA. The development potential for land within the PDA for residential development is deemed to be low given the designation and zoning. Eight parcels of active agriculture Crown-lease lands

will be affected by the LMOC PDA (Gillis, pers. comm. 2019). Concerns were expressed during the IPEP related to changes to leases for Crown land and the need for Crown land discussions with MSD. Further comment was provided that "if the channels are to be public lands, then the public should be able to have access because there are lots of dangers in and on other public lands that are used".

Four Crown land and eight Crown-leased land parcels are also similarly affected in the Project PDA. These lands would become severed/isolated in terms of road access due to Project. These Crown land leases will need to be closed because road access will have been removed.

There are no planned rural residential developments or multi-lot subdivisions affected by or close to the Project. The potential for the possibility of breach or failure of the LMOC and LSMOC is addressed in Chapter 14 related to slope instability or failure of channel side slopes or temporary constriction of the channels resulting in failure of the channels or associated dikes. Should a breach occur, emergency response procedures as per the Manitoba Flood Coordination Plan (part of the Manitoba Emergency Plan) would be implemented.

PR 239 Realignment

In siting the new road realignment for PR 239 (see Chapter 2, Section 2.3.2.5), Manitoba Infrastructure considered the following:

- minimizing cost and improving channel hydraulic efficiency
- minimizing road user costs, distributing crossing opportunities and moving the intersection location with PTH 6
- avoiding traffic disruptions on connector roads
- reducing/minimizing environmental effects by avoiding wetlands and undeveloped areas by using existing municipal road alignments as much as possible
- avoiding conflicts with Manitoba Hydro linear infrastructure
- improving road user safety through design standards and reconfigured intersections
- minimizing socio-economic effects by avoiding residences and livestock operations, reducing the loss of agricultural land and providing improved access to the Steep Rock community from PTH 6.

Realignment of PR 239 will reduce the number of bridge crossings needed over the LMOC. Sections of municipal road will be realigned, and bridges will be constructed to accommodate agricultural activities and residential access. The realignment of PR 239 will affect a total of 24 properties along its length. Twenty-one of these properties are privately owned; one is Crown land and three are Crown-leased parcels. An additional five Crown-leased lands are located within the LAA for the road realignment.

The realignment of PR 239 has 33 residences in the LAA which includes the LMOC PDA; seven of these are less than 100 m from the road allowance for the realignment. Manitoba Infrastructure will acquire lands for land parcels taken up by the road realignment through expropriation, which is governed by the *Expropriation Act* and would maintain existing access for property owners onto the new ROW.

The Project will be constructed to limit possible disturbance and annoyance to residents related to construction noise and interference with residential properties through adoption of mitigation measures. See Chapter 6, Section 6.2.4 for detailed assessment of potential noise effects, and description of mitigation measures.

Access Roads

Comments received during the IPEP related to access and public safety included landowner concerns about keeping people off access roads, or from boating down the channel; and managing people who are accessing Crown-leased land and resultant associated damage and liability issues from access. Concern was expressed about what would be expected from landowners for stopping people from accessing the channel. Landowners also wished it to be known that the new highway (PR 239) will increase accessibility for night lighters (i.e., hunting by lamp light at night). Manitoba Infrastructure responded that they would investigate into controlling and monitoring these access concerns .

Permanent access to the LSMOC will be via the proposed LSM Access Road (formerly a 19.5 km winter road) that extends northward from the existing forestry road (Idylewild Road) to the LSMOC channel inlet and the Emergency Outlet Channel (Reach 1).

Eight municipal roads in the RM of Grahamdale (i.e., Township Line Road, Bayton Road, Carne Ridge Road, Burnett Road, Rafskillen Road, Iverson Road, Bankert Road, and Grahamdale Road) will be affected by channel excavation, changing access to properties affected by the LMOC PDA. Access restrictions are anticipated to last for the period of construction. An Access Management Plan will be developed to address traffic accommodation plans and logistics and lessen effects during construction. Access roads for construction would be temporary and removed, once construction of the channels is complete, and allowed to revegetate. Access roads at bridge crossings of the LMOC will remain.

Access roads constructed along the dikes paralleling the LSMOC will be permanent, allowing for maintenance activities along the channel. Landowners in the LAA may experience changes to access to private property. Residual effects on access are anticipated to be low. Section 9.3 provides details regarding effects on change in transportation.

Distribution Line

A new distribution line will cross provincial Crown Land in unorganized territory resulting in a degradation effects to Crown land. Manitoba Hydro will be responsible for constructing the distribution line for the Project. Power is expected to be provided to a LMOC water control structure by a very short tap from nearby lines.

Temporary Construction Areas

Temporary construction areas (e.g., staging areas) and associated works and activities (e.g., temporary construction camps, quarry development sites) may involve existing or disturbed sites depending on location. It is unknown at this time where these areas and works will be located for the Project.

Residual effects on land use because of aggregate/quarry development associated with the Project are undetermined at this time as their precise locations are not known. Quarries developed by contractors will be required to meet applicable provincial Acts and regulations regarding reclamation and rehabilitation activities.

Summary of Construction Residual Effects on Land Use (Property and Residences)

Following the implementation of mitigation measures described above, residual effects for change in land use during construction are characterized as follows:

- direction is adverse because there will be a net loss in land use (residences and property)
- duration is short-term for nuisance disturbance because the period is for construction (2.5 to 3 years), including for temporary staging areas, camps, and access, such that nearby residents will not be affected for prolonged periods as equipment is moved along the LMOC channel and road realignment
- magnitude for land use, consisting of property and residences, is low to moderate, based on 1) the low number of residences or other receptors to be displaced along the proposed LMOC PDA and proposed PR 239 realignment, 2) the small proportion of private land lost within the LAA, 3) the small proportion of land affected within the RAA, and 4) the low development potential, based on applicable development plan designation and zoning within the RAA overall
- timing is not applicable for construction effects on land use because effects are not restricted to specific seasons
- residual effects extend to the PDA and LAA
- frequency of effects will be infrequent over the construction phase
- effects are reversible (short-term) once construction is completed
- socio-economic context is dependent upon location within the PDA and is resilient because land use can accommodate some change in the baseline; Manitoba Infrastructure acknowledges that the effect of the LMOC on private land and residences is considerable from the perspective of the individual landowner

Operation and Maintenance

Project operation and maintenance has the potential to affect residents and property owners through visual aesthetic changes. Concerns regarding visual effects are referenced in Chapter 10, Section 10.1. Visual effects could be an issue along the LMOC due to proximity to some rural residences, but not an issue along the LSMOC because there are no identified residences proximate to that channel alignment. Because the Project will have low visual prominence and because the landscape of the LAA has low topographical relief, the Project will likely only be visible to receptor sites in its immediate vicinity.

Audible noise generated along the LMOC and LSMOC will be limited during Project operation and maintenance given the expected infrequent nature of maintenance activities. Audible noise effects are anticipated to be of lower effect and limited mainly to the PDAs (see Section 6.2.4).

In consideration of the low number of residences that will be directly affected during operations and maintenance, the Project is anticipated to have a low effect on properties within the LAA, overall.

Operation and maintenance activities associated with the LMOC and its potential to adversely affect property value based on proximity is uncertain. The potential to affect property value is anticipated to be low, based on research for other linear developments (e.g., transmission lines) that any observed effects would be expected to diminish with distance and disappear over time. The operation of the LMOC does have the potential to offer some flood damage avoidance benefit to properties located near Lake Manitoba and Lake St. Martin, and other low-lying areas related to less flood risk to property value over the long-term.

Temporary construction areas will be reclaimed following construction, so no effects will continue during operation and maintenance.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure. Similarly, the new distribution line will also be permanent and will be subject to routine operation and maintenance activities as conducted by Manitoba Hydro.

Summary of Operation and Maintenance of Residual Effects on Land Use (Property and Residences)

Following the implementation of mitigation measures described above, residual effects for change in land use during Project operation and maintenance are characterized as the follows:

- direction is adverse because there will be visual aesthetic changes affecting residences and property and potentially positive for land development and property value from benefits of reduced flood risk
- duration is long-term because effects may persist for greater than 5 years
- magnitude for property, related to property value/aesthetics, although uncertain, is anticipated to be low, and if present, could vary depending on the location and visibility of outlet channels and road infrastructure to adjacent properties

- magnitude for audible noise effects are anticipated to be of low magnitude
- timing is not applicable for effects on land use because effects are not restricted to specific seasons
- residual effects extend to the PDA and LAA
- frequency of effects will be infrequent for audible noise and regular continuous related to presence of the channel and associated infrastructure
- effects are irreversible related to loss of land and potentially reversible long-term for property value
- socio-economic context is dependent upon location within the PDA and is resilient because land use can accommodate some change in the baseline; Manitoba Infrastructure acknowledges that the effect of the LMOC on private land and residences is considerable from the perspective of the individual landowner

9.2.4.3 Change in Agricultural Land Use

There is no agricultural land use within the LSMOC portion of the LAA; therefore, this sub-component of the LAA is not discussed within this section.

Agricultural land use occurs in the southern portion of the land and resource use LAA along the LMOC and along the southern and western shoreline portion of the LAA surrounding Lake St. Martin. In addition, temporary Project components including the Lake Manitoba rock quarries, borrow material areas, temporary construction camps and staging areas will potentially be located in areas of agricultural land use.

Conversion of areas of agricultural land uses to industrial land use within the PDA is a possible outcome of constructing the Project components, including LMOC and PR 239 realignment. Further, due to the presence of the LMOC, access to some parcels of land under agricultural land use adjacent to, but outside of, the PDA will be precluded. Agricultural lands affected include lands privately-held, as well as Crown lands being used for agriculture under lease and permit. Therefore, the Project will require conversion of lands from agricultural land use within the PDA for use by the LMOC and PR 239 components. Agricultural lands affected outside of the PDA are anticipated to revert to natural vegetation land use. This conversion will affect these areas through Project operation.

Locations of temporary Project components are not yet identified. However, pathways of effects can be identified based on a general understanding of the Project activities associated with these components and a general understanding of the existing conditions in the RAA. Further, it is assumed that if these components are developed in areas of agricultural land use, they can be reclaimed for pre-Project land uses, as feasible, when they are no longer required to support Project construction.

Construction and presence of Project infrastructure will affect landowners' use of the land outside of the LMOC PDA. There are multiple pathways for Project effects through the construction and operations phases

Project Pathways

Within this section, the pathways for potential effects to agricultural land use are identified and described. These include:

- permanent losses of agricultural land within and adjacent to the LMOC
- return of capability and productivity of agricultural lands currently affected by flooding around the shoreline of Lake St. Martin
- potential temporary losses and/or degradation of agricultural land outside of the LMOC PDA in areas of temporary Project components, including rock quarries, borrow material sites, temporary construction camps and staging areas, if these are located in areas of agricultural land use
- alterations to local drainage due to the presence of the LMOC
- conflict with agricultural activities due to the presence of the LMOC

The discussion of pathways for potential effects does not consider the implementation of mitigation. Mitigation and anticipated residual effects considering the implementation of mitigation are discussed subsequent to this section.

Permanent Land Loss

Areas under current agricultural land use or with agricultural capability within the LMOC PDA will be lost from current agricultural land use or future potential agricultural land use. These lands are mostly privately-held lands that will be expropriated. In addition, access to some agricultural lands outside of the PDA will be cut-off by the Project. These include a combination of privately-held agricultural land and Crown lands being used by agricultural landowners under leases and permits. As a result, these agricultural lands outside of the PDA that will have access cut-off will not be available for agricultural land use as a result of the Project. These lands are predominantly located on the east side of the LMOC PDA, but a few land parcels are located on the west side of the channel. These lands outside of the PDA that will not be available for agricultural land use as a result of the Project are displayed in the context of agricultural capability in Appendix 9A, Figure 9.2-8 and crop type distribution in Appendix 9A, Figure 9.2A-10. Areas of current agricultural land use and lands with agricultural capability that are within the LMOC portion of the PDA and outside of the PDA but having access cut-off by the presence of LMOC (i.e., the “other areas of agricultural land conversion” comprised of privately-held lands being expropriated and areas of Crown land being used for agriculture under lease and permit), are assumed to be permanent losses for agricultural land use.

Through the IPEP (see Chapter 9, Section 9.2.1.2), landowners raised specific concerns related to permanent land loss. This commonly included direct effects of loss of property; however, other financial concerns raised included reduced farm operation value following splitting of farms, increasing land values (presumably from reduced agricultural land availability in the local area), tax implications, reduced borrowing ability, and compensation for recent land improvements (e.g., clearing, fencing, drainage).

Another issue that was raised was the future effects loss of land may have on farm succession, including the loss of income for future generations.

Lake St. Martin Shoreline

The reduction of lake levels in Lake St. Martin due to the operation of the LMOC and LSMOC is a desired positive outcome and objective of the Project.

Under the current operating conditions without the outlet channels, Lake St. Martin is above the top of its desired operating range 24.4% of the time; with the operation of the outlet channels, the amount of time that Lake St. Martin is above the top of its desired operating range changes to 5.2% (see Section 6.4 groundwater and surface water; Manitoba Infrastructure 2019b).

Review of modelled results showed that operation of the new outlet channels will decrease the peak water levels substantially during high flood conditions (i.e., Lake Manitoba, greater than 813.5 ft, or 247.95 m), and reduce peak levels in all years, which will increase the amount of time the lake is within its desired operating range (see Section 6.4 groundwater and surface water; Manitoba Infrastructure 2019).

These reductions in lake levels will affect agricultural land use within the LAA surrounding Lake St. Martin. A reduction in flood levels is anticipated to have a positive effect associated with the return of agricultural capability and productivity for agricultural land uses which were adversely affected during pre-Project conditions, particularly as a result of flood events. This return of capability and productivity is anticipated to occur over the short-term but may require some reclamation activities to restore productivity, for example, tillage (seedbed preparation), re-seeding and fertilization to restore pasture and haylands.

Temporary Land Loss and/or Land Degradation

Temporary land loss and/or land degradation might affect current and potential agricultural land use in areas of temporary Project components, including Lake Manitoba rock quarries and borrow material areas, and temporary construction camps and staging areas. Efforts will be made to locate these components within the ROW; however, the locations of these components are not known at this time, and, while the likelihood is low, they may be located outside of the ROW in areas that affect current or future agricultural land use. This pathway to potential effects will only occur if temporary Project components are located outside of the ROW and in areas of privately-held lands currently under agricultural land use or under other uses but which have agricultural capability and may be used for agriculture in the future.

Loss of pre-Project agricultural land use may occur at the temporary Project components. These losses will be temporary in that they are anticipated to occur primarily during the construction phase. Following their use in supporting construction activities, these areas will be reclaimed and returned to pre-Project agricultural land uses, if and when required. This is anticipated to occur at the end of the construction phase, when they are no longer required to support the Project.

During the construction phase, site preparation and construction of the temporary Project components are anticipated to require clearing, topsoil stripping, soil excavation, and soil handling and stockpiling. If conducted on agricultural lands, these activities might affect agricultural capability through changes to soil quality or quantity as a result of various mechanisms, including improper soil stripping, excavation and handling, admixing, compaction of topsoil and upper subsoil, and wind and/or water erosion of disturbed, exposed and stockpiled soils. During construction reclamation, soil replacement activities are important in re-establishing agricultural capability for return to agricultural land uses, where applicable. Proper soil replacement will maintain topsoil and upper subsoil quantity (thickness/depth) and quality (e.g., organic matter content), to the extent feasible.

In the event that temporary Project components are located outside of the ROW and in areas of privately-held lands currently under agricultural land use or under other uses but which have agricultural capability and may be used for agriculture in the future, it is assumed that Project contractors will negotiate the temporary use of these lands with landowners, as required. This will include uses of private lands for temporary Project components, including Lake Manitoba rock quarries and borrow material areas, and temporary construction camps and staging areas. If affected lands will not be able to be returned to equivalent agricultural land use and/or agricultural capability following use for the Project, it is assumed that Project contractors will negotiate the removal of these lands from agriculture with affected landowners, as required.

Alterations to Local Drainage

Alterations to localized surface drainage and shallow groundwater flow as a result of the presence of LMOC and the associated Lake Manitoba drainage realignment are anticipated to affect soil wetness and drainage regimes, which in turn may affect agricultural capability and land use.

The primary pathway for these potential effects is through alterations to natural drainage paths and shallow groundwater flow as a result of the presence of the LMOC. Regional surface and shallow groundwater flow is in a general west to east direction within the LAA. Unmitigated, this effect would be expected to result in wetting-up on the upgradient or west side of the channel and drying-down on the downgradient or east side of the channel. This would be expected to increase the potential for increased seepage, inundation and flooding west of the channel, which could adversely affect agricultural capability and soil productivity for agricultural crop production, haylands and pasture. Conversely, this could result in drier soils east of the channel, which could also affect agricultural land use.

Conflict with Agricultural Activities

Unmitigated, effects due to conflict with agricultural activities will occur commencing with construction and will last through the operation and maintenance phase. Conflict with agricultural activities will be primarily due to the presence of the LMOC. This will result in limitations to access for operations which have fields on both sides of the channel, loss and/or damage to facilities (e.g., barns, fencing, corrals, hydro power, groundwater wells and dugouts), increased management effort and production costs and concerns related to increased biosecurity risks.

Limitations to Access

Limitations to access will occur in situations where farming operations are split as a result of the presence of the LMOC. The LMOC will create a physical barrier separating agricultural fields from the base of operations and will require new, and in some cases, longer access routes to fields. This will also require traveling over roads and bridge structures. Limitations to access will occur beginning with the construction period and will last through Project operation and maintenance. These limitations will affect farming operations throughout the LAA, and in some cases beyond the LAA and into the RAA, if fields associated with affected operations occur outside of the LAA boundary.

A major concern raised by landowners during IPEP relates to moving livestock. Cattle must be moved regularly through the spring, summer and fall, and sometimes the winter, to access fields for grazing and feedlots, typically used for over-wintering. Due to the access issues caused by the presence of the LMOC, livestock may have to be hauled in transports to access fields separated by the LMOC. Cattle may have to be moved (walked) over bridges, which landowners have raised as a safety concern and one of feasibility, in some cases (e.g., bridge over PR 239). This may require additional grazing fields to be purchased or developed and/or additional facilities to be developed (e.g., corrals, feeding areas).

Related to the need to move farm machinery across bridge structures, landowners raised feasibility and safety concerns during the IPEP. Slow-moving and wide equipment (e.g., combine headers up to 30 ft wide) travel on busy roads and on highways increases the risk to safety for operators and the public. Specific concerns included feasibility with moving equipment across these structures, the need for pilot vehicles (and associated additional labour), and potentially the need to purchase smaller equipment in order to make structure crossings.

The increased management effort and production costs associated with access limitations is addressed in the following section.

Increased Management Effort and Production Costs

In some cases, farmers will face challenges related to increased labour time and production costs, as well as general nuisance and inconvenience, associated with having to access lands split from their base of operations by the presence of the LMOC. This will affect some landowners' ability to continue production at current levels or continue production at current levels at the same cost of production.

The presence of the LMOC will have to be considered when planning and executing field operations. This will be a challenge, in some instances, primarily due to the physical separation and additional travel distance required between fields. This becomes exacerbated due to phasing of field operations and timing of operations in a given field, as timing of field operations depends on crop type and also field and weather conditions. In other words, planning of field operations to reduce travel time and expense is limited by other factors out of control of the producer. Additionally, many activities such as checking on livestock, feeding livestock and scouting crop need to happen as frequently as daily.

Farm management units, or individual field areas, may be cut and reduced in size by the LMOC. These situations may result in inefficiencies in field operations and increases in production costs per unit area.

In some cases, the agricultural land loss (discussed above) may limit the field area available for manure application, which could pose additional challenges for producers if manure generated exceeds the amount that can be agronomically spread on available land.

Loss of Use of Agricultural Buildings, Facilities and Related Resources

Existing agricultural buildings, structures and other facilities within the LMOC PDA will not be available for use following the commencement of construction. For example, results from the IPEP indicated that potentially affected buildings and facilities within the PDA include barns, fencing, corrals, hydro power, groundwater wells and dugouts. Direct effects to farm operations will occur from the loss of use of these types of buildings and facilities. Effects may include time and monetary costs to replace these buildings and facilities. These effects are anticipated to be limited to the PDA.

One landowner indicated a concern with a manure stockpile within the PDA. Manure stockpiles are a valuable source of nutrients intended for application onto land to support crop growth. If not removed from the PDA prior to construction, these stockpiles can be a source of impact to surface water by runoff of nutrients (e.g., nitrogen and phosphorus) and other parameters of concern (e.g., bacteria). These stockpiles should be relocated, in consultation with landowners, prior to construction for avoiding potential adverse effects. Areas under manure stockpiles and feedlot areas in general have potentially manure-impacted soils which may be a concern if these soils are disturbed; this issue is addressed in Chapter 6, Section 6.3.4.

A concern raised by numerous landowners is livestock gates being left open during construction activities. Livestock exiting confinement areas uncontrolled can result in animal safety issues, nuisance and safety concerns to the public, and time and labour costs for landowners to recover animals. These instances are anticipated to be limited as the land within the PDA will not be under agricultural land use at commencement of construction. However, if access to Project areas for the purposes of construction are through existing livestock farming operations, this will have to be addressed through access management planning.

Agricultural landowners cited concerns about loss of groundwater supply or effects to groundwater quality (contamination) from the Project. Depressurizing of the confined aquifer is required during construction of the Project. This may depressurize portions of the aquifer within which wells are installed. This potential effect is addressed in Section 6.4 and Section 9.2.4.5, where effects to land and resource use is discussed. Effects on groundwater quality are not anticipated because the aquifer is confined and under artesian pressure (see Section 6.4).

The issue of grass fires within the ROW is another concern raised by a landowner during IPEP. Grass fires along the ROW may be caused by Project activities (e.g., vehicles driving over dry grass) and could spread to adjacent agricultural land, damaging crop land, pastures and buildings.

Croplands Biosecurity

Soil transport is an important mechanism for the spread of weeds and soil-borne diseases from one field or region to another. Movement of equipment and workers on and off the construction ROW in cropland areas provides a potential pathway for disease and weed transmission to previously non-affected soils, compromising biosecurity for affected lands. There is potential for soil to be transferred from the PDA to areas outside of the PDA during the construction phase as a result of unclean construction equipment, other vehicles and people moving from the PDA and transiting through areas of agricultural crop production, including access roads and municipal roads.

The introduction of pests can have lasting adverse production value (reductions in yield) and production cost (increased input and management costs) effects. They can negatively affect yield, quality, value and sale of raw and processed commodities into domestic and international markets (Howard 2013). Diseases can spread quickly within and between fields by natural means (*e.g.,* wind, rain, water and soil erosion and insects) or human-related means through transport of infested seed, soil and crop residues.

Clubroot is a disease which affects canola, a common crop within the LMOC portion of the LAA, and is caused by *Plasmodiophora brassicae,* a soil-borne pathogen (Howard 2013; Manitoba Agriculture 2019c). 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. There have been increasing reported cases in Manitoba in the last few years. Based on testing conducted by Manitoba Agriculture, the RM of Grahamdale is reported to have between 0 and 1,000 clubroot spores per gram of soil (Manitoba Agriculture 2019d). Symptoms are commonly deformed roots and poor growth and wilting aboveground. The RM of West Interlake has not been tested by Manitoba Agriculture. Currently, there are no economical control measures that can remove the disease from a canola field once it has been infested. However, it is possible to curtail the spread and reduce the incidence and severity of infection (Canola Council of Canada 2015) through limiting the movement of infected soil. Movement of infected soil on machinery is an important mechanism for the spread of clubroot.

In 2014, Verticillium wilt in canola caused by *Verticillium longisporum* was detected in Manitoba and this was the first case of this disease on an oilseed crop in North America (Manitoba Agriculture 2019c). *Verticillium longisporum* overwinters in soil as microsclerotia, which are small masses of fungal cells that are hard and compact and capable of surviving in the soil for up to 15 years (Manitoba Agriculture 2019c).

Another biosecurity concern raised by landowners is related to management of the channel ROW. Weed growth along rights-of-way can be a source of weeds to adjacent agricultural land through various mechanisms of transfer including weeds spreading invasively, weeds seeds blowing onto land and birds and other wildlife transferring weed seeds. A properly managed ROW should not be a source of noxious weeds to agricultural land.

Livestock Biosecurity

Right-of-way clearing and presence of linear infrastructure can change wildlife access to agricultural areas increasing predation and contact which can increase disease transmission vectors and reduce

natural shelter for livestock. However, this is likely not an important pathway related to this Project because the LMOC area is heavily disturbed with good existing access for wildlife. The reduction in shelter will be limited to the PDA where livestock are not expected to be permitted.

Anthrax is a disease of concern for cattle, which could be spread due to compromised biosecurity attributable to Project activities because of soil disturbance and the presence of large wildlife. Anthrax is a disease that quickly kills cattle, sheep and other grazing livestock (CFIA [Canadian Food Inspection Agency] 2013). It appears regularly in Manitoba and it is important to vaccinate for the disease every year (Manitoba Agriculture 2019e). Anthrax is caused by the bacteria *Bacillus anthracis* (CFIA 2013). The bacteria form spores that are released into the environment and remain in the soil for decades. Conditions such as flooding, drought and recent digging can bring spores into close contact with grazing animals (Manitoba Agriculture 2019e). Elk, a large mammal that may provide a vector for disease transmission as the LAA around the LMOC, overlaps the northwestern extent of the South Interlake elk herd range (see Section 8.3). When the channels aren't conveying large volumes of water, the Project is not expected to alter access in a manner that would change the likelihood or frequency of contact with livestock; however, it is difficult to predict how the channels will affect elk movements during flooding events (see Section 8.3).

Contact between workers or equipment and livestock and/or livestock manures is a vector for the transmission of various diseases (e.g., bovine tuberculosis). This is of particular concern when workers or equipment have recently been in contact with livestock within another farm or region. 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 close within common spaces (e.g., cattle feedlots).

Interactions between the Project and biosecurity will occur in the vicinity of the PDA, primarily during the construction phase (e.g., transfer of manure off the ROW from vehicle and equipment movements, worker and equipment contact with livestock off the ROW, spread of soil pathogens), but will extend through the operations and maintenance phase (e.g., noxious weed transfer from the ROW to adjacent agricultural lands). Unmitigated, these interactions are a concern for agricultural biosecurity in the LAA around the LMOC.

Restrictions to Future Expansion

The presence of the Project can impose permanent land use restrictions, including limited capacity for future expansion of operations or future consolidation of farm fields. This is of particular concern where presence of the LMOC splits fields within a given, existing farm operation and where these occur in close proximity to existing farm infrastructure. Future expansion of farm buildings and other operations (e.g., livestock feedlot expansion, creation of new rotational paddocks, increasing cropping land) in proximity of the LMOC might be hindered. During the IPEP, landowners raised this issue as a concern.

The potential for restriction to future expansions would occur through the operations and maintenance phase, with potential effects limited to the LMOC portion of the LAA.

Mitigation

Mitigation for potential effects to agricultural land use are summarized below by the various pathways.

Permanent Land Loss

Manitoba Infrastructure will acquire land through expropriation of lands according to the *Expropriation Act*. Through the expropriation process, landowners will be compensated for the permanent land loss, as the offer of compensation under the Act allows for payment of the market value of the land. The Act allows for compensation of other costs, expenses, losses, damages and value related to the expropriation, which are discussed below.

Temporary land loss and/or land degradation

Manitoba Infrastructure's Environmental Management Program is described in Chapter 3, Section 3.7. General mitigation measures will be provided in various CEMPs that will developed for the Project by Manitoba Infrastructure and Project contractors. The Project Environmental Requirements (PERs, Manitoba Infrastructure 2019) are also being developed to achieve regulatory compliance and meet requirements of Project approvals, permits, licences and authorizations. The PERs include mitigation measures to address potential effects relevant to agricultural land use at temporary Project components.

Mitigation provided in the PERs pertinent to rehabilitating soils in areas of agricultural land use are listed below. These will be conducted in conjunction with mitigation listed in Chapter 6, Section 6.3.

- Designated areas and access:
  - Topsoil in designated areas[5] shall be stripped and stockpiled for later reuse in site restoration. Granular material or other surface preparation, as approved by the Engineer, shall be placed to ensure all weather accessibility.
  - Locations within **Designated Areas** where equipment, hazardous material and/or wastes will be stored or maintained shall be underlain with at least 30 cm of impermeable soil or approved equal and lined with an impermeable groundsheet to contain spills and minimize cleanup costs.
  - Immediately following construction, all salvaged and stockpiled organics and soils which were set aside during site development shall be spread back over the area from which they originated and shall be seeded. If local soils are not available, other measures will be explored.

[5] Designated areas include, but are not necessarily limited to, laydown and staging areas, waste storage areas, fuel storage and refueling area, work camps and others as required by the Engineer

- Site decommissioning (temporary works):
  - All designated areas shall be leveled to pre-existing grade and slope as part of decommissioning. Stockpiled topsoil and other organic matter that had been removed from the site will be spread to promote natural re-establishment of vegetation
- Revegetation and vegetation maintenance:
  - Immediately following construction, all salvaged and stockpiled organics and soils that were set aside during site development will be spread back over the area from which they originated and shall be seeded. If local soils are not available, other measures will be explored.

The Project Environmental Management Program being developed by Manitoba Infrastructure is summarized in Section 3.7 and is being developed to facilitate environmental protection and regulatory compliance during Project construction. It will include plans anticipated to be pertinent to agricultural land use, including the Environmental Protection Plan (EPP), Access Management Plan, Sediment Management Plan, Revegetation Plan, and Construction Decommissioning Plan.

If temporary Project components, including rock quarry and borrow material sites and temporary construction camps and staging areas are located outside of the ROW in agricultural areas and result in temporary loss of land for agricultural use, it is assumed that Project contractors will negotiate the temporary use of these lands with landowners, as required. Additional mitigation is as follows:

- land will be reclaimed and rehabilitated for equivalent agricultural land capability and use following use of these components in support of Project construction, as feasible

Alterations to Local Drainage

Project-specific mitigation to minimize effects associated with alterations to local drainage due to the presence of the LMOC include:

- drainage channels and realignments on upgradient sides of LMOC will channel water downslope and into the channels to minimize the risk of inundation and flooding as a result of channel presence
- surface drainage patterns for other Project components will be re-established where possible

Conflict with Agricultural Activities

The Environmental Management Program will include the Environmental Protection Plan (EPP), Access Management Plan, and Construction Decommissioning Plan. Specific mitigation measures for conflict with agricultural activities are provided below.

Limitations to Access, Increased Management Effort and Production Costs, and Loss of Use of Agricultural Buildings, Facilities and Related Resources

Manitoba Infrastructure will continue to engage with individual landowners to confirm issues related to access, increased management effort and production costs and damage to agricultural facilities for each operation. Manitoba Infrastructure will seek to minimize access effects to individuals through construction and operation of the Project through the following:

- through the Access Management Plan, Manitoba Infrastructure will accommodate local land use and consider limitations to access for individual farm operations
- bridge structures will be designed to accommodate agriculture to the extent feasible
- locations of manure stockpiles within the PDA will be confirmed and stockpiles will be relocated to suitable areas outside of the PDA determined in conjunction with landowners prior to construction (mitigation associated with manure stockpiles will be done in conjunction with Section 6.3.4, which addresses the potential for nutrient impacts to soils)

In addition to compensation for the market value of the land, as discussed for permanent land loss, above, compensation through the expropriation process under The *Expropriation Act* allows for payment in aggregate of:

- the reasonable costs, expenses and losses arising out of or incidental to the owner's disturbance
- damages for injurious affection
- the value to the owner of any special economic advantage arising out of or incidental to the actual occupation of the land

These aspects of compensation under The Act are anticipated to offset increased management and production costs, and costs associated with loss of use of buildings, structures and facilities.

Biosecurity Risk

Biosecurity is a concern for croplands and livestock during construction and operation and maintenance phases of the Project.

Typical procedures for reducing soil transport, and disease and weed transmission, include:

- cleaning and disinfecting equipment, vehicles and footwear
- record keeping for filled-out agricultural biosecurity checklists, vehicle and equipment cleaning records, and equipment cleaning inspection
- all equipment will arrive at and leave the construction site clean and free of soil or vegetative debris (including weed seeds)

Project-specific mitigation to reduce biosecurity risk related to Project activities includes the following:

- Manitoba Infrastructure will develop a biosecurity management plan to address biosecurity concerns related to Project activities. This plan will include:
  - summary of biosecurity issues related to construction and operation activities
  - identification of specific biosecurity risk sites and risk types (e.g., livestock manures, access routes [to be identified through the Access Management Plan])
  - identification of specific mitigation requirements, including landowner communication, work timing and scheduling, notification, avoidance areas, equipment cleaning and disinfection
  - worker training and record-keeping
  - monitoring and follow-up

Restrictions to Future Expansion

If restrictions to future expansion are a concern to individual landowners, these concerns will be operation specific in nature. Therefore, it is anticipated that concerns related to restrictions to future expansion will be:

- discussed between landowners and Manitoba Infrastructure and addressed through the Access Management Plan, to the extent feasible
- discussed and addressed through pertinent mechanisms of the expropriation process provided for under *The Expropriation Act*

Project Residual Effects

Permanent Land Loss

The area of permanent land loss includes lands under agricultural land use or with agricultural capability within the LMOC PDA and some lands outside of the PDA but having access cut-off by the presence of LMOC (i.e., the “other areas of agricultural land conversion” comprised of privately-held lands being expropriated and areas of Crown land being used for agriculture under lease and permit). A summary of these land areas is provided in Table 9.2-16.

A total of approximately 1,929 ha of land rated for agricultural capability will be lost permanently as a result of the Project. This will include 1,024 ha (53.1% of total affected area) within the LMOC PDA, and 905 ha (46.9%) outside of the PDA, comprised of 577 ha (29.9%) of private land to be expropriated, 191 ha (9.9%) of Crown land under lease and 137 ha (7.1%) of Crown land under permit. This includes 878 ha of Class 4 land or 11.3% of the LMOC portion of the LAA, which have severe soil-landscape limitations that restrict the range of crops or require special conservation practices or both (CLI 1969) and

are considered marginal for sustained arable agriculture (Podolsky 1981). Class 6 soils comprise 544 ha of land being lost for agricultural use (7.0% of the LAA). Soils in this class are capable only of producing perennial forage crops and improvement practices are not feasible, so are generally considered limited to native pasture production. Class O5WD soils consist of organic soils and occupy 440 ha within the area of permanent loss. They have limitations due to excess wetness and structure and permeability. The 5WD potential of these soils can only be achieved through reclamation or development implemented with varying degrees of difficulty (Leeson et al. 1969; Podolsky 1981), for example, intensive drainage. Most of these areas are currently under natural vegetation; however, some are under agricultural production for pasture, hayland and cropping. If the potential of areas of organic soils not currently under agricultural land use was achieved, they would be considered capable of improved permanent pasture and hayland only. The remaining 68 ha of land within the permanent loss areas is Class 7 soils with no capability for arable agriculture.

Therefore, a total of 1,863 ha of land within the areas of permanent land loss would be considered to have some degree of agricultural capability (Classes 1-6 and Class O5WD). This represents 23.9% of the LMOC portion of the LAA or 96.5% of the areas of permanent land loss within the LMOC PDA and other agricultural conversion areas outside of the PDA lost due to access being cut-off by the presence of the LMOC.

Table 9.2-16 Agricultural Capability in Areas of Permanent Agricultural Land Loss

Agricultural Capability Class	Agricultural Capability Class and Subclass	LMOC Portion of the LAA - Existing Conditions	LMOC Portion of the LAA – Post-Construction[2]	LMOC Portion of the LAA – Change in Areas	
		ha	ha	ha	% of Area of LMOC Portion of the LAA Rated for Agricultural Capability
Class 1	Total Class 1	0	0	0	0.0
Class 2	Total Class 2	3	3	0	0.0
	2W	3	3	0	0.0
Class 3	Total Class 3	0	0	0	0.0
Class 4	Total Class 4	4,693	3,815	-878	-11.3
	4DP	4,693	3,815	-878	-11.3
Class 5	Total Class 5	12	12	0	0.0
	5P	3	3	0	0.0
	5RP	9	9	0	0.0
Class 6	Total Class 6	1,892	1,348	-544	-7.0
	6W	1,892	1,348	-544	-7.0
Class 7	Total Class 7	356	288	-67	-0.9
	7M	62	42	-20	-0.3
	7W	293	246	-47	-0.6

Table 9.2-16 Agricultural Capability in Areas of Permanent Agricultural Land Loss

Agricultural Capability Class	Agricultural Capability Class and Subclass	LMOC Portion of the LAA - Existing Conditions	LMOC Portion of the LAA – Post-Construction[2]	LMOC Portion of the LAA – Change in Areas	
		ha	ha	ha	% of Area of LMOC Portion of the LAA Rated for Agricultural Capability
Organic soils	Total Organic soils	824	384	-440	-5.7
	O5WD	824	384	-440	-5.7
Grand Total		**7,780**	**5,850**	**-1,929**	**-24.8**

Notes:

Areas and proportions may not add up to totals due to rounding
1. Water occupies 146.3 ha or 1.8% of the LMOC portion of the LAA. This area has been removed from the LAA area for the interpretation of agricultural capability

Within the area of permanent land loss, according to crop type distribution in 2018 (AAFC 2019) approximately 876 ha (11.4% of the LAA) was under hay, pasture and grasses production (Table 9.2-17). A small portion of the area comprising 168 ha (2.2%) was under annual crop (cereals, oilseed and pulses). Therefore, a total of 1,044 ha of land under agricultural crop production in 2018 would be included in the permanent land loss area. This represents 13.7% of the LAA or 54.1% of the area of permanent land loss.

For areas considered non-agricultural land use, excluding water, wetlands occupy 373 ha (4.9%), forests 225 ha (2.9%), exposed/bare land 149 ha (1.9%), shrubland 56 ha (0.7%) and developed land (i.e., roads, buildings and residences) 54 ha (0.7%). Therefore, a total of 857 ha of land under non-agricultural use in 2018 would be included in the permanent land loss area. This represents 11.2% of the LAA or 45% of the area of permanent land loss.

Table 9.2-17 Crop Type Distribution in 2018 in Areas of Permanent Agricultural Land Loss

Crop Category	Crop Type	LMOC Portion of the LAA – Existing Conditions	LMOC Portion of the LAA – Post-Construction	LMOC Portion of the LAA – Change in Areas	
		ha	ha	ha	% of LMOC Portion of the LAA
Cereal		**266**	**216**	**-50**	**-0.6**
	Spring wheat	264	215	-50	-0.6
	Oats	2	2	0	0.0

Table 9.2-17 Crop Type Distribution in 2018 in Areas of Permanent Agricultural Land Loss

Crop Category	Crop Type	LMOC Portion of the LAA – Existing Conditions	LMOC Portion of the LAA – Post-Construction	LMOC Portion of the LAA – Change in Areas	
		ha	ha	ha	% of LMOC Portion of the LAA
Oilseed		**353**	**272**	**-81**	**-1.1**
	Canola	353	272	-81	-1.1
Pulses		**293**	**256**	**-37**	**-0.5**
	Soybeans	293	256	-37	-0.5
Hay, Pasture and Grasses		**3,377**	**2,501**	**-876**	**-11.4**
	Pasture/forages	322	263	-59	-0.8
	Grassland	3,055	2,238	-817	-10.6
Non-agriculture		**3,391**	**2,534**	**-857**	**-11.2**
	Developed	198	144	-54	-0.7
	Exposed/bare land	712	562	-149	-1.9
	Forest	1,158	933	-225	-2.9
	Shrubland	267	211	-56	-0.7
	Wetland	1,056	683	-373	-4.9
Totals		**7,680**	**5,779**	**-1,901**	**-24.7**

Notes:

Source: AAFC (2019)
Areas and proportions may not add up to totals due to rounding
Water occupies 234 ha of the LAA and 152 ha of the area of permanent land loss, including areas of priveately-held land and Crown land leases and permits oustisde of the PDA being converted from agricultural land use due to access limitations

There will be an adverse residual effect from permanent land loss from the Project. This will be limited to the areas of the LMOC PDA, as well as areas of privately-held land being expropriated, and Crown land being being converted from agricultural land use as they won't be accessible due to the presence of the LMOC. Therefore, effects will extend into the LAA and will persist through operation of the Project. As these lands will be expropriated, landowners will be compensated through the expropriation process, as provided for under the *Expropriation Act*. This compensatory mitigation to individual landowners is anticipated to offset this adverse residual effect.

Lake St. Martin Shoreline

The reduction of flood levels along the Lake St. Martin shoreline is a desired positive outcome and objective of the Project. This will result in an estimated decrease in the peak water level for a 2011 flood event of 0.76 m (2.5 ft). This represents a decrease of 27.5 km^2 (2,750 ha) in the amount of area that

would have been inundated by flood waters around Lake St. Martin (see Section 6.4 groundwater and surface water; Manitoba Infrastructure 2019b). For a minor flood condition (i.e., Lake Manitoba elevation between 812.5 ft and 813.5 ft, or 247.7 m and 248 m), the average decrease in water level in Lake St. Martin is 0.52 m (1.7 ft) representing a decrease in flooded area of 21.4 km^2 (2,140 ha).

Within the portion of the LAA along the LSM shoreline, the predominant agricultural capability class is Class 4 (54.2%; Table 9.2-6), which has severe limitations and considered marginal for sustained arable agriculture. Most of the shoreline is Class 6 (26.5%) and considered only capable of producing perennial forage crops and improvement practices are not feasible (i.e., limited to native pasture). Crop type distribution within the agricultural land use portion of the Lake St. Martin shoreline in 2018 was 38% hay, pasture and grasses (Table 9.2-11). A minor portion (6.8%) was under annual crop production, including cereals, oilseeds, pulses and miscellaneous crops. The remaining 55.2% of land was under non-agricultural cover types.

The reduction in flooding will have a positive effect within the Lake St. Martin shoreline portion of the LAA. It is anticipated that this will allow for the return of soil capability and productivity to the area of the shoreline affected by flooding in recent years. This is anticipated to manifest primarily in return of hayland and pasture productivity within reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation along the western shoreline and in private lands along the southwestern and southern shorelines. This positive effect will persist through operation of the Project.

Temporary Land Loss and/or Degradation

As efforts will be made to locate all Project components within the ROW, there is a low likelihood that temporary Project components, including Lake Manitoba rock quarries and borrow material areas, and temporary construction camps and staging areas, will be located outside of the ROW and in areas of privately-held land currently under agricultural land use or under other uses but which have agricultural capability and may be used for agriculture in the future. However, as the locations of these temporary Project components are not yet identified, in the event that contractors site these components outside of the ROW and in areas affecting current or future agricultural land use, it is assumed that the use of these lands for the Project will be negotiated with the landowners. As use of privately-held lands outside of the ROW for these components would represent temporary disturbances, it is anticipated that equivalent land capability will be restored with the implementation of general and Project-specific mitigation measures. If affected lands will not be able to be returned to equivalent agricultural land use and/or agricultural capability following use for the Project, it is anticipated that Project contractors will negotiate the removal of these lands from agriculture with the landowners, as required.

Through anticipated negotiations between Project contractors and landowners, it is expected that adverse residual effects from temporary land loss/degradation will not occur as a result of Project activities.

Alterations to Local Drainage

The incorporation of Project design mitigation of the Lake Manitoba drainage realignment will consist of an outside drain along the west side of the LMOC, likely along its entire length, to capture the drainage from the west that flows across the LMOC. Most of the flow will be re-directed into the LMOC upstream of PTH 6.

Following the implementation of mitigation, comprised primarily of surface drainage structures on the upgradient side of the LMOC, it is anticipated that residual effects to upgradient (i.e., west side of the LMOC) surface drainage and shallow subsurface flow will be limited in extent to the channel ROW or PDA (see Section 6.4 Groundwater and Surface Water and Section 6.3 Geology and Soils). It is anticipated that effects to subsurface drainage in the till materials with discontinuous sand lenses are anticipated to be very localized. Further, surface drainage will be improved in close proximity to the drainage structure which could provide beneficial effects to agricultural capability in soils with wetness limitations.

However, residual effects downgradient (i.e., east side) of the LMOC are anticipated to extend beyond the channel ROW or LMOC PDA. It is challenging to model or otherwise predict changes to near-surface hydrology in these mineral and organic soil complexes; therefore, it is unknown to what distance these effects will extend perpendicular to the channel (see Section 6.4 groundwater and surface water). The change in water balance east of the LMOC PDA may result in changes to water levels in wetlands (see Section 6.4 groundwater and surface water). Should this occur, it could, in turn, have positive effects to agricultural capability but adversely affect soil productivity for natural vegetation (see Section 8.2 vegetation) and wildlife habitat (see Section 8.3 wildlife).

Project planning will include the development of a Groundwater Management Plan (GWMP) and a Surface Water Management Plan (SWMP), which will provide for management of drainage during construction and operation. Additionally, monitoring during Project construction and operation will allow for these effects to be better understood. Additional mitigation may be applied as this understanding develops.

Conflict with Agricultural Activities

Adverse residual effects due to conflict with agricultural activities will occur commencing with construction and will last throughout the operation phase. A summary of residual effects by individual pathway or issue identified is outlined as follows:

- Where individual farming operations are split as a result of the presence of the LMOC, access limitations will result in potential residual effects. For example, the LMOC is anticipated to create challenges moving livestock and farm equipment from individual farms' bases of operation to fields located on the opposite side of the LMOC. Consideration of these effects within the Access Management Plan is anticipated to reduce the degree of adverse residual effect. However, an adverse effect related the inconvenience and nuisance is likely to persist at the individual operations level through operation of the Project in the form of increased management effort and production costs.

- Increased management effort and production costs is anticipated to result from the presence of the LMOC. Some issues will be mitigated prior to construction, for example, access limitations through the Access Management Plan, to the extent feasible, relocating manure stockpiles to appropriate areas outside of the PDA, and providing solutions if groundwater wells are affected by aquifer depressurization. However, it is anticipated that adverse effects will remain at the individual farm operation level following these types of Project-specific mitigations. The *Expropriation Act* allows for payment for the reasonable costs, expenses and losses arising out of or incidental to the owner's disturbance. Therefore, it is anticipated that these residual effects remaining following the implementation of Project-specific mitigation will be offset by expropriation payments to the landowners.

- Based on review of buildings and other major facilities, it is anticipated that approximately five agricultural operations will be affected by the Project. This includes two operations with facilities along the LMOC PDA, one along PR 239 realignment and two in areas of expropriated lands. This review did not consider some types of infrastructure and minor facilities such as fencing, groundwater wells and hydro power. It is anticipated that the effects from loss of use of these buildings and facilities will be offset by payments made to landowners through the expropriation process.

- A Project-specific Agricultural Biosecurity Management Plan will address biosecurity risks resulting from Project activities. Therefore, adverse effects due to biosecurity are not anticipated to cropping or livestock production systems in the vicinity of the LMOC.

- Restrictions to future agricultural development are anticipated to be addressed through the Access Management Plan, to the extent feasible. If effects remain at the individual farm operation level following access management mitigation, restrictions may be discussed and addressed through pertinent mechanisms of the expropriation process provided for under the *Expropriation Act*.

Following Project-specific mitigation, effects resulting from conflict with agricultural activities are expected to be adverse and will persist through operation of the Project. These effects are anticipated to extend into the LMOC portion of the LAA, and potentially into the RAA for those operations with agricultural fields beyond LAA boundaries.

Summary

With the implementation of mitigation measures, residual adverse effects from the Project on agricultural land use within the LAA are anticipated to be of moderate to high magnitude. There is anticipated to be a measurable change in agricultural land use and capacity for activities and production in the LAA such that production cannot take place at similar levels as under pre-Project baseline conditions. While permanent agricultural land loss is anticipated to affect less than 2% of the land and resource use LAA, a large portion of the LAA is water or non-agricultural land use and is not capable for agricultural land use and not relevant to agriculture. Approximately 24% of the LMOC portion of the LAA will be affected by this land loss, which will result in a measurable and important change to agricultural land use and production in the area of the LMOC. At the level of individual farming operations affected by the presence of the LMOC, effects are anticipated to be substantive and generally of high magnitude. However, it is

anticipated that these effects will be offset by payments made to landowners under the expropriation process.

Effects on agricultural land use around the Lake St. Martin portion of the LAA are expected to be positive, as a result of decreased lake levels and flood levels due to the Project.

Effects will be long-term in duration because they will persist throughout operations. Some effects have a moderate to high sensitivity to timing of construction activities. Generally, construction in the winter season is beneficial to agricultural activities because there is a lower potential for conflict due to decreased intensity and frequency of agricultural activities during this season.

Effects will generally be limited to the LAA, except for the potential for conflict with agricultural activities to extend in to the RAA in the vicinity of the LMOC where farm operations split by the presence of the channel have fields outside of the LAA. If this situation occurs, it is expected to be limited, will be offset at the individual farm operation level by payments made through the expropriation process, and not of relevance at the scale of the RAA.

Effects will generally be considered regular/continuous in nature and will be irreversible because there are no plans to decommission the Project.

The social context of the effects to agricultural land use are considered resilient at the scale of the RAA. At the individual farm operation level, landowners of farming operations affected by the presence of the LMOC would have limited resilience to adapt or recover from the change; however, payments to individual landowners made through the expropriation process are anticipated to offset effects to individual farming operations.

9.2.4.4 Change in Parks, Recreation and Tourism

Recreational land use (i.e., camping, swimming, fishing, snowmobiling, etc.) occurs throughout the land and resource use RAA. In addition, temporary Project components including quarries, borrow material areas, temporary construction camps and staging areas will potentially be located in areas of recreational land use.

Project Pathways

The assessment of change in parks, recreation and tourism focuses on one potential effect:

- change in recreation and tourism including proposed protected areas (i.e., candidate area of special interest). Issues and concerns associated with these effects are Project disturbances (e.g., due to proximity, noise, or visual intrusion, area loss); and disruption/intrusion to areas, recreation and tourism activities.

Construction

Project construction activities, including channel excavation, change in area access, the establishment of marshalling yards for the storage of materials and equipment could degrade established recreational activities. Clearing and excavation of the channel and other Project activities can lead to the loss of land that could potentially be available for future protection along the LSMOC (i.e., proposed protected areas [candidate areas of special interest]).

Outlet channel construction could diminish or disturb recreational activities—such as cottaging, boating, fishing, swimming and snowmobiling—in the LAA. Channel excavation for the ROW may physically interfere with recreational activities and limit the ability of recreationalists from accessing recreation areas. Nuisance effects (e.g., Project-related noise, dust and reduced visual quality) may also affect the experience of recreationalists and cottage owners on Watchorn Bay. Individuals who access the LAA for recreation may be indirectly affected by construction activities through nuisance effects (i.e., noise, emissions, light).

During construction there is potential for interference with recreational fishing in waterbodies connected by the PDA. Construction of the channel inlets and outlets may affect fish species. Impacts to fish and fish habitat is discussed in Chapter 7 related to aquatic environment. This effect is also addressed under change in resource use (Section 9.1.4.5). During construction of the outlet channels and in-water works, the inlet and outlet areas to Lake Manitoba, Lake St. Martin, and Lake Winnipeg may be isolated and unavailable for sportfishing and recreational boating.

Changes to recreational attributes within the LAA could adversely affect the recreational experience of visitors. Businesses reliant on visitor experience for their revenues, such as guide-outfitters, could also be affected.

Lake Manitoba and Lake Winnipeg are considered navigable waterways under the *Navigation Protection Act* (NPA). Navigation on other permanent non-scheduled waterbody crossings where navigation is possible (e.g., by canoe/kayak) is also protected under the NPA. Other waterbodies in the RAA such as Watchorn Creek and Birch Creek would be considered non-navigable as they are small and are primarily drainage ditches.

Temporary construction areas and associated works and activities (e.g., temporary construction camps, staging areas, quarries) are required and have potential to affect recreational use activities, depending on location. Their footprint and area of land required (ha) has not been determined at this time. It is anticipated that these areas and associated works and activities will be located on disturbed land (see Chapter 3).

Construction of a new distribution line as part of the LSMOC would have its own disturbance and nuisance effects related to noise associated with it. The route of the distribution line is expected to cross provincial Crown land in unorganized territory. A third party, Manitoba Hydro, will construct the distribution line for the Project.

Operation and Maintenance

During operation and maintenance of the outlet channels, the inlet and outlet areas to Lake Manitoba, Lake St. Martin, and Lake Winnipeg for sportfishing and recreational boating in proximity to the Project would be affected by the ongoing presence of the in-water components and would be unavailable for recreation activities.

There is potential for visual quality concerns for recreational features along the PDA, such as swimming beaches. KPIs conducted with stakeholders during the IPEP indicated concern about the outlet channels and potential property damage and change to access along the channel ROW by recreational vehicle users, such as snowmobiles operating in the area. Once constructed, the LMOC and LSMOC may form barriers to some recreational activities and degrade recreation sites. Outlet channel operation and maintenance could also have an effect on a proposed protected area (i.e., candidate Area of Special Interest) through vegetation maintenance along the LSM channel ROW.

The ROW is not meant to be accessible to public automobile traffic or for use as a recreational trail for snowmobiles and ATVs. Manitoba Infrastructure will post warning signs to prohibit the unauthorized use of outlet channel ROWs for recreational purposes due to safety concerns.

Mitigation

Routing of the outlet channels included the consideration of recreation and tourism. No lodges, campgrounds, resorts or cottages are traversed by the LMOC or LSMOC alignments. The following mitigation address potential Project effects on parks, recreation and tourism:

- Manitoba Infrastructure will provide Project development information on their website.
- All plant and equipment supplied for use on the Project will be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- Channel excavation will be limited to defined rights-of-way and associated access routes.
- Existing roads, road allowances, trails, portages and other travel ways will not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users.
- Access routes not required for on-going maintenance will be leveled to natural or pre-existing grade and slope as part of decommissioning.
- Where seeding is not required, temporary site locations will be left in a manner which promotes natural re-vegetation of the site.
- In cases where seeding is required, and when conditions permit, it will commence immediately upon completion of grading, capping and trimming operations.
- Manitoba Infrastructure will implement an access management plan, which may include control measures such as gating approaches to Project access roads to restrict public access to the PDA.
- Recreation will not be allowed along the outlet channels through the life of the Project; Manitoba

Infrastructure will install warning signs indicating no authorized personnel where required.

- Transport Canada (TC) *Navigation Protection Act* approval(s) will be required for the construction of permanent or temporary waterbody crossings and/or other in-water structures. All conditions specified in the permit and other directives will apply to the work.
- Notices to boaters, involving the posting of signage (i.e., danger, do not trespass warnings) will be implemented to communicate with boaters that the channels are not to be used for navigation.

Project Residual Effects

Construction

Existing protected areas or ecological reserves are not anticipated to be affected from construction of the outlet channels because these were avoided through routing (see Chapter 2). Areas avoided include existing and proposed ecological reserves, legally protected WMAs, and First Nation Reserves. Outlet channel routing also considered proximity to campgrounds, picnic areas and recreational sites, lodges, resorts, cottages and recreation sites/trails.

One provincial park, Watchorn Provincial Park is located near the LMOC inlet at Watchorn Bay. The final outlet channel routes do not traverse a WMA, and none are located in proximity to the routes. No effects on WMAs are anticipated from the Project. The LMOC crosses through one conservation district (West Interlake) and does not directly affect any municipal conservation lands.

The final route for the LSMOC does not cross any designated parcels of Crown land in unorganized territory between Lake St. Martin and Lake Winnipeg. Other Crown land and Crown-leased lands are crossed by the LMOC, as described in Section 9.2.4.2. No existing or proposed protected areas/ASIs are traversed by the LMOC. One candidate protected area (ASI) located along Sturgeon Bay is crossed by the LSMOC, encompassing approximately 418 ha (see Appendix 9A, Figure 9.2A-4). ASIs are selected to represent enduring features found within an ecoregion that still need to be captured in Manitoba's protected areas network. No issues were identified by Parks and Regional Services staff regarding the proposed outlet channels during the IPEP. Neither of the LMOC or LSMOC PDAs cross First Nation Reserves or within 1 km of the PDAs.

There are no designated lands or protected areas along the proposed realignment of PR 239 or along the proposed ROW for the new distribution line.

During the construction phase, the presence of workers and equipment in the LAA will generate noise, dust and a visual presence. This may detract from the recreational experience causing tourists and recreational users to reduce or stop their use of areas near Project work sites during periods of construction activity. All plant and equipment supplied for use on the Project will be effectively sound-reduced by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds. Existing roads, road allowances, trails, portages and other travel ways will not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with recreational users. Access to some

areas will be restricted at certain times by the nature of the work undertaken or for safety reasons (e.g., during blasting).

Lake Manitoba and Lake Winnipeg are “Scheduled Waters” under the NPA. The area of Lake Manitoba affected by the LMOC PDA is 37 ha (1.4%) while the area of Lake Winnipeg affected by the LSMOC PDA is 52 ha (0.1%). Transport Canada (TC) Navigation Protection Approval(s) may be required for the construction of permanent or temporary waterbody crossings and/or other in-water structures. Manitoba Infrastructure will obtain these permits, as required.

Recreational activities such as fishing and hunting may be disturbed during construction, but this disruption is expected to be temporary and short term. Increased access can lead to an increase in fish harvest from waterbodies outlet channel ingress and egress locations resulting in greater pressure on the resource. Given the size of the workforce involved in construction, potential adverse effects can result at the intersected waterbodies (i.e., Lakes Manitoba, Lake St. Martin and Lake Winnipeg).

Recreation users in the LAA may experience changes in access during construction of the outlet channels and the realignment of PR 239, including delays and detours. This would include access for recreational organizations, lodge operators and clientele, and to lands used for consumptive and non-consumptive recreation. As mitigation, existing roads, road allowances, trails, portages and other travel ways will not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with recreational users.

There are no parks or recreational areas along the proposed realignment of PR 239; however, one recreational snowmobile trail will be affected by the realignment.

The Project will not overlap with or effect access to existing parks and protected areas, therefore, the Project may only have temporary nuisance effects to these areas. Given the low number of designated lands and protected areas that will be affected by the proposed outlet channels ROWs, Project disturbance of designated lands and protected areas is predicted to be of low magnitude.

A new distribution line will cross provincial Crown land in unorganized territory. Construction of a new distribution line as part of the LSMOC would have its own potential to affect recreational use through degradation of recreational lands. Manitoba Hydro will be responsible for constructing the distribution line for the Project. Power is also expected to be provided to a LMOC water control structure from a very short tap from nearby lines. There are no recreational sites along the new distribution line ROW.

The footprint and area of land required (ha) for temporary construction areas and associated works and activities (e.g., temporary construction camps, staging areas, quarries) has not been determined at this time. These works will necessitate the use of land for the period of construction and Project-related effects are potentially adverse.

With the adoption of mitigation measures presented above, the Project will be constructed to limit possible disturbance and disruption to recreational uses and users. In consideration of mitigation

measures, the Project will have a low disturbance effect on recreational users and activities. Disturbance or disruption will be temporary and short term during the construction period.

Summary of Construction Residual Effects on Parks, Recreation and Tourism

Following the implementation of mitigation measures described above, residual effects for change in parks, recreation and tourism during construction are characterized, as follows:

- direction is adverse because there will be a change in area for parks, recreation and tourism
- duration is short-term because the period is for construction (2.5 to 3 years), including for temporary staging areas, camps, and access
- magnitude for parks, recreation and tourism, including designated land and protected areas is low related to loss and access for recreational use, with a small effect on designated lands and protected areas because there is one candidate protected areas affected along the proposed PDA (i.e., Sturgeon Bay ASI)
- timing related to construction effects on parks, recreation and tourism is of moderate to high sensitivity for some effects as the extent would vary; generally, construction in the winter season would have less effect on recreational activities as there would likely be less visitors to parks and recreation areas during this season
- residual effects extend to the PDA and LAA
- frequency of effects will be infrequent over the construction phase
- effects are reversible (short-term) once construction is completed
- socio-economic context is dependent upon location within the PDA and is resilient for parks, recreation and tourism because they can accommodate some change in the land base

Operation and Maintenance

Project operation and maintenance has the potential to affect recreational users through permanent changes in visual quality.

Project operation is not expected to interfere with recreational use of Watchorn Provincial Recreation Park. Project effects on recreation areas are predicted to be of low magnitude, restricted to part of the PDA and of medium-term duration.

During Project operation and maintenance, potential interactions with recreational use/activities will be limited, except from the presence and visibility of the outlet channels. The potential for interaction with recreational use relates to effects on visual quality from the channel's presence. In most cases, the channels will only be visible when one is right beside them. Visual quality within the LAA is not expected

to change overall with the Project. The outlet channels are potentially adverse for some recreational users (e.g., snowmobilers), as expressed by stakeholders related to restrictions of access created. The final outlet channel routes avoids recreational parks and sites (with the exception of nearby Watchorn Provincial Park and recreational snowmobile trails). There are no cottages near the channels, therefore, it is predicted that visual quality of cottage users will not be affected. Potential interactions from operation and maintenance activities consist of the physical presence of the outlet channels potentially affecting visual experience and use of the access road dikes for recreational activities (e.g., snowmobiling). The effects are long-term in duration.

The potential effects on sport fishing on connected waterbodies as a result of operation of the outlet channels will only occur when the channels are in operation (water control structure gates are open) and are long-term in duration. Restrictions (e.g., signage) will be implemented to prohibit access to the channels for fishing. Access to other water bodies in the RAA will not be increased as a result of the Project.

Temporary construction areas will be reclaimed following construction, so no effects will continue during operation and maintenance. Similarly, it is anticipated that aggregate/quarries developed for the Project will be reclaimed if required.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure. The new distribution line's disturbance effects related to change in aesthetics will also be permanent and will be subject to routine operation and maintenance activities as conducted by Manitoba Hydro. Effects on recreation and tourism will be long-term, regular continuous for presence of the infrastructure, and irreversible for land loss. Over the long term, the road realignment could beneficially affect tourism travel by improving the road connection to destinations (e.g., Steep Rock) and will extend beyond the LAA.

Some removal of proposed protected area lands (Sturgeon Bay ASI [candidate protected area]) will occur along the LSMOC, encompassing approximately 418 ha and will be lost for the operation and maintenance period. As noted previously, Manitoba Infrastructure will be required to engage with Manitoba's Protected Areas Initiative with respect to the potential effects of the Project on this candidate site.

Summary of Operation and Maintenance of Residual Effects on Parks, Recreation and Tourism

Following the implementation of mitigation measures described above, residual effects for change in parks, recreation and tourism during Project operation and maintenance are characterized, as follows:

- direction is adverse because there will be a change in area for parks and recreation (Sturgeon Bay ASI) and potentially positive for tourism travel with PR 239 realignment
- duration is medium-term (for snowmobile use of along channel dikes) because effects may persist until completion of construction and rehabilitation activities and long-term (changes to sport fishing, boating) as effects may persist for >5 years

- magnitude is anticipated to be low (due to presence of the channels)
- timing is of moderate to high sensitivity for some effects because the extent would vary; generally, operation and maintenance in the summer season would have greater effect on recreational activities as there would likely be more visitors to parks and recreation areas during this season
- residual effects extend to the LAA
- frequency of effects will be regular continuous related to presence of the channel and associated infrastructure
- effects are irreversible related to recreational land loss
- socio-economic context is dependent upon location within the PDA and is resilient for parks, recreation and tourism because there are numerous recreational opportunities available across the landscape and as such the area is likely adaptable to some change in recreational land use (e.g., alteration of snowmobile trails).

9.2.4.5 Change in Resource Use

Resource use in the LAA consists of hunting, trapping, commercial fishing, mining/aggregates, forestry, and groundwater/surface water use. Temporary Project components including quarries, borrow material areas, temporary construction camps and staging areas will potentially be located in areas of resource use.

Temporary construction areas and associated works and activities (e.g., temporary construction camps, staging areas, quarries) are required and have potential to affect resource use, depending on location. Their footprint and area of land required (ha) has not been determined at this time. It is anticipated that these areas and associated works and activities will be located on disturbed land (see Chapter 3).

Construction of a new distribution line as part of the LSMOC would have its own disturbance and nuisance effects associated with it. The route of the distribution line is expected to cross provincial Crown land in unorganized territory. A third party, Manitoba Hydro, will construct the distribution line for the Project.

Project Pathways

Construction

Hunting, Trapping and Fishing

The assessment of change in hunting, trapping and commercial fishing focuses on reduction in or degradation of hunting, trapping and commercial fishing activities (e.g., area affected, harvesting success) and potential damage to equipment (e.g., hunting shacks, traps) from restrictions to access, that could result from the Project. Potential Project pathways for affecting hunting and trapping include areas

lost due to construction of the channel ROWs and marshalling yards, direct disturbance of hunting, trapping and commercial fishing activities due to Project-related construction activity.

There is potential for hunting and trapping activities to be adversely affected from temporary nuisances (e.g., noise, traffic), permanent degradation and restriction of access, and activity-related sensory disturbances during construction that could temporarily and permanently displace some wildlife and movement patterns (see Section 8.3). There may be related disturbances and reduction in harvesting success due to degradation and sensory disturbance due to increased access and workers in the area affecting the presence of consumptive species. This could result in a reduction of hunting and trapping success rates through disruption to mammals and furbearers. The Project could create undesired access to wildlife resources. MSD representatives indicated that access to hunted species (e.g., moose) may be more easily facilitated, especially late in the season with snowmobiles. Increased access for hunters/trappers, particularly along the LSMOC ROW (i.e., channel sides) is a primary pathway for indirect change to mortality risk for wildlife (see Chapter 8).

During construction activities, terrestrial furbearers may leave an area because of sensory and habitat disturbance, which could result in a temporary decline in trapping productivity. However, animals could be expected to normally return to an area after construction is completed and disturbances have ceased. The presence of the channels could result in negative local effects on some wildlife populations in moving from one area to another that may lead potentially to overharvesting in a particular area. Section 8.3 provides a detailed assessment of potential wildlife and wildlife habitat effects and description of mitigation measures.

The creation of new channel outlets related to construction could result in a restriction in hunter/outfitter access. The restriction of access may deter hunters/outfitter from utilizing areas in the vicinity of the Project. Access along the channel ROWs during construction could lead to incidents of vandalism with respect to, for example, trapping equipment.

There is some potential for an interaction or effect from noise and vibration due to construction related activities and from excavation of the channels and creation of new access to the channels and PR 239 realignment. Potential receptors sensitive to noise, vibration and dust include resource users (i.e., hunters, trappers, outfitters) because game may be disturbed, or the hunting experience comprised. Noise sources within the PDA are anticipated to be typical of construction activities in rural areas and will include some temporary noise disturbances (e.g., movement of equipment, excavated materials). Potential effects include disturbance and annoyance to resource users because of heavy equipment operated nearby. The Project will result in a change in access to resource use areas along the PDA.

The realignment of PR 239 has the potential to result in access restrictions for the period of construction and degradation to a hunting shack. Resource users may experience change to access during construction of the road realignment, including longer traveling distance to businesses by owners and clientele (e.g., outfitters) and loss of access to a hunting shack.

The presence of workers could result in an increase in competition for species harvested by commercial fishers and anglers within the LAA on Lake Manitoba, Lake St. Martin and Lake Winnipeg.

Minerals and Aggregate

The assessment of change in minerals and aggregate focuses on change in mineral/aggregate extraction that could result from the Project. Issues and concerns associated with these effects consist of permanent disruption of the resource through area loss during construction and disturbance/interference with resource extraction operations; and disruption to access related to channel presence.

Potential pathways for affecting mining/aggregate operation includes area lost due to construction of the channel ROWs and marshalling yards, disturbance and interference with resource extraction activities due to channel ROW proximity and issues related to restricted accessibility along the channel ROWs during operation and maintenance. Access along the channel ROW could also affect quarrying operations due to temporary disturbance activities.

Forestry

The assessment of change in forest areas focuses on two potential effects: effects on productive (commercial) forestland and effects on high value forest sites. Issues and concerns associated with these effects include the removal of productive forestland from the land base (i.e., reduction in potential SHL) and reduction in areas of high value forest sites (e.g., plantations, research and monitoring sites, woodlots and private forestland). The assessment of environmental effects on productive forestland and high value forest sites is based on the potential loss and removal of timber volumes and reduction in forested areas due to channel ROW excavation during Project construction.

Effects can include loss to productive areas and damage to timber sale and personal use areas and high value forest sites (i.e., permanent sample plots, tree improvement sites). The construction of the outlet channels will remove productive forestland within the PDA. Site access to the channel ROW also has the potential for affecting productive forestland and high value forest sites.

The reduction in productive forestland from the commercial forest area will affect the determination of sustainable harvest levels. When MSD updates the Forestry Resource Inventory (FRI)/Forest Land Inventory (FLI) for a major land withdrawal or large area depletion resulting from a natural disaster, the Sustainable Harvest Level (SHL) is recalculated. The FRI/FLI for FMUs 41, 42 43, and 45 was last updated in 2016 by MSD. When the SHL is recalculated the loss of productive forestland resulting from the construction of the outlet channels will form a portion of the resulting reduction in sustainable harvest levels. Construction will affect past personal timber permit areas within the PDA through the reduction in area.

The realignment of PR 239 is anticipated to involve access restrictions for the period of construction. Resource harvesters may experience change to access during construction of the road realignment, including longer traveling distance to businesses by owners (e.g., quota holders).

Groundwater and Surface Water Use

The assessment of change in groundwater use focuses on change in quantity and quality that may arise from interaction with the Project. Issues and concerns associated with this effect include changes in flowing and high-water level wells, and groundwater well and surface water areas.

Potential pathways for affecting groundwater use includes reduction in groundwater quantity (levels) from dewatering of the aquifer during construction that could lower pressure and effect flowing wells and wells in the area of the LMOC (3 km to 5 km on each side; see Chapter 6 (Section 6.4.4.2)). The risk to groundwater quality at the proposed LMOC is very low due to high artesian pressure maintaining any flow in the direction from groundwater to surface water (see Chapter 6 (Section 6.4.4.3).

At the LSMOC, bedrock surface is shallow at the proposed location of the most upstream drop structure, to a point that the carbonate aquifer might be exposed (Figure 6.4 7). Hydraulic head at this location is at higher elevation than the channel invert. Consequently, artesian pressure will be relieved at this location, locally depressurizing the carbonate aquifer. The depressurization zone of influence will expand over a limited distance (1 km), centered on the artificially created groundwater discharge. Based on hydrogeological conditions, springs are likely present in that general area. Provided that depressurization is expanding to the point of reaching a spring originating from the carbonate aquifer, the flow of this spring could decrease; the closer is the spring, the greater the flow could decrease. The nearest groundwater wells are 5 km away along the Dauphin River and would not be affected by during construction.

The excavation depth of the LMOC will range from approximately 6 m to 12 m below the surface. The LSMOC channel depth will be variable due to the change in elevation and numerous drop structures along its length. Groundwater dewatering during excavation has the potential to disturb groundwater quantity through the depressurization of aquifers in artesian areas of flowing and high-water wells (see Appendix 9A, Figure 9.2A-18) which has the potential for a drop in the aquifer pressure. In the unlikely event of a noticeable drop in groundwater pressures, local groundwater users could be affected. More discussion on change in groundwater flows and levels is provided in Chapter 6 (Section 6.4.4.2). Outlet channel construction does not traverse areas of saline flowing well conditions and therefore the release of saline groundwater through unintended discharge of aquifers in artesian conditions is not expected. Accidents and malfunctions related to spills into groundwater are discussed in Chapter 14.

The realignment of PR 239 has the potential to interact with groundwater wells if the route intersects with the location of wells. The construction of the road will not affect the aquifer and groundwater usage in the area.

Operation and Maintenance

Hunting and Trapping

The creation of new channel outlets related to operation and maintenance could result in a change in hunter/outfitter access. The restriction of access may deter hunters/outfitter from utilizing hunting areas and a hunting shack in the vicinity of the Project.

The presence of the outlet channel ROWs may also result in a change in hunting opportunities in designated hunting areas, resulting in an adverse effect to hunting activity. Potential effects from Project presence could also affect a resource user's quality of experience on the landscape.

Mining and Aggregates

During the operation and maintenance phase, there is no potential for interference with current or future planned facility operations and the ability to develop mineral areas (e.g., quarry or aggregate deposits) for future commercial extraction from presence of the outlet channels.

The realignment of PR 239 is anticipated to involve access restrictions for the period of construction. Resource users may experience changes to access during construction of the road realignment, including longer traveling distance to businesses by owners (e.g., quarry/aggregate operations). Additional access along the channel ROW or from other access points will not be created that could result in increased mineral development activity.

Forestry

Previously cleared forest sections in the PDA will remain cleared and unavailable for commercial forestry throughout Project operation and maintenance. Past personal permit areas will be affected for the duration of the Project from the presence of the LMOC.

Groundwater and Surface Water Use

In general, groundwater and surface water use, quality and quantity will not be affected under normal conditions of operation of the Project. The nearest groundwater wells are 5 km away along the Dauphin River and would not be affected by the Project during operation and maintenance.

The operation of the road will not affect the aquifer and groundwater usage in the area.

Mitigation

Mitigation measures of potential Project effects on resource use (i.e., hunting, trapping, commercial fishing, mining/aggregates, forestry, and groundwater and surface water use) include the following:

Resource Users

- Manitoba Infrastructure will provide information on Project developments via the Project website.
- Manitoba Infrastructure will communicate the schedule of Project activities throughout the construction and operation phases to affected local resource users and MSD Regional representatives.
- Signage will be implemented in the PDA to alert local resource users of Project construction activities and the presence of Project facilities.

Hunting and Trapping

- Employees, workers and other staff will not hunt, trap or harass wildlife on the construction sites.
- No person will remove, disturb, spring or in any way interfere with any trap set out lawfully by any other person for the purpose of taking furbearing animals.
- Manitoba Infrastructure will restrict unauthorized access to the outlet channels during operation.
- Manitoba Infrastructure will install warning signs indicating no authorized personnel where required along ROWs.

Commercial Fishing

- Manitoba Infrastructure will engage with commercial fish harvesters, anglers and MSD Regional representatives to address potential conflict, disturbance, or access restrictions to fishing/harvesting areas in the PDA and LAA, and availability of fish resources.
- South of 53rd parallel, the contractor will not undertake any in-water activities in fish bearing waters or potentially fish bearing waters between September 15 and June 30 of the following year, during periods of high stream flow or identified spawning periods, unless otherwise authorized by Fisheries and Oceans Canada and MSD.
- Manitoba Infrastructure will develop and implement a Water Management Plan to manage surface water management activities to minimize impacts to the environment (e.g., fisheries) and people.

Mining and Aggregates

- The Contractor shall comply with all legislations, licenses, authorizations and permits respecting the Project and quarries.
- Quarries shall be developed in accordance with the site plan submitted to the Engineer prior to the beginning of construction and, where applicable, the immediate quarry area plan provided to MSD as part of the work permit.
- Quarry operations shall not encroach within 15 m of any property boundary adjoining, private, municipal, or Crown leased land.
- The contractor may be subject to operational restrictions if in close proximity to sensitive receptors, including but not limited to wildlife, fish, residences or communities as stipulated in applicable permits or by the Engineer.

A Quarry Management Plan will be developed in accordance with all applicable permits, Legislation and Regulations and as approved by the Engineer.

Forestry

- Unless otherwise authorized by the Engineer, all brush and trees, except those designated to be saved shall be cut level with the ground. All surface debris, excluding merchantable timber but including fallen timber, slash limbs, brush, grass and weeds will be disposed of in an appropriate manner.
- There will be no bulldozing of trees or woody debris into standing timber.
- Timber from which forest products can be manufactured (merchantable timber) will be cleared of limbs and neatly stockpiled piled within the work limits as directed or permitted by the Engineer.
- All stockpiled material located on Crown land will be removed or disposed of by April 30 following clearing activities, where applicable.
- Locations of past personal permit areas (timber) will be identified in the Environmental Protection Plan(s) (EPPs) to prevent damage from construction activities (e.g., errant construction equipment).
- Loss of Crown productive forestland (if present) from channel clearing will require compensation to be paid by Manitoba Infrastructure to MSD Forestry and Peatlands Management Branch based on the forest damage appraisal and valuation (FDAV) policy:
  - MSD's FDAV policy identifies the parameters for the calculation of financial compensation, due to the Crown, or the removal of timber and the effect on high value silvicultural investments on productive Crown forestlands
  - MSD Forestry and Peatlands Management Branch assesses a Timber Damage Appraisal Assessment for the merchantable timber found within a project area
  - the appraisal takes into account the area of disturbance and the associated cost to re-establish the timber; the timber volumes and dues, the forest renewal charge and fire protection charges (MSD 2017b)

Groundwater and Surface Water

- A qualified drilling contractor with appropriate experience will be present for work in areas underlain by artesian aquifers (i.e., flowing and high-water well areas).
- Construction dewatering will be limited through appropriate construction planning and will be in accordance with terms and approval conditions of *The Groundwater and Water Well Act* and *The Water Rights Act.*
- Monitoring of groundwater levels in drill holes will be conducted during drilling and channel excavation.
- Drill holes will be sealed as soon as possible in the case of a groundwater level rise.
- Precautions will be taken where there is potential for mixing surface and groundwater to prevent

interconnection of these waters.

- Existing water wells within the PDA will be plugged and decommissioned to prevent groundwater contamination.
- Protection measures will be in place for sealing/grouting and pumping out drill holes in artesian well areas to prevent groundwater contamination as part of the Groundwater Management Plan (Section 3.7).
- Follow-up inspections of drill holes, foundations, and excavated channels will be conducted to monitor for excess water leakage; monitoring will be incorporated into Operation and Maintenance Manuals for susceptible areas.
- Should situations arise where a decrease in water pressure occurs in domestic wells to noticeable levels (in comparison to the natural variability) or in livestock wells to unusable levels (for flowing wells) as a result of Project activities, appropriate measures to mitigate the resultant drop in water pressure will be implemented to ensure that potable water is available (i.e., providing landowners with new wells, pumps or temporary water supply for livestock during construction) as per the Groundwater Management Plan.
- Groundwater seepage can be mitigated by allowing seepage to either infiltrate back into the subsurface, or flow back into waterbodies via the surface drainage pathway (the channel) via provincial permit based on water quality testing.
- Manitoba Infrastructure will develop a Surface Water Management Plan to manage temporary diversions of surface water (including, but not limited to ditches and drains), management of water resulting from precipitation events (e.g., winter snow accumulation in excavated channel or heavy rainfall event), and management of natural watershed flows during construction. Measures identified in the plan shall minimize impacts to the environment (e.g., fisheries) and people (e.g., consideration given to avoid localized flooding due to surface water management activities.
- Manitoba Infrastructure will develop a Groundwater Management Plan to avoid or minimize adverse effects on groundwater quality and quantity in the PDA, manage groundwater brought to the surface from depressurization activities, and to prevent groundwater impacts to local well users. It will identify adaptive measures to take in the event that the outlined monitoring reveals the need for additional steps.

Access

- The contractor will restore access roads not required for on-going maintenance to their original condition.
- Channel excavation will be limited to defined rights-of-way and associated access routes.
- Existing roads, road allowances, trails, portages and other travel ways will not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users.

- Access routes (i.e., short approaches to the ROW) not required for on-going maintenance will be leveled to natural or pre-existing grade and slope as part of decommissioning.
- Manitoba Infrastructure will implement an access management plan, which will include control measures such as gating approaches to Project access roads to restrict public access to the PDA.

Project Residual Effects

Construction

Hunting and Trapping

Project construction will span 33 separate hunting seasons between the fall of 2020 and spring/summer 2023: six seasons each for elk, deer, and migratory birds, five seasons for black bear, and three seasons for wolf, coyote, grouse, and gray partridge (MSD 2018a). MSD has noted that elk along the LMOC portion of the LAA may be particularly susceptible to an adverse interaction with the Project due to the construction of the outlet channels. Elk and other wildlife may be reluctant to cross the PDA due to construction noise and activity. An effect on outfitting would only occur if construction occurred in the period when elk hunting is active (i.e., late August to mid-September [MSD 2018]). The effect on outfitting operations related to access during construction in the PDA will be low magnitude, infrequent (with indirect effects related to nuisance being regular continuous), and short-to medium-term in duration. Chapter 8, Section 8.3 contains further discussion on wildlife game species affected.

The Project's construction phase will also span three trapping seasons in Open Trapping Area Zone 3 and the Gypsumville RTL, excluding black bear in all zones and wolverine in Open Trapping Zone Area 3 (MSD 2018b). MSD has noted that marten along the LSMOC LAA may also be particularly susceptible to an adverse interaction with the Project due to the construction of the outlet channels, which may act as a barrier impeding dispersal. During construction, noise and activity is anticipated to deter furbearer movement across both channels (Chapter 8, Section 8.1.1.19).

Big game hunting areas crossed by the outlet channel routes include GHAs 21 and 25. The Project crosses a game bird hunting zone GBHZ 3. The LMOC PDA crosses land owned by the Moosehorn Duck Club Inc. There are no operating lodges located in immediate proximity to the outlet channels. The closest outfitter lodge, operated by Einarsson's Guide Service, is located on the west side of Lake St. Martin, approximately 6.4 km west of the LSMOC. The proposed distribution line for the Project will be located within GHA 21 and OTA Zone 3, encompassing a small portion of the LAA. As a mitigation measure, employees, workers and other staff will not be allowed to hunt or harass wildlife on construction sites or during working hours.

Project construction activities (e.g., access, channel excavation) may result in temporary sensory disturbance (e.g., construction noise) and nuisance effects (*e.g.,* traffic) displacing big game and reducing the hunting success rates in proximity to the outlet channels. The restriction in access to resources could also affect the experience qualities of hunters using a particular area.

Resource users in the LAA may experience changes in access during construction of the outlet channels, the realignment of PR 239, including delays and detours. This would include access for lodge operators and clientele, and to lands used for consumptive and harvesting (i.e., hunting and trapping). Access to a hunting shack along the PR 239 realignment would also be affected.

A new distribution line will cross provincial Crown land in unorganized territory. Construction of the new distribution line as part of the LSMOC would have its own disturbance and nuisance (noise) effects associated with it. Manitoba Hydro will be responsible for constructing the distribution line for the Project. Power is also expected to be provided to a LMOC water control structure via a very short tap from nearby lines.

The Project will pass through parts of the LAA that are used by established commercial outfitting operations. No lodges or camps are located within the PDA, but two are in the LAA and ten in the RAA. One hunting shack is also located in the LAA.

The outlet channel routes cross a portion of OTA Zone 3 and the Gypsumville RTL. Construction activities may temporarily displace wildlife from areas in proximity to the outlet channels due to sensory disturbance (e.g., construction noise) and disrupt trapping activity. During the IPEP, comments were received from the public related to a concern that construction could disrupt furbearing animals and affect trapping. Employees, workers and other staff will not be allowed to trap or harass wildlife on construction sites or during working hours. Anticipated effects in any one area are predicted to be small, based on the overall affected area within the LAA compared to the total area available for trapping (in the open area and registered trapline area), limited to the PDA and long-term in duration.

Commercial Fishing

The temporary restriction to access to resources could also affect the harvest of commercial fishers using a waterbody.

There are three waterbodies that have been commercially fished within the Project PDA and LAA: Lake Manitoba, Lake St. Martin, and Lake Winnipeg. These lakes were commercially fished in 2017 (based on available baseline data records). Lake Manitoba has been commercially harvested on an annual basis since 1997. Commercial fish species harvested in Lake St. Martin are harvested during a winter fishery and spring fishery. Commercial fish species harvested in Lake Winnipeg are harvested as part of a summer/fall fishery and a winter fishery (see Chapter 7). Commercial fisheries may be affected by Project construction.

Access to these commercial fish lakes will be negligibly affected by the Project. The physical area removed (temporarily) from fish harvesting (i.e., the inlet and outlet areas) will be negligible in proportion to the overall sizes of Lake Manitoba (1.4%), Lake St. Martin (0.2%), and Lake Winnipeg (0.1%). Predicted residual effects from the Project on fish habitat in Lake Manitoba, Lake St. Martin and Lake Winnipeg are predicted to be negligible in magnitude (see Chapter 7). As such, the residual effect is considered low due to small area for commercial fisheries affected, limited to the LAA, medium-term in duration, infrequent, and reversible (short-term).

The presence of a construction workforce could lead to increased competition for fish resources that are of interest to commercial fishers in the LAA. Existing access is already available to commercial fishing lakes. The residual effect is expected to be low, given the small area of commercial fishing lakes affected.

Minerals and Aggregate

Project construction has the potential to disturb or interfere with quarrying/aggregate activities in the LAA by damaging areas and potentially disrupting current/future operations/extraction activities. The Project has considered potential effects on mineral and peat mineral interests.

The Project is not expected to disturb or disrupt various existing mineral extraction operations within the PDA, including quarry leases, casual quarry permits, private quarry permits, quarry withdrawal areas, peat mine and other mining areas (e.g., aggregate deposits) of varying potential economic quality, some of which are associated with existing sand and gravel pits. An aggregate deposit of medium potential will be intersected by the LMOC PDA along the southern shore of Lake St. Martin (Rural Municipality of Grahamdale 2006). One other aggregate deposit will be intersected by the LSMOC PDA, along the shore of Sturgeon Bay on Lake Winnipeg. The aggregate potential of the deposit is unknown (Manitoba Energy and Mines 1988b).

There are no aggregate deposits along the PDA for the LSMOC of suitable development potential, although there is one aggregate deposit of unknown potential south of Lake Winnipeg (Sturgeon Bay). One medium potential aggregate deposit area was identified along the LMOC route, south of Lake St. Martin. Discussions with the RM of Grahamdale during the IPEP and KPIs identified resource depletion (i.e., aggregate resource needs for municipal road maintenance) as a potential issue. The outlet channel routes do not cross either active private sand and gravel pits in the RMs of Grahamdale, or within unorganized territory (related to the LSMOC). A new distribution line will cross provincial Crown land in unorganized territory. Construction of the new distribution line as part of the LSMOC would have its own disturbance and nuisance (noise) effects associated with it. Manitoba Hydro will be responsible for constructing the distribution line for the Project.

Power will be provided to the LMOC water control structure from a very short tap from nearby lines.

The realignment of PR 239 does not affect current mineral dispositions or mining operations, including sand and gravel pits and quarries. One area of medium aggregate potential is intersected by the road realignment at PTH 6 where the new route deviates from the existing route in the LAA.

The proposed distribution line for the LSMOC does not intersect with mineral dispositions, mining operations, or potential aggregate deposit areas.

Mining activities and dispositions in the RAA correspond to an area totaling approximately 27,042 ha. The PDAs represent approximately 7.5% of the total area of actual or potential mining activities in the RAA.

The extent to which the Project could affect existing operations relates to direct effects on mining interests through disruption and disturbance to the potential resource and area loss during construction, and

potential for interference with current or future planned operations and the ability to develop mineral areas for future commercial extraction from Project presence. Quarries/aggregate required for the Project will be developed in accordance with a quarry area site plan prior to the beginning of construction and, where applicable, provided to MSD as part of a work permit. Given the low number of mineral dispositions and aggregate deposits affected by the outlet channel routes, the effect is anticipated to be low in magnitude for the PDA. Aggregate deposit areas affected by construction activities (i.e., channel excavation) will be sporadic/intermittent for the period of construction and short term in duration. The creation of the channel ROW and associated access trails may have a detrimental effect for some related activities, such as mineral exploration, by restricting access into some areas.

Forestry

The outlet channel routes avoid a known timber supply area, peat harvest licence areas, and provincial tree improvement sites and permanent sample plots. As such, there are no anticipated on these types of forested areas. One past personal permit area is located along the LMOC PDA in the LAA (NW20-27-8W).

The proposed distribution line does not affect any of these high value forest sites.

There is one past personal permit area in the LAA for the road realignment of PR 239.

The construction phase affects a total of 201 ha of commercial forest area (productive forestland) in FMUs 41, 43, and 45 for the LMOC and LSMOC PDAs. The Project will result in the removal of 3.1% of total commercial forest area. Because the Project will affect only 3.1% of commercial forest area in the respective FMUs within the LAA, effects on the commercial forest are considered low magnitude and restricted to the PDAs. The loss of commercial forest area is a single event that will endure throughout the life of the Project due to creation of the channel ROW. This loss of productive forest area (i.e., standing timber) will only have a small effect on productive forestland, for which compensation is to be provided as a mitigation through the forest damage appraisal and valuation (FDAV) policy.

In addition to the productive forestland evaluated in the PDA, some additional clearing may be required for access development or PR 239 realignment as necessitated by channel excavation. Timber from which forest products can be manufactured (merchantable timber) will be delimbed and neatly stockpiled piled within the work limits where applicable. The specific locations of the borrow/deposition areas are currently unknown; however, they are likely to be very localized and small in area.

The construction of the Project does not affect any high value forest sites (i.e., permanent sample plots or reforestation areas) in the PDA and LAA. There is one timber supply area (TSA) within the LMOC portion of the LAA. However, channel excavation will not affect this existing TSA. As such, these represent a 0% decline within the LAA for high value forest sites and is of negligible magnitude in the PDA. Twenty-three past personal permit areas are located in the LAA for the Project, one is located in the LMOC PDA. The loss of the past personal permit area in the LMOC represents a 3% decline within the LAA. Locations of past personal permit areas (timber) will be identified in the Environmental Protection Plan(s) (EPPs) to limit damage from construction activities (e.g., errant construction equipment).

The realignment of PR 239 will affect 12.6 ha (22.6%) of productive forest in FMU 43.

The proposed distribution line for LSMOC will affect 1.0 ha (2.1%) and 26.5 ha (58.1%) of productive forest in FMUs 41 and 45. A new distribution line will cross provincial Crown land in unorganized territory. Construction of the new distribution line would have its own disturbance and nuisance (noise) effects associated with it. Manitoba Hydro will be responsible for constructing the distribution line for the Project.

Power is also expected to be provided to a LMOC water control structure from a very short tap from nearby lines.

No high value forest sites are affected by either linear feature, except for one past personal permit area along the PR 239 realignment (4.4 ha).

Groundwater and Surface Water Use

Portions of the LMOC and LSMOC will be located through areas with numerous groundwater wells as well as flowing and high-water level wells. A groundwater management plan (See Section 3.7.2) will contain measures to take to avoid or minimize adverse effects on the groundwater quality and quantity in the PDA. The Groundwater and Surface Water Management Plans will outline measures to manage groundwater which is brought to the surface as a result of depressurization activities, as well as measures to prevent groundwater impacts to local well users. It will identify adaptive measures to take in the event that the outlined monitoring reveals the need for additional steps.

One groundwater well is located in the LMOC PDA. An additional 240 wells are located in the LMOC and LSMOC LAA. Groundwater dewatering wells will be installed in the confined aquifer in the area of construction and water will be pumped out to lower the pressure in the aquifer, below the channel, during construction. For the LMOC, an “estimated drawdown of 1.5 to 3.3 m is predicted at 3 km distance from the segments of the channel being depressurized, decreasing to an estimated 0.9 to 2.7 m at 5 km distance” (Section 6.4.4.2). It was noted that the typical seasonal piezometric head variation in the aquifer in the area of the LMOC is 2.5 m to 3 m per year. In most cases at a distance greater than 3 km and in all cases at a distance greater than 5 km, the decrease in pressure (piezometric head) from Project dewatering will be within the typical season variation of pressure and would have no impact on domestic well operation (see Chapter 6, Section 6.4.4.2 Changes in Local Groundwater Flows, Levels and Quality for further details). Should situations arise where a decrease in water pressure in domestic wells to noticeable levels or livestock wells to unusable levels result from Project activities, appropriate measures to mitigate the resultant drop in water pressure will be implemented to ensure that potable water is available (i.e., providing landowners with new wells, pumps or temporary water supply for livestock during construction) as per the Groundwater Management Plan.

Flowing wells and high-water level wells in the PDA and LAA are concentrated along the LMOC and significantly less so along the LSMOC (see Appendix 9A, Figure 9.2-18). The flowing and high-water level well areas most prevalent along the LMOC have a water level that ranges from between ground surface and 3 m ags, encompassing some 494 ha or 74% of the total for all flowing and high water level well areas within the LMOC PDA. Only one flowing and high-water level well area is located in the LSMOC

PDA, encompassing 22 ha (between ground surface and 3 m bgs). Proposed mitigation measures are:

- monitoring of groundwater levels in drill holes during drilling and channel excavation
- sealing of drill holes as soon as possible in the case of a groundwater level rise
- taking precautions where there is potential for mixing surface and groundwater to prevent interconnection of these waters
- plugging and decommissioning existing water wells within the PDA to prevent groundwater contamination

There are 16 wells in the LAA for the realignment of PR 239; no groundwater wells are along the proposed route for the road. Twelve flowing and high-water level well areas are located along the PR 239 realignment. Proposed mitigation measures as described above will serve to address potential for effects on groundwater. There is one groundwater well located in the vicinity of the distribution line ROW and one flowing and high-water level well area; however, both are outside the LAA.

The new distribution line will cross provincial Crown land in unorganized territory. Manitoba Hydro will be responsible for constructing the distribution line for the Project.

Power is expected to be provided to a LMOC water control structure from a very short tap from nearby lines. No Project effects on groundwater are anticipated.

There will be potential for adverse residual effects on groundwater use during the construction phase of the Project through groundwater release to the surface as pressure change (piezometric head) will be greater than the natural variability. With the implementation of the standard mitigation measures described above, the residual effect is expected to be moderate in magnitude, short-term in duration, limited to the LAA, infrequent, and reversible once construction is complete.

Summary of Construction Residual Effects on Resource Use

Following the implementation of mitigation measures described above, residual effects for change in resource use during construction are characterized, as follows:

- direction is adverse because there will be a net loss in resource use area
- duration is short-term because the period is for construction (several months up to one year), including for temporary staging areas, camps, and access for hunting, trapping, and mining/aggregates, medium-term for fishing, long-term for forestry due to area or site loss, and short-term for groundwater use once construction dewatering is complete
- magnitude for hunting, trapping and commercial fishing is low (related to access, access restrictions, change in resource harvesting, including indirect nuisance effects) because physical disturbance effects on hunting (i.e., GHAs) and open trapping (i.e., OTAs and RTLs) represents approximately less than 0.1% of the total area for hunting and trapping activities, and 0.2% of commercial fishing

lakes respectively, in the RAA and the related change in the affected land and resource base represents a small area, respectively

- magnitude for mining and aggregates is low because Project disturbance effects on mining/aggregate extraction represents a small area (approx. 7.5%) of the total area for mining activities within the RAA
- magnitude for forestry is low magnitude given compensation and because loss of commercial forest area (3.1%) within affected FMUs is small in relation to the total commercial forest area, with only a small effect on productive forestland and small area reduction in past personal timber permit areas
- magnitude for groundwater and surface water use is moderate (groundwater dewatering in the LMOC)
- timing is not applicable related to construction effects on resource use (or there is no sensitivity)
- residual effects extend to the PDA and LAA
- frequency of effects will be infrequent (hunting, trapping, fishing, forestry, and groundwater), sporadic/intermittent (mining/aggregates) over the construction phase
- effects are reversible (short-term) for hunting, trapping, fishing, and mining/aggregates (excavation and access) and groundwater (construction dewatering) once construction is complete, and irreversible for forestry
- socio-economic context for the residual effects across the LAA is dependent upon location within the PDA and is resilient in nature because there are numerous opportunities to participate in hunting, trapping activities and commercial fishing throughout the RAA. Hunting, trapping commercial fishing, mining and aggregate, forestry activities can accommodate some change in the baseline conditions in the area while groundwater would be able to accommodate some change in resource base conditions compared to groundwater resources availability

Operation and Maintenance

Hunting and Trapping

With respect to the channel routes, the concern of increased access for hunting and trapping is anticipated to remain an issue in the Interlake Region of Manitoba, more so in the LSMOC area and less so in the LMOC area due to the prevalence of other access routes in the south. Mitigation measures listed in Chapter 8 will be implemented to limit unauthorized public access to the outlet channel ROWs; however, even if access is prohibited that does not mean that hunting/trapping could not occur. If so, it is anticipated to result in an increased mortality risk to furbearers and ungulates. The linear features provide an efficient mechanism to move across the landscape that also provides relatively clear, elevated sightlines that are desirable to resource users. Furthermore, while access may be controlled at regular crossings (i.e., road), it will not be controlled adjacent to private property. Chapter 8, Section 8.3 provides further discussion on wildlife mortality risk related to access.

A potential residual effect is the presence of the Project on commercial outfitters and their operations in the LAA (e.g., location of outcamps in the vicinity of the channels). Concerns were expressed during the IPEP and through KPIs about the effects of the outlet channels. The presence of the Project in relation to established hunting/outfitting, trapping and fishing was identified as having a potential effect on resource harvesting through loss of use (i.e., license), alteration of area, and success of harvesting. The physical presence of channel could act as a barrier to mammal movements from one area to another. The presence of the outlet channels is not anticipated to result in an increase in disruption of wildlife movements beyond that of the construction phase, other than temporarily reducing regular or seasonal movements in the LAA (see Chapter 8, Section 8.1.1.19). It is possible that an outfitter may choose not to use a particular area near the ROW, based on the potential that a successful experience would not be enhanced by the presence of the outlet channels. Chapter 8, Section 8.3 contains the assessment of potential wildlife and wildlife habitat effects, and description of mitigation measures.

Except for periods where routine maintenance and vegetation management occurs along the PDA, resource harvesting (e.g., hunting, trapping) will be able to continue uninterrupted near the Project ROW throughout its operating life. Vegetation management and other maintenance is anticipated to occur as required, throughout operation and maintenance. Effects on hunting and trapping will be of low magnitude and medium term in duration because the presence of the outlet channels will be regular and continuous throughout operations.

Temporary construction areas will be reclaimed, as required, following construction, so no effects will continue during operation and maintenance. Similarly, it is anticipated that the aggregate/quarries developed for the Project not needed for ongoing maintenance, would be reclaimed if required.

A new distribution line will cross provincial Crown land in unorganized territory for the LSMOC. Manitoba Hydro will be responsible for constructing the distribution line for the Project. Potential Project effects are anticipated to be associated with increased access and changes to visual aesthetics. The new distribution line will also be permanent for the life of the Project and will be subject to routine operation and maintenance activities as conducted by Manitoba Hydro.

Power will be provided to a LMOC water control structure from a very short tap from nearby lines.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure.

Effects on hunting and trapping will be long-term, regular continuous for presence of the infrastructure, and irreversible for land loss.

Commercial Fishing

No residual effects on commercially fished areas would be expected from the channels during the operation and maintenance phase because habitat alteration from channel construction would have already occurred. Chapter 7 contains the detailed assessment of potential aquatic environment effects and description of mitigation measures.

Minerals and Aggregate

Except within the channel and associated infrastructure, quarrying/aggregate resource use activities will be able to occur adjacent or near the PDA throughout operations. The area of the aggregate deposits intersected by the LSMOC and LMOC will be permanently removed as a result of the presence of the outlet channels.

Temporary construction areas will be reclaimed, as required, following construction, so no effects will continue during operation and maintenance. It is anticipated that the aggregate/quarries developed for the Project not needed for operations would be reclaimed if required.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure. Similarly, the new distribution line will also be permanent for the life of the Project and will be subject to routine operation and maintenance activities as conducted by Manitoba Hydro. No effects on mining and aggregate are expected with the proposed infrastructure works.

Forestry

Project operation and maintenance activities are not expected to affect commercial forestry use b trees will have been already removed from the channel ROW. High value forest sites will not be affected as none are located within the PDA and LAA.

The loss of past personal permit areas represents a small area overall. Reduction in past personal permit areas is only 1.1% of the LAA. Effects on past personal permit areas will be permanent due to area loss and regular continuous for operation and maintenance.

Temporary construction areas will be reclaimed, as required, following construction, so no effects will continue during operation and maintenance. It is anticipated that the aggregate/quarries developed for the Project not needed for operations would be reclaimed if required.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure. Similarly, the new distribution line will also be permanent as productive forestland will be lost and will be subject to routine operation and maintenance activities in the future as conducted by Manitoba Hydro. No effects on forestry resources are expected from the proposed infrastructure works during operation and maintenance.

Groundwater and Surface Water Use

Project operation and maintenance has the potential to effect groundwater quantity within the LAA, through seepage into the channels. Shallwo groundwater seeping into the channel would return to the underlying aquifer through a different pathway. Effects on regional shallow groundwater quantity would be mitigated by groundwater seeping and infiltration back into the subsurface or flowing back into Lake St. Martin and Lake Winnipeg by the surface drainage pathway (the channel).

Temporary construction areas will be reclaimed, as required, following construction, so no effects will continue during operation and maintenance. Similarly, it is anticipated that the aggregate/quarries developed for the Project not needed for operations would be reclaimed if required.

The realignment of PR 239 will be permanent. Normal road operation and maintenance would be undertaken by Manitoba Infrastructure. Similarly, the new distribution line will also be permanent and will be subject to routine operation and maintenance activities as conducted by Manitoba Hydro. However, no effects on groundwater quantity are anticipated.

With the implementation of the standard mitigation measures described above, residual effects on groundwater and surface water use during Project operation and maintenance are expected to be low in magnitude, long-term in duration, limited to the PDA, regular continuous, and irreversible because seepage could continue.

Summary of Operation and Maintenance of Residual Effects on Resource Use

Following the implementation of mitigation measures described above, residual effects for change in resource use during Project operation and maintenance are characterized, as follows:

- direction is adverse because there will be a net loss in resource use area
- duration is medium-term (for hunting and trapping) and long-term (loss of mining/aggregates, loss of productive forestland, groundwater seepage in the LSMOC) because effects may persist beyond completion of construction and rehabilitation activities
- magnitude is anticipated to be low (due to presence of the channels)
- timing is not applicable related to effects on resource use or of no sensitivity
- residual effects limited to the PDA and LAA
- frequency of effects will be infrequent (forestry) and regular continuous related to presence of the channel and associated infrastructure
- effects are irreversible related to hunting and trapping, mining/aggregates and forestry (area loss), and groundwater seepage (as it could continue for the life of the Project)
- socio-economic context is dependent upon location within the PDA and is resilient for hunting and trapping because there are numerous opportunities available across the landscape such that the area is likely adaptable to some change. Mining/aggregate extraction can accommodate some change in land base, and forestry and groundwater can accommodate some change in the resource base conditions compared to the availability of forest resources and groundwater resources

9.2.4.6 Summary of Project Residual Effects

Table 9.2-18 summarizes the residual environmental effects on land and resource use during construction and operations.

Table 9.2-18 Summary of Project Residual Effects on Land and Resource Use

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-economic Context
Change in Land Use	C, O	A/P	ST/LT	L/M	N/A	PDA/LAA	IF/RC	RS/I/RL	R
Change in Agricultural Land Use	C, O	A/P	LT	M-H	NS/HS	PDA/LAA	RC	I	R/NR
Change in Parks, Recreation and Tourism	C, O	A/P	ST/MT/LT	L	MS/HS	PDA/LAA	IF/RC	RS/I	R
Change in Resource Use									
Hunting and Trapping	C, O	A	ST/MT/LT	L	N/A	PDA/LAA	IF/RC	RS/I	R
Fishing	C	A	MT	L	N/A	LAA	IF	RS	R
Mining/Aggregates	C, O	A	ST/LT	L	NS	PDA	SI/RC	RS/I	R
Forestry	C	A	LT	L	NS	PDA	IF	I	R
Groundwater/ Surface Water	C, O	A	ST/LT	M/L	NS	LAA/PDA	IF/RC	RS/I	R

KEY

See Table 8.2-2 for detailed definitions

C: Construction
O: Operation

P: Positive
A: Adverse
N: Neutral

ST: Short-term
MT: Medium-term
LT: Long-term

NL: Negligible or Low
M: Moderate
H: High

NS: No sensitivity
MS: Moderate sensitivity
HS: High sensitivity

PDA: Project development area
LAA: local assessment area
RAA: regional assessment area

N/A: Not applicable

IF: Infrequent
SI: Sporadic/Intermittent
RC: Regular/Continuous

RS: Reversible (short-term)
RL: Reversible (long-term)
I: Irreversible

R: Resilient
NR: Not resilient

9.2.5 Determination of Significance

9.2.5.1 Significance of Residual Environmental Effects from the Project

A significant effect on land and resource use, not including agricultural land use, is one that results in:

- wide degradation, restriction or disruption of present land and resource uses to a point where these activities and production cannot continue at or near baseline levels or cannot be adequately compensated

Manitoba Infrastructure considered effects on private property and residential development in the routing of the outlet channels. With application of mitigation measures identified in Section 9.2.4 (and subsections), the Project will not restrict or degrade land development to a point where it cannot continue at or near baseline levels. The Project will not directly affect designated lands, protected areas or federal or provincial parks. The LMOC will be located approximately 400 m to the northwest of Watchorn Provincial Recreation Park and will not otherwise affect the functioning of this park. Project effects on resource use, including hunting, trapping, fishing, mining/aggregates, forestry, and groundwater and surface water have been considered and reduced through the application of mitigation measures and are of low to moderate magnitude. The Project will not degrade, restrict or disrupt any of these land and resource uses to a point where they cannot continue at or near baseline levels.

Residual effects of the Project on land and resource use, due to change in land use (property), parks, recreation and tourism (including designated lands and protected areas), and resource use (hunting, trapping, fishing, mining/aggregates, forestry, groundwater and surface water) are anticipated to be not significant.

A significant effect on agricultural land and resource use is one that results in:

- loss of agricultural land, loss of agricultural capability, or interference with agricultural operations and/or activities such that existing agricultural production cannot continue at current levels for extended periods of time (beyond the construction phase) or cannot be adequately compensated

Manitoba Infrastructure considered effects on agricultural land use and landowners. With application of mitigation measures identified in Section 9.2.4.3, the Project will not result in loss of agricultural land, loss of agricultural capability, or interference with agricultural operations and/or activities such that existing agricultural production cannot continue at current levels for extended periods of time (beyond the construction phase) within the context of the RAA.

Reductions in production levels mostly attributable to permanent agricultural land losses within and adjacent to the LMOC PDA and conflict with agricultural activities are considered of moderate to high magnitude in the context of the LAA. The adverse effects within the LAA will be borne primarily by individual farming operations with their base of operations within the LMOC or with operations that will be split by the presence of the LMOC. These effects will persist through Project operation and maintenance and are such that existing agricultural production cannot continue at current levels for extended periods

relative to the area of existing agricultural land use within the LAA, and certainly at the scale of individual operations and landowners affected. However, compensation through land offsets (i.e., Crown land transfer to agricultural landowners) and/or by monetary means (e.g., market value or income replacement) is anticipated to adequately mitigate these reductions in production relative to current levels.

The alterations to drainage in the vicinity of the LMOC are anticipated to be localized and may have a positive effect on agricultural capability and land use in close proximity to the LMOC PDA.

The reductions in lake levels and flood levels in Lake St. Martin as a result of the Project will provide positive effects to agricultural land use along the Lake St. Martin shoreline that will persist throughout operations. It is anticipated that this will allow for the return of soil capability and productivity to the area of the shoreline affected by flooding in recent years. This is anticipated to manifest primarily in return of hayland and pasture productivity within reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation along the western shoreline and in private lands along the southwestern and southern shorelines.

With the implementation of mitigation, including compensation, residual effects of the Project on agricultural land use are anticipated to be not significant.

9.2.6 Potential Land and Resource Use Effects on Federal Lands

Federal lands within the land and resource use RAA consist of the reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Dauphin River First Nation and Lake Manitoba First Nation. A portion of the Peguis Notice Area is located within the RAA. Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation lands are located within the Lake St. Martin shoreline portion of the LAA, while Dauphin River First Nation is located along the shoreline of Sturgeon Bay, adjacent to the LAA. Locations of these lands are presented in Appendix 9A, Figure 9.2A-1.

The Project is not expected to adversely affect land and resource on federal lands (i.e., National Parks, Wildlife Refuges) or First Nation Reserves. Residual effects of the Project on land and resource use, due to change in land use and property, parks, recreation and tourism, resource use (hunting/trapping, fishing, mining/aggregates, forestry, groundwater and surface water) and agriculture are not expected to be greater on federal lands.

A reduction in lake levels and the frequency and levels of floods will allow for the return of soil capability and productivity over the long term. This will be a positive effect to agricultural land use along the shoreline of Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation lands. These Project effects are described in detail Section 9.2.4.3. Project effects on lake levels in Lake St. Martin are discussed in more detail in groundwater and surface water in Section 6.4 and in the context of soil quality and quantity in geology and soils in Section 6.3.

Mitigation measures for land and resource use are provided in Section 9.1.4 for these various components. No additional mitigation measures beyond those identified are specifically required for federal lands.

Follow-up and monitoring for land and resource use is provided in Section 9.1.9. No additional follow-up and monitoring programs beyond those identified are specifically required for federal lands.

9.2.7 Prediction Confidence

There is a moderate to high degree of confidence in the predicted effects of construction, operation and maintenance of the Project on land and resource use. The prediction confidence is based on information collected as part of desktop-based data compilation, GIS data analyses and understanding of Project activities and locations. Through a process of extensive public engagement and Indigenous engagement undertaken for the Project (i.e., open houses, stakeholder meetings, KPIs), there is good understanding of the issues and concerns related to land and resource use which have been addressed in the EIS. While some of the desktop data were limited in terms of availability (e.g., private woodlot data, individual outfitter allocation areas, groundwater quality data) or scale (e.g., soil resource information, including agricultural capability ratings, big game and game bird hunting areas and open trapping area data to support harvest evaluation, groundwater well locational accuracy), environmental effects mechanisms are well understood. Many of the effects analyzed were supported through quantification. The mitigation measures identified in Section 9.1.4 are standard practice and have been implemented on other projects. Finally, the significance conclusion is based upon a reasonable understanding of the land and resource use context within the Project RAA.

The prediction confidence with respect to cumulative effects is moderate given the lack of quantifiable information available for the assessment of cumulative effects at the RAA scale.

9.2.8 Follow-Up and Monitoring

Manitoba Infrastructure's practice is to develop project-specific environmental protection plans where the mitigation measures are stipulated for construction, operation and maintenance activities. These measures are regularly reviewed for their effectiveness as part of a process of adaptive management in project monitoring and follow-up.

Land and resource use activities within the RAA are the subject of ongoing planning, management, regulatory enforcement and monitoring by the federal, provincial and municipal governments. This includes monitoring and the collection of information on, for example, municipal land use, hunting and angling activity and development for the purpose of licensing, enforcement and resource management. Manitoba Infrastructure has provided and will continue to provide Project information to relevant agencies and organizations as required and requested.

Follow-up required for land and resource use includes identifying the locations of manure stockpiles prior to construction and determine a plan for removal from the PDA and relocation to a suitable site on agricultural land outside of the LMOC PDA in cooperation with landowners, or proper disposal at an

approved landfill facility or through land application in consultation with Manitoba Sustainable Development

Potential monitoring for land and resource use will include:

- monitoring of groundwater wells in the vicinity of the channel to determine if potable water supply changes with the construction phase of the Project and post Project phase

No other follow-up and monitoring programs for land and resource use are proposed for the Project.

9.2.9 Conclusions for Land and Resource Use

9.2.9.1 Change in Land Use

Project effects on land use have been considered and avoided or reduced through the application of mitigation measures. Land use within the PDA for the LMOC and LSMOC will change as a result of the Project. Access to areas in the PDA and LAA will be affected by construction activities temporarily and permanently with Project presence. The Project will comply with the RM of Grahamdale development plan land use policies and PLUPs. Residual adverse effects are anticipated to be low to moderate magnitude and will not substantially affect land use activities in the LAA. Potential positive effects are associated with less flooding risk. Residual effects on change in land use are predicted to be not significant.

9.2.9.2 Change in Agricultural Land Use

Project effects on agricultural land use have been considered and avoided or reduced through the application of mitigation measures. There are is no agricultural land use within the LSMOC portion of the LAA. Along and adjacent to the LMOC, residual adverse effects are anticipated to be moderate to high magnitude considering the context of agricultural land use areas within the LAA, are mostly due to the permanent loss of agricultural land and conflict with agricultural activities. Following the consideration of compensatory mitigation through expropriation, residual effects are predicted to be not significant.

Effects to agricultural land use around the Lake St. Martin portion of the LAA are expected to be positive, as a result of reduced lake levels in Lake St. Martin during periods of high water levels due to the Project.

9.2.9.3 Change in Parks, Recreation and Tourism

Project effects on parks, recreation and tourism have been considered and avoided or reduced through the application of mitigation measures. The Project will not affect the functioning of Watchorn Provincial Park and will not affect any federal or provincial existing designated or permanently protected lands. Sediment transport studies will be included as part of detailed design, and identify whether the construction of groins to protect the inlet of the LSM outlet channel may affect sand deposition along the beach at Watchorn Provincial Park. If the Project can potentially affect the beach, additional mitigation measures will be considered. One candidate ASI area at Sturgeon Bay will be affected by LSMOC PDA. Residual adverse effects are anticipated to be low magnitude and will not substantially affect recreational

use activities in the LAA Residual effects on change in parks, recreation and tourism are predicted to be not significant.

9.2.9.4 Change in Resource Use

Project effects on resource use (hunting, trapping, fishing, mining/aggregates, forestry, groundwater and surface water) have been considered and avoided or reduced through the application of mitigation measures. Residual adverse effects generally are low to moderate in magnitude and will not substantially affect any of the resource use activities within the LAA. Residual effects on resource use are predicted to be not significant.

9.3 INFRASTRUCTURE AND SERVICES

9.3.1 Scope of the Assessment

This assessment of infrastructure and services is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of this EIS. Section 7.1 of the Agency EIS Guidelines for the Project (CEAA 2018) requires baseline information on the human environment and Section 7.1.12 specifies information to include aspects such as the location, and proximity of any permanent, seasonal or temporary residences or camps, access to and delivery of goods and services for the local communities, including essential goods (e.g., food) and emergency services. Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) indicates that the EIS will describe infrastructure and services. Community services is discussed in Section 3.4.2 of the scoping document.

Chapter 4 (Section 4.4.1) of this EIS describes VCs as features that may be affected by the Project, as related to the role of the VC in the ecosystem and the value people place on it. Infrastructure and services is a VC because of the potential for the Project to increase the demand for, or interfere with, local and regional infrastructure and services. This VC was identified as important by the Rural Municipality (RM) of Grahamdale's Reeve and Council, directly affected landowners, Indigenous groups, stakeholders and the public. It was also identified as a potential issue during the key person interviews (KPIs). A summary of comments from the IPEP is provided in Chapter 5.

9.3.1.1 Regulatory and Policy Setting

A list of various regulatory requirements that were considered in developing this environmental impact statement (EIS) can be found in the Introduction (Section 1.5 and Appendix 1A). Particular consideration was given to the following federal and provincial legislation, policies and guidelines in the preparation of this environmental assessment.

Federal Regulations and Policy

The Project is of potential interest to Transport Canada because of its mandate to protect navigation rights under the *Navigation Protection Act* (NPA). The purpose of the NPA is to regulate works and obstructions that risk interfering with the public right of navigation in scheduled navigable waters. Lake Manitoba and Lake Winnipeg are both scheduled waterbodies under the NPA. Navigation is also protected in Canada for non-scheduled navigable waters not listed in the Act (i.e., the right to use navigable waters as a highway).

The *Transportation of Dangerous Goods Act* defines the methods for handling, containment and transportation of substances that could cause damage to personal safety or the environment. This act may apply to the movement of dangerous goods, as defined under the act during Project-construction.

Provincial Regulations and Policy

The Environment Act has regulations such as the Waste Disposal Grounds Regulation, which defines proper construction and permitting for various types of infrastructure.

The Public Health Act and associated regulations outlines standards and guidelines to protect the health and well-being of Manitoba residents by providing public health services. The operation of a construction camp is also subject to applicable regulations (e.g., Food and Food Handling Establishment Regulation; Water Works, Sewage and Sewage Disposal Regulation).

The Highways Protection Act protects highway infrastructure and the safety of the travelling public by controlling access within a controlled area of certain highways.

The Highway Traffic Act and associated regulations (e.g., Vehicle Weights and Dimensions on Classes of Highway Regulation) regulate traffic on highways. This includes vehicle and licensing requirements traffic operations and the movement of oversized vehicle loads on highway.

The *Dangerous Goods Handling and Transportation Act* and associated regulations outline the conditions and standards with respect to the generation, handling, storage, transport and disposal of dangerous goods or hazardous wastes.

The *Sustainable Development Act* provides a framework through which sustainable development can be implemented into a development.

9.3.1.2 Engagement and Key Concerns

Manitoba Infrastructure has undertaken engagement prior to and throughout preparation of the EIS, and will continue to consult with Indigenous groups, directly affected landowners, government agencies, and stakeholders throughout the life of the Project. A discussion of the engagement process is provided in Chapter 5: Indigenous and Public Engagement. Engagement feedback has been an important consideration in identifying issues of concern, framing the scope of the EIS baseline and effects assessments, and in identification of specific mitigation measures, where provided. Additional information

was collected through key person interviews (KPIs) with representative stakeholders and groups. Indigenous input and community concerns contributed to selecting the outlet channel routes for the Project (see Chapter 5). Key issues regarding infrastructure and services identified through the process, and the sections of the EIS where they are addressed, are as follows:

- potential effects on quarries, landfill sites and recycling services
- increased need for RCMP, fire and medical services
- increased travel times and maintenance of property access, and number and control of access roads connected with the Project
- increased traffic on the provincial and municipal roads
- potential effects on the domestic water supply
- Project-related road deterioration and increased maintenance cost
- possible interference with cellular services
- changes to drainage
- damage to homes and infrastructure from 2011 flood

Feedback received from engagement with Indigenous groups related to infrastructure and services can be grouped under the following categories, which are discussed further below:

- number and control of access roads connected with the Project
- increase in vehicle traffic and potential for vehicle-wildlife collisions
- impact of road works
- effects of Project construction on natural drainage patterns

The number of roads that Project traffic will travel along and the potential for the Project to limit or control access to roads that are used by Indigenous groups to practice Traditional Land and Resource use (TLRU) activities was identified as a concern by multiple Indigenous groups: Interlake Reserves Tribal Council (IRTC), Dauphin River First Nation, Black River First Nation, Fisher River Cree Nation, Lake St. Martin First Nation Pinaymootang First Nation and Peguis First Nation. Fisher River Cree Nation commented that an increase in vehicle traffic associated with Project construction and operation could lead to an increase in vehicle-wildlife collisions. The impacts of road works connected with the Project was expressed as a concern by Lake St. Martin First Nation. IRTC were concerned about the potential for the construction of the access road to block natural water drainage patterns that feed into Mantagao Lake.

Potential effects on solid waste disposal, water supply, and emergency services are addressed in Section 9.3.4.3. Potential effects on quarries are addressed in Section 9.2. Potential effects related to

increased road use and change to road network are addressed in Section 9.3.4.4. Potential effects related to change in access are addressed in Section 9.2 (Land and Resource Use). Potential effects of alterations to drainage systems are addressed in Section 6.4 (Groundwater and Surface Water) and Section 9.2 (Land and Resource Use). Potential effects on communications utilities are addressed in Section 9.3.4.5. There are separate federal and provincial processes, such as the Manitoba 2011 Flood Review Task Force which are addressing damage to infrastructure and housing from the 2011 flood. The damage and disruption caused by that flood is acknowledged as part of the socio-economic context of the effects assessment.

9.3.1.3 Potential Effects, Pathways and Measurable Parameters

This section assesses potential adverse environmental effects on infrastructure and services. Potential environmental effects, effect pathways and measurable parameters used to assess potential effects on infrastructure and services are provided in Table 9.3-1. Potential effects were identified through the identification of potential interactions between the Project and infrastructure and services, and through consideration of the results of IPEP.

Table 9.3-1 Potential Effects, Effect Pathways and Measurable Parameters for Infrastructure and Services

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in accommodations	The Project workforce may increase demand for temporary accommodations	• Workforce numbers • Available temporary accommodation units (#)
Change in community infrastructure and services (e.g., fire and police services, health services, potable water)	The Project workforce and activities may increase demand for community infrastructure and services	• Measurable parameters specific to the demand and capacity of each component (e.g., location, travel distance, response time and capacity of health services in the RAA)
Change in road traffic and road network	The Project will generate road traffic which may cause congestion of roads (e.g., PTH 6) and the municipal road network in the RM of Grahamdale Sections of the provincial and RM of Grahamdale municipal road network will be affected and possibly damaged by the LMOC and the realignment of PR 239 which may affect access	• Traffic volumes (annual average daily traffic) • Traffic collision frequency and rates • The sections of the road network affected and changes to access
Change in utility infrastructure	Construction and presence of the Project may interfere with utility infrastructure	• Intersection of utility infrastructure

9.3.1.4 Boundaries

Spatial Boundaries

The Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on infrastructure and services are shown in Figure 9.3A-1.

Project Development Area

The PDA encompasses the Project footprint and is the area of physical disturbance in which the Project components (main works) and associated works and activities are located. The PDA has an area of 2,099 ha or 21.0 km^2. There are two primary PDA components: the Lake Manitoba Outlet Channel (LMOC) and PR 239 and municipal roadway re-alignments (LMOC PDA); and the Lake St. Martin Outlet Channel (LSMOC PDA). The LMOC PDA is approximately 24.1 km in length while the LSMOC PDA is approximately 23.8 km in length.

Local Assessment Area

The LAA for the assessment of effects on infrastructure and services is composed of communities within the following:

- RM of Grahamdale
- RM of West Interlake
- Pinaymootang First Nation (Fairford Reserve)
- Lake Manitoba First Nation (Dog Creek)
- Little Saskatchewan First Nation
- Dauphin River First Nation (Dauphin River 48A)
- Dauphin River Northern Affairs Community (Dauphin River NCM, Designated Place)
- Fisher River Cree Nation (Fisher River 44 & 44A)
- Fisher River Northern Affairs Community (Fisher River NCM, Designated Place)
- Kinonjeoshtegon First Nation
- Lake St. Martin First Nation
- Peguis First Nation (Peguis 1)
- Lake St. Martin Northern Affairs Area

The infrastructure and services LAA is the area where direct and indirect effects on infrastructure and services are likely to be most pronounced and encompasses local affected communities and their infrastructure and services.

Regional Assessment Area

The RAA for the assessment of effects on infrastructure and services is the same as the LAA. This is primarily because the existing infrastructure (including its use, maintenance and development) forms a core part of the cumulative effects assessment, and the RAA provides context for Project effects and the area in which cumulative effects are assessed.

Temporal Boundary

The temporal boundary for the assessment of effects on infrastructure and services covers the duration of the construction and operation and maintenance phases of the Project. The construction duration is estimated to occur over 2.5 to 3 years with 1 to 2 years for post construction works (e.g., site clean-up and offsetting measures). The operation and maintenance phase of the Project is expected to be indefinite.

9.3.1.5 Residual Effects Characterization

Table 9.3-2 presents definitions for the characterization of residual environmental effects on infrastructure and services. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table 9.3-2 Characterization of Residual Effects on Infrastructure and Services

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change on the VC.
	Adverse	Net loss (adverse or undesirable change) on the VC.
	Positive	Net benefit (or desirable change) on the VC.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of several months up to 3 years).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities (i.e., 3 to 5 years).
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project (i.e., a timeframe of greater than 5 years).
Magnitude	Negligible or Low	Negligible – no measurable change in use or, access to, or interference with infrastructure and services from existing conditions.

Table 9.3-2 Characterization of Residual Effects on Infrastructure and Services

Characterization	Range of Criteria	Level of Effect and Definition
(degree or intensity of the change)		Low – a measurable change in use of, access to, or interference with infrastructure and services but on a scale that is within the current available capacity and will not affect the quality of the service provided.
	Moderate	Moderate – measurable change in use of, access to or interference with infrastructure and services that nears the available capacity or may affect the quality of services provided.
	High	High – measurable change in the use of, access to, or interference with infrastructure and services that meets or exceeds the available capacity or degrades the quality of service provided.
Timing	No Sensitivity	No effect on infrastructure and services related to timing
	Moderate Sensitivity	Effect on infrastructure and services may occur during a lower sensitivity period (e.g., winter).
	High Sensitivity	Effect on infrastructure and services occurs during a higher sensitivity period (e.g., summer when tourism activities are higher)
Extent (Spatial Boundary)	Project Development Area	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities (e.g., borrow pits and quarries)
	LAA	Area within which potential Project effects are measurable and extending beyond the Project Footprint to, but not beyond, the LAA.
	RAA	The RAA for the assessment of effects on infrastructure and services is the same as the LAA for this VC. The RAA provides context for Project effects and the area in which cumulative effects are assessed.
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project (e.g., potential wildlife-vehicle collisions).
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project (e.g., construction traffic on PTH 6 and PRs in the RAA).
Reversibility (the degree of permanence)	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (< than five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> than five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
Socio-Economic Context	Resilient	System is able to adapt and maintain pre-Project activities in the region.
	Not Resilient	System will not be able to adapt to changes or maintain pre-Project activities in the region.

9.3.1.6 Significance Definition

A significant effect on infrastructure and services is one that results in an exceedance of available capacity or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies or mitigation measures. A significant adverse residual effect is also unlikely to recover to existing conditions.

9.3.2 Existing Conditions for Infrastructure and Services

9.3.2.1 Methods

Information on existing conditions for infrastructure and services was obtained through primary and secondary sources. Primary data was collected through the IPEP for the Project (e.g., open houses, meetings with the Reeve and Council from the RM of Grahamdale, meetings with directly affected landowners) and KPIs conducted for the Project (see Chapter 5). Secondary sources included a review of statistical information and other desktop information and included the following:

- Statistics Canada census data
- Indigenous Services Canada (formerly Indigenous & Northern Development Canada) data
- baseline reports prepared for the outlet channel route options for the Project
- websites for infrastructure and service providers including temporary accommodations, health care facilities, fire and police
- websites for Indigenous communities in the RAA
- Manitoba Infrastructure highway traffic count and collision data
- provincial and federal government databases on transportation and utility infrastructure. These databases provided information on the location of infrastructure including roads, transmission lines, railways and other infrastructure

9.3.2.2 Overview

The Project is located in the Interlake Region of Manitoba. The RAA/LAA encompasses the RMs of Grahamdale and West Interlake and includes communities such as Moosehorn, Gypsumville and Ashern. It also includes Dauphin River First Nation, Dauphin River Northern Affairs Community, Lake St. Martin First Nation, Pinaymootang First Nation, Little Saskatchewan First Nation, Peguis First Nation, Fisher River Cree Nation, Kinonjeoshtegon First Nation and the Lake St. Martin Northern Affairs area (Figure 9.3A-1). Infrastructure in the RAA/LAA includes roadways (Provincial Trunk Highways – PTHs, Provincial Roads – PRs, and municipal roads), waste disposal sites, an abandoned railway line and Manitoba Hydro transmission and distribution lines. Services include police, fire, hospitals, medical clinics, ambulance services and temporary accommodations.

9.3.2.3 Population

Statistics Canada population data for 2011 and 2016 and population change for the RMs in the RAA and the Province of Manitoba are presented in Table 9.3-3. In 2016, the RM of Grahamdale's population was 1,359, a 0.4% change since 2011. In 2016, the RM of West Interlake's population was 2,162, a -2.0% change since 2011. Population growth in the Province of Manitoba over the same period was 5.8%.

Table 9.3-3 Population and Population Change in RMs in the RAA and Manitoba, 2016 and 2011

	Population		% Change 2011 – 2016
	2011	2016	
RM of Grahamdale	1354	1,359	0.4%
RM of West Interlake[1]	2206	2,162	-2.0%
Province of Manitoba	1,208,268	1,278,365	5.8%

[1] The RM of West Interlake was formed on January 1, 2015. It encompasses the former RMs of Eriksdale and Siglunes.
Source: Statistics Canada. 2017.

In 2016, the median age of residents in the RM of Grahamdale was 51.6 (Table 9.3-4). This is older than the provincial median age of 38.3 years. In 2016, there were more residents in the RM over the age of 65 (26.1%) compared to approximately 13% for the Province of Manitoba. Data for 2006 are similar for the RM of Grahamdale and the Province of Manitoba. In 2016, the average age of residents of the RM of Grahamdale was 45.9 years compared to 39.2 years for Manitoba as a whole. In addition, in 2016, the average household size was 2.3 persons compared to 2.5 persons for the Province of Manitoba.

Table 9.3-4 Population Demographics for the RM of Grahamdale 2016

Age Characteristics	Population		
	Total	Male	Female
Total All Persons	1,360	700	655
Age 0-14	290	185	145
Age 15-64	730	375	370
Age 65 and over	355	200	155
Median Age	51.6	52.6	50.2

Source: Statistics Canada. 2017

As shown in Table 9.3-5 in 2016, the median age of residents in the RM of West Interlake was 48.2 years. This is older than the provincial median age of 38.3 years. In 2016, there were more residents in the RM over the age of 65 (29.4%) compared to approximately 13% for the Province of Manitoba. Data for 2006 are similar for the RM of West Interlake and the Province of Manitoba. In 2016, the average age of residents of the RM of West Interlake was 45.8 years compared to 39.2 years for Manitoba as a whole.

In addition, in 2016, the average household size was 2.1 persons compared to 2.5 persons for the Province of Manitoba.

Table 9.3-5 Population Demographics for the RM of West Interlake 2016

Age Characteristics	Population		
	Total	Male	Female
Total All Persons	2,160	1,060	1,105
Age 0-14	390	185	205
Age 15-64	1220	620	595
Age 65 and over	575	280	360
Median Age	48.2	47.8	48.6
Source: Statistics Canada. 2017.			

Table 9.3-6 summarizes the total registered population of First Nations in the RAA in 2019 along with First Nations on their own or reserves of other First Nations, and the off-reserve population. Pequis First Nation is the largest First Nation in the RAA, followed by Fisher River First Nation, both of which are over 100 km from the PDA.

Table 9.3-6 Population of First Nations in the RAA, 2019

	Total Registered Population[1]	On Own or Other Reserves	Off Reserve	2016 Census
Dauphin First Nation	389	251	137	N/A[2]
Fisher River Cree Nation	3,999	986	2,004	1,510[3]
Kinonjeoshtegon First Nation	1,086	409	677	207[4]
Lake Manitoba First Nation	2,133	1,287	846	874[5]
Lake St. Martin First Nation	2,848	1,706	1,140	5[6]
Little Saskatchewan First Nation	1,320	719	601	288[7]
Pinaymootang First Nation	3,309	1,338	1,971	1,169[8]
Pequis First Nation	10,356	3,688	6,666	27059

Source: INAC 2019, Statistics Canada 2017

Notes

1. Registered populations (on-reserve and off-reserve) from INAC 2019.
2. Dauphin River 48A Census subdivision
3. Fisher River 44 & Fisher River 44A Census subdivisions
4. Jackhead 43 and Jackhead 43A Census subdivisions
5. Dog Creek 46 Census sub-division
6. The Narrows 49 Census subdivision
7. Little Saskatchewan 48 Census subdivision
8. Fairford 50 census sub-division

There are two Manitoba Northern Affairs Communities located in the LAA. These are Dauphin River NCM, and Fisher Bay NCM. Dauphin River NCM had a 2016 Census population of 15, while Fisher Bay NCM had a 2016 Census population of 22 (Statistics Canada 2016).

In 2016, the Census population of the LAA was 10,336 persons, a decrease of 2% from 2011. When the 2016 Census was taken, residents of several communities, particularly Dauphin First Nation, Dauphin River NCM, Lake St. Martin First Nation, and Little Saskatchewan First Nation were still displaced by the 2011 flood and were living elsewhere in Manitoba. Therefore, the 2016 Census has likely underestimated the actual permanent population of the LAA. Should all those who were displaced by the 2011 flood return to their home communities, the permanent population of the LAA would be estimated at approximately 12,000 persons.

In the summer months, the LAA's population is increased by the presence of tourists, recreationalists, and other temporary visitors. Summer daily traffic volumes within the LAA is generally 13% to 15% higher compared to average annual volumes (28% higher for PR 239, see text on "Road Traffic" within Section 9.3.2.5), though some of this increase could be attributed to higher roadway usage by LAA residents.

9.3.2.4 Temporary Accommodations

Temporary accommodations in the RAA include hotels, motels and campgrounds. Within the RAA, there are nine hotels and motels. The Moosehorn Motor Hotel, which has 12 rooms, is located in the community of Moosehorn. There are three motels in Ashern: the Sharptail Motor Inn, with eight rooms; the Interlake Motel, with 18 rooms; and the Ashern Motor Hotel, with 12 rooms. In addition, the Pinaymootang Motel & Entertainment Centre, located in Fairford, has 20 rooms. Additional accommodations include: The St. Martin Motor Hotel in Saint Martin at the juncture of PTH 6 and PR 513 and the Eriksdale Inn in Eriksdale. There are hotels in Fisher River Cree Nation (Bay River Inns & Suites) and at Hodgson but these are more distant from the PDA.

9.3.2.5 Community Infrastructure and Services

Police

The Royal Canadian Mounted Police (RCMP) is the primary provider of police services in the RAA. There are two RCMP detachments in the RAA in the immediate vicinity of the PDA (Ashern and Gypsumville). Pequis First Nation also has an RCMP detachment. The Ashern RCMP detachment has one corporal and four constables (RCMP 2018 pers.comm.). The Gypsumville detachment has one sergeant, one corporal, four constables and one special constable. Table 9.3-7 lists incident-based crime statistics for the Gypsumville RCMP detachment and Manitoba as a whole in 2016 and 2017. Year-over-year, the number of incidents increased for the Gypsumville RCMP detachment and Manitoba; however, the incident rate increased by approximately 15% for the Gypsumville detachment but only approximately 2.5% for Manitoba.

Table 9.3-7 Incident-Based Crime Statistics for the Gypsumville RCMP Detachment and Manitoba, 2016 and 2017[1]

	Gypsumville RCMP		Manitoba	
	2016	**2017**	**2016**	**2017**
Actual incidents	446	515	124,946	129,906
Rate per 100,000 population	16,025	18,412	9,479	9,708
Percentage change in rate 2016 - 2017	14.9%		2.4%	
Unfounded incidents[2]	-	92	-	9,377
Percent unfounded	-	15.2%	-	6.7%

[1] Data are not available for the Ashern RCMP detachment. Data for unfounded incidents not available for 2016.
Source: Statistics Canada 2019.

Fire

There are fire departments in the RAA in the immediate area of the Project and all are volunteer based. These are located in Ashern, Grahamdale, Gypsumville, Moosehorn, Fairford, Faulkner, Hilbre, St. Martin, Steep Rock and Eriksdale (Fire Canada 2018). Pequis First Nation, which is over 100 km from the PDA, also has a fire hall.

Health

The Interlake-Eastern Regional Health Authority (RHA) is responsible for the administration and operation of health care in the RAA. The RHA boundaries include areas in the Interlake and eastern Manitoba which are outside of the RAA. The RHA is divided into six zones and 15 districts. The North Zone, District 14, includes the RM of Grahamdale, Pinaymootang First Nation, Little Saskatchewan First Nation, Lake St. Martin First Nation, Lake Manitoba First Nation, and the RMs of Eriksdale and Siglunes (now part of the RM of West Interlake) [Province of Manitoba 2014]. The LAA (and RAA) encompasses the North Zone and the following districts:

- Eriksdale/Ashern District – consists of the communities of Gypsumville, Hilbre, Faulkner, Grahamdale, Moosehorn, Ashern, Camper, Mulvihill, Vogar, Eriksdale, and Deerhorn
- Fisher/Peguis District – consists of the northern affairs community of Dauphin River and part of Unorganized Territory, Manitoba and Lake St. Martin area

General Health Conditions

General health indicators are used to describe population health on a broad level in the RAA (IERHA 2019). General health measures were compared between the Interlake-Eastern Regional Health Authority (RHA) and the province. Some of the health indicators are available only at the RHA level or Zone

areas/districts and not at a community level. The Interlake-Eastern RHA reported some improvements in health conditions over time (i.e., 2007-2011 to 2012-2016) when compared to the provincial average, as measured by indicators such as infant mortality and premature mortality. At the zone level, the North Zone experienced higher total mortality rates (9.9 per 1,000) than the provincial average (7.1 per 1,000). The gap in potential years of life lost (all deaths) for the Interlake-Eastern RHA, while narrowed substantially, was still higher (55.7 life years lost per 1,000) than the provincial average (52.3 life years lost per 1,000).

Chronic Conditions

Chronic conditions are diseases such as cancer, heart disease, and diabetes. Chronic diseases can considerably affect a person's overall health and ability to function. The Interlake-Eastern RHA has high rates for many chronic diseases compared to the provincial average. This includes rates for cancer, hypertension, and diabetes (IERHA 2019). At the zone level, the North Zone had an overall cancer incidence rate substantially higher (551.4 per 100,000 residents) than the Manitoba rate (478.4 per 100,000 residents). The North Zone, specifically the Fisher/Peguis and Eriksdale/Ashern districts, had hypertension rates substantially higher (24.1% and 26.0%, respectively) than the provincial average (20.7%). Both districts in the North Zone also had rates for new diagnoses of diabetes substantially higher (1.51 to 1.60 per 100 person years) than the provincial average (0.80 per 100 person years). The IERHA has a slightly older population profile when compared to provincial population data. The higher rates of chronic diseases could partially be attributable to the higher median age of residents living in region as they could be more susceptible to the onset of such diseases.

Personal Health Behaviour

Some personal health behaviours such as alcohol use and smoking can negatively affect health outcomes. The extent of use (i.e., how much, how often) are key factors that increase or decrease an individual's overall health and well-being. Other behaviours such as physical activity and a healthy diet can beneficially affect health outcomes.

In general, the IERHA was found to have a substantially lower percentage of residents who consider themselves a "regular drinker" (40.2%) when compared to the province (49.0%). A larger percentage of residents in the IERHA considered themselves as "occasional drinkers" or "did not drink in the last 12 months" at 58.4% (IERHA 2019). The prevalence of current smokers was also lower in the IERHA (15.1%) as compared to the province (17.5%). Those who considered themselves as "lifetime abstainers" from tobacco use/smoking were somewhat similar between the IERHA (43.7%) and the province (45.7%).

Physical activity levels for those who reported to be "active" were found not to be substantially different between the IERHA (53.5%) and Manitoba (52.6%). Fruit and vegetable consumption were reported to be 25.7% for the IERHA, slightly above the provincial rate of 24.6% (IERHA 2019). Overweight and obesity rates (i.e., body mass index) were not substantially different between the IERHA (54.4%) and the province (52.6%). Those residents who consider themselves to be "underweight/normal" was lower (35.7%) in the IERHA than for the province (40.6%).

Infectious Diseases

Infectious diseases, including communicable diseases, consist of any diseases that can be transmitted from person to person. Two types of infectious diseases described below are: respiratory infections and sexually transmitted infections.

The percent of residents diagnosed with respiratory disease (i.e., asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction) in the IERHA was 9.4%, compared to the provincial rate of 10.3% (IERHA 2019). At the North Zone level, the incidence of respiratory disease was 9.7%. Rates varied at the district level, ranging from 6.5% for the Fisher/Peguis district and 10.4% in the Eriksdale/Ashern district. The rates of influenza immunization (age 65+) in the IERHA was 54.3%, compared to 55.2% for Manitoba. Rates for pneumonia immunization (age 65+) ranged from 60.2% for the IERHA to 61.2% for Manitoba (IERHA 2019).

Sexually transmitted infections (STIs) include chlamydia, gonorrhea, HIV, and syphilis. The IERHA has lower rates per 100,000 population for chlamydia (501.3), gonorrhea (254.1) and syphilis (39.9) than that of the province (i.e., 546.4 [chlamydia], 265.4 [gonorrhea], and 58.6 [syphilis]). However, cases for chlamydia increased 25% in the IERHA over a five-year reporting period (2014-2018), while cases of gonorrhea and syphilis also increased over this period. In 2017, 89 positive cases of HIV were reported in Manitoba. Residents in the IERHA constituted 7% of the new HIV positive cases in Manitoba (i.e., six or fewer infections), as compared to 81% reported for the Winnipeg RHA in 2017 (IERHA 2019).

Cardiovascular Health

Stress can contribute to the development of many adverse health conditions, including hypertension, heart disease, and stroke. The rates for hypertension were substantially higher for the IERHA (23.8%) and the North Zone districts of Fisher/Peguis (24.1%) and Eriksdale/Ashern (26.0%) than the provincial average (20.7%). Ischemic heart disease (IHD) prevalence rates varied across the IERHA. The IERHA had a rate of 8.1% compared to the Manitoba average of 8.3%. However, the Fisher/Peguis and Eriksdale/Ashern districts experienced rates of IHD higher than the IERHA and provincial rates at 10.5% and 11.3% respectively (IERHA 2019). The rates for heart attack (per 1,000 residents) was also higher for the IERHA (3.86) and the North zone districts (4.25 for Fisher/Peguis and 4.65 for Eriksdale/Ashern) than the provincial average of 3.24 (IERHA 2019). Congestive heart failure (CHF) rates were substantially higher in the IERHA (1.9%) than the provincial rate (1.6%). The rates of CHF for the Fisher/Peguis and Eriksdale/Ashern districts were higher than the provincial rate, at 2.3% and 2.7%, respectively (IERHA 2019). The rate for stroke (per 1,000 residents) was substantially higher for the Fisher/Peguis district (4.33) than the provincial average (2.48). The Eriksdale/Ashern district had a rate of 2.86 per 1,000 residents (IERHA 2019). The rates for stroke events have nevertheless declined substantially for the IERHA over time since 2011 (IERHA 2019).

Mental Well-being

The percent of residents (aged 18+) diagnosed with mood and anxiety disorders was substantially lower for the IERHA (20.4%) and North zone districts of Fisher/Peguis (16.6%) and Eriksdale/Ashern (19.7%) than the provincial average (23.2%). A higher prevalence of mood and anxiety disorders was found in urban areas compared to rural areas (IERHA 2019).

Injury

Unintentional injury causes of death focuses on accidental causes of death such as motor vehicle accidents, drowning, falls, burns, and poisonings (IERHA 2019). The rate of unintentional injury causes of death were not substantially different between the IERHA and the province. Unintentional injury hospitalization rates for the IERHA stood at 5.89 per 1,000 residents, compared to the provincial average of 5.42 per 1,000 residents. The North Zone had a substantially higher rate (8.49) than the Manitoba average (IERHA 2019). Falls were the most frequent cause of injury hospitalization in the RHA at 47.6%. This was followed by poisoning, suffocation, occupant (motor vehicle accident), and “struck by or against” injury categories (IERHA 2019).

Self-reported Health Characteristics

Self-rated general health scores were generally found to not be statistically different between the IERHA and the provincial average. The IERHA reported the highest percentage of respondents indicating their general health as either very good or excellent (61.3%) compared to Manitoba at 59.5% (IERHA 2019).

The IERHA reported that the majority of respondents rated their mental health as either very good or excellent (70.8%) compared to 67.6% for the Manitoba average (IERHA 2019). Life stress results were found not to be statistically different between the IERHA and the provincial average. The IERHA reported the lowest percentage of respondents indicating “not at all/not very stressful” (37.2%) compared to the Manitoba average (40.4%) and the highest percentage indicating “quite a bit/very stressful” (21.4%) when compared to the Manitoba average of 18.9% (IERHA 2019).

The majority of respondents in the IERHA reported that they have a “somewhat strong” sense of belonging to their community (47.6%) which is associated with positive health outcomes. The provincial average was found to be comparable at 48.0% (IERHA 2019).

Mental Health Services

Mental health services are offered at the RHA level, including within the IERHA. The IERHA has Mental Health Liaison Nurses (MHLN) operating out of the Selkirk Regional Health Centre to provide mental health assessments for individuals that present to the emergency department with mental health concerns. The focus of the service is on individuals that are in “urgent/emergent need” of mental health services who are unable to wait for service in the community (IERHA 2019). A total of 770 emergency department assessments were completed in 2018-19 by the MHLN. Additional services provided by the MHLN consisted of telephone consultation services provided to three other emergency departments in

the region (i.e., Arborg, Pinawa, and Pine Falls). Over the 2018-19 period, there were over 50 telephone consultations with the MHLN regarding resources and interventions (IERHA 2019).

Summary

The non-Indigenous population residing in the North Zone of the IERHA has rates of many chronic diseases that are higher than the provincial average, including cancer, heart disease, and diabetes. This could be partially attributed to the higher median age of the non-Indigenous population living in this region, compared to Manitoba overall. Incidence of personal health behaviours related to alcohol and tobacco use was lower in the IERHA compared to the Manitoba average. Physical activity, healthy eating, and overweight and obesity rates were not substantially different between the IERHA and Manitoba. Rates of communicable diseases have increased in the IERHA, though still lower than the Manitoba average. Self-reported health characteristics are similar between the IERHA and the provincial average. The Fisher/Peguis and Eriksdale/Ashern districts in the IERHA had rates of mood and anxiety disorders substantially lower than the provincial average. Falls were the most frequent cause of injury hospitalization in the IERHA, with the North zone having a rate substantially higher than the provincial average. The IERHA had the highest percentage of residents responding that their general health was either very good or excellent. A majority of residents in the IERHA also indicated that their mental health was either very good or excellent as compared to Manitoba.

Hospitals and Health Centres

Table 9.3-8 outlines rates of health care utilization in the Interlake-Eastern RHA and Manitoba as a whole for 2011/12 and for 2017/18. In terms of physician use, the percentage of residents is similar for the Interlake-Eastern RHA and Manitoba. From 2017 to 2018, 78.5% of Manitoba residents saw a physician at least once during the year while in the RHA the rate was 77.1% (Province of Manitoba 2018).

Table 9.3-8 Rates of Health Care Utilization in the Interlake-Eastern RHA and Manitoba, 2011/12 and 2017/18

	Interlake-Eastern RHA		Manitoba	
	2011/12	**2017/18**	**2011/12**	**2017/18**
Physician use (age-sex adjusted % of residents who used services)	79.7%	77.1%	79.4%	78.5%
Ambulatory visits (age-sex adjusted rate of visits to a physician per resident)	4.5	4.3	4.5	4.7
Use of hospitals (age-sex adjusted % of residents with at least one in-patient hospital stay per year)	6.9%	6.4%	6.46%	6.1%
In-patient hospitalization (age-sex adjusted rate per 1,000 residents)	100	N/A	90.6	N/A
Hospitalization rates for ambulatory care sensitive conditions (age-sex	9.1	7.1	6.8	6.8

Table 9.3-8 Rates of Health Care Utilization in the Interlake-Eastern RHA and Manitoba, 2011/12 and 2017/18

	Interlake-Eastern RHA		Manitoba	
	2011/12	**2017/18**	**2011/12**	**2017/18**
adjusted rate per 1,000 residents age 0-74)				
Mood and Anxiety Disorders Prevalent among residents 10+ (age-sex adjusted % of residents)	21.5%	22%[1]	23.5%	23.1%[1]

[1] Note: data is from 2013/14 to 2017/18.
Source: Province of Manitoba 2018.

2011 to 2012, rates of ambulatory visits per resident were also very similar: 4.5 for the Interlake-Eastern RHA and 4.51 for Manitoba. From 2017 to 2018, there was an average of 4.7 ambulatory visits to physicians per Manitoba resident compared to 4.3 in the RHA (Province of Manitoba 2018). From 2011 to 2012, the in-patient hospitalization rate per 1,000 residents was higher in the RHA: 100 versus 90.6 for Manitoba as are hospitalization rates for ambulatory care sensitive conditions. From 2017 to 2018, the hospitalization rate for ambulatory care sensitive conditions were similar for the RHA (7.1 per 1000 residents) to that for Manitoba overall (6.8 per 1000 residents).

The prevalence of mood and anxiety disorders in 2011/12 were lower in the RHA: 21.5% compared to 23.5% for Manitoba. From 2013/14 to 2017/18, the age-sex adjusted mood and anxiety disorders were 22% in the RHA and 23.1% in Manitoba (Province of Manitoba 2018).

In 2017/18, there were 8,984 hospitalizations related to injury among Manitoba residents, which is a rate of 6.6 injury hospitalizations per 1,000 population, the same as the rate in the RHA (Province of Manitoba 2018). From 2016 to 2017 there were 662 deaths due to injury for Manitoba residents, which is a rate of 0.49 deaths per 1,000 population. The age-and sex-adjusted death rate in the RHA for the same period was 20% higher than Manitoba overall at 0.59 deaths per 1,000 population.

The Lakeshore General Hospital 14-bed acute care hospital is located in the community of Ashern. The hospital has an emergency room that is open 24 hours a day, 7 days a week and has ambulance services that includes transporting patients to and from Winnipeg and Dauphin (Ashern 2018). There are community health offices in Ashern and St. Laurent; the latter is approximately 95 km from Ashern and is outside of the RAA. Both communities also have emergency medical service stations. In addition, a mobile clinic visits Gypsumville once a week. The E.M. Crowe Memorial Hospital, located in the community of Eriksdale, has 13 acute care beds.

The Interlake-Eastern RHA provides services to communities located outside of First Nation communities. The federal government provides most services to residents living on reserve in First Nation communities. First Nation members living on reserve also access regional hospitals and programs that are off reserve in the region (Province of Manitoba 2014).

Shock Trauma Air Rescue Society (STARS) is contracted by the provincial government to provide rapid and emergency medical care and air transport for critically ill and injured patients. The Winnipeg RHA oversees STARS.

Table 9.3-9 outlines maximum response times for catchment areas in the RAA from October 1 to December 31, 2018. Fifty percent of the time an ambulance reaches the incident in the catchment area for Ashern in 31.83 minutes or less for priority 1, 2 or 3 calls (emergency) compared to 31.43 minutes or less for Gypsumville. The response time is 29.9 minutes for Ashern when priority 4 and 5 calls (non-emergeny) are included. For Gypsumville, the response time increases to 32.08 minutes. Ninety percent of the time, an ambulance reaches the incident in the catchment area for Ashern in 43.65 minutes or less for priority 1, 2 or 3 calls compared to 56.13 minutes or less for Gypsumville. When priority 4 and 5 calls are included, the response time increases to 46.60 minutes or less for Ashern's catchment area but increases to 62.52 minutes or less for Gypsumville's catchment area.

Table 9.3-9 Maximum Response Times for Emergency Medical Services in Communities in the RAA, October 1 – December 31, 2018

Community	Maximum Response Time (Minutes)				Total Calls
	50th percentile		90th percentile		
	Priority 1-3	Priority 1-5	Priority 1-3	Priority 1-5	
Ashern	31.83	29.90	43.65	46.60	118
Gypsumville	31.43	32.08	56.13	62.52	185
Source: Manitoba Health 2018					

Community Well-being Index

The Community Well-being (CWB) Index measures socio-economic well-being for communities across Canada based on census subdivisions (CSDs, a spatial geography used in Statistics Canada's Census) for which data are available. The index comprises four components considered to be important to well-being: education, labour force activity, income, and housing (Indigenous Services Canada 2019). The four component topics are combined to create a single well-being score that ranges from a low of 0 to a high of 100. Values are available across a temporal timeframe (for Census reporting years 1981, 1991, 1996, 2001, 2006, 2011, and 2016) to allow for comparison and identification of changes in well-being over a 35-year period.

Within the LAA (and RAA), CWB Index scores are available for the rural municipalities (i.e., CSDs) of Grahamdale, West Interlake, Eriksdale and Siglunes, and for a larger CSD, Division No. 19, Unorganized, Manitoba. Data for West Interlake is only available for 2016, as the rural municipality was only created in 2016 through a process of amalgamation between the rural municipalities of Eriksdale and Siglunes. For the census years prior to 2016, scores are presented for the rural municipalities of Eriksdale and Siglunes separately.

CWB Index scores for Grahamdale (rural municipality) rose steadily between 1981 and 2006 from 63 to 74 points, after which the scores remained relatively constant increasing slightly from 74 to 75 points between 2011 and 2016. A low CWB score of 63 was seen in 1981 which was likely attributable to low income and education scores. The overall CWB Index score for Manitoba (non-Indigenous) was 78 points, four points higher than for Grahamdale.

CWB Index scores for Eriksdale and Siglunes (rural municipalities) rose between 1981 and 1991, remaining relatively constant between 1991 and 2006, before rising again in 2011. The trend lines do not continue into 2016 as a result of municipal amalgamation, which formed West Interlake. Eriksdale's overall CWB score increased 14 points between 1981 and 2011 (from 61 to 75). Siglunes overall CWB score increased 10 points over the same time period (from 63 to 73). Low education and income scores were common for both Eriksdale and Siglunes between 1981 and 2011. In 2016, West Interlake had an overall CWB score of 74 points, compared to the overall CWB score for Manitoba (non-Indigenous) of 78 points.

CWB Index scores for Division No. 19, Unorganized, and Manitoba rose steadily between 1981 and 2016, increasing 20 points (from 44 to 64). Lower education, labour, income, and housing scores are noted for this area over this time period. The labour score trend was relatively flat between 1981 and 2016, increasing marginally from 66 to 72 points (1981-2006) and then dropping back down to 68 points (2011-2016). The housing score increased initially from 1981 to 1991, stabilizing between 1996 and 2006, before rising again between 2011 and 2016. The 2016 overall CWB index score for Division No. 19, Unorganized, Manitoba was 64 points, 14 points lower than Manitoba's overall CWB score of 78 points (non-Indigenous).

Summary

CWB scores for Grahamdale and West Interlake are comparable to Manitoba overall, while scores for Division No. 19 Unorganized, are somewhat lower. Health outcomes in the study area appear to be roughly correlated with CWB index scores, though other factors, such as the higher average age of the population compared to Manitoba overall, may be more relevant in explaining the higher incident rates of some chronic health conditions in the study area.

Airports

There is one active airport in the RAA, which is located at Ashern. The Anama Bay-Dauphin River and Pineimuta airports are no longer active (Forster et al. 2016).

Railway Lines

There is one rail line in the RAA that parallels PTH 6. The 104 km long line segment for the Warren to Steep Rock Junction route was operated by the Canadian National Railway (CNR) but was abandoned in 1997. Several spur lines connected to the route were also abandoned including the spurs to Spearhill and Steep Rock (Forster et al. 2016).

Potable Water

Regional and local potable water in the RAA is provided through public, semi-public and private water systems. The Province of Manitoba Office of Drinking Water defines a public water system as a system with 15 or more service connections; a private water system as a system that supplies potable water to only one private residence; and semi-public water systems are those systems that are neither public nor private (MSD 2018). There is a public potable water system at Ashern and a private system at the beaches at Steep Rock sourced from groundwater wells (MSD 2017). Semi-public potable water systems are located at the following locations: Ashern Auction Mart, Ashern Curling Rink, Einarssons Guide Service, Fairford Bridge Convenience, Gypsumville School, Mooshehorn Co-op, Moosehorn Curling Clib, Moosehorn Motor Hotel. Roviera Resort and Campground, Sharptail Park, St. Martin Chicken Delight, St. Martin Family Foods, Watchorn Provincial Park.

There are water treatment plants at Dauphin River First Nation, Lake St. Martin First Nation, Lake Manitoba First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Kinonjeoshtegan First Nation, Fisher River Cree Nation, and Pequis First Nation all sourced from groundwater (Neegan Burnside Ltd. 2011).

Wastewater

There are seven wastewater treatment lagoons in operation in the RAA. They are located near the communities of Ashern, Faulkner, Moosehorn, Pineimuta, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinymootang First Nation and Dauphin River First Nation. The closest wastewater treatment lagoon to the PDA is the one for Moosehorn, located approximately 6.6 km east of the LMOC alignment.

Solid Waste

There are six waste disposal grounds located within the RAA in the vicinity of the PDA that are in operation (Rural Municipality of Grahamdale 2018; Rural Municipality of West Interlake 2018). These waste disposal grounds are located near the communities of Ashern, Mulivihill, Faulkner, Moosehorn, Pineimuta and Eriksdale. Dauphin River First Nation has a solid waste transfer station and a waste disposal ground is under construction in Little Saskatchewan First Nation (INAC 2019).

Transmission and Distribution Lines, and Pipelines

Electrical services are provided to communities in the RAA by Manitoba Hydro. Transmission lines located within the RAA include portions of the Bipoles I and II high voltage direct current (HVDC) lines that pass through the RAA in a ROW adjacent to PTH 6, and sections of two 230 kV transmission lines that connect to communities in the region (Appendix 9A, Figure 9.3A-2). There is a transformer station located at Ashern. There are also distribution lines in the area providing power to communities and residences in the RAA. There are no natural gas, oil or other pipelines located in the RAA.

Road Traffic

The road network in the RAA includes the provincial highway network and the access road to the LSMOC that are owned and maintained by Manitoba Infrastructure. The various municipal governments operate the municipal road network. The provincial highway network includes primary routes called provincial trunk highways (PTHs) and secondary routes called Provincial Roads (PRs). PTH 6, which is two-lane and paved, is a primary route that connects the City of Winnipeg to the City of Thompson in northern Manitoba. PRs 237, 239 and 513 are secondary routes. PRs 237 and 513 are gravel surfaced, while PR 239 is two-lane and paved.

Table 9.3-10 presents combined annual average daily traffic (AADT) counts for PTH 6 and provincial roads in the vicinity of the Project, which will likely provide access to the Project PDA. Roadway volumes on PR 237, PR 239, and PR 513 indicate low volume rural roads and, with the exception of PR 513, show a decline in usage. Roadway volumes on PTH 6 increased by approximately 15% from 2012 to 2017. Summer traffic levels on all routes are higher than annual averages. For PR 237, PR 513, and PTH 6, summer volumes averaged 13% to 15% higher than annual averages, while for PR 239 summer volumes were 28% higher, over the monitoring periods (UOMTIG 2018).

Table 9.3-10 Annual Average Daily Traffic at PTH 6 and Provincial Roads in RAA

Traffic Count Station[1]	2010	2012	2013	2014	2015	2016	2017
PR 237 Station A[2]	50	-	-	-	30	-	-
PR 237 Station B[3]	220	170	-	-	115	-	-
PR 237 Station C[4]	70	50	-	-	70	-	-
PR 239 Station A[5]	310	440	-	-	400	-	-
PR 513 Station A[6]	570	380	-	-	640	-	-
PTH 6 Station A[7]		1,510	1,470	1,530	1,650	1,660	1,730

Source: UMTIG 2018
Notes
[1]All counts are combined (both directions)
[2]0.8 km east of Lake Manitoba
[3]West of PTH 6
[4]East of PTH 6
[5]West of PTH 6
1 3.2 km east of Gypsumville
2 South of PR 325 junction

Most municipal roads in the RMs are two-lane, gravel surfaced public roads with the numbering system based on the section-township and range grid system. Municipal roads in communities are often paved and named. RMs have limited records of traffic volumes.

The functioning of a roadway is defined as its level of services (LOS). There are LOS levels, ranging from free flow conditions (LOS A) to severe congestion (LOS F). LOS, expressed in AADT, is based on a roadway's characteristics, including roadway type, number of lanes, road lane width, proportion of trucks

on the road and speed limit, amongst other factors. Table 9.3-11 provides a general description of LOS for two-lane highways.

Table 9.3-11 Level of Service Descriptions

Level of Service	General characteristics	Operating Speed (km/h)
LOS A	Free traffic flow with no restrictions or delays	90
LOS B	Stable traffic flow with no delays. Slight restrictions on speed and maneuverability	80
LOS C	Stable traffic flow with minimal delays, but some restrictions on speed selection and passing ability	70
LOS D	Traffic flow becoming unstable with delays, speeds may change suddenly, and passing is difficult	65
LOS E	Traffic flow is unstable with substantial delays and highly variable speeds.	55
LOS F	Traffic is congested. Stop and go traffic.	_
Source: Adapted from Manitoba Hydro (2015)		

US DOT (2017) provides rural two-lane highway generalized service volumes. Flat, two lane rural highways, with 10% truck volume, with a speed limit of 80 km/h would operate at LOS B at 8,600 vehicles/day, LOS C at 13,900 vehicles/day, and LOS D at 19,000. The 2017 AADT for PTH 6, a comparable roadway in the RAA is 1,730 vehicles/day, indicating that this road is operating at LOS B or higher.

Road Safety

Traffic collision data is collected by Manitoba Infrastructure for highways in the Province of Manitoba. Table 9.3-12 outlines collision data for key highways in the RAA that are anticipated to be used during construction of the Project. Of the sections reviewed, the top three mostly involved wildlife-vehicle collisions and were located on PTH 6. Collisions on the municipal road network are expected to be low due to the low volume of traffic.

Table 9.3-12 Traffic Collisions on Key Provincial Highways in the RAA, 2013 - 2017[1]

Highway Number	Number of Collisions
PTH 6	212
PR 513	11
PR 239	21
PR 237	1
PR 325	17

Table 9.3-12 Traffic Collisions on Key Provincial Highways in the RAA, 2013 - 2017[1]

Highway Number	Number of Collisions
PTH 6	212
PR 513	11

[1] Data for 2012 – 2013 is incomplete due to collision data reporting changes. Data is collected through insurance claims and law enforcement records. Hence MI cannot guarantee that the data includes all collisions on highways.

Source: Manitoba Infrastructure 2019

Communications Facilities

There are communications towers close to Ashern, east of Faulkner, south of Steep Rock, along PTH 6 to the south of PR 328, and in the vicinity of Dauphin River First Nation, Little Saskatchwan First Nation and Pinayootang First Nation. Currently there are no known plans to add additional communications towers for the Project.

9.3.2.6 Flood Damages

A described in Chapter 2, the region is currently susceptible to flooding, and the alleviation of this is the primary purpose of the Project. This flooding has resulted in substantial damage to infrastructure in the region that has required costs and efforts to repair. As an example, in 2011 the floodwater flowing through the Lake Manitoba and Dauphin River sub-basins caused widespread damage to people and infrastructure in the area. Natural watercourses were overwhelmed, and entire communities—Lake St. Martin First Nation, Little Saskatchewan First Nation, Dauphin River First Nation and Dauphin River Northern Affairs Community—were displaced by flooding and suffered damages to homes, schools, and infrastructure (CBC June 2019). The Manitoba 2011 Flood Review Task Force (MFRTF 2013) identified extensive flood damage to infrastructure and services such as flooding of households and communities, roadway flooding and bridge damage, interruption in utility/communications service, bus routes affected, school closures, emergency service access challenges, and flooding of water supply and septic fields (and associated contamination concerns).

9.3.3 Project Interactions with Infrastructure and Services

Table 9.3-13 identifies for each potential effect, the Project components and physical activities that might interact with infrastructure and services during construction and operations and maintenance and result in the identified environmental effect. These interactions are identified by check marks and are discussed in detail in Section 9.3.4 in the context of effects pathways, standard and project-specific mitigation and residual effects. A justification for no effect is provided following the table.

Table 9.3-13 Project-Environment Interactions with Infrastructure and Services During Construction and Operations and Maintenance

Project Components and Physical Activities	Environmental Effects			
	Change in Accommoda-tions	Change in Community Infrastructure and Services	Change in Road Traffic and Road Network	Change in Utilities
Construction				
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])				
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	-	-		-
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)				–
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])				–
Water development and control (dewatering and realignment of existing water works)	–	–	–	–
Reclamation				–
Operations and Maintenance				
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure. e.g., water control structure gates are either open or closed)				
Operation and maintenance of other Project components[1] (normal operations conditions associated with PR 239 and municipal road realignments, distribution line, and bridges and culverts)	–	–	–	–
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	–	–	–	–
Operation, maintenance, and reclamation of quarries	–	–	–	–

NOTES:
indicates a potential interaction.
– indicates no potential interactions are expected.

Table 9.3-13 Project-Environment Interactions with Infrastructure and Services During Construction and Operations and Maintenance

Project Components and Physical Activities	Environmental Effects			
	Change in Accommoda-tions	Change in Community Infrastructure and Services	Change in Road Traffic and Road Network	Change in Utilities
[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas, and quarries.				

Project-related transportation in the LAA is not expected to affect temporary accommodations, community infrastructure and services, and utilities as it involves the movement of vehicles and equipment. Similarly, construction of Project components and quarry development are not expected to affect utilities as any changes will occur during site preparation. Potential effects on utilities during construction are managed through utility relocations which are a routine part of projects. Water development and control is not expected to affect temporary accommodation, community infrastructure and services, and road traffic and the road network as any changes will also occur during site preparation.

Operation and maintenance of the Project is expected to involve one or two workers in one vehicle, which is not expected to affect infrastructure and services. However, by lowering the risk for flooding, the Project will reduce the likelihood and extent of infrastructure and services being adversely affected by flood events.

9.3.4 Assessment of Residual Environmental Effects on Infrastructure and Services

9.3.4.1 Analytical Assessment Techniques

Baseline conditions regarding the supply and demand of temporary accommodations, infrastructure and services, and the roadway transportation network are provided in Section 9.3.2. The potential effect on infrastructure and services is described and/or estimated in consideration of potential service demands of the Project's workforce, other service and infrastructure usage by the project (e.g., waste disposal and roadway use), and direct infrastructure effect (e.g., roadway reconstruction or utility re-location). Where data is available, incremental Project effects are estimated based on capacity information, service utilization factors, or incidence rates. Data used to assess the effects on infrastructure and services was obtained from a variety of sources, including statistical data (e.g., Statistics Canada), websites (e.g., RCMP, Interlake-Eastern RHA), the IPEP and KPIs conducted for the Project.

9.3.4.2 Change in Accommodations

Project Pathways

The Project construction workforce (discussed in Chapter 3, Section 3.5.2.16) may increase demand for temporary accommodations through use of existing motels. For the LMOC, the peak workforce is estimated to be up to 325 workers in the second year of construction, while the LSMOC peak workforce is estimated at 250 workers. While the expectation is that contractors would use local existing accommodations if and when appropriate, these are limited in the RAA to approximately 70 rooms (see Section 9.2.2.4). Depending on the timing and the number of workers requiring temporary accommodations, there is a potential that there will be limited accommodations available for other visitors to the area (e.g., tourists, non-Project contractors) during construction, particularly in the vicinity of the LMOC. Operations and maintenance of the Project is expected to involve one or two workers (expected to be regional Manitoba Infrastrucure staff or small contractor crews conducting specific maintenance activities), which will not affect temporary accommodations.

Mitigation

The following mitigation measures will be implemented to reduce demands on temporary accommodations:

- Manitoba Infrastructure will continue to share Project information, such as construction schedules, and workforce numbers with the RMs, First Nations, local communities, service providers and businesses in the RAA during construction.
- Based on current accommodations, temporary construction camps will be used to house the construction workforce for the LMOC and LSMOC if required.
- Transportation of workers between construction camp and accommodations and worksites may be done in groups (e.g., vans) to reduce the potential number of vehicles on the road network.

Project Residual Effects

It is expected that the majority of the Project's workforce will be from outside of the RAA and will require accommodations while on site. These workers will stay in construction camps established for the Project or at hotels and motels found in the communities located in the RAA. Because of the currently limited availability of such temporary accommodations in the LAA, most workers will be housed at one or more temporary construction camps. Residual effects on accommodations are expected to be adverse during construction because of the limited availability of temporary accommodations in the RAA and the potential for displacement of other users, such as tourists, but this would be mitigated through the establishment of construction camps. In addition, there could be an economic benefit to the RAA because of spending on accommodations and related services.

With the implementation of mitigation measures, residual effects are expected to be moderate in magnitude. Effects are predicted to be regular/continuous during construction and there is expected to be moderate sensitivity in terms of timing, based on the current level of tourism use in the RAA during the summer. The effects are expected to be reversible in the short-term and businesses will be resilient to the change. With the limited number of workers and vehicles required during operations and maintenance, no effects on temporary accommodations will occur post-construction. Using a conservative approach, the socio-economic context is considered not resilient because some communities within the LAA remain vulnerable to flooding and/or may still in the process of recovering from the 2011 flood.

During the operation and maintenance phase, the Project will require the services of one or two maintenance personnel. The housing requirements of these individuals will have a negligible effect on housing markets or temporary accommodations within the RAA.

The operation of the LMOC and LSMOC will allow more water to be conveyed from Lake Manitoba to Lake Winnipeg more quickly and increasing the percentage of time that Lake Manitoba and Lake St. Martin can be managed at desired levels. Based on a hydrological model developed by Manitoba Infrastructure, in the event of another flood of the magnitude of the 2011 event, the Project would decrease peak water levels on Lake Manitoba by up to 1.5 ft, and on Lake St. Martin by 2.5 ft. This would decrease the amount of area flooded around Lake Manitoba by 754 km^2 and around Lake St. Martin by 27.5 km^2. This would result in a substantial flood-damage avoidance benefit to low-lying communities and infrastructure located near Lake Manitoba and Lake St. Martin.

9.3.4.3 Change in Community Infrastructure and Services

Project Pathways

The Project's construction workforce and Project activities may increase the demand for community infrastructure and services. This could result in a reduction in available capacity or quality of services for local residents and visitors to the area. Project construction may result in an increased demand for health, emergency and protection services which may increase response times. For example, there could be injuries at construction sites, vehicle collisions because of increased traffic, and incidents requiring police response. This could reduce the availability of existing capacity to respond to other emergencies in the RAA. In addition, construction of the Project will generate solid waste and the construction camps will require water, wastewater and solid waste services. If these services are procured locally, they may result in demands that exceed the capacity of service providers, affecting their ability to serve local customers; however, the Project's use of such services also represents business opportunities for these service providers.

Mitigation

The following mitigation measures will be implemented to reduce demands on community infrastructure and services:

- Manitoba Infrastructure will continue to share Project information with the RMs, First Nations, local communities, service providers and businesses in the RAA about the construction workforce and timing of construction activities.
- Solid wastes generated as a result of Project-related construction and operation and maintenance phases will be regularly transferred to appropriately permitted/licensed facilities for recycling and/or disposal.
- Wastewater generated as a result of the Project construction (i.e., wastewater from work camps) will be stored and transferred for disposal to existing licensed facilities by qualified carriers.
- Drinking water could potentially be sourced from wells (existing permitted/licensed sources or otherwise to be permitted/licensed by contractors with approvals obtained in accordance with provincial acts and regulations) or delivered by truck from the nearest licensed/permitted water treatment facility.
- An Emergency Response Plan will be developed for the Project and shared with Project personnel. The plan will include measures to address emergency response communications, 24-hour emergency transport to hospital for occupational and non-occupational injuries and a plan for fire response and evacuation. Contractor's will also be required to have emergency response plans in place.
- An Access Management Plan, which will address access related issues expressed by directly affected landowners, Indigenous communities and the public (see Chapter 5), will be prepared to outline specific measures to ensure proper access during the construction of the Project.
- A Waste Management Plan will be prepared for the Project that will include practices for management both general and hazardous wastes.

Project Residual Effects

There are two RCMP detachments in the LAA. In addition to the hospital in Ashern, which has a 14-bed capacity, the Province of Manitoba operates STARS within flying range of Winnipeg to provide rapid emergency medical care and transport for injured persons to Winnipeg. Potential effects from the Project on health, emergency and protection services will be reduced through the implementation of the Emergency Response Plan, which will include a plan for medical incidents that includes 24-hour emergency transport to hospital and a plan for fire response and evacuation.

Safe Work Manitoba maintains data on time-off injury rates for various industries. In 2017, the time-off injury rate for the heavy construction industry was 3.6 injuries per 100 full-time equivalents (SWM 2018). Assuming that the 2017 time-off injury work is applicable to the Project, and workers who took time off

also sought medical attention, at peak Project workforce of 575 persons there would be 20.7 injuries/year, or 1.7 injuries per month. In consideration of identified mitigation measures, the Project will have a negligible to low effect on services provided by first responders and medical facilities within the LAA.

At peak, the Project will require approximately 575 workers, or approximately 5% of the RAA's permanent population. A detailed estimate of wastewater generation has not been completed for the Project; however, because it is estimated that there are 575 workers during peak construction, compared to the LAA permanent population, the increase in solid waste in the LAA would be approximately 5%, or less.

Depending on the final size and occupancy of the temporary construction camps, camp trailers will most likely be equipped with self-contained holding tanks for potable water and wastewater. Otherwise separate holding tanks will be used to temporarily store these fluids. The tanks would be pumped out at regular intervals and disposed of at permitted or licensed facilities or lagoons. The final wastewater disposal sites will be confirmed by the contractor.

Drinking water could potentially be sourced from wells (existing permitted/licensed sources or otherwise to be permitted or licensed by contractors with approvals obtained in accordance with provincial acts and regulations). If there are potable water supply constraints within the LAA, potable water may be delivered by truck from licensed and permitted facilities located outside of the LAA.

The Project will increase demands on community infrastructure and services during construction in the RAA and, hence, is expected to have an adverse effect. With the implementation of mitigation measures, during construction, effects are expected to be short-term in duration and regular/continuous in terms of frequency. The effects are predicted to be low to moderate in magnitude and moderately sensitive in terms of timing because the RAA experiences a summertime increased in population from visitors. Using a conservative approach, the socio-economic context is considered not resilient because some communities within the LAA remain vulnerable to flooding and/or are still in the process of recovering from the 2011 flood. This includes First Nation members that remain displaced from reserves which were affected by flooding.

With the limited number of workers during operations and maintenance, no effects on community infrastructure and services will occur during normal operations. The operation of the LMOC and LSMOC will alleviate flooding in low-lying areas within the LAA. This will result in a substantial flood-damage avoidance benefit to infrastructure located near Lake Manitoba and Lake St. Martin, and other low-lying areas (see maps in Appendix 6G).

9.3.4.4 Change in Road Traffic and Road Network

Project Pathways

The Project will involve the movement of workers, materials and equipment to construction sites, staging areas, and workforce accommodations areas in the PDA and LAA. Project-generated construction phase road traffic will increase traffic volumes, potentially contributing to roadway congestion. In addition, realignment of PR 239 and municipal roads in the RM of Grahamdale is required in order to

accommodate the LMOC. As noted in Section 9.3.1.2, the IPEP identified concerns expressed regarding the potential for increased travel times and maintenance of property access, and number and control of access roads connected with the Project. Access routes to some residences in RM of Grahamdale may be altered where existing access may be cut off. Construction of the LSMOC will use the Lake St. Martin access road, being developed as a separate project (Manitoba Infrastructure 2019), which will extend the Idylwild Forestry Road, east of Lake St. Martin, and connect via local roads to PTH 6, south of Grahamdale.

Mitigation

The following mitigation measures will be implemented to reduce changes in road traffic and the road network:

- Manitoba Infrastructure will continue to share Project information with the RMs, First Nations, local communities and stakeholders in the RAA during construction so that detours can be communicated to residents and mitigate travel delays.
- Transportation of workers between construction camp/accommodations and worksites will be done in groups (e.g., vans) and often using the PDA itself for access, to reduce the potential number of vehicles on the road network.
- Materials transported by truck will be compliant with weight restrictions, Spring Road Restrictions and geometric constraints set out by Manitoba Infrastructure and the RMs of Grahamdale and West Interlake.
- A Traffic Management Plan will be prepared for the Project, which will include a traffic control plan to describe anticipated detours and schedules specific to the Project design to mitigate travel delays.
- An Access Management Plan will be developed to address access related issues expressed by directly affected landowners, First Nations and the public and outline the requirements for specific measures to ensure compliant contractor access during the construction of the Project.
- Sections of municipal roads will be reconstructed, realigned or extended to provide access across the LMOC at the bridge crossings to be constructed.
- Temporary detours will be used to maintain access through the LMOC PDA during construction to reduce/avoid potential effects on access interruption and maintain access for emergency medical services.
- Other than initial mobilization, de-mobilization, and transportation of construction materials Project construction-related traffic will be restricted to the Project PDA and associated temporary access routes to the extent practical and required.
- The contractor will be responsible for repairing roads if they are damaged during construction.

Project Residual Effects

With the application of mitigation measures, the Project is predicted to have a low effect on traffic volumes within the LAA. While Manitoba Infrastructure has yet to estimate the volume of Project-related travel, the main public roads within the LAA that will be transited by Project traffic, PTH 6 and PR 239, are currently operating at free-flow conditions (i.e. LOS A or B, see Table 9.3-11), and the incremental Project volumes are unlikely to degrade the LOS of these roads.

PTH 6 will be the main access road for the transportation of equipment, materials, and personnel from Winnipeg, and other commercial centres into the LAA. In 2017, PTH 6 south at the junction of PR 325 had an AADT of 1,730 vehicles/day. With an operating speed limit of more than 80 km/h this roadway can accommodate approximately 8,600 vehicles/day and still operate at near free flow (LOS B). Since current volumes are well below the LOS B threshold, the Project will change the level of service of this road.

For LMOC construction, it is anticipated that southern sections of the PDA will be accessed by PR 237, central sections by PR 239, and northern sections by local roadways. In 2015, PR 237 near PTH 6 had an AADT of 130 vehicles/day, a very low volume that would allow for free-flow traffic conditions. Incremental Project volumes will not alter the level of service of this road. If necessary, area residents, and visitors to Watchorn Provincial Park will be able to access PTH 6 by other local roadways that parallel PTH 6. In 2015, PR 239 had an AADT of 400 vehicles/day, which is likely well below the capacity of this road. Should there be Project-related delays along this route, residents of Steep Rock and visitors to Steep Rock Beach Park would be able to access PTH 6 by local roads that parallel PR 239 to the north and south.

LSMOC construction sites will be accessed by the Lake St. Martin Access Road, which will be built east of Lake St. Martin and is not part of the Project. Because most of the LSMOC construction traffic will use the Lake St. Martin Access Road, it is anticipated that Project-related traffic along PTH 6, north of Grahamdale as well as on connecting roads, will be minimal, and will not affect the level of services on those roads.

Construction of the LMOC will sever PTH 6, PR 239, and local roadways. Bridges will be built over the LMOC at four locations: PTH 6, PR 239, the Township Line Road across the southern end of the LMOC, and Iverson Road across the northern end of the LMOC (see Appendix 3B, Figure 3-1). PR 239 and some local roadways will be re-routed to facilitate construction of the LMOC.

Traffic flow along roadways during construction periods will be managed through a traffic management plan, which may involve re-routing traffic along alternative routes. This could result in delays or increased travel times for roadway users. The maximum likely re-routing during construction would add approximately 10 km to local trips, resulting in increased travel times (assuming 60 km/h) of ten minutes per trip.

In summary, with the implementation of mitigation measures, effects related to change in roadway volumes are expected to be of low magnitude, and regular/continuous frequency throughout the construction period. The effects are expected to be reversible in the short-term, and because of available

roadway capacity, and the availability of alternative local routes, the roadway transportation system is considered resilient. Because of limited workers during operations and maintenance, the Project will have negligible effects on traffic volumes post-construction.

Changes to the provincial and municipal road network during construction are expected to be adverse and short-term in duration. With the implementation of mitigation measures, effects are expected to be low in magnitude and sporadic/intermittent in terms of frequency. The effects are expected to be limited to the PDA and expected to be reversible in the short-term. In the baseline condition, roadway infrastructure is resilient under most conditions because provincial and local roads operate at high LOS. This would change during flood conditions that result in flooding roadways, as it would restrict accessibility to some communities in the LAA until repairs are made.

During normal operations and maintenance (i.e., closed WCS gate conditions), the Project will have negligible effect on roadway traffic volumes. North-south connectivity within the LAA will be maintained at the baseline level because the main travel route, PTH 6, will remain operational. West of PTH 6, the realigned PR 239 and LMOC bridge crossings of PR 239 and Township Line Road will maintain connectivity and local trip travel times at or near baseline conditions. West of PTH 6, the combination bridge/WCS at the Iverson Road crossing of LMOC will also maintain connectivity of local road networks along the southern end of Lake St. Martin. While these roadway re-alignments were designed to minimize effects to local residents, they could result in minor increases in some trip travel times for local residents and visitors and will, therefore, have a negligible effect on the roadway network within the LAA, overall.

The operation of the LMOC and LSMOC will alleviate flooding in low-lying areas within the LAA. Roadways that may otherwise be flooded, such as PR 513, may remain operational, facilitating the connectivity of residents, businesses, and services that use these roads.

9.3.4.5 Change in Utility Infrastructure

Project Pathway

Project construction can sever or alter municipal infrastructure, including drainage systems and electricity and telecommunications lines. This would occur if any underground utilities intersect with the LMOC alignment, and the re-alignment of PR 239 and local roadways. Potential effects of alterations to drainage systems are addressed in Chapter 6, Section 6.4: Groundwater and Surface Water and Chapter 9, Section 9.2: Land and Resource Use.

Mitigation

- Manitoba Infrastructure will continue to share Project information with entities responsible for underground and above-ground utilities (e.g., the RM of Grahamdale, Manitoba Hydro), and will coordinate any utility re-routing as part of Project construction.
- Manitoba Infrastructure will consider requiring self-provision of communications infrastructure for construction contracts.

Project Residual Effects

There is limited potential for construction related impacts to utility infrastructure in the LAA. There are no identified potable water or sewer mains that would be affected. Residences, businesses, and service providers obtain potable water from either individual wells, private or semi-public local networks. Municipal sewage collection/treatment systems are located within several communities (see Section 9.3.2) but none of these facilities are located near the LMOC alignment. Retail natural gas distribution is not available in this part of Manitoba. Overhead electricity and telecommunication utilities that could be affected by roadway re-alignment would be relocated with minimal service interruption in accordance with a utility relocation agreement between Manitoba Infrastructure and the respective utility providers. Manitoba Infrastructure will consider requiring self-provision of communications infrastructure for construction contracts. In consideration of the above there will be no residual effects on utility infrastructure during construction.

The operation of the LMOC and LSMOC will alleviate flooding in low-lying areas within the LAA. A potential concern of flooding is contamination of potable water wells from flooded septic fields or wastewater lagoons. The reduced flooding risk associated with the Project will lower the risk of flooding related effects on utility infrastructure within the LAA. This will be a positive effect that will occur throughout the LAA during operations and will occur on a regular/continuous basis. The socio-economic context is considered not resilient because some communities within the LAA remain vulnerable to flooding or are still in the process of recovering from the 2011 flood.

9.3.4.6 Summary of Project Residual Effects.

Table 9.2-13 summarizes the residual environmental effects on infrastructure and services during construction and operations.

Table 9.2-13 Summary of Project Residual Effects on Infrastructure and Services

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-economic Context
Change in Accommodations	C	A/P	ST	M	MS	RAA	RC	RS	NR
Change in Community Infrastructure and Services	C	A/P	ST	L-M	MS	RAA	RC	RS	NR
Change in Road Traffic and Road Network	C	A/P	LT	L	MS	RAA	RC	RL	R
Change in Utilities	O	P-	LT-	M	MS	RAA	RC	RL	NR-

Table 9.2-13 Summary of Project Residual Effects on Infrastructure and Services

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-economic Context
KEY See Table 9.3-2 for detailed definitions *C: Construction* *O: Operation* *P: Positive* *A: Adverse* *N: Neutral* *ST: Short-term* *MT: Medium-term* *LT: Long-term*		*N: Negligible* *L: Low* *M: Moderate* *H: High* *NS: No sensitivity* *MS: Moderate sensitivity* *HS: High sensitivity* *PDA: Project Development Area* *LAA: Local Assessment Area* *RAA: Regional Assessment Area* *N/A: Not applicable*				*IF: Infrequent* *SR: Sporadic/Intermittent* *RC: Regular/Continuous* *RS: Reversible (short-term)* *RL: Reversible (long-term)* *I: Irreversible* *R: Resilient* *NR: Not resilient*			

9.3.5 Determination of Significance

9.3.5.1 Significance of Residual Environmental Effects from the Project

A significant effect on infrastructure and services is one that would result in an exceedance of available capacity or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies or mitigation measures. A significant adverse residual effect is also unlikely to recover to existing conditions.

Effects on accommodations, community infrastructure and services, road traffic and road network, and utility infrastructure were considered. During construction there are two general effect pathways on infrastructure and services: increased demand and use of infrastructure owing to the presence and movement of the construction workforce, and direct effects on infrastructure due to Project construction (mainly related to the effect on roadways during LMOC construction). The LAA is a relatively lightly populated area, comprising several small communities and rural homesteads. Unmitigated, the influx of up to 575 workers during the Project could place considerable demand on temporary accommodations, potentially displacing tourists and other visitors to the region. However, the construction of self-contained work camps would reduce or eliminate Project demands on accommodations, as well as municipal infrastructure such as potable water supply, wastewater treatment, and solid waste disposal.

Project construction will result in a temporary increase in road traffic, as well as some changes to the roadway network during construction and operation of the LMOC. Because of the relatively low traffic volume levels on roadways throughout the LAA, the additional Project volumes will not degrade the overall LOS of LAA roadways. There could be localized delays in areas where roadways are being re-routed or re-built to accommodate the LMOC, but because of available detour options the traffic network's connectivity will be maintained throughout construction. During operations, incremental Project traffic volumes will be negligible, and with the construction of four LMOC crossings, roadway network connectivity within the LAA will be maintained at or near existing conditions. There is low potential for Project effects on utility infrastructure and, with mitigation, there are no residual effects.

Legacy effects of the 2011 flood are still being felt within the LAA, particularly by those Indigenous groups that are still rebuilding and restoring housing and community infrastructure lost or affected by the flood. Once built, the LMOC and LSMOC will have a positive impact on the availability of infrastructure and services within the LAA, by (i) reducing the risk that housing and accommodations, roadways, and other built infrastructure will be damaged or rendered unusable by flooding and (ii) reducing the risk that the delivery of emergency services, or access to educational facilities or other public services will be limited.

Based on the assessment of the proposed effects of the Project on infrastructure and services and the proposed mitigation measures, the residual effects are considered not significant.

9.3.6 Potential Effects on Federal Lands

There are no federal lands within the PDA. Federal Lands within the LAA consist of the reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Fisher River First Nation, Peguis First Nation and Dauphin River First Nation. Locations of these lands are presented in Figure 9.3A-1. Because of legacy effects from the 2011 flood, several First Nations communities, in particular Lake St. Martin First Nation, Little Saskatchewan First Nation, Dauphin River First Nation, and Pinaymootang First Nation may be operating in a lower state of resilience than the LAA population as a whole. Because of such lowered resilience, such communities may experience adverse socio-economic impacts to a higher degree than other communities throughout the LAA, overall. However, direct effects on these communities will be moderated by the physical location of Project construction activities. LMOC construction will take place south of Lake St. Martin, which will reduce the potential for direct interaction between Project activities or the Project workforce with communities located north of Grahamdale. Similarly, the LSMOC PDA will not be physically connected with any Indigenous communities, lessening the potential for direct effects upon infrastructure and services of those communities. The beneficial effects of flood control by the Project are expected to be particularly beneficial to those Indigenous communities that are located on low-lying areas near Lake Manitoba and Lake Winnipeg.

9.3.7 Prediction Confidence

There is a moderate degree of confidence in the predicted effects of construction, operation and maintenance of the Project on infrastructure and services. The prediction confidence is based on

information collected as part of desktop-based data compilation and understanding of Project activities and locations. Through a process of public engagement and Indigenous engagement undertaken for the Project (i.e., open houses, stakeholder meetings, KPIs), there is good understanding of the issues and concerns related to potential effects on infrastructure and services, which have been addressed.

The prediction of effects on infrastructure and services has been informed by the understanding of baseline conditions within the LAA, the predicted nature and magnitude of Project interactions, and the assumed successful implementation of mitigation measures identified in this assessment. At present, there is limited information on some of these measures, which is relevant to the significance determination for infrastructure and services. In particular, there are no details on the workforce camp(s) (e.g. size, location, amenities provided, transportation of workers). Additional details on these proposed facilities may increase the prediction confidence of this assessment.

9.3.8 Follow-Up and Monitoring

Manitoba Infrastructure's practice is to develop Project-specific environmental protection plans where the mitigation measures are stipulated for construction, operation and maintenance activities. These measures are regularly reviewed for their effectiveness as part of a process of adaptive management in Project monitoring and follow-up.

No follow-up monitoring plans for the Project's effect on infrastructure and services have been identified.

9.3.9 Conclusions

9.3.9.1 Change in Accommodations

Project construction will result in an increased demand for temporary accommodations within the LAA to house workers that are not resident to the area. This demand is predicted to exceed the capacity of accommodation providers within the LAA (i.e. hotels and motels), particularly during the peak summer tourist season. The operation of workforce camps will limit the potential for adverse effects, while Project spending on accommodations within the LAA will provide an economic benefit within the region. The operation of the Project will have a beneficial effect on accommodations within the LAA due to reduced risk of flood-related damage.

9.3.9.2 Change in Infrastructure and Services

Project construction will result in a temporary increase of population in the LAA due to the presence of the Project workforce. This could include increase demands placed on medical services, emergency services, and municipal utilities. With implementation of mitigation measures, and in particular, the operation of self-contained workforce camp(s), potential impacts on infrastructure and services will be limited. When in operation (water control gates open), the flood protection measures provided by the Project will reduce the risk of flood related damage or disruption to infrastructure and services in the LAA.

9.3.9.3 Change in Road and Road Networks

Project construction will result in temporary increases in roadway volumes, and localized disruption to some roadways, particularly along the proposed LMOC alignment. Construction related effects will be limited due to the implementation of a traffic management plan and because roadway traffic volumes in the LAA are generally modest. There will be permanent changes to the traffic network due to the realignment of PR 239 and installation of four new crossings over the LMOC. However, with the installation of these crossings, roadway connectivity within the LAA is predicted to remain at or near baseline conditions. The operation of the Project will have a beneficial effect within the LAA due to a reduced risk of flood-related damage and/or reduced risk of disruption in connectivity within the LAA due to roadway flooding.

9.3.9.4 Change in Utilities

With implementation of mitigation measures, such as utility relocation procedures, Project construction is not expected to disrupt the provision of telecommunications or electricity services within the LAA. The operation of the Project will have a beneficial effect within the LAA due to reduced risk of flood-related damage to utility infrastructure, and reduced potential for service disruption.

9.4 ECONOMY

9.4.1 Scope of the Assessment

This section describes the present economic conditions of the Interlake Region (LAA/RAA), within which the Project will be built, and assesses potential effects of construction and operation of the Project on the local and regional economy.

This economy assessment is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) submitted to Manitoba Sustainable Development indicates that the EIS will describe socioeconomic attributes of the Project. Section 3.4.2 specifies that it will include economic activities such as agriculture and other businesses.

Section 7.1 of the Agency EIS Guidelines for the Project (CEAA 2018) requires that the EIS include a description of baseline conditions and Section 7.1.12 specifies requirements that the human environment information include sectors and economies that support the local and regional communities, including agriculture, tourism, and fishing

Economy is a valued component (VC) because of its importance to local and provincial residents, businesses, communities and governments. Through employment and procurement of goods and services, the Project would provide employment and sources of revenue for regional residents and

businesses. Because of the magnitude of Project spending, relative to the local and regional economy within the Interlake Region, it has potential to substantially affect the local and regional economy, both positively and negatively.

Economy comprises the following topic areas:

- provincial economy refers to economic output from Project spending, gross domestic product (GDP), employment, and labour income
- regional economy refers to local and regional businesses and economic sectors, potential effects due to labour constraints
- labour refers to availability of labour to satisfy Project requirements
- goods and services refers to availability and cost of goods and services to community residents

9.4.1.1 Regulatory and Policy Setting

A list of federal and provincial legislation that were considered in the assessment of the economy VC can be found in the Chapter 1 (Introduction, Appendix 1A); however, CEAA EIS Guidelines and Manitoba Infrastructure's Scoping Document provided the primary guidance. No other federal or provincial legislation, policy or agreements related to acquiring permits are directly applicable in the assessment of effects on economy. No other municipal policies or by-laws related to acquiring permits are directly applicable in the assessment of effects on the economy.

9.4.1.2 Engagement and Key Concerns

As part of the Indigenous and Public Engagement Process (IPEP), Manitoba Infrastructure shared information and documented concerns regarding the Project (see Chapter 5). Additional information was collected through key person interviews (KPIs) with representative stakeholders and groups. Indigenous group input and community concerns contributed to selecting the channel routes for the Project. For example, a route was chosen to utilize the Willow Point alignment for the LSMOC to avoid impacts to the Johnson Beach area and to avoid Buffalo Lake. Key economic issues identified through the IPEP are summarized in the following sub-sections.

Public Engagement

Manitoba Infrastructure received numerous comments about potential economic effects during four rounds of the IPEP, which included open houses and meetings. Detailed information on the IPEP is provided in Chapter 5. Economy related comments from public engagement are grouped into the following categories:

- impacts to local economic sectors, including commercial fishing, and tourism
- economic effects related to loss of farmland or changes to farming practice

- effect on property values
- cost of Project to local taxpayers
- Project procurement and tendering process
- compensation for past flood damage

Economic issues are addressed in the EIS in the following manner and sections:

- The potential impacts to local economic sectors related to Project spending are addressed in Section 9.4.4.3.
- Potential effects on agricultural land use, including loss of agricultural lands and change in agricultural productivity are addressed in Section 9.2.4.2.
- Potential effects on commercial fishing are addressed in Section 9.2.4.5, tourism in Section 9.2.4.4, and property values in Section 9.2.4.2.
- The Project will be funded by the provincial and federal governments, not local/regional taxpayers. The Project will result in some lands being removed from the taxable land base. Manitoba Infrastructure will pay a fee in lieu of property taxes. Potential taxation-related effects are assessed in Section 9.4.4.3.
- Manitoba Infrastructure will follow an open tendering process for Project procurement. Some potential procurement opportunities for local and regional businesses are identified in Section 9.4.4.3.

Indigenous Engagement

Throughout the IPEP, Manitoba Infrastructure received comments about economic issues. A summary of key feedback received consisting of interests and concerns with respect to economic issues is provided in Chapter 5.

Indigenous groups were provided opportunities to share their knowledge to help inform routing of the channel and the assessment through the IPEP. The input they provided added to the understanding of baseline conditions and informed the scope of issues addressed. Economy-related comments from engagement with Indigenous groups are grouped into the following categories:

- potential impacts to commercial fishing and forestry
- compensation for adverse effects on resource-based industries, including commercial fisheries and trapping
- opportunities for economic participation in the Project
- local spending by Project-related contractors

- training and mentoring opportunities
- compensation for previous losses due to flooding

Potential effects of the Project related to the economy are presented as follows:

- Potential effects on other resource-based industries, including fishing and forestry, are addressed in Section 9.2 of the EIS.
- The Project is expected to result in economic benefits to local businesses due to direct, indirect, and induced spending, as discussed in Section 9.4.4.3.

9.4.1.3 Potential Effects, Pathways and Measurable Parameters

Project spending will contribute to the regional and provincial economies and will add value to the GDP. It will also contribute to federal, provincial and local government revenue through taxation on income and on goods and services required for the Project. Potential effects, the effect pathways, and the measurable parameters used to assess potential effects on the economy are provided in Table 9.4-1.

Table 9.4-1 Potential Effects, Effect Pathways and Measurable Parameters for Economy

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in provincial economy	Project spending would affect local and regional labour forces, populations, and businesses. Project spending would contribute to municipal, provincial and federal tax revenue. Project spending would affect the provincial and federal GDP	• Project's spending in province • Estimated GDP ($). • Estimated government revenue ($) generated through construction, operation and maintenance. • Employment, labour force .
Change in regional economy	Local, regional, businesses would benefit from Project and consumer-related spending.	• Project's local spending. • Employment, labour force.
Change in regional labour force	Project employment, expenditures and population growth related to development can result in positive and adverse effects. Adverse economic effects might occur when the labour, goods and services required for the Project exceed the existing capacity, potentially leading to supply issues and cost increases. Positive economic effects relate to the employment of workers directly and indirectly	• Construction and maintenance employment. • Labour force, participation and unemployment rates.

Table 9.4-1 Potential Effects, Effect Pathways and Measurable Parameters for Economy

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in goods and services	Project consumption of goods and services may cause shortages or result in price increases to local residents.	• Cost of living

9.4.1.4 Boundaries

Spatial Boundaries

The spatial boundaries for the assessment of effects on economy are the Project development area (PDA), the local assessment area (LAA) and the regional assessment area (RAA). In this assessment, the LAA and RAA are the same geographic area, encompassing the RMs of Grahamdale and West Interlake, communities, including designated places, First Nations and unorganized territory and Northern Affairs communities areas. These are shown in Figure 9.4A-1 and described below. Economic effects related to expenditures will ripple throughout local, regional, provincial, and national economies as dollars are recycled. For the assessment of economic effects, the LAA is based on the area within which the local labour pool may be affected, based on an assumed commute time of an hour to any site related to Project construction or operations This defines an area also sufficiently large for the assessment of cumulative effects. In this section, the LAA is used to refer to both the local and regional assessment areas (see Figure 9.4A-1).

Project Development Area

The PDA encompasses the Project footprint and is the area of physical disturbance in which the Project components (main works) and associated works and activities are located. The PDA is an area of 2,099 ha, or 21.0 km^2. The primary PDA components are the Lake Manitoba Outlet Channel, PR 239 and municipal alignments (the LMOC PDA), and the Lake St. Martin Outlet Channel (the LSMOC PDA). The LMOC PDA is 24.1 km in length and occupies 1,022 ha. The LSMOC PDA is 23.8 km in length and occupies 993 ha. There are no Federal lands within the PDA.

Local Assessment Area

The LAA is the area where direct and indirect effects on the economies of local communities are likely to be most pronounced. The LAA for the assessment of effects on economy is composed of the communities in the following Census subdivisions:

- Lake Manitoba First Nation (Dog Creek 46)
- RM of West Interlake

- RM of Grahamdale
- Little Saskatchewan First Nation (Little Saskatchewan 48)
- Pinaymootang First Nation (Fairford [Part] 50)
- Fisher River Cree Nation (Fisher River 44 and Fisher River 44A)
- Peguis First Nation (Peguis 1B)
- Kinonjeoshtegon First Nation (Jackhead 43)
- Dauphin River First Nation (Dauphin River 48A)
- Lake St. Martin First Nation (The Narrows 49)
- Dauphin River Northern Affairs Community (Dauphin River NCM)
- Fisher River Northern Affairs Community (Fisher Bay NCM)

Regional Assessment Area

Because the LAA is a broad area including multiple communities that could be affected both directly and cumulatively by the Project, the RAA is the same as the LAA, and it is sufficiently large for the assessment of cumulative effects.

Province of Manitoba

The Province of Manitoba is an administrative boundary relevant to the economy assessment. Some information is available only at the provincial scale (i.e., contribution to provincial GDP).

Temporal Boundary

The assessment of effects on economy covers the duration of the construction and operation phases of the Project. Construction is estimated to occur over 2.5 to 3 years with approximately 1 to 2 years for post-construction-related works (Chapter 3, Section 3.6). The operations and maintenance phase of the Project is expected to be indefinite. During construction, operation and maintenance, the economy will be affected by the presence of a workforce and through the purchases of goods and services.

9.4.1.5 Residual Effects Characterization

Table 9.4-2 presents definitions for the characterization of residual effects on the economy. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table 9.4-2 Characterization of Residual Effects on Economy

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change on the VC.
	Adverse	Net loss (adverse or undesirable change) on the VC.
	Positive	Net benefit (or desirable change) on the VC.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of several months up to one year).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities.
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project.
Magnitude (degree or intensity of the change)	Negligible or Low	Negligible – no measurable change in local employment, goods and service demand, and economic activity from baseline conditions. Low – a small measurable change in local employment, goods and services demand, and economic activity.
	Moderate	Measurable change but unlikely to pose a substantial risk or benefit to the economy.
	High	Measurable change on a scale that is substantial compared to current economic conditions and if negative, represents a management challenge.
Timing	No Sensitivity	No effect on economy related to timing.
	Moderate Sensitivity	Seasonal dependent economic sectors, such as tourism, may be moderately sensitive to Project activities
	High Sensitivity	Seasonal dependent economic sectors, such as tourism, will be highly sensitive to Project activities
Extent (Spatial Boundary)	PDA	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities
	LAA	Area within which potential Project effects are measurable and extending beyond the PDA to, but not beyond, the LAA. (e.g., RM boundaries)
	RAA	The regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA. (e.g., RM and Provincial boundaries)
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project.
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project.

Table 9.4-2 Characterization of Residual Effects on Economy

Characterization	Range of Criteria	Level of Effect and Definition
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project.
Reversibility	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (<five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (>five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
Social Context	Average condition	Economic condition within area, measured by unemployment rate, per-capital income, or other indicators is comparable with provincial average
	Below average condition	Economic condition within area, measured by unemployment rate, per-capital income, or other indicators, is demonstrably below the provincial average

9.4.1.6 Significance Definition

A significant adverse residual effect on the economic environment is defined as one that is distinguishable[6] from current conditions and trends and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation measures.

The residual effects assessment considers both positive and adverse effects after mitigation and other management measures are implemented. However, significance determination is made for adverse effects only.

9.4.2 Existing Conditions for Economy

9.4.2.1 Methods

Information on existing conditions for the economy was obtained through primary and secondary sources. Primary data was collected through the IPEP for the Project (e.g., open houses, meetings with the Reeve and Council from the RM of Grahamdale) and KPIs with stakeholders. Secondary sources included a review of statistical and other information. This included the following:

- Statistics Canada Census data
- Indigenous community profile information from INAC

[6] "Distinguishable" means that the adverse effect is measurable, predictable, and attributable to one or more project or cumulative interactions (i.e., it is not within the boundaries of normal variation of the measurable parameter under existing conditions).

- RM and community websites (e.g. local chambers of commerce, websites of Indigenous communities)
- MI workforce and expenditure information for construction and operation/maintenance of the Project
- information collected during the IPEP
- general literature review

9.4.2.2 Overview

The LAA occurs within the Interlake Region of Manitoba, and is composed of two rural municipalities, several Indigenous communities, and unorganized Crown land. The LAA is relatively lightly populated, with the majority of the population living in settlements to the south of Lake St. Martin. (See Section 9.3.2 for information on population and demographics within the LAA.) Moosehorn and Gypsumville and the largest communities within the RM of Grahamdale, while Ashern and Eriksdale are the largest communities within the RM of West Interlake. These communities, several smaller hamlets, and Indigenous communities serve as local centres of commerce. The nearest large commercial centre to the LAA is the City of Winnipeg, located approximately 143 km SE of Eriksdale.

Agriculture, aggregate and limestone mining, commercial fishing, forestry, and tourism are the predominant land and resource-based industries in the LAA. Other important economic sectors include construction, public services (e.g., health care and education), retail trade, and transportation. Retail level businesses throughout the LAA provide a wide variety of goods and services to residents and visitors.

9.4.2.3 Labour Force

In 2016, the labour force of the LAA consisted of 3,725 persons over the age of 15 years (see Table 9.4-3). Of these individuals, 49% (participation rate) were employed or actively seeking work and 17% were unemployed. In 2016 the participation rate within the LAA was substantially lower than that of Manitoba overall, while the unemployment rate was substantially higher.

There was a marked contrast in the participation rates and unemployment rates among those living within or outside of a First Nation Reserve, as identified within the Census. Within the rural municipalities of Grahamdale and West Interlake, the labour force participation rate is 61% while the unemployment rate is 8.0%, as compared to the province wide unemployment rate of 6.7%. By contrast, the average participation rate of LAA residents living on a reserve is 43%, while the unemployment rate is 34%.

In 2016, there were 635 unemployed workers in the LAA, of which 125 lived in the rural municipalities of Grahamdale and West Interlake, with the balance living in an Indigenous community.

Table 9.4-3 2016 Labour Force (15 Years and Older), LAA and Manitoba

Location	Adult Population	Labour Force	Participation Rate (%)	Employed	Unemployed	Unemployment Rate (%)
Lake Manitoba FN (Dog Creek 46)	575	165	28.7	150	10	6.1
West Interlake	1,760	1,060	60.2	980	85	8
Grahamdale	1,090	690	63.3	645	40	5.8
Little Saskatchewan FN (Little Saskatchewan 48)	195	75	38.5	70	10	13.3
Pinaymootang FN (Fairford [Part] 50)	755	230	30.5	175	60	26.1
Fisher River CN (Fisher River 44)	1,015	515	50.7	355	165	32
Fisher River CN (Fisher River 44A)	35	20	57.1	10	10	50
Peguis FN (Peguis 1B)	1,910	880	46.1	665	220	25
Kinonjeoshtegon FN (Jackhead 43)	160	90	56.2	55	35	38.9
Dauphin River FN (Dauphin River 48A)	-	-	-	-	-	-
Lake St. Martin FN (The Narrows 49)	-	-	-	-	-	-
Dauphin River NCM	-	-	-	-	-	-
Fisher Bay NCM	-	-	-	-	-	-
LAA	**7,495**	**3,725**	**49.7**	**3,105**	**635**	**17.0**
Manitoba	1,001,305	662,155	66.1	617,465	44,690.0	6.7

NOTES:
- = data not available
NA = not applicable
SOURCE: (Statistics Canada 2017)

9.4.2.4 Labour Force Employment by Industry

In 2016, approximately 58% of the LAA labour force was employed in basic industries (industries whose customer base is located primarily outside of an economic region), 36% in non-basic industries (industries whose customer base is located primarily within an economic region), and the balance not identified (see

Table 9.4-4). Among basic industries, employment in health care and social assistance accounted[7] for 17.7% of the LAA labour force, followed by education services (13.0%), agriculture, forestry, fishing and hunting (12.7%), and construction (12.4%). Among non-basic industries, employment in public administration accounted for 8.7% of the LAA labour force, followed by retail trade (7.3%), and accommodations and food services (4.6%).

Comparing the proportion of the LAA labour force employed in basic industries to those employed in non-basic industries provides context in the assessment of economic effects. A ratio of less than one is indicative of a labour force that is more heavily employed in basic industries whereas a ratio greater than one is indicative of a labour force more heavily employed in non-basic industries. A higher ratio may indicate an economy is more diversified, and less dependent on resource or manufacturing sectors. The non-basic to basic ratio of the LAA as of 2016 was 0.6. By comparison, the provincial ratio was 1.2 in 2016.

Table 9.4-4 2016 Labour Force by Industry (15 Years and Older), LAA

Industry		Employed Persons	Percent (%) of LAA Labour Force[3]
Basic Industries	Agriculture, forestry, fishing and hunting	470	12.7
	Mining, quarrying, and oil and gas extraction	20	0.5
	Utilities	35	0.9
	Construction	460	12.4
	Manufacturing	45	1.2
	Educational services	480	13.0
	Health care and social assistance	655	17.7
	Total employment in basic industries	**2,165**	**58.4**
Non-basic Industries	Wholesale trade	45	1.2
	Retail trade	270	7.3
	Transportation and warehousing	100	2.7
	Information and cultural industries	30	0.8
	Finance and insurance	45	1.2
	Real estate and rental and leasing	15	0.4
	Professional, scientific and technical services	65	1.8
	Management of companies and enterprises	0	<0.1
	Administrative and support, waste management and remediation services	85	2.3
	Arts, entertainment and recreation	85	2.3
	Accommodation and food services	170	4.6

[7] For this analysis, government funded service industries, such as health care and education are considered “basic” because they are provincially funded and, thus, they result in a capital inflow to the region.

Table 9.4-4 2016 Labour Force by Industry (15 Years and Older), LAA

Industry		Employed Persons	Percent (%) of LAA Labour Force[3]
	Other services (except public administration)	115	3.1
	Public administration	320	8.7
	Total employment in non-basic industries	**1,345**	**36.4**
No applicable North American Industry Classification System (NAICS) industry		**185**	**5.0**
Total Industry Employment		**3,695**	**100.0**

NOTES:
1 = Totals may not sum due to rounding
SOURCE: (Statistics Canada 2017)

9.4.2.5 Labour Force Employment by Occupation

In 2016, employment in occupations related to sales and service (i.e., retail sales, specialized sales, wholesale and retail, personal services, sales support) accounted for the largest proportion of employed persons within the LAA (19.5%), followed by construction related occupations (trades, transport and equipment operators and related occupations) at 19.2%. Occupations related to manufacturing and utilities accounted for 1.5% of the workforce, while art, culture, recreation, and sport accounted for 0.5%.

Table 9.4-5 2016 Labour Force by Occupation (15 Years and Older), LAA

Occupations	Total	Percent (%) of LAA Labour Force[1]
Management	495	13.5
Business, finance and administration	370	10.1
Natural and applied sciences and related	55	1.5
Health	220	6.0
Education, law and social, community and government services	575	15.6
Art, culture, recreation and sport	20	0.5
Sales and service	715	19.5
Trades, transport, equipment operators and related	705	19.2
Natural resources, agriculture and related production	275	7.5
Manufacturing and utilities	55	1.5
Occupation - not applicable	190	5.2
Total	**3,675**	**100.0**

NOTES:
1 = Totals may not sum due to rounding
SOURCE: (Statistics Canada 2017)

9.4.2.6 Individual Income

In 2015, the overall average incomes of the LAA (median of $16,331, mean of $25,287) were substantially lower than the provincial averages (median of $34,188, mean of $43,767). Similarly, average employment income in the LAA was substantially lower than the provincial average (Table 9.4-6).

There is a marked contrast in the average income between those living within or outside of Indigenous communities. Within the rural municipalities of Grahamdale and West Interlake, mean total income in 2015 was nearly $40,000, while mean employment income was approximately $47,850. By comparison, the mean total income of LAA residents living on a Reserve lands in the LAA was approximately $20,250, while the mean employment income was $41,100.

Table 9.4-6 2015 Individual Income, LAA

Location	Total Income ($)		Employment Income ($)	
	Median Income	Mean Income	Median Income	Mean Income
Lake Manitoba FN (Dog Creek 46)	10,976	14,960	28,032	30,536
RM of West Interlake	27,680	36,473	44,183	48,112
RM of Grahamdale	27,712	37,695	39,562	47,457
Little Saskatchewan FH (Little Saskatchewan 48)	13,504	17,656	24,320	35,713
Pinaymootang FN (Fairford [Part] 50)	12,715	17,594	32,064	35,152
Fisher River CN (Fisher River 44)	16,883	21,795	34,532	40,486
Fisher River CN (Fisher River 44A)	-	-	-	-
Peguis FN (Peguis 1B)	15,616	22,355	35,413	45,944
Kinonjeoshtegon FN (Jackhead 43)	-	-	-	-
Dauphin River FN (Dauphin River 48A)	-	-	-	-
Lake St. Martin FN (The Narrows 49)	-	-	-	-
Dauphin River NCM	-	-	-	-
Fisher Bay NCM	-	-	-	-
LAA[1]	**16,331**	**25,287**	**35,289**	**41,645**
Manitoba[1]	34,188	43,767	50,026	59,523

Table 9.4-6 2015 Individual Income, LAA

Location	Total Income ($)		Employment Income ($)	
	Median Income	Mean Income	Median Income	Mean Income

NOTES:

- = data not available

1 = data is presented for weighted (population-based) median and mean

Total income = includes employment income from wages, salaries, tips, commissions and net income from self-employment (for both unincorporated farm and non-farm activities); income from investment sources, such as dividends and interest on bonds, accounts, guaranteed investment certificates (GICs) and mutual funds; income from employer and personal pension sources, such as private pensions and payments from annuities and registered retirement income funds (RRIFs); other regular cash income, such as child support payments received, spousal support payments (alimony) received and scholarships; income from government sources, such as social assistance, child benefits, Employment Insurance benefits, Old Age Security benefits, Canada Pension Plan and disability income.

Employment income - All income received as wages, salaries and commissions from paid employment and net self-employment income from farm or non-farm unincorporated business and/or professional practice during the reference period.

SOURCE: (Statistics Canada 2017)

9.4.2.7 Education Attainment

In 2016, approximately 43% of the LAA population aged 15 years or older held no certificate, diploma or degree, while approximately 25% of the population held a high school diploma or equivalent (see Table 9.4-7). Approximately 8% of the LAA population held an apprenticeship or trades certificate, while nearly 25% had obtained a college or university certificate.

Table 9.4-7 2016 Educational Attainment (15 Years and Older), LAA

Characteristic	Total	Percent (%) of LAA Population[1]
No certificate, diploma or degree	3,220	42.7
Secondary (high) school diploma or equivalency certificate	1,890	25.1
Apprenticeship or trades certificate or diploma	570	7.6
College, CEGEP or other non-university certificate or diploma	1,065	14.1
University certificate or diploma below bachelor level	295	3.9
University certificate, diploma or degree at bachelor level or above	500	6.6
Total	7,540	100.0

NOTES:

1 = Totals may not sum due to rounding

SOURCE: (Statistics Canada 2017)

9.4.2.8 Local and Regional Businesses

Resource Based Industries

The LAA for the Project supports agriculture, fishing, mineral extraction, recreation and tourism (outfitting, campgrounds), as well as traditional use activities by Indigenous people. Traditional use activities in the economy RAA occur primarily around the LSMOC, based on input received from Indigenous communities. The major economic sector in the LAA continues to be agriculture, which is focused mainly on ranching and feedlots for cattle (M. Forster et. al. 2016). Other resource industries within the RAA include forest products, aggregate mining, and commercial fishing ranging from small-scale (e.g., sawmill) to larger-scale business operations (e.g., limestone quarry) with products sold in local, regional and provincial markets. Section 9.2.2.2 provides a detailed description of resource-based industries in the LAA. Table 9.4-8 is a non-comprehensive listing of resource companies identified to have operations within the LAA.

Table 9.4-8 Selected Resource-based Companies in LAA

Industry	Companies
Quarries/Aggregate	Graymont Western Canada Inc., CBR Cement Canada Limited, Gagne Gravel Co. Ltd, 5420041 Manitoba Ltd., Shoreline Excavating Ltd, Strilkiwski Contracting Ltd, RM of Grahamdale, Glacier North Limited , Glenko Enterprises (1994) Ltd., Armstrong Construction Ltd., Riverside Gravel (1985) Inc., Narrow West Land & Cattle Co. Inc., .RM of West Interlake (quarry lease)
Forestry/Forest Products	Ashern Sawmill, Fisher River First Nation Forestry
Commercial Fishing	Dauphin River Fisheries, Ashern Fisheries Cooperative Ltd., Fisher River Cree Nation fish processing Iplant, Keewahtinook Fishers of Lake Winnipeg
Guiding/Outfitting	Adamson Outfitting, Agassiz Outfitters, Davis Point Lodge & Outfitters, Mega Bucks Outfitting, Plum Lake Outfitters) Einarsson's Guiding Services, Wildwood Outfitters, Fisher River Outfitters, Bear Track Outfitters, Dauphin River Transport
Campgrounds	Anama Bay Tourist Camp, Elm Point Campground, Roviera Campground.
SOURCE: Forester et al.2016; MGET 2019	

General Commerce

Within the RM of Grahamdale, agriculture is the most prevalent business type, accounting for over 47% of registered businesses, followed by real estate (9.4%), construction (8.7%), other services (5.7%), and retail (5.4%) (RM of Grahamdale 2019). Most businesses registered in the RM of Grahamdale are small:– 57.5% of businesses have four or fewer employees, while 20% have five to nine employees.

Businesses listed on the RM of Grahamdale business directory include hospitality (food and beverage, accommodations), tourism and recreation (outfitting, campgrounds health and veterinary clinics, food producers, construction companies, real estate, transportation, auto repair, and other retail and service providers (RM of Grahamdale 2019).

Graymont Western Canada Inc. limestone and gypsum quarries and processing plant is located on PR 239 between the communities of Steep Rock and Faulkner and is a major employer in the area. The plant can produce up to 117,000 metric tonnes of lime per year. Seven silos provide 2,240 tonnes of storage for pebbled, pulverized and crushed quicklime or dolomitic lime. The plant can also produce 80,000 tonnes per year of calcium carbonate (Graymont 2019).

The RM of Grahamdale operates a Community Development Corporation, with objectives including promoting social and economic development, cultivating the growth of the regional economy, and facilitating employment opportunities for RM residents (RM of Grahamdale 2019).

Agriculture is the prevalent business type in the RM of West Interlake, accounting for over 57% of registered businesses, followed by construction (12.2%), retail (5.3%), real estate (5.3%), and other services (5.3%). Businesses listed on the RM of West Interlake business directory include: agriculture/farm supply, automotive repair, tourism and recreation (camping, museum), business/professional services (accounting, architecture, legal, financial services, real estate), construction/excavation, trades, concrete/aggregate, other retail and service providers (RM of West Interlake 2019).

In partnership with RM of West Interlake, the Eriksdale Community Development Corporation, offers a property tax incentive program to encourage new business development within the community (RM of West Interlake 2019).

Tourism is important to the LAA, with tourism-dependent businesses including lodges and outfitters and campgrounds (see Table 9.4-8). Other employers in the region include motels, retailers, schools (e.g., Alf Cuthbert School, Gypsumville School) and hospitals (e.g., Lakeshore General Hospital, E. M. Crowe Memorial Hospital).

Indigenous Communities

Indigenous groups in the LAA operate businesses that service community members, other area residents, as well as tourists and visitors. A non-comprehensive list of such businesses includes gas service stations (Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Fisher River First Nation, Lake Manitoba First Nation, and Peguis First Nation); convenience stores/supermarkets (Pinaymootang First Nation, Peguis First Nation), and campgrounds (Ahki 2019, RezGas 2019). Indigenous groups also have temporary accommodations in the RAA. These include the Pinaymootang Motel & Entertainment Centre, located in Fairford, which has 20 rooms, as well as hotels in Fisher River Cree Nation (Bay River Inns & Suites).

Indigenous-owned enterprises are also involved in various resource-based industries, including commercial fishing, trapping, and guide-outfitting (see Section 9.2.2.2). The Indigenous communities of Lake St. Martin, Little Saskatchewan River, and Pinaymootang engage in agricultural land use associated with hay lands. Fisher River Cree Nation has a forestry-based industry that includes timber harvest operations, sawmill, firewood production, tree nursery, tree plantations, biomass production, and forest regeneration contracts.

Peguis First Nation operates the Peguis Development Corporation (PDC), which has a mandate of facilitating economic development and employment within the Peguis community. Currently, the PDC owns businesses involved in construction, food retail, marketing communications, drill rig service, dry goods, and a gas service station. The PDC has also facilitated the development of businesses by community members (Peguis 2019).

9.4.2.1 2011 Flooding

The 2011 flood disrupted the lives of thousands of individuals and affected numerous businesses and services providers in areas affected within the RAA, and elsewhere in Manitoba. Within the LAA, flooding forced the evacuation of 4,000 persons from the Lake St. Martin First Nation, Little Saskatchewan First Nation, Dauphin River First Nation, and Pinaymootang First Nation, plus thousands more living off-reserve (CBC June 2019). As of the end of March 2018, 1,717 people from the most affected First Nation communities remained evacuated. Over 1,600 of the 1,717 are from the four Lake St. Martin area First Nations: Lake St. Martin First Nation, Little Saskatchewan First Nation, Dauphin River First Nation and Pinaymootang First Nation (Government of Canada 2019). The long-term displacement due to the flooding has been identified by Indigenous residents as a strain on livelihoods and well-being of community members (Einarsson 2017).

9.4.2.2 Provincial Economy

Manitoba has a diversified economy, which includes a substantial natural resource base, including agriculture, forestry, mining, and hydroelectric development; well-developed construction, transportation, wholesale and retail trade, hospitality, and services sectors; and substantial employment in health, education, and other public-sector services. Manitoba's 2018 GDP grew 1% from 2017 to 2018 to approximately $67.2 billion (MBS 2019). As of May 2019, Manitoba had an employed workforce of 654,800 persons, out of a population of 1,360,396, and an unemployment rate of 5% (MBS 2019).

9.4.3 Project Interactions with Economy

Project interactions with economy are organized into the following topics as presented in Section 9.4.1.3:

- changes in provincial economy
- changes in regional economy
- changes in regional labour force
- changes in goods and services

Table 9.4-9 identifies for each potential effect, the Project components and physical activities that might interact with the economy during construction and operations and maintenance and result in the identified environmental effect. These interactions are identified by check marks and are discussed in detail in

Section 9.4.4 in the context of effects pathways, standard and project-specific mitigation and residual effects. A justification for no effect is provided following the table.

Table 9.4-9 Project-Environment Interactions with Economy During Construction and Operations

Project Components and Physical Activities	Environmental Effects			
	Change in Regional Labour Force	Change in Regional Economy	Change in Provincial Economy	Change in Goods and Services
Construction				
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])	✓	✓	✓	✓
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	✓	✓	✓
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)	✓	✓	✓	✓
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])	✓	✓	✓	✓
Water development and control (dewatering and realignment of existing water works)	✓	✓	✓	✓
Reclamation (for construction of Project components[1])	✓	✓	✓	✓
Operations and Maintenance				
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure. e.g., water control structure gates are either open or closed)	✓	✓	✓	✓
Operation and maintenance of other Project components[1] (normal operations conditions associated with PR 239 and municipal road	✓	✓	✓	✓

Table 9.4-9 Project-Environment Interactions with Economy During Construction and Operations

Project Components and Physical Activities	Environmental Effects			
	Change in Regional Labour Force	Change in Regional Economy	Change in Provincial Economy	Change in Goods and Services
realignments, distribution line, and bridges and culverts)				
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	✓	✓	✓
Operation, maintenance, and reclamation of quarries	✓	✓	✓	✓

NOTES:
✓ indicates a potential interaction.
– indicates no potential interactions are expected.
[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas, and quarries.

In general, all Project-related activities involving labour and/or capital expenditure within the LAA are considered to have an economic effect. All construction-related activities will involve labour and capital expenditures. The disposal of Project-related solid wastes is assumed to occur at a fee-based facility within or outside the LAA. The magnitude of economic effect during operations will be much lower relative to Project construction phase, because of limited labour and operations/maintenance expense requirements during operations.

9.4.4 Assessment of Effects on Economy

9.4.4.1 Analytical Assessment Techniques

This section describes the techniques employed to assess the effects on the Manitoba economy, regional economy, regional labour force, and goods and services.

Change in Provincial Economy

Project effects on the economy of Manitoba and Canada related to Project expenditures were estimated using national and provincial multipliers taken from the Statistics Canada Interprovincial Input-Output Model (SCIPIOM). These multipliers were used to estimate changes in output, GDP, employment, and labour income associated with the Project.

The process for undertaking the multiplier analysis is as follows:

Step 1 – A notional breakdown of the Project's capital spending on goods, equipment, and services was developed, based on the 2016 preliminary cost estimated provided by Manitoba Infrastructure, and on the capital expenditures breakdowns available from similar heavy civil engineering projects. The total construction costs, excluding land cost and contingency, were broken down by cost category, and assumed proportion of expenditure by the following expenditure locations: LAA, Manitoba (outside the LAA), and other Canada. The assumed proportion of expenditures by expenditure location was informed by the review of companies and businesses operating within the LAA (see Section 9.4.2.8).

Step 2 – Costs were categorized in an Excel spreadsheet model using appropriate Input-Output Industry Classification (IOIC) codes used by Statistics Canada. The following IOIC codes were used in the analysis:

- BS23C100 – Transportation engineering construction
- BS23C500 – Other engineering construction
- BS541300 – Architectural, engineering and related services
- BS212310 – Stone mining and quarrying
- BS327300 – Cement and concrete product manufacturing
- BS333900 – Other general-purpose machinery manufacturing
- BS335300 – Electrical equipment manufacturing

Step 3 – Direct, indirect, and induced economic impacts for each expenditure item were estimated based on Manitoba provincial multipliers available from the Industry Accounts Division of Statistics Canada. The following multipliers were used: output, GDP basic price, labour income, and jobs. Multipliers for output, GDP, and labour income are expressed as a coefficient of output "shock", where the output shock" represents new revenue or expenditure within an economy. For example, a GDP multiplier of 0.6 would mean that for every $1 of additional output $0.6 of GDP will be created. The multipliers for jobs is expressed as jobs per million dollars of output. Multipliers are provided for direct effects, simple multipliers (direct and indirect), and total multiplies (direct, indirect, and induced). Multipliers are also provided for within the province (Manitoba), and all provinces. Based on this information the direct, indirect, and induced effects of Project expenditures within Manitoba and elsewhere in Canada were estimated.

Step 4 – The direct employment estimate, provided in Table 9.4-17 , incorporates both direct employment, estimated using the multipliers, as well as the construction workforce estimates provided by Manitoba Infrastructure, where "direct construction employment" is construction employment, expressed in person-years, based on the Manitoba Infrastructure estimates, and "other direct" is the difference

between estimated employment, based on the multipliers, and “direct construction employment” provided by MI.

Step 5 – Summaries of construction spending, and estimated effects on GDP, construction employment, and labour income are provided in tables within the section.

The following assumptions were used in assessing a change in the provincial economy:

- all dollar figures are expressed in nominal 2016 Canadian dollars ($)
- expenditure data are based on 2016 Manitoba Infrastructure preliminary estimates (assumed Class D) and are considered accurate to within +/- 50%
- expenditure data used in the economic impact analysis does not include the cost of land, or escalation reserve
- the spending breakdown assumes availability of Manitoba goods and services providers, and successful award of Project-related contracts

Because of the relatively small amount of annual operating expenditure (estimated at less than $500,000/year), the effects of operations and maintenance on the provincial economy is provided qualitatively. However, it should be noted that these benefits are minor in comparison to the economic purposes of the completed Project, which include preventing the economic costs of flooding to governments, businesses, their employees, and residents.

Change in Regional Economy

The assessment of change in the regional economy uses a combination of methods. Quantified economic effects of Project expenditures in the LAA are based on assumed Project expenditures by category. For this assessment, the following assumptions, based on a preliminary identification of goods and services available within LAA, are used:

- 10% of general construction/contracting services are procured within LAA.
- 100% of aggregate will be procured within the LAA.
- Other construction/contracting services, goods and equipment used in Project construction, and professional services will be procured from elsewhere in Manitoba and Canada.

Because major tendering for the Project has yet to occur, there is considerable uncertainty around these assumptions. It is also acknowledged that local labour force size is not necessarily a factor limiting the extent of procurement from local companies because such firms can also bring in labour from outside the LAA. Economic benefits may also come from the construction and operation of work camps, including construction services, material and supplies purchasing, and catering and camp operations.

Indirect and induced economic effects occur as a result of the recycling of dollars spent by Manitoba Infrastructure (in the case of indirect effects) and its workforce (in the case of induced effects). The magnitude of these multiplier effects is captured in provincial level multipliers, based on the SCIPIOM. Because the economy of the LAA is less diversified than that of the province, overall, there are fewer opportunities for recycling of spent dollars, and thus indirect and induced multipliers at the LAA scale would be expected to be smaller than those at a provincial scale. Indirect and induced economic effects within the LAA were estimated using multipliers that were adjusted using a factor that accounts for the more limited economic diversification within the LAA compared to Manitoba overall, based on the ratio of employment in non-basic to basic sectors between the LAA and Manitoba (see Table 9.4-10). See Section 9.4.2.4 for discussion of basic and non-basic sectors.

Table 9.4-10 Adjustment Factors, Indirect and Induced

Location	Non-Basic to Basic Ratio	Adjustment Factor (% of Manitoba Ratio)
LAA	0.62	52%
Manitoba	1.20	100%
SOURCE: Estimate based on existing characteristics from Statistics Canada (see Section 9.4.2.4) using methods described in the paragraph above this table.		

In addition to quantifiable positive effects due to potential capital inflows into the LAA, potential adverse effects related to competition for labour and increased goods and services costs are discussed qualitatively in Sections 9.4.4.4 and 9.4.4.5.

The potential economic effects related to change in land values or resulting from potential changes in land and resource use are not addressed in this section. Potential effects on land and resource use are addressed in Section 9.2.

The potential effects related to changes to the taxation base within the LAA has not been quantified. Manitoba Infrastructure will pay a fee in lieu of taxes to the RM of Grahamdale in accordance with *The Expropriation Act* and will provide funding to compensate for additional costs incurred by the RM of Grahamdale associated with Project engagement., Because of the relatively small amount of annual operating expenditure (estimated at less than $500,000/year), the effects of operations and maintenance on the regional economy is provided qualitatively.

The operation of the LMOC and LSMOC will alleviate flooding in low-lying areas within the LAA. This will result in a positive economic benefit through reduction in risk of flood-related damage and disruption to commercial activities in the LAA.

Change in Regional Labour Force

Direct employment estimates for the construction and operations workforces were provided by Manitoba Infrastructure. Other direct labour estimates are based on the difference between direct employment calculated using provincial multipliers for select IOICs from the SCIPIOM and Manitoba Infrastructure's

direct employment estimates. Indirect and induced employment within Manitoba was calculated using provincial multipliers.

The indirect and induced employment estimates for the LAA were calculated by multiplying provincial employment estimates by SCIPIOM IOIC provincial multipliers and derived adjustment factors, as discussed above in methods for change in regional economy.

Average annual wage of Project construction workforce was estimated by dividing estimated labour income by estimated person-years (PYs) of labour.

To determine the number of Project positions that could be filled by LAA residents during construction and operations (i.e., available labour force), existing LAA characteristics were compared with labour requirements for the Project. To calculate the available labour force, the existing LAA unemployment rate was multiplied by the labour force size for relevant occupations (e.g., trades, transport and equipment operation). Because unemployment rates are likely to vary by occupation, this is considered an approximation of the available labour force in the LAA.

To facilitate a conservative approach, peak workforce estimates and conservative (i.e., underestimated) local hire estimates were used. Peak workforce estimates were assumed to apply at the start of each Project phase (e.g., construction and non-operation) and be sustained for the duration of that phase regardless of actual fluctuations in project employment. Because of the relatively small amount of labour associated with operation and maintenance (estimated at one or two maintenance staff), the effects of operations and maintenance the regional labour force is provided qualitatively.

Change in Goods and Services

The assessment of potential effects on cost and availability of goods and services incorporates the results of a literature review of similar-sized construction projects undertaken in Manitoba and elsewhere. Potential effects to communities within the RAA will be inferred based on this review, in consideration of contextual factors, such as the size and diversification of the economy within the RAA, the relative size of the Project, and the connectivity between communities in the RAA and those elsewhere in Manitoba.

9.4.4.2 Change in Provincial Economy

Project Pathways

Project spending can affect the provincial economy through the generation of GDP, employment, labour income, and government revenue. Dollars spent on labour, equipment, and materials will be recycled resulting in spin-off benefits (i.e. indirect and induced economic impacts). Because the Project will be government funded, the capital used to pay for it will have been ultimately provided by taxpayers and other government funding sources. Therefore, the proportion of the Project financed by the Government of Manitoba can be regarded as an allocation of taxpayer funds back into the provincial economy. The proportion of the Project financed by the federal government can be regarded, partially, as an injection of capital into the Manitoba economy.

Mitigation

Project effects on the provincial economy are expected to be positive in direction with the addition of direct, indirect, and induced employment income and GDP. As such, no mitigation measures are proposed. Manitoba Infrastructure will adhere to government procurement policies and procedure with respect to labour, and goods and services.

Project Residual Effects

Construction

Project capital expenditures, exclusive of land and contingency, are estimated at $456 million, of which 12% ($55 million) is expected to occur in the LAA. Table 9.4-11 shows estimated total capital costs for the Project. A total of $371 million of capital expenditures are estimated to occur in other parts of Manitoba, and $28 million in other parts of Canada. Of total capital expenditures, an estimated 29% ($131 million) will be spent on direct labour.

Table 9.4-11 Estimated Construction Spending in Manitoba and Canada

Location	Estimate (Millions $)	Percent of Total (%)
LAA	55	12
Other parts of Manitoba	371	81
Other parts of Canada	29	6
Total	**456**	**100**

SOURCE: Manitoba Infrastructure 2016 estimate of construction cost. Stantec assumptions of construction expenditure breakdown by location (see Section 9.4.4.1).

A breakdown by major types of goods and services that would be procured during construction, and the distribution of costs between the LAA, other parts of Manitoba, and other parts of Canada is provided in Table 9.4-12. The effects of Project spending on businesses and the labour force within the LAA are assessed in Section 9.4.4.3 and Section 9.4.4.4 respectively.

Table 9.4-12 Estimated Construction Spending Breakdown

Construction Costs		LAA ($ Millions)	Other Manitoba ($ Millions)	Other Canada (Millions $)	Total (Millions $)
		Estimate (Millions $)	Estimate (Millions $)		
Goods	Concrete or aggregate	50	10	0	59
	Machinery or equipment	0	3	3	6
	Other goods	0	2	2	4

Table 9.4-12 Estimated Construction Spending Breakdown

Construction Costs		LAA ($ Millions)	Other Manitoba ($ Millions)	Other Canada (Millions $)	Total (Millions $)
		Estimate (Millions $)	Estimate (Millions $)		
Services	Construction services	5	318	11	335
	Engineering and other professional services	0	38	13	51
Total		**55**	**371**	**29**	**456**

NOTE:
Totals may not sum due to rounding
Expenditures do not include cost of land or contingency provision.
SOURCE: Manitoba Infrastructure 2016 estimate of construction costs. See Section 9.4.4.1 for description of methods used for breaking down construction costs by type and location.

Based on the multipliers taken from the Statistics Canada Interprovincial Input-Output Model, the Project construction would generate an estimated $675 million in economic output in Manitoba, inclusive of direct, indirect, and induced effects, and $291 million in economic output in other parts of Canada. Project construction is predicted to contribute an estimated $335 million to Manitoba's GDP, with an additional $165 million in GDP accruing to other parts of Canada (see Table 9.4-13).

Table 9.4-13 Gross Domestic Product, Manitoba and Canada

Category	Manitoba	Other Canada	Total Canada
	Estimate (Millions $)	Estimate (Millions $)	Estimate (Millions $)
Direct	191	0	191
Indirect	89	101	190
Induced	60	53	113
Total	**339**	**154**	**493**

SOURCE: Estimate based on SCIPIOM□IOIC provincial multiplier analysis (Statistics Canada 2019). See Section 9.4.4.1 and Manitoba Infrastructure 2016 construction cost estimates.

Estimated construction employment (direct, indirect and induced) is summarized in Table 9.4-14. Within Manitoba the direct employment is estimated at 1,860 person-years (PYs), 1,640 PYs through direct construction employment and 220 PYs through other direct employment (e.g., primary suppliers), with indirect and induced employment at 825 PYs and 585 PYs respectively. Approximately 49% of indirect employment and 54% of induced employment is estimated to occur within Manitoba. The remaining indirect and induced employment will occur in other parts of Canada.

Table 9.4-14 Estimated Construction Employment, Manitoba and Canada

Category	Manitoba Estimate (PYs)	Other Canada Estimate (PYs)	Total Canada Estimate (PYs)
Direct construction employment	1640	0	1640
Other direct employment	220	0	220
Indirect employment	825	870	1695
Induced employment	585	505	1090
Total employment	**3270**	**1375**	**4645**

SOURCE: Estimate based on SCIPIOM□IOIC provincial multiplier analysis (Statistics Canada 2019). See Section 9.4.4.1 and Manitoba Infrastructure 2016 construction cost estimates

Total labour income in Manitoba associated with Project employment is estimated at $293 million (see Table 9.4-15).

Table 9.4-15 Estimated Labour Income, Manitoba and Canada

Category	Manitoba Estimate (millions $)	Other Canada Estimate (millions $)	Total Canada Estimate (millions $)
Direct	131	0	131
Indirect	53	60	113
Induced	24	26	49
Total	**207**	**86**	**293**

SOURCE: Estimate based on SCIPIOM□OIC provincial multiplier analysis (Statistics Canada 2019). See Section 9.4.4.1. and Manitoba Infrastructure 2016 construction cost estimates.

Direct construction labour costs are the largest Canadian expenditure item, accounting for 29% of total estimated Project expenditures. In addition, all the expenditure items identified as services in Table 9.4-12 also include a large labour content, considered indirect labour (i.e., the labour component of supplied goods and services).

Operations

The Project operations will have a negligible effect on the provincial economy given, the relatively small annual expenditure (less than $500,000) and workforce involved (one or two persons). A similar magnitude of spin-off benefits (i.e., indirect and induced economic effects) would also occur. Manitoba Infrastructure will be responsible for the cost of operations and maintenance of Project infrastructure. Because the Project will become the property of the Manitoba Infrastructure, it would be exempt from paying property taxes. However, the local government can apply for a grant in place of property tax in accordance with T*he Expropriation Act*. Manitoba Infrastructure will also provide funding to compensate for additional costs incurred by the RM of Grahamdale associated with Project engagement. Therefore,

the Project would either directly or indirectly pay for potential local infrastructure costs (e.g., local road maintenance) associated with the Project.

Over the long term, the Project will beneficially affect the provincial economy by lowering the risk of flood-related damage and disruption to businesses and other places of employment. This benefit will extend beyond the LAA, and will include other areas, such as low-lying areas around Lake Manitoba, which will benefit from the Project's flood control function.

Summary

Project residual effects on the provincial economy are expected to be positive in direction with the addition of direct, indirect, and induced employment income and increased GDP. These effects are considered low in magnitude relative to the province's overall economy. Project effects are expected to extend beyond the LAA and be felt at the provincial level. Because most Project spending will occur during construction, the highest magnitude effects will occur during this phase, and will occur continuously throughout the construction period. Effects on the provincial economy related to Project expenditures would be substantially reduced once project construction is completed because of the much lower levels of spending during the operations and maintenance phase.

Over the long term, the Project will beneficially affect the provincial economy by lowering the risk of flood-related damage and disruption to businesses and other places of employment.

9.4.4.3 Change in Regional Economy

Project Pathways

Project spending can positively and adversely affect regional businesses (where "regional is defined as "within the LAA"). Benefits typically relate to increased revenue from Project-associated spending within the LAA. Local firms who have been awarded Project-related supply or service contracts will benefit from increased revenue, which could support capital investment, hiring, and other business initiatives. Other local businesses could be expected to benefit from spending by the Project's labour force, including both workers recruited locally, and non-resident workers, residing temporarily in the LAA.

Potential adverse effects relate to increased demand for labour, goods, and services, which can increase operational costs of local businesses through wage inflation and employee turnover. Such phenomena have been observed in other projects involving large construction workforces taking place in small communities (LNG Canada 2014). Increased competition for labour can also decrease the capacity of local businesses through labour shortages. Project spending can also adversely affect the affordability of accommodations due to increased demand by visitors to the LAA in search of Project employment.

Land and resource-based businesses could also be beneficially and/or adversely affected by the Project. The procurement of resource products, such as aggregate, from local suppliers will result in revenue inflows into the RAA. Land and resource-based industries can also be adversely affected due to land

take-up by the Project, property fragmentation, changes to access, and nuisance effects. Potential adverse effects on resource-based industries are addressed in Section 9.2.

During operations, local businesses will benefit from direct spending by the Project, as well as spending by the Project's operations and maintenance personnel. There will be less expenditure related effects during operations because of the limited Project spending during this phase.

The RM of Grahamdale could experience changes in local tax revenue to the extent that tax assessable properties will be acquired by MI to provide lands for the PDA and the road.

Mitigation

Project specific mitigation measures to manage effects to the regional economy include the following:

- adhere to government procurement policies and procedure with respect to labour, and goods and services
- compensate RM of Grahamdale for decreased tax revenue by paying an annual fee in lieu of taxes in accordance with the *Expropriation Act*
- implement mitigation measures related to effects on land and resource use, as identified in Section 9.2

Project Residual Effects

Construction

Businesses located within the LAA and other areas of the Interlake Region provide goods and services that could be used in Project construction, including civil construction, heavy equipment repair and maintenance, aggregate, transportation/logistics, fuel, and hospitality. Due to their proximity, these businesses are well positioned to benefit from Project spending. The extent by which capital spending will occur in the LAA will depend on a number of factors, including the capacity and capability of firms to satisfy Project work orders, if applicable, their willingness to undertake capital investments (such as equipment purchase), retain additional staff, as well as their cost competitiveness.

Based on the assumptions identified in Section 9.4.4.1, capital expenditures within the LAA, net of contingency, escalation, and land cost, are estimated at $83 million or 18% of total capital expenditures (see Table 9.4-16). In addition, indirect and induced economic activity would result in increased spending in the LAA.

Table 9.4-16 Estimated CAPEX of Goods and Services, LAA

Cost Item		Expenditure ($ millions)	Percent (%) of LAA CAPEX
Goods	Concrete and aggregate	50	60
	Machinery and equipment	0	0
	Other goods	0	0
Services	Construction services	34	40
	Professional and Engineering Services	0	0
Total		**83**	**100**

NOTE:
Totals may not sum due to rounding
Expenditures do not include provisions for escalation, contingency, or allowance for funds used during construction.
SOURCE: Manitoba Infrastructure estimate of construction cost. Stantec assumptions of construction expenditure breakdown by location (see Section 9.4.4.1).

Adverse effects of Project spending relate to increased operational costs due to wage inflation and employee turnover. Increased competition for labour, leading to wage inflation, could also decrease the capacity of local businesses through labour shortages. During Project construction, the average annual wage of direct full-time workers (e.g., construction and trades) is estimated at $70,186. This is substantially higher than the median employment wage in the LAA enumerated in the 2016 Census, which is $35,289 (see Table 9.4-15). Considering the size of the Project relative to the economy within the LAA, there is potential that Project-related employment could result in some wage inflation, particularly in construction-related industries. It could also cause higher rates of turnover, as some employees seek Project related employment.

Operations

Project operations would have a negligible effect on the regional economy related to expenditures, given the relatively small annual expenditure (less than $500,000) and workforce involved (one or two persons). A similar magnitude of spin-off benefits (i.e., indirect and induced economic effects) would also occur. Throughout the operations and maintenance phase, the Project is expected to have a low magnitude economic impact on agriculture and other land and resource-based industries, as concluded in Section 9.2. The Project will not adversely affect the taxation base of the RM of Grahamdale, because Manitoba Infrastructure will pay a grant in lieu of property taxes that would offset the reduction in tax revenue from assessable properties that were removed from the tax base for Project use for a period of three years after the year in which the lands are acquired.

Over the long term, the Project will beneficially affect the regional economy by lowering the risk of flood-related damage and disruption to businesses and other places of employment.

Summary

The regional economy is predicted to experience both positive and adverse effects. Positive effects will result from capital inflows associated with Project-related direct and indirect spending within the LAA, as well as increased household spending from the local residents hired by the Project. Commercial sectors within the LAA that may benefit from local spending include aggregate suppliers, concrete suppliers, construction companies, vehicle and equipment maintenance companies, construction material suppliers, accommodations providers, fuel companies, and grocery stores.

Local businesses may also experience adverse effects related to competition for employees, and potentially higher costs of labour and some services due to localized inflation associated with Project spending. These are considered to be of moderate magnitude relative to the size of the LAA's economy, though the extent of such effects will depend on the extent of procurement within the LAA, which is not known at this time.

Project effects are expected to extend beyond the LAA. Because most Project spending will occur during construction, the highest magnitude effects will occur during this phase, and will occur continuously throughout the construction period. Effects on the regional economy would be substantially reduced once construction is completed because of the much lower levels of spending during the operations and maintenance phase. Regional economic effects are predicted to have moderate timing sensitivity due to the seasonality of tourism and some recreation-based industries. The LAA has higher levels of unemployment and lower average incomes that the province. As well, the local economy is likely still affected by the 2011 flood, particularly if members of the labour force remain displaced.

Over the long term, the Project will beneficially affect the regional economy by lowering the risk of flood-related damage and disruption to businesses and other places of employment.

9.4.4.4 Change in Regional Labour Force

Project Pathways

During construction, Project contractors and subcontractors would hire trades and related workers from within the LAA and would also bring in workers from outside the LAA to meet labour requirements. Local suppliers to the Project would create additional indirect jobs, and spending by the direct and indirect workforce would result in induced employment. Project labour demands may cause shortages of skilled workers and competition with current employers in other sectors such as resource industries, service providers, and local government.

The Project's workforce is estimated to peak at 575 persons during construction (Figure 9.4-1). During operations and maintenance, the Project will require a workforce of one to two persons for ongoing maintenance (Section 3.5.3.7). Based on these estimates, the ramp up and ramp down to peak construction activity would have the greatest effect on the LAA labour force. During ramp-up, Project demand for qualified labour from the LAA could decrease the number of unemployed persons in the LAA,

but could also contribute to labour shortages, potentially resulting in increased costs for some local businesses.

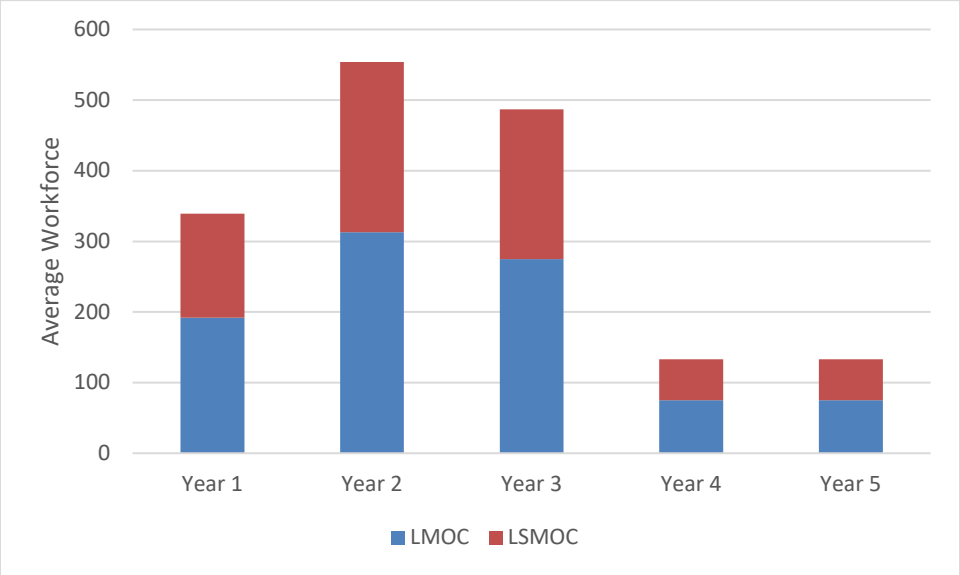


Figure 9.4-1 LMOC and LSMOC Average Annual Workforce

As the Project transitions to operations and maintenance, the requirements for labour will decline.

Project Residual Effects

Construction

Manitoba Infrastructure estimates that approximately 19% of direct construction labour needed for the Project (105 persons, 313 PYs) could be satisfied by current LAA residents with the remaining hired from elsewhere in Manitoba. Based on the Project's design, demand for skilled labour would be greatest among occupations in trades, transport and equipment operators.

In 2016, there were approximately 705 persons employed in trades, transport and equipment operation and related occupations in the LAA. Assuming a similar number of persons are employed in these occupations at the onset of construction and that 17% (the overall unemployment rate of the LAA in 2016) of these persons are unemployed, approximately 120 persons could be available to work on the Project, which exceeds estimated local demand.

In addition to direct employment, local suppliers to the Project would create indirect jobs, while spending by the direct and indirect workforce would result in induced employment. Applying adjustment factors listed in Table 9.4-10, it is estimated that 83 PYs of indirect employment and 59 PYs of induced employment would be created in the LAA during Project construction. Table 9.4-17 summarizes estimated direct, indirect, and induced employment in the LAA during construction.

Construction related employment will end, once the Project has been built. The Project-based, short-term nature of employment is common in the construction industry and, as Project related demand for construction workers winds down, it is anticipated that many workers will find employment on other projects. Further, the skills, experience and labour income gained by construction workers during their employment with the Project could improve qualifications and employability for future projects in the LAA and elsewhere.

Table 9.4-17 Project Construction Employment Effects, LAA

Employment	Employment in LAA	
	Person-Years	**Jobs (Peak Year)**
Direct	313	105
Direct – Contract	52	17
Indirect	83	28
Induced	59	20
Total	**507**	**171**
SOURCE: Estimate based on SCIPIOM□IOIC provincial multiplier analysis (Statistics Canada 2019		

Project residual effects on the LAA labour force are expected to be positive during construction with the addition of direct, indirect, and induced employment, and high in magnitude relative to the labour force in the economy LAA. Project effects are expected throughout the LAA and, because they are associated with Project construction, would be short-term in duration and occur as a regular event (albeit with fluctuations in demand for labour). Effects are reversible once construction is complete. Timing sensitivity is considered to be moderate with respect to labour supply availability. In the summer months, it is anticipated that there will be less labour available in the LAA because some workers may take up seasonal employment opportunities.

Operations

During operations, the Project will employ one or two individuals, who will undertake ongoing maintenance. Additional contractors may be hired on a periodic basis to provide more substantive maintenance. It is assumed that the Project's operational workforce will reside within the LAA, and household spending by these individuals will contribute to induced employment within the LAA.

The Project will have a negligible effect on the labour force within the LAA during operations because of the low number of workers that will be directly or indirectly employed during this phase.

Summary

Project residual effects on employment are expected to be positive in direction with the addition of direct, indirect, and induced employment and labour income. While the magnitude of Project-related hiring within the LAA is unknown at this time, due to the modest size of the labour force within the LAA, it is predicted that the Project could have a high magnitude effect on labour and employment. Project effects are expected to extend beyond the LAA and be felt at the provincial level. Because most Project spending will occur during construction, the highest magnitude effects will occur during this phase, and will occur continuously throughout the construction period. Effects on labour and employment would be substantially reduced once construction is completed because of the much lower labour requirements during the operations and maintenance phase. The economy in the LAA is in a below average condition because of higher levels of unemployment, relative to the province overall, and lower average income. As well, the local economy is likely still affected by the 2011 flood, particularly if members of the labour force remain displaced.

Over the long term, the Project will beneficially affect employment in the LAA by lowering the risk of flood-related disruption to businesses and other places of employment.

9.4.4.5 Change in Goods and Services

Project Pathways

The Project will increase economic activity in the LAA, due to Project-associated spending (see Section 9.4.4.3). Project-related demand for goods and services within the LAA could result in reduced availability and increased costs to LAA residents. Potential effects mechanisms related to change in cost and availability of goods and services could include (Jaquet 2009):

- purchase of materials and services by Project, such as temporary accommodations, could result in reduced availability and increased costs to LAA residents and visitors
- Project hiring of LAA residents could contribute to labour shortages, resulting in local businesses needing to increase wage costs to retain staff and increased costs may need to be passed to consumers as higher prices
- Project hiring of construction workers could result in delays in other construction activities, such as residential construction

The Project could cause adverse effects on other economic sectors as a result of its demand for labour, goods and services. Project-related hiring could increase competition for the available labour force, reducing the ability of local businesses in other sectors to recruit and retain employees and, thus, affecting their ability to provide services to LAA resident and visitors.

Mitigation

Mitigations measures are as follows:

- construct and operate work camps to accommodate non-resident workforce during construction phase, to reduce demand on temporary accommodations within LAA.

Project Residual Effects

Construction

The Project will lead to increased demand for goods and services, and workers hired directly or indirectly as a result of the Project will likely have higher incomes that could result in greater spending. It is not expected that the Project will affect cost and availability of consumer and other goods to residents or visitors within the LAA because the market will respond to increased supply of such items, which can easily be transported from major commercial centres. The use of one or more construction camps will limit Project-related demands on accommodation providers within the LAA, thus limiting effects on tourism-related businesses that partially depend on the availability of temporary accommodations within the area. Project-related hiring of skilled and unskilled workers may contribute to labour shortages in some economic sectors, including trades and service employees. This phenomenon has been observed in locations where a large civil construction project is located within or near small communities (LNG Canada 2014). This is predicted to have a moderately adverse economic effect, which will persist over the course of the construction period and be reversed upon completion of construction.

Operations and Maintenance

Due to the relatively small amount of Project spending during operations, effects on goods and services during this phase are predicted to be negligible.

Summary

Project residual effects on goods and services are expected to be both positive and adverse in direction Project procurement spending, as well as spending by the Projects' workforce during construction will provide revenue for local businesses and is expected to generate additional employment and labour income in the LAA. Commercial sectors within the LAA that may benefit from local spending include aggregate suppliers, concrete suppliers, construction companies, vehicle and equipment maintenance companies, construction material suppliers, accommodations providers, fuel companies, and grocery stores. While the magnitude of Project spending within the LAA is unknown at this time, due to the modest size of the economy within the LAA, it is predicted that the Project could have a low to moderate magnitude effect upon LAA communities. Project-related hiring and procurement of construction-related services could result in labour shortages for some businesses, affecting their ability to provide services to local residents. This would extend the duration of Project construction.

Because most Project spending will occur during construction, the highest magnitude effects will occur during this phase, and will occur continuously throughout the construction period. Effects on goods and services will be reduced to near pre-project conditions, once project construction is completed, because of the much lower levels of spending during the operations and maintenance phase. The economy in the LAA is considered to be in a below average condition because of higher levels of unemployment, relative to the province overall, and lower average income. As well, the local economy is likely still affected by the 2011 flood, particularly if members of the labour force remain displaced.

9.4.4.6 Summary of Project Residual Effects

Table 9.4-18 summarizes the residual environmental effects on economy during construction and operations and maintenance.

Table 9.4-18 Summary of Project Residual Effects on Economy

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-Economic Context
Change in provincial economy	C, O	P	LT	L	N/A	RAA	RC	R	N/A
Change in regional economy	C, O	P, A	LT	M	MS	RAA	RC	R	BAC
Change in labour	C	P	ST	H	MS	RAA	RC	R	BAC
Change in goods and services	C	A	ST	L/M	MS	RAA	RC	R	BAC

KEY
See Table 9.4-2 for detailed definitions

C: Construction
O: Operation

P: Positive
A: Adverse
N: Neutral

ST: Short-term
MT: Medium-term
LT: Long-term

N: Negligible
L: Low
M: Moderate
H: High

NS: No sensitivity
MS: Moderate sensitivity
HS: High sensitivity

PDA: Project development area
LAA: local assessment area
RAA: regional assessment area

N/A: Not applicable

IF: Infrequent
SR: Sporadic/Intermittent
RC: Regular/Continuous

R: Reversible
I: Irreversible

AC: Average Condition
BAC: Below Average Condition

9.4.5 Determination of Significance

9.4.5.1 Significance of Residual Environmental Effects from the Project

A significant effect on the economy is defined as one that is distinguishable from current conditions and trends and cannot be managed or mitigated through adjustments to program, policies, plans, or through other mitigation measures.

The Project will have a positive effect on the provincial economy, while it is predicted to have both positive and adverse effects on the regional economy, employment, and goods and services. Project spending will give a financial boost to the regional economy during construction, benefiting local businesses that supply goods and services to the Project, as well as those that benefit from increased household spending associated with the higher levels of wages enjoyed by LAA residents who obtain Project-related employment. Some businesses may be adversely affected due to the competition for available labour. However, mitigation measures will help offset this phenomenon and the relatively high unemployment rate within the LAA indicates that the labour market has some capacity to absorb additional demand. The Project will affect some individual agricultural operations, and other land and resource users. However, with the application of mitigation measures, such effects will not degrade or disrupt such activities to a degree that they cannot continue at near the baseline level within the LAA overall (see Section 9.2.6.1). Finally, the Project has potential to affect the cost and availability of some services within the LAA. However, community residents will have alternatives—though they may need to seek them out—and any such shortages will likely be most pronounced during the relatively short peak employment period. As well, such adverse effects will be balanced by the benefits that will be enjoyed by the communities, as summarized above.

The Project's economic effects on Indigenous communities may differ qualitatively from communities within the LAA overall. Indigenous community members have a higher likelihood of being engaged in land and resource based economic activities, for which it has been concluded that the Project will have low to moderate adverse effects. Indigenous communities tend to have higher rates of unemployment than does the remainder of the LAA overall so these communities may experience higher rates of Project employment compared to communities in the LAA overall. Identified Indigenous operating businesses within the LAA shows somewhat less diversity than for the LAA overall. This could result in more limited opportunities for economic participation. Mitigation measures to facilitate local economic participation in the Project may help offset this limitation.

Based on the assessment of the proposed effects of the Project on economy and the proposed mitigation measures, the residual effects are considered not significant.

9.4.6 Potential Effects on Federal Lands

There are no federal lands within the PDA for economy. Federal Lands within the LAA consist of the reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Fisher River First Nation, Peguis First Nation and

Dauphin River First Nation. Locations of these lands are presented in Figure 9.4A-1. The Project will not be economically affecting any reserve lands. However, it has potential to affect individuals and businesses that reside on those lands. As discussed in Section 9.4.5.1 Indigenous communities may experience economic effects of the Project differently than will communities within the LAA overall.

9.4.7 Prediction Confidence

There is a moderate degree of confidence in the predicted effects of construction, operation and maintenance of the Project on the economy. The prediction confidence is based on information collected as part of desktop-based data compilation, economic impact assessment, and understanding of Project activities and locations. Through a process of extensive public engagement and Indigenous engagement undertaken for the Project (i.e., open houses, stakeholder meetings, KPIs), there is good understanding of the issues and concerns related to potential effects on the economy, which have been addressed. The analysis was based on preliminary assumptions on Project spending during construction, and the likely actual extent and nature of Project procurement and hiring is not known. The mitigation measures identified in this section are standard practice and have been implemented on other projects. Finally, the significance conclusion is based upon a reasonable understanding of the regional economy within the Project RAA.

9.4.8 Follow-Up and Monitoring

Manitoba Infrastructure's practice is to develop project-specific environmental protection plans where the mitigation measures are stipulated for construction, operation and maintenance activities. These measures are regularly reviewed for their effectiveness as part of a process of adaptive management in project monitoring and follow-up.

No follow-up monitoring plans for the economic effects have been identified.

9.4.9 Conclusions

9.4.9.1 Change in the Provincial Economy

Expenditures made by the Project during construction will result in positive economic effects to the Manitoba economy, and result in an increase in economic output, GDP, employment, and labour income. While such effects will be substantial at the local scale, they will be of low magnitude relative to the economy of Manitoba, overall. The Project is designed to manage the effects of flooding and will reduce adverse economic effects of future flood events, such as loss, damage, or degradation of property, buildings and infrastructure.

9.4.9.2 Change in the Regional Economy

Expenditures made by the Project during construction will result in positive economic effects to the LAA economy, and result in increased revenue for regional businesses, employment, labour income and spin-

off effects. The magnitude of such benefits will depend on the degree to which companies operating in the LAA succeed in obtaining Project contracts, the extent of local hiring, and extent of patronage of local businesses by the Project and its workforce. Commercial sectors within the LAA that may benefit from local spending include aggregate suppliers, concrete suppliers, construction companies, vehicle and equipment maintenance companies, construction material suppliers, accommodations providers, fuel companies, and grocery stores.

Local businesses may also experience adverse effects related to competition for employees, and potentially higher costs of labour and some services due to localized inflation associated with Project spending. These are of medium magnitude relative to the size of the LAA's economy, though the extent of such effects will depend on the extent of procurement within the LAA. Some individual land and resource dependent businesses, including those involved in agriculture, tourism, and aggregate production, may be adversely affected because of land take up by the Project. However, such effects are of low magnitude relative to the economy of the LAA as a whole.

The flood protection service provided by the Project will result in economic benefits during a flood event, including reduction or avoidance of loss, damage, or degradation of property, buildings, and infrastructure.

9.4.9.3 Change in Labour

Project residual effects on the employment are expected to be positive in direction with the addition of direct, indirect, and induced employment and labour income. The overall unemployment rate within the LAA is much higher than for the province overall, so Project-related employment opportunities during construction phase are most likely to be welcomed. Because there will be few employment opportunities during operations, employment benefits will have only a short-term impact on the economy within the LAA.

9.4.9.4 Change in Goods and Services

Project residual effects on goods and services are expected to be both positive and adverse in direction. Project procurement spending, as well as spending by the Projects' workforce during construction will provide revenue for local businesses and is expected to generate additional employment and labour income in the LAA. Commercial sectors within the LAA that may benefit from local spending include aggregate suppliers, concrete suppliers, construction companies, equipment maintenance companies, construction material suppliers, accommodations providers, fuel companies, and grocery stores. However. Project-related hiring and procurement of construction-related services could result in labour shortages for some businesses, affecting their ability to provide services to local residents. This would extend the duration of Project construction. The Project's effect on cost and availability of goods and services during operation and maintenance phase will be negligible because of limited Project-related spending and employment.

9.5 HUMAN HEALTH

9.5.1 Scope of the Assessment

This human health assessment is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) submitted to Manitoba Sustainable Development indicates that the EIS will describe socioeconomic attributes that include human health and safety. Section 7.1 of the Canadian Environmental Assessment Agency (the Agency) EIS Guidelines for the Project (CEAA 2018) requires the EIS to include a description of baseline conditions and Section 7.1.12 specifies requirements for human environment information to include "health and socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities."

Human health is a VC because it is inherently important to people and people have expressed health-related concerns associated with the Project, and because the Project activities have the potential to change environmental conditions that influence the health risk of people. Project construction activities, such as ROW clearing, channel excavation, and berm construction, will result in air emissions (dust, fine particulate matter, vehicle emissions) and noise to which people may be exposed. During operations, vehicles will produce air emissions and noise. Potential exposures to Project-related chemical emissions and/or noise may affect real or perceived health risks, or cause concern for people who live, work, or engage in traditional or recreational activities in the area.

The human health assessment evaluates health risks associated with changes in exposures to chemicals and noise in the environment. This is based on the current understanding of potential health effects associated with chemical and noise exposures, as established in the scientific literature and applicable regulatory guidelines and objectives. It is not designed to evaluate perceived health effects, which are qualitative and variable among individuals.

9.5.1.1 Regulatory and Policy Setting

In Manitoba, public health is the responsibility of the Manitoba Ministry of Health, Seniors and Active Living in accordance with the *Public Health Act.* Health Canada's mandate includes the protection of human health from exposures to chemicals in the environment. The scope of the human health assessment VC satisfies the requirements for environmental assessment under Manitoba's *The Environment Act* and the *Canadian Environmental Assessment Act,* which consider the potential project

effects to human health. The assessment of potential human health effects follows the guidance framework published by Health Canada as follows:

- "Federal Contaminated Sites Risk Assessment in Canada, Part I: Guidance on Human Health Risk Preliminary Quantitative Risk Assessment, Version 2.0" (Health Canada 2010a)
- "Federal Contaminated Sites Risk Assessment in Canada, Part II: Health Canada Toxicological Reference Values and Chemical-Specific Factors, Version 2.0" (Health Canada 2010b)
- "Federal Contaminated Sites Risk Assessment in Canada, Part V: Guidance on Complex Human Health Detailed Quantitative Risk Assessment for Chemicals ($DQRA_{CHEM}$)" (Health Canada 2010c)
- Supplemental Guidance on Human Health Risk Assessment for Country Foods. Contaminated Sites Division Safe Environments Directorate (Health Canada 2010d)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality (Health Canada 2016a)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality (Health Canada 2016b)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada 2017)
- Guidelines for Canadian Drinking Water Quality (Health Canada 2017a)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods (Health Canada 2018)

9.5.1.2 Engagement and Key Concerns

A discussion of the Indigenous and Public Engagement Process (IPEP) is provided in Chapter 5 (Indigenous and Public Engagement). Additional human health information was collected through key person interviews (KPIs) with representative stakeholders and groups. Key issues regarding health that were identified through the process (and the sections of the EIS where they are addressed) are summarized in the following sub-sections.

Public Engagement Process

Manitoba Infrastructure received comments about human health during four rounds of the IPEP. Detailed information on the IPEP is provided in Chapter 5. Information is also available in the supporting IPEP summary reports and appendices. The following subheadings summarize the feedback received regarding interests and concerns with respect to human health:

- concerns regarding air quality were related to construction dust and air pollution

- concerns about existing water quality and if the Project could potentially change water quality
- concern about mercury accumulation in aquatic biota

Indigenous Engagement Process

Throughout the Indigenous and Public Engagement Process (IPEP), Manitoba Infrastructure received comments about human health. A summary of key feedback received, consisting of interests and concerns with respect to human health, is provided in Chapter 5 along with the assessment of effects on human health.

First Nation and Metis were provided opportunities to share their knowledge to help inform routing of the channel and the environmental assessment through the IPEP. First Nations raised specific issues about potential effects of the Project related to use of unoccupied Crown land and traditional land use activities during the IPEP and Traditional knowledge studies (TKS). The input provided by First Nations through the IPEP added to the understanding of the existing land and resource use conditions, informed baseline conditions, supported the scope of issues assessed and provided input into the mitigation process. A summary of the feedback received from the IPEP is provided in Chapter 5.

This health assessment recognizes the feedback received regarding interests and concerns with respect to Indigenous issues, including:

- water quality effects and runoff from farmland
- contamination of waterbodies
- pathways for contamination from Lake Manitoba to Lake Winnipeg
- changes to fish health and quality
- effects on terrestrial country food quality

Engagement feedback specifically related to air quality was provided by Fisher River Cree Nation, who expressed concern that the Project would lead to an altered cultural experience due to dust effects and the presence of permanent structures.

Concerns related to the effects of the Project on water quality were expressed by multiple Indigenous groups, including Dauphin River First Nation, Norway House Cree Nation, Pinaymootang First Nation, Peguis First Nation and Little Saskatchewan First Nation. Peguis First Nation and Lake St. Martin First Nation were concerned about the possibility of mercury content coming through the channels. Comments from Dauphin River First Nation and Interlake Reserves Tribal Council were related to the potential contaminants entering water during construction, including spills from construction practices and machinery.

Interlake Reserves Tribal Council and Lake St. Martin First Nation commented around the potential for chemicals (pesticides, herbicides) used on farmland to drain into the channel. Keewahtinook Fishers of

Lake Winnipeg provided the following specific comment “The channels will allow for polluted waters from Lake Manitoba to get into Lake Winnipeg. We will get the pollution from the farmer’s, pig operations and sewage. This will ruin our water quality and the commercial fisheries. Our nets are covered in slime from the poor water quality in Lake Winnipeg. The channels will make this worse.”

Changes to fish health and quality was expressed as a concern by multiple Indigenous groups including, Interlake Tribal Council, Manitoba Metis Federation, Dauphin River First Nation, Fisher River Nation and Hollow Water First Nation. Interlake Tribal Council commented that they were concerned for the potential for the channels to result in changes to the distribution of fish and fish populations.

As stipulated by the Agency’s Project guidelines, in addition to input from engagement, traditional land and resource use (TLRU) information was considered in the preparation of each aspect of the EIS (See Chapter 10, Section 10.2). Traditional Land and Resource Use (TLRU) information contributed to an understanding of existing land use and was used to aid in identifying lands that are used for traditional purposes. It also informed the assessment of potential Project effects on health. Although TLRU information did not directly affect the significance definition, it was incorporated in the analysis of the effects upon which the determination of significance was based.

9.5.1.3 Potential Effects, Pathways and Measurable Parameters

The focus of this assessment is on effects that have the potential to cause harm to human health. Construction and operation and maintenance of the Project could release chemicals to the environment. There are a number of potential effect pathways through which the Project may alter the degree of human health risk relative to baseline risks. For example; people may directly inhale chemicals released in vehicle exhaust or may inhale fine particulate matter released in vehicle exhaust and in dusts generated during excavation activities. These chemicals may also deposit on soil or surface water, which could lead to changes in the chemical concentrations in soil and surface water. People could then be directly exposed to these chemicals in soil and surface water. Chemicals deposited to soil or surface water could be taken up into terrestrial or aquatic country foods and people could be indirectly exposed to these chemicals by consuming country foods and drinking water. In addition, herbicides used for vegetation control during the operations and maintenance phase could be taken up by plants that are consumed by country food harvesters. Potential environmental effects, the effect pathway and measurable parameters used to assess potential effects on human health are provided in Table 9.5-1.

Table 9.5-1 Potential Effects, Effect Pathways and Measurable Parameters for Human Health

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change to Human Health	Construction and operation of the Project could result in increased chemical concentrations in the environment at toxicologically relevant levels. People may be exposed to these chemicals through	Chemical concentrations in exposure media (i.e., air, soil, water, and country foods). Chemical exposures that exceed objectives established by relevant regulatory organization(s) and are

Table 9.5-1 Potential Effects, Effect Pathways and Measurable Parameters for Human Health

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
	ingestion (direct ingestion of soil and/or water and ingestion of terrestrial and aquatic country foods), inhalation, or dermal contact.	likely to result in a long-term change in the health of an identified receptor(s). This conclusion is based on a consideration of chemical concentrations, the health-based objective and relevant contextual effects attributes.
	Change in noise levels due to construction noise and noise from vehicles and machinery during operation and maintenance pose a potential annoyance risk for humans near the ROW.	Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise, Healthy Manitoba Provincial Noise Guidelines (dBA). The Manitoba government has provincial guidelines for audible noise to prevent public annoyance and protect public health and welfare (Province of Manitoba 1992).

9.5.1.4 Boundaries

Spatial Boundaries

The effects assessment for human health was conducted using the spatial boundaries defined by the atmospheric environment assessment (Chapter 6, Figure 6.2B-1). These boundaries include the boundaries for the acoustic environment which are contained within the spatial boundaries of the atmospheric environment. The spatial boundaries of the atmospheric environment are used following the rationale that the release of contaminants to the air from the Project would be the primary route for Project to interact with human health. Therefore, the spatial boundaries include potential direct and indirect effects on Indigenous and non-indigenous people and the human environment.

The Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on human health are shown in Figure 9.5A-1. Federal lands within the RAA consist of reserve lands associated with the Indigenous communities.

Project Development Area

The PDA is an area of 2,099 ha and is the area in which the Project components and activities are located. Public access to the PDA during construction will be limited, and during operations and maintenance there are no continuous emissions related to air or noise. Therefore, the human health assessment focuses on areas outside the PDA, where there is public access during construction and therefore where the public might be affected by Project emissions.

Local Assessment Area

The LAA for the assessment of effects on human health is the LAA defined in the air quality assessment (Chapter 6.2.1.4) as the areas where measurable Project-related changes in air quality may occur. Potential changes in human health risk associated with Project activities are related primarily to changes in air, water and soil quality that may occur during the construction and operations phases of the Project. This also includes the LAA for the acoustic environment used to evaluate the potential health effects associated with changes in noise levels. Construction and operation of the Project are not anticipated to alter chemical concentrations in soil or water and, thus, will not alter soil or water quality as it relates to changes in chemical concentrations in these media (see Chapter 6, Section 6.3 Geology and Soil and Chapter 6, Section 6.4 Groundwater and Surface Water). However, the release of contaminants to the air (e.g. dust, fine particulate matter, vehicle exhaust) during Project construction and operation and maintenance may alter air quality and thereby may alter inhalation-related human health risks from those that currently exist in the area.

Regional Assessment Area

The RAA for the assessment of effects on human health is the PDA, LAA and RAA defined by the air quality assessment.

Temporal Boundary

The temporal boundary for the assessment of effects on health covers the duration of the construction and operation and maintenance phases of the Project. The construction duration is estimated to occur over 2.5 to 3 years with approximately 1-2 years for post construction-related works. During construction, land and resource use will be affected by access restrictions within construction areas, the presence of the workforce noise associated with operating heavy equipment. The Project will affect some land and resource uses throughout operation and maintenance because of permanent take up of lands used for channel construction and associated works. The operation phase of the Project is expected to be indefinite.

9.5.1.5 Residual Effects Characterization

Table 9.5-2 presents definitions for the characterization of residual environmental effects on human health. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table 9.5-2 Characterization of Residual Effects on Human Health

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change on human health.
	Adverse	Net loss (adverse or undesirable change) on human health.
	Positive	Net benefit (or desirable change) on human health

Table 9.5-2 Characterization of Residual Effects on Human Health

Characterization	Range of Criteria	Level of Effect and Definition
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of several months up to one year).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities (i.e., > 1 year to 3 years).
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project (i.e., a timeframe of greater than 10 years).
Magnitude (degree or intensity of the change)	Negligible or Low	Negligible – No detectable or measurable change in measurable parameters from existing conditions. Low – A measurable change in measurable parameters from existing conditions but is below environmental and/or regulatory criteria and does not represent an unacceptable change to human health.
	Moderate	A measurable change in measurable parameters from existing conditions that is above environmental and/or regulatory criteria but does not affect human health.
	High	A measurable change in parameters from existing conditions that is above environmental and/or regulatory criteria and represents potentially unacceptable change to human health.
Timing	No Sensitivity	Timing does not affect human health
	Moderate Sensitivity	Timing does not affect human health
	High Sensitivity	Timing does not affect human health
Extent (Spatial Boundary)	PDA	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities
	LAA	Area within which potential Project effects are measurable and extending beyond the PDA to, but not beyond, the LAA.
	RAA	The anticipated regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA.
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project.
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project.

Table 9.5-2 Characterization of Residual Effects on Human Health

Characterization	Range of Criteria	Level of Effect and Definition
Reversibility (the degree of permanence)	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (< five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
Social Context	Resilient	Social: Indigenous and non-indigenous people/communities are able to maintain pre-Project activities in the region.
	Not Resilient	Social: Indigenous and non-indigenous people/communities will not be able to maintain pre-Project activities in the region.

9.5.1.6 Significance Definition

A significant effect on human health is one that results in exposures that exceed objectives established by relevant regulatory organization(s) and are likely to result in a long-term change in the health of an identified receptor(s). This conclusion is based on a consideration of the magnitude of the exposure relative to the regulatory guideline and the relevant contextual effects attributes such as the spatial and temporal distribution of effects and an understanding of the confidence in the estimated potential changes in human health.

9.5.2 Existing Conditions for Human Health

9.5.2.1 Methods

This section describes the methods and sources of information used to characterize existing air quality, soil quality, water quality and noise level conditions related to human health risks issues associated with the Project.

Sources of Information

Baseline conditions for human health are based on several information sources, including publicly available literature and databases, baseline technical data reports, and Indigenous Traditional Knowledge. This section presents information about existing environmental conditions from the air quality, water quality and noise disciplines, and the geology and soils disciplines, that are relevant to the assessment of human health risks for the Project. Baseline information for the assessment of human health risks was obtained through the following:

- a desktop review of general literature and Project-specific reports (e.g. previous projects of a similar nature, atmospheric environment [Chapter 6.2], geology and soils assessment [Chapter 6.3] and groundwater and surface water assessment [Chapter 6.4])

- review of input from the Public Engagement Process (Chapter 5)
- review of input from the Indigenous engagement and consultation process (Chapter 5.2)

9.5.2.2 Overview

This section describes the existing air quality, water quality, soil quality and noise level conditions that are relevant to assessing the existing potential human health risks associated with current environmental conditions within the Project study area.

Air Quality

Information about existing air quality within the LAA and RAA for the human health VC is from the atmospheric environment assessment (Chapter 6, Section 6.2). There are no air quality monitoring stations located within the LAA or RAA. Therefore, the assessment of current ambient air quality was based on data collected from air quality monitoring stations located elsewhere in Manitoba. The stations selected by the air quality team and the rationales to support the selection of these stations are provided in Chapter 6, Section 6.2.

The air quality assessment baseline study focused on criteria air contaminants (CACs) with known human health effects for which there are established ambient air quality criteria: the Manitoba Ambient Air Quality Criteria (MAAQCs) (MCWS 2005), and the Canadian Ambient Air Quality Standards (CAAQS). (GOC 2017a; GOC 2017b; CCME 2012, CCME 2017). Manitoba criteria include nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO) and particulate matter (PM), monitored from long-term ambient air quality monitoring stations in Manitoba. A summary of the baseline ambient air quality data that is relevant to the human health VC is provided below.

- For NO_2, the maximum 1-hour concentration (76.2 µg/m^3) is below the 1-hour MAAQC (400 µg/m^3), and the CAAQS 1-hour concentration of 113 µg/m^3, the maximum annual average concentration (7.72 µg/m^3) is below the annual average MAAQC (100 µg/m^3) and the annual average 2020 CAAQS annual average (32 µg m^3).
- For SO_2, the maximum 1-hour SO_2 (25.9 µg/m^3) is below the 1-hour MAAQC (900 µg/m^3) and the 2020 1-hour CAAQS (183 µg/m^3), and the maximum annual average concentration (2.3 µg/m^3) is below the annual average MAAQC (50 µg/m^3) and the 2020 CAAQS (13 µg/m^3).
- For $PM_{2.5}$, in Flin Flon the three-year average of the annual 98th percentile of the daily 24-hour average $PM_{2.5}$ concentration is 27.9 µg/m^3 which is above the 24-hour CAAQS (27 µg/m^3). However, in Thompson, the equivalent $PM_{2.5}$ 24-hour concentration is 19.1 µg/m^3 which is below the CAAQS. In Flin Flon and Thompson the annual three-year average $PM_{2.5}$ concentrations are 4.99 µg/m^3 and 5.36 µg/m^3 respectively. These values are below the 2020 CAAQS annual average (8.8 µg/m^3). Review of the 24-hour $PM_{2.5}$ data for Flin Flon (Table 6.2A-9 and Figure 6.2A-7 of Appendix 6.2) shows that in general, 24-hour $PM_{2.5}$ levels in Flin Flon are below the MAAQC of 30 µg/m^3 and that the elevated three-year average 24-hour $PM_{2.5}$ concentration in Flin Flon was driven by a spike in $PM_{2.5}$

concentrations that occurred in September 2017 (see Figure 6.2A-7). It is also important to note that the Air Quality assessment did not correct the data to account for the effects of wildfires on the baseline data used in the report. Therefore, the marginal exceedance of the CAAQS reported for Flin Flon likely captures a wildfire event and thus, over-predicts the three-year average of the annual 98th percentile of the daily 24-hour average $PM_{2.5}$ concentrations in the LAA and RAA.

- For O_3, the three-year average of the fourth highest daily maximum 8-hour O_3 concentration (102 µg/m^3) is below the 8-hour 2020 CAAQS (122 µg/m^3).
- For CO, the maximum 1-hour concentration (3,790 µg/m^3) is below the 1-hour MAAQC (35,000 µg/m^3) and the maximum 8-hour average concentration (2,188 µg/m^3) is below the 8-hour MAAQC (15,000 µg/m^3).

These data indicate that baseline air quality generally meets appropriate ambient air quality guidelines and would be likely to meet appropriate ambient air quality guidelines for $PM_{2.5}$ if the data were to be adjusted to account for the effects of wildfires.

Noise

No baseline sound level measurements were performed within the Project's LAA. The existing acoustic environment in the LAA was estimated based on the recommendations by Health Canada Guidance (Health Canada 2017b) for areas where baseline measurement data are not available. The acoustic environment within the LAA was assumed to correspond to that of a quiet rural area. A conservative (i.e., more protective) approach was chosen whereby the baseline sound level was assumed to be 35 dBA Ldn in what Health Canada Guidance considers a reasonable worst-case scenario. There are no heavily developed urban/suburban areas encompassed within the LAA and, therefore, the assumed baseline sound level of 35 dBA Ldn is appropriate.

Water Quality

Information about existing water quality within the LAA and RAA for the human health assessment is taken from the groundwater and surface water assessment (Chapter 6, Section 6.4 – Appendix 6D). Surface water and groundwater data relevant to the assessment of potential human health risks relates to the suitability of their use as sources of potable water. The assessment of existing surface water conditions includes limited data on drinking water quality for a number of metals (arsenic, boron, cadmium, chromium, copper, lead, mercury, methylmercury, molybdenum, nickel, thallium, uranium, and zinc) in the Fairford River, Lake St Martin, Dauphin River, Sturgeon Bay and the Buffalo Creek Watershed. In each of these water bodies, concentrations of the specified metals were below their respective drinking water quality guidelines or standards (Appendix 6D). Although similar information is not available for other waterbodies within the RAA (Watchorn Bay, Watchorn Creek, Birch Bay, Birch Creek, and Lake Manitoba), it is reasonable to expect that similar conditions also exist in these waterbodies. As discussed in Section 6.4, there is no indication that surface water is used as a daily source of domestic potable water. The consumption of surface water may occur on an occasional basis; however, given that surface water either meets, or is expected to meet, drinking water quality standards

for metals, the occasional use of surface water for drinking would not be expected to represent a potential human health risk based on metal content.

Information on groundwater quality provided in the groundwater and surface water assessment reported that a comparison of groundwater quality with the Health Canada Canadian Drinking Water Quality Guidelines (HC-CDWQG) (Health Canada 2017a) suggests that groundwater is generally of good quality. Measured components are below their corresponding guideline except for total dissolved solids (TDS), total coliforms and manganese. The HC-CDWQGs for manganese and TDS are based on aesthetics (staining and taste) and are not based on the protection of human health. Health Canada has developed a maximum acceptable concentration for manganese in drinking water of 120 µg/L, which is higher than the aesthetic CDWQG for manganese in drinking water of 20 µg/L. The assessment noted that groundwater is typically free of total coliforms and recommended additional testing to confirm the results.

Soil Quality

The geology and soils assessment provides information on agricultural capability, compaction risk, wind and water erosion risks, wind erosion risk, and reclamation suitability. While information regarding the concentrations of metals or other chemicals in the soils in the region is not currently available, the assessment of potential health risks associated with exposures to chemicals in the soils focuses on a qualitative evaluation.

Noise Levels

A review of the RAA was carried out as a part of the desktop studies to estimate the existing sound levels as well as identify potential receptor locations within the RAA. Health Canada recommends 35 dBA Ldn as a baseline for rural areas and 45 dBA for urban/suburban areas. No urban/suburban areas were identified within RAA. The areas within the RAA of LSMOC, LMOC and PR 239 realignment route are considered rural and the existing sound levels are assumed to be 35 dBA Ldn, as suggested in Health Canada Guidance.

There are no communities or residential receptors located within 5 km (i.e., within the LAA) of the LSMOC PDA and there are three communities (Grahamdale, Faulkner, Hilbre and Birch Bay) with numerous residential receptors within 5 km of the LMOC PDA and PR239 realignment route (see Chapter 6, Section 6.2).

9.5.3 Project Interactions with Human Health

Table 9.5-3 identifies the Project components and physical activities that might interact with human health during construction, operations and maintenance, and result in the identified environmental effect. These interactions are identified by check marks and are discussed in detail in Section 9.5.3 in the context of effects pathways, standard and Project-specific mitigation and residual effects.

Table 9.5-3 Project-Environment Interactions with Human Health During Construction, and Operations and Maintenance

Project Components and Physical Activities	Environmental Effects
	Change to Human Health
Construction	
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])	
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)	
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])	
Water development and control (dewatering and realignment of existing water works)	
Reclamation	
Operations	
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure [e.g., water control structure gates] are either open or closed)	
Operation and maintenance of other Project components[1] (normal operations conditions associated with PR 239 and municipal road realignments, distribution line, and bridges and culverts)	
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	
Operation, maintenance, and reclamation of quarries	

NOTES:

indicates a potential interaction.

– indicates no potential interactions are expected.

[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas, and quarries.

9.5.4 Assessment of Residual Environmental Effects on Human Health

9.5.4.1 Analytical Assessment Techniques

Methodology

The assessment of effects to human health is based on an evaluation of whether or not the potential changes to the environment (such as potential changes in air quality, water quality, and noise exposure) may affect the health outcomes or risks to human health, with a focus on Indigenous peoples' health. If risks to human health due to changes in one or more of the potentially affected components are predicted, a human health risk assessment (HHRA) would need to be completed to quantitatively characterize potential risks to human health, including potential exposures through secondary pathways (e.g., changes to water quality that could contaminate aquatic country foods such as fish tissues).

Consistent with Health Canada (2016a), the evaluation of human health impacts associated with changes to air quality is made based on a comparison of predicted contaminant concentrations to health-based air quality guidelines and standards. If predicted concentrations of contaminants remain well below the CAAQS or applicable guidelines, then a HHRA is not necessary. A HHRA may be necessary if contaminant concentrations exceed CAAQS or applicable guidelines, the Project is the dominant source of contaminant to the local airshed, or the Project leads to significant deterioration of the air quality. The human health assessment relies on the information provided by atmospheric environment assessment, which applied the MAAQCs (MCWS 2005) to areas where there is public access (i.e., LAA, but outside the PDA, during construction). For NO_2, SO_2, PM_{10}, and $PM_{2.5}$, the atmospheric environment assessment applies the CAAQS (GOC 2017a; GOC 2017b; CCME 2012, CCME 2017) to areas where there is public access.

The evaluation of human health impacts associated with changes to water quality takes into consideration the concentrations of contaminants in the water and the exposure of humans to those contaminants. As noted in Health Canada (2016b), a human health risk assessment is not always necessary in an environmental assessment when the Project's predicted impacts meet applicable guidelines, such as the Guidelines for Canadian Drinking Water Quality (GCDWQ), given that extensive human health risk assessments have already been performed to establish these guidelines and standards. The evaluation relies on information provided by the groundwater and surface water assessment, which assessed the potential changes in water quality and applied the GCDWQ as part of the assessment of Project residual effects on groundwater and surface water quality within the LAA.

There are no direct Project-related emissions or releases of contaminants to soil; however, the human health assessment considered potential direct exposure and indirect exposure (e.g., contaminant uptake from soil to terrestrial country foods) to soil. This assessment relies on the information provided in the geology and soils assessment for information related to potential changes in soil quality associated with changes in chemical concentrations in surface soils associated with Project activities.

When evaluating human health risks, three components must be present for there to be a potential human health risk:

- the presence of a human receptors (e.g. residents, members of Indigenous communities)
- the presence of a hazard (e.g. chemicals of potential concern)
- the presence of an exposure pathway through which a person could come into contact with the chemical hazard

If one of these components is missing, there is no potential for human exposure and therefore, no potential human health risk. For example, potential hazards such as the generation of dust and fine particulate matter generated by the movement of materials and heavy equipment during construction would not occur during the operations and maintenance phase of the Project and, thus, would not represent a potential human health risk once construction is complete.

This assessment is based on a desktop study using the results and findings of relevant VC chapters and data from similar projects, research literature and the professional judgement of the Project team. When professional judgement is applied, the assumptions and rationale for the assessment finding are provided. Provincial and federal health standards are also applied to assess human health risks, when applicable. Relevant standards and guidelines are noted in the sections below.

Human Receptors and Receptor Locations

Human receptors are the people, or groups of people, who may be exposed to Project-related chemicals while they are within the LAA. Receptor locations define the places within the LAA where human receptors are likely to be present. An understanding of the people who may be present with the LAA, where they may spend time, and how much time they may spend in a given location with the LAA is fundamental to characterizing the exposures and associated health risks that could be experienced by the receptors and in estimating how much these exposures and risks may change as a result of the Project.

Within the context of this assessment, human receptors are not intended to represent specific individuals. Rather, the human receptors represent hypothetical people of all ages (e.g. infants, toddlers, children, adolescents and adults) that could potentially be exposed to contaminants of potential concern (COPCs) within the human health LAA.

Two theoretical receptor groups have been considered for the evaluation of the potential changes in human health risk that may result from the construction and/or operation of the Project: a residential receptor and an Indigenous receptor. Both the residential and Indigenous receptors are assumed to live near the Project, and both are assumed to have the opportunity to gather, harvest and consume foods from the local area (both locally grown produce and country foods) from the Interlake Region that lies within the LAA. Visitors, tourists and other recreational users of the area may also be present in the LAA; however, these receptors would be present on a less frequent basis than either the residential or Indigenous receptors. As a result, the exposures to Project-related COPCs and human health risks

associated with these exposures, would be lower than those that may be experienced by either the residential or Indigenous receptors. Therefore, the potential changes in exposures and risks assessed for the residential and Indigenous receptors provides conservative estimates of the changes in risk that could be experienced by visitors, tourists and recreational users of the area.

Workers for the Project are not included as human receptors in the human health assessment. Worker health and safety is addressed through compliance with applicable provincial (Work Safe Manitoba) and federal legislation. Non-work-related exposures of these persons (e.g., recreational activities within the LAA during non-work hours) would be the same as the other human receptors already identified.

9.5.4.2 Change in Human Health

Project Pathways

During the construction phase, combustion exhaust and fugitive dust would emit COPCs, including CACs such as NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO and VOCs. These COPCs may be inhaled by residential and Indigenous receptors resulting in an increased health risk. Fugitive dust generated during construction activities may deposit on soils and alter the chemical concentrations in soil if the chemical concentrations in the fugitive dusts differ from the chemical concentrations in surface soils outside the PDA. Direct contact with these soils may result in an increased human health risk. In addition, increases in chemical concentrations in soil could increase the concentrations of these chemicals in country foods that, in turn, may result in an increase in human health risk for people who consume these foods. Project construction activities related to excavation of the outlet channels may also result in changes in surface water and/or groundwater quality that may result in an increase in human health risk for people who use surface water or groundwater as a source of domestic water.

Project-Related Changes in Air Quality

As indicated in Section 9.5.1.3, Project-related emissions of chemicals to the air from Project-related construction and operations activities may expose human receptors to these chemicals via inhalation. The Project-related COPCs in air emissions, as identified in the atmospheric environment assessment, are:

- nitrogen dioxide (NO_2)
- sulphur dioxide (SO_2)
- particulate matter less than 10 microns in diameter (PM_{10})
- particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)
- ozone (O_3)
- carbon monoxide (CO)

- volatile organic compounds (VOC)

The assessment of Project effects on air quality determined that changes in air quality are expected to be consistent with those of a typical construction project (Chapter 6, Section 6.2.4.4). The air quality assessment concluded that:

- the primary effects on air quality are related to dust concentrations, including PM_{10} and $PM_{2.5}$
- Project effects on ambient air quality are greatest near the PDA and decrease substantially with increasing distance from the PDA
- COPC concentrations within the PDA will be higher than those at the nearest occupied receptors and exceedances of the applicable MAAQCs and/or CAAQS are unlikely to occur at these receptor locations

Project activities related to construction and operation are not anticipated to result in increases in COPC concentrations that exceed the applicable short-term (1-hour, 24-hour) or long-term (annual average) MAAQCs or CAAQS. The MAAQCs and CAAQS are intended to be protective of human health (including sensitive members of the population such as children and the elderly) and, thus, COPC concentrations that are below the applicable MAAQC or CAAQS would be considered to represent a negligible human health risk.

Regulatory agencies such as Health Canada, however, consider NO_2, SO_2 and $PM_{2.5}$ to be non-threshold contaminants and that even small amounts of exposure can be associated with potential human health risks. At very low concentrations, the potential health risks are low and as the concentrations increase, the potential health risk increases. This is analogous to the incremental increases in lifetime cancer risk associated with exposures to non-threshold carcinogenic compounds. For carcinogenic compounds, a cancer risk acceptability benchmark has been set by regulatory agencies. Exposures to carcinogenic chemicals that result in incremental increases in lifetime cancer risk that are below the risk acceptability benchmark are deemed to represent a negligible human health risk. Risk acceptability benchmarks for non-carcinogenic chemicals that act through non-threshold mechanisms have not been established by regulatory agencies. The human health-based ambient air quality standards for chemicals such as NO_2 SO_2 or $PM_{2.5}$ are defined as representing concentrations in ambient air (over the specified averaging period) that represent negligible risk to human health, including sensitive members of the population. Thus, Project-related changes in air quality that do not exceed the established MAAQC or CAAQS values, would be considered to represent a negligible human health risk and a negligible change in human health risk from existing baseline conditions.

The human health assessment follows Health Canada guidance for the evaluation of human health related to air quality (Health Canada 2016a) to determine whether the predicted changes in air quality were of sufficient magnitude to warrant further assessment in a detailed HHRA, This guidance states " If predicted concentrations or levels of COPCs and particulate matter remain well below the CAAQS or applicable criteria or guidelines, then generally, no further assessment is necessary" (Health Canada 2016a).

These findings show that outside the PDA, the predicted Project-related concentrations of NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO and VOCs would remain well below their respective CAAQS or applicable MAAQC values. Based on these findings, the residual effects of the Project on air quality would be not significant and no further assessment of potential human health risks related to changes in air quality would be required.

Project-Related Changes in Soil Quality

As indicated in Section 9.5.1.3, changes in soil quality resulting from the deposition of Project-related dust to soil could alter the concentrations of Project-related chemicals in surface soils within the LAA. Changes in soil quality could, in turn, result in changes in the quality of terrestrial country foods (both plants and animals) if the chemicals are taken up into these country foods. Changes in the concentrations of Project-related chemicals in soil would only occur if chemical concentrations in Project-related dusts were different from the chemical concentrations found in surface soils within the LAA.

Information presented in the geology and soils assessment (Chapter 6, Section 6.3) and the atmospheric environment assessment (Chapter 6, Section 6.2) indicates that dust generated during Project construction and operations activities will be derived from the surface soils within the PDA and the chemical concentrations in these dusts would not be expected to differ from the concentrations in the surrounding surface soils within the LAA. Thus, deposition of Project-related dust onto vegetation would not alter chemical concentrations in vegetation beyond what would be associated with dust deposition in the absence of the Project. Therefore, the deposition of Project-related dusts to surface soil within the LAA would not be expected to alter the concentrations of Project-related chemicals in surface soils within the LAA.

The human health assessment follows Health Canada guidance for the evaluation of human health related to country food (Health Canada 2018) to determine whether the predicted changes in soil quality and country food quality would be of sufficient magnitude to warrant further assessment in a detailed HHRA, This guidance states “For those EAs where country foods are not considered to be an operable exposure pathway, the human health Risk Assessment (HHRA) should provide a clear rationale for not including country foods as a medium in the HHRA (e.g., no increase of COPCs in any foods that may be consumed by individuals currently or in the future)” (Health Canada 2018).

The findings show that Project-related construction, operations and maintenance activities that release fugitive dusts will not increase COPC concentrations in surface soil, or in terrestrial country food that may be consumed by individuals currently or in the future. In addition, the use of herbicides to control vegetation during operations and maintenance phases, will be done according to label directions and in accordance with provincial legislation. Pesticides approved for used by Health Canada, have already undergone human health risk assessments by Health Canada and are considered safe for use, provided that all guidelines for herbicide application are followed (GOC, 2019c). Based on these findings, a detailed HHRA to assess potential Project effects on country foods is not necessary. These results further indicate that the Project will have no residual effects on soil or terrestrial country food quality and

consequently the Project will have no residual effects on human health risk associated with exposures to chemicals in soil or terrestrial country foods.

Project-Related Changes in Water Quality

As indicated in Section 9.5.1.3, Project-related changes in chemical concentrations in surface water may alter the potential human health risks for people who use surface water as a potable water source. Changes in chemical concentrations in surface water may also result in changes in the concentrations of these chemicals in fish and other aquatic biota that are used as country foods. Changes in the quality of surface water and/or aquatic country foods may result in changes in human health risks for people who consume surface water and/or aquatic country foods.

Information presented in the groundwater and surface water assessment (Chapter 6, Section 6.4) indicates that Project activities related to construction and operation of the Project are not anticipated to result in changes in surface water quality or groundwater quality (Section 6.4.6.7). Therefore, the Project will not affect aquatic country food quality. As a result, the human health risks associated with the consumption of groundwater, surface water and/or aquatic country foods will not be affected by Project activities.

The human health assessment follows Health Canada guidance for the evaluation of human health related to water quality (Health Canada 2016b) to determine whether the predicted changes in water quality were of sufficient magnitude to warrant further assessment in a detailed HHRA, This guidance states “If the EA demonstrates that a project will not result in any exceedances of applicable water quality standards at the point of human consumption or exposure, it is reasonable to conclude that negative impacts are not expected from exposure to drinking or recreational water” (Health Canada 2016b).

The findings show that groundwater and surface water meet the Canadian Drinking Water Quality Guidelines and the Project-related construction and operations activities are not expected to alter groundwater or surface water quality (Chapter 6, Section 6.4). Based on these findings and Health Canada guidance, it is reasonable to conclude that the Project will not change the human health risks associated with the consumption of groundwater or surface water within the RAA. Based on these findings, a detailed HHRA to assess potential Project effects on groundwater or surface water is not necessary. These results further indicate that the Project will have no residual effects on groundwater or surface water quality and consequently the Project will have no residual effects on human health risk associated with exposures to chemicals in groundwater, surface water or aquatic country foods.

Project-Related Changes in Noise Levels

The assessment of the acoustic environment (Chapter 6, Section 6.2) considered potential increases in ambient noise levels at 44 residential receptor locations within the LAA (see atmospheric environment

VC, Chapter 6, Section 6.2.4.4). The assessment identified potential noise impacts as either low, moderate or high based on the following criteria (Health Canada 2017b):

- Low noise impact occurs when the predicted noise level is below the lower noise threshold of 50 dBA equivalent sound level (Leq)
- Moderate noise impact occurs when the predicted noise level is above 50 dBA Leq but below upper noise threshold of 57 dBA Leq
- High noise impact occurs when the predicted noise level could exceed 57 dBA Leq

The upper noise threshold is based on the 6.5% increase in people who are highly annoyed, above the baseline level of 35 dBA, and established by Health Canada (Health Canada 2017b). The results of the acoustic assessment determined that residual noise effects are expected to be low (peak noise levels would not exceed 50 dBA) at 24 of the receptor locations. At 12 receptor locations, residual noise effects could be moderate (peak noise level would exceed 50 dBA but would not exceed 57 dBA). At 6 of the 44 receptor locations residual noise effects could be high (peak noise levels exceed 57 dBA). These predictions do not include the application of receptor-specific noise mitigation measures.

Based on these results, the assessment of Project-related changes in noise levels concluded that:

- During the construction phase of the Project, the potential noise effects of the Project construction activities are expected to occur primarily within the PDA and extend to the LAA
- Increased noise emissions may also occur along the provincial and municipal roads used for access and transport of materials, equipment and crews in PDA during construction activities. Duration of noise emissions from construction activities will be limited to the construction phase
- Following the construction phase, the sound levels within the LAA are expected to decrease to pre-construction levels
- Effects on acoustic environment during Project operation and maintenance activities are expected to be lower in magnitude, duration and extent than during the construction phase due to the reduced use of vehicles and equipment and infrequent nature of the of the activities
- Effects during the operation and maintenance phase are expected to be negligible and limited mainly to the PDA, with some use of Project area roadways

Mitigation

Project-Related Changes in Air Quality

Based on the information contained in the atmospheric environment assessment, increases in the concentrations of COPCs are predicted to be small and would result in final concentrations that remain below the appropriate MAAQC and/or CAAQS. The air quality assessment assumed that standard dust

mitigation measures would be applied during the construction phase to limit the release of fugitive dusts during construction and operations. Further mitigation includes the following:

- Machinery will arrive on site in a clean condition and shall be kept in good working order and free of fuel, oil or fluid leaks. Machinery that is found to be leaking any fuel, oil or other fluids shall be moved off the work site immediately for repaired.
- All internal-combustion engines (regardless of fuel type) will be shut down during fueling
- Project off-road construction equipment will comply with emission standards in the Canadian Off-Road Compression-Ignition Engine Emission Regulations (GOC 2019a)
- Engines and exhaust systems will be properly maintained. Equipment will not be operated, including construction equipment, that shows excessive emissions of exhaust gases until corrective repairs or adjustments are made
- The concentration of sulphur in diesel fuel will not exceed 15 mg/kg to comply with Sulphur in Diesel Fuel Regulations (GOC 2019b)
- Construction vehicle idling times will be reduced to the extent possible in order to reduce emissions, as a best management practice
- Cold starts will be limited to the extent possible to reduce emissions, as a best management practice
- Use of a work camp will reduce emissions associated with transportation of staff to and from site during construction

Project-Related Changes in Soil Quality

The Project is predicted to have no measurable residual effect on the chemical quality of soil. Therefore, mitigation measures to address potential changes in human health risks related to changes in soil chemistry are not required

Project-Related Changes in Water Quality

The Project is predicted to have no measurable residual effect on the chemical quality of water. Therefore, mitigation measures to address potential changes in human health risks related to changes in water chemistry are not required.

Project-Related Changes in Noise Level

Manitoba Infrastructure's Environmental Management Program and associated Project Environmental Requirements are described in Chapter 3, Section 3.7. The need for mitigation depends on the type of activity and the proximity of receptors to Project activities. Mitigation measures were not incorporated in

the acoustic models for the assessment of effects since the construction equipment list and schedule are preliminary.

At present, potential acoustic mitigation measures comprise applying best practices in construction noise management and reducing or restricting equipment activities in specific areas or during specific time periods. The following best management practices for noise would be implemented to help mitigate noise effects at receptors with moderate to high noise impacts:

- Residents near to construction noise-generating activities will be notified. Temporary construction noise abatement barriers may be used to reduce noise levels. If noise abatement barriers are ineffective, a temporary reduction in the intensity of construction activities may be considered.
- Machinery and factory-supplied noise-abatement equipment (e.g., mufflers) will be maintained in good working order.
- Machinery idling will be minimized.
- A complaint response procedure will be implemented to address noise complaints should they arise.

Project Residual Effects

The Project is anticipated to have a residual effect on air quality. However, the concentrations of COPCs are predicted to remain below the applicable MAACQs and/or CAAQS, as such, further assessment is not required. There are no expected changes to surface water quality, groundwater quality, soil quality or country food quality in the LAA or RAA as a result of the Project. Therefore, there are no residual effects to be characterized. The Project effects on noise levels, in the absence of mitigation, are expected to result in an increase to levels that would exceed the 57 dBA upper noise threshold at a limited number of (6 of 44) residential receptor locations (assuming a conservative baseline of 35 dBA). This effect would not last beyond construction of the Project and is not expected to extend beyond the LAA. Indigenous and non-Indigenous receptors in the area are expected to be able to continue pre-project activities in the area.

9.5.4.3 Summary of Project Residual Effects

Table 9.5-4 summarizes the residual environmental effects on human health during construction and operations.

Table 9.5-4 Summary of Project Residual Effects on Human Health

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Social Context
Change in Human Health – Air Quality	C,O	A	ST	N	NS	LAA	SI	R	R
Change in Human Health – Noise levels	C	A	ST	M	NS	LAA	SI	R	R

KEY
See Table 9.5-2 for detailed definitions

C: Construction
O: Operation

P: Positive
A: Adverse
N: Neutral

ST: Short-term
MT: Medium-term
LT: Long-term

N: Negligible
L: Low
M: Moderate
H: High

NS: No sensitivity
MS: Moderate sensitivity
HS: High sensitivity

PDA: Project development area
LAA: local assessment area
RAA: regional assessment area

N/A: Not applicable

IF: Infrequent
SI: Sporadic/Intermittent
RC: Regular/Continuous

RS: Reversible (short-term)
RL: Reversible (long-term)
I: Irreversible

R: Resilient
NR: Not resilient

9.5.5 Determination of Significance

9.5.5.1 Significance of Residual Environmental Effects from the Project

A significant effect on human health would be one that results in exposures that exceed objectives established by relevant regulatory organization(s) and are likely to result in a long-term change in the health of an identified receptor(s). This conclusion would be based on a consideration of the magnitude of exposure and relevant contextual effects attributes such as the spatial and temporal distribution of effects and an understanding of the confidence in the estimated potential changes in human health.

The Project will have no residual effects on air quality, surface water quality, groundwater quality, soil quality, terrestrial country food quality or aquatic country food quality. As a result, the Project will have no significant residual effects on human health from airborne dispersion of contaminants.

A significant effect on noise levels is one that results in changes in audible noise levels that exceed provincial guidelines, and where there is a reasonable expectation that the predicted changes in noise

levels could result in an increase in public annoyance and could affect human health and welfare. Residual effects on changes in noise levels are limited to the construction phase and do not extend beyond the LAA. Construction related changes in noise levels are sporadic and/or intermittent and will only persist at a given receptor location while construction activities are occurring in the vicinity of the receptor location. As construction moves away from a given receptor location, noise levels are expected to return to pre-Project levels.

In conclusion, the residual effects are considered not significant.

9.5.5.2 Significance of Residual Cumulative Environmental Effects

There are no residual effects on human health or changes in noise levels associated with the Project. Therefore, there are no residual cumulative environmental effects on human health. As such, cumulative effects are not significant.

9.5.6 Potential Effects on Federal Lands

The Project is not expected to affect air quality, soil quality, surface water quality, groundwater quality or terrestrial and aquatic country food quality on the Dauphin River, Lake St. Martin, Little Saskatchewan First Nation, or Pinyamootang First Nation Reserves, which are located in the RAA. No additional follow-up and monitoring programs beyond those identified are required specifically for potential health effects on federal lands.

9.5.7 Prediction Confidence

Prediction confidence is based on the information compiled during desktop-based data compilation and an understanding of Project activities, location and schedule. There is a high degree of confidence in the assessment predictions. Although some of the available desktop data are limited (e.g., construction-related quantitative air quality predictions), the environmental effects mechanisms are well understood.

9.5.8 Follow-Up and Monitoring

Follow-up and monitoring for human health is typically based on the outputs of physical environment monitoring, such as water quality. Therefore, examination of results from a health perspective will be based on surface and groundwater monitoring (Chapter 12, Section 12.4). The environmental assessment determined that significant effects are not anticipated for these pathways to human health, with a high prediction confidence (see Chapter 6). However, if results of ongoing monitoring indicate that applicable quality standards are exceeded, a human health risk assessment may be necessary to determine whether the noted changes represent a potential human health risk. A key aspect of the process is the efficient communication with those potentially exposed to human health risks.

Development of monitoring plans is ongoing and incorporates outputs from engagement/consultation and regulatory review process. The plans will include rationale and justification, and efficient protocols for communicating results of physical environment monitoring, particularly if they appear to result in a

concern to human health and the need for a risk assessment. Manitoba Infrastructure anticipates that follow-up and monitoring developed for aquatic and terrestrial programs will also serve to confirm predictions regarding effects to the resources necessary for Indigenous and Treaty rights. Similarly, follow-up and monitoring programs for atmospheric environment (air, noise), human health, and socioeconomics will also serve to confirm predictions regarding effects to the conditions that support the exercise of Indigenous and Treaty rights.

Ongoing engagement through Project construction/operation will be used to share results of VC monitoring/follow-up and pathways to Indigenous peoples and potential impacts to Aboriginal or Treaty rights. Manitoba Infrastructure is committed to ongoing engagement with Indigenous groups as outlined in the Indigenous Consultation Approach and Current Status document. Further information regarding efforts to engage with Indigenous groups to verify the applicability of proposed follow-up and monitoring programs with respect to potential effects to Indigenous peoples and impacts to Aboriginal or Treaty rights are described there.

9.5.9 Conclusions

9.5.9.1 Change in Human Health, Air Quality

Based on the assessment of the potential effects of the Project on air quality as it relates to changes in human health risk, and the proposed mitigation measures, the residual effects are considered not significant.

9.5.9.2 Change in Human Health, Noise Levels

Based on the assessment of the potential effects of the Project on changes in noise levels, and the proposed mitigation measures, the residual effects are considered not significant.

9.6 HERITAGE RESOURCES

9.6.1 Scope of the Assessment

This heritage resources assessment is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 7.1 of the Canadian Environmental Assessment Agency (the Agency) EIS Guidelines for the Project (CEAA 2018) requires the EIS to include a description of baseline conditions and Section 7.1.12 specifies requirements for human environment information to include physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance. Section 3.4 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018) submitted to Manitoba Sustainable Development) indicates that the EIS will describe

socioeconomic attributes and Section 3.4.2 specifies that the human environment will include heritage and cultural resources.

Chapter 4 (Section 4.4.1) of this EIS describes VCs as features that may be affected by the Project as related to the role of the VC in the ecosystem and the value people place on it. Heritage resources is a VC because, as the Historic Resources Branch (HRB) of Manitoba Sport, Culture, and Heritage states: "Manitobans have inherited a rich legacy from the past. The reminders range from our natural landscapes, heritage sites, and landmark buildings to the historic objects and documents in our museums and archives, as well as the knowledge, ideas, and traditions of our ancestors" (Manitoba Sport, Culture, and Heritage n.d.). First Nations have indicated, through engagement, concern for cemeteries and unmarked graves as well as traditional travel ways.

Project activities associated with construction could interact with heritage resources through ground disturbance activities. Ground disturbance associated with operation and maintenance, specifically shoreline erosion, is not anticipated to occur beyond historically high or low water levels so the Project adds no new effects in this regard. These interactions could potentially result in altering heritage resources. The value of these resources is not quantified in terms of individual objects, but rather in the information that is obtained between the individual objects and features, their spatial distribution, and their depositional context. Any alteration to these inter-relationships during Project construction, operation, or maintenance phases can result in the permanent loss of information that is fundamental to understanding heritage resource sites and their formation.

9.6.1.1 Regulatory and Policy Setting

A list of various regulatory requirements that were considered in developing this environmental impact statement (EIS) can be found in the Introduction (Chapter 1, Section 1.5 and Appendix 1A). Particular consideration was given to the following federal and provincial legislation, policies and guidelines in the preparation of this environmental assessment.

Federal Regulations and Policy

Guidance for the consideration of archaeological resources under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) is provided in Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archaeological, Paleontological or Architectural Significance under the Canadian Environmental Assessment Act, 2012, Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing (Canadian Environmental Assessment Agency 2019). The CEAA Technical Guidance for Cultural Heritage recognizes that archaeological resources can fall under the authorities of other governments (i.e., municipal or provincial) and that information from other levels of government may be used to inform federal EAs.

As noted in Section 2(1) of the Act "any change that the project may cause in the environment, including any effects of such change..., on physical and cultural heritage, on the current use of lands and resources for traditional purposes by Aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance."

Provincial Regulations and Policy

Manitoba's regulatory requirements are outlined in *The Heritage Resources Act* (1986). The Act stipulates that if the Minister of Manitoba Sport, Culture, and Heritage has reason to believe that heritage resources or human remains that are upon, within or beneath a site are likely to be damaged or destroyed by reason of any work, a Heritage Resource Impact Assessment (HRIA) of the Project may be required. In Manitoba, potential impacts to paleontological resources are also addressed in *The Heritage Resources Act*. An HRIA is a written evaluation of the effect that a proposed development may have on heritage resources that are known or thought likely to be present at a development site. The goal of the HRIA is to facilitate investigation prior to Project construction. An HRIA is separate and distinct from an environmental assessment, but the information collected during an HRIA assists in making informed decisions regarding potential effects and mitigation measures to address these effects. It also provides data required for CEAA filing requirements, such as the potential for any undiscovered heritage resources in the PDA and assists with developing contingency plans and field measures that would be required if a heritage resource was discovered during construction.

It is anticipated that the HRIA that is expected to be required for the Project would be conducted by a Heritage Resources specialist in advance of construction. It's currently expected that this process would include surveys for sites or objects of importance or cultural significance to Indigenous peoples. Opportunities for inclusion of Indigenous monitors is possible and would be addressed as planning proceeds. Additionally, as outlined in the Indigenous Consultation Approach and Current Status document, potentially affected Indigenous Communities will be provided an opportunity to comment on Manitoba Infrastructure's Follow-Up and Monitoring Program, which identifies a pre-construction HRIA.

The Province of Manitoba also enforces *The Policy Respecting the Reporting, Exhumation and Reburial of Found Human Remains* (1987), which is administered by the HRB (Manitoba Sport, Culture, and Heritage n.d.). This policy outlines the protocols to follow in the event that human remains, or objects thought to be human remains, are found. Section 35 of *The Cemeteries Act*, administered by the Manitoba Public Utilities Board, may also be relevant to the Project. This section of the Act discusses consequences of any damage, mutilation, defacing, or removal of any tomb, monument, gravestone, or other structure placed in a cemetery, or any fence, railing, or other work for protection or ornament of a cemetery.

Municipal Regulations and Policy

Under Part III Section 25 of *The Heritage Act*, municipalities may designate, as a municipal heritage site, any site within the municipality that, in the opinion of the municipality, has sufficient heritage significance or should be so designated by virtue of its proximity to and for the protection or enhancement of a municipal heritage site. There are seven municipally designated sites within the Project Region.

The West Interlake Planning District has no stated heritage policies, regulation, or guidance (West Interlake Rural Municipality n.d.).

9.6.1.2 Engagement and Key Concerns

A discussion of the Indigenous and public engagement process (IPEP) is provided in Chapter 5 (Indigenous and Public Engagement). Additional heritage resources and cemeteries information was collected through key person interviews (KPIs) with representative stakeholders and groups. The engagement process on heritage resources issues also involved discussions with regulators. First Nation and Metis contributions and community concerns contributed to selecting the channel routes for the Project, including avoiding areas described as important, such as the St. Thomas Lutheran Cemetery. Key issues regarding heritage resources identified through the process are summarized in the following sub-sections.

Public Engagement Process

Manitoba Infrastructure received numerous comments about land and resource use during four rounds of the IPEP. Detailed information on the IPEP is provided in Chapter 5. Information is also available in the supporting IPEP summary reports and appendices. The following summarizes the feedback received regarding interests and concerns with respect to heritage resources:

- several artifacts found at/near Watchorn Provincial Park
- consideration should be given to archeological sites
- value in carrying out archaeological studies, beyond just Project ROW

Indigenous Engagement Process

Manitoba Infrastructure has undertaken engagement prior to and throughout preparation of the environmental impact statement (EIS), and will continue to consult with Indigenous groups, government agencies, and stakeholders throughout the life of the Project. A discussion of the engagement process is provided in Chapter 5: Indigenous and Public Engagement. Engagement feedback from Indigenous groups, has been an important consideration in identifying issues of concern, framing the scope of the EIS baseline and effects assessments, and in identification of specific mitigation measures, where provided.

Concerns relevant to heritage resources were raised during open houses held with the public and engagement with Indigenous groups since 2011. From 2017 to present, engagement has been focused on the Project. Before that, engagement activities were associated with an alternatives assessment as described in Chapter 2. Fisher River Cree Nation expressed concern about the loss, damage, or disturbance of areas of cultural, historical, archaeological, paleontological, or architectural significance through Project-related disturbance. Reduced access to culturally important gathering resources such as plant species of cultural, spiritual, and medicinal importance due to permanent structures bisecting the landscape was also identified by Fisher River Cree Nation.

Consideration of Indigenous Information and Traditional Knowledge

Traditional knowledge (TK)—including information about existing conditions, potential effects and mitigation measures—has also been provided by Indigenous groups through Project-
summary of recommended Project-related effects/issues of concern related to heritage resources found in Project specific studies follows.

- Dauphin River First Nation
  - Two historic settlements were recorded on the west shore of Lake Winnipeg, south of the Dauphin River reserve. A community member noted that there are graves located at one of these settlements:

    According to the Interlake Reserves Tribal Council October Phase 1 Traditional Land Use and Traditional Knowledge Report (Golder Associates Ltd. 2018) this cemetery is in or near the north side of the LAA on Sturgeon Bay, and it is discussed below in the effects assessment

- Little Saskatchewan First Nation Community
  - There is a cemetery location on the Little Saskatchewan Reserve that is extremely important to the community:

    This cemetery is outside the LAA. The Project will not interact with it and is not included in the heritage resources effects assessment.

- Lake St. Martin First Nation (LSMFN)
  - “There are unmarked LSM community member graves along the shore of LSM near Rabbit point and are flooded because of high water of LSM”:

    This cemetery is outside the LAA. The Project will not interact with it and is not included in the heritage resources effects assessment Fisher River First Nation (FRCN)

  - The ridge that runs beside the Project area will need to be addressed. It is a historic travel corridor:

    Historic trails are discussed in the effects assessment

The comments shared indicate that potential effects on graves, both marked and unmarked, are a substantial concern for Indigenous peoples. Effects on heritage resources and traditional travel ways are also a concern. These shared interests, if pertaining to areas within the LAA, may be addressed by a preconstruction HRIA that includes ground-truthing of the issues raised in the IPEP to determine whether the Project will interact features and areas of concern.

9.6.1.3 Potential Effects, Pathways and Measurable Parameters

The focus of this assessment is on effects that have the potential to cause harm to heritage resources. Potential environmental effects, the effect pathway and measurable parameters used to assess potential effects on heritage resources are provided in Table 9.6-1. There are two potential effects measured in this assessment: change, by removal, in the number of heritage resources in the LAA; and change, by ground or other disturbance, of cemeteries and human burials in the LAA or disruption of use of an active cemetery.

Table 9.6-1 Potential Effects, Effect Pathways and Measurable Parameters for Heritage Resources

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in number of known and intact heritage resource sites and change in sites inadvertently exposed	Project components requiring subsurface disturbance have the potential to disturb the horizontal and vertical context of artifacts	Number of known and intact heritage resource sites in LAA
Change in cemeteries and burials	Project components requiring subsurface disturbance and altered surface and ground water flow have the potential to disturb burials within a cemetery. Construction and maintenance activities have the potential to disrupt use of active cemeteries	Number of intact cemeteries within the LAA

Primary and secondary potential effects from the Project on heritage resources include the following:

- Primary effects occur during construction, including loss or disturbance to site contents and site contexts through vegetation or topsoil removal, channel excavation, compaction, vehicle traffic, grading for access roads, tower construction, and rock quarrying.
- Secondary effects may include vandalism if the Project creates new human access opportunities, or damage to surface sites through artifact collection.

9.6.1.4 Boundaries

Spatial Boundaries

The Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on heritage resources are shown in Appendix 9A, Figure 9.6A-1.

Project Development Area

The Project development area (PDA) encompasses the Project footprint and is the area of physical disturbance in which the Project components (main works) and associated works and activities will occur.

The PDA is an area of 2,099 ha or 21.0 km^2. The PDA components are the Lake Manitoba Outlet Channel (LMOC), PR 239 and municipal alignments, and the Lake St. Martin Outlet Channel (the LSMOC). The LMOC PDA encompasses approximately 1,022 ha. The LSMOC PDA occupies approximately 993 ha. There are no Federal lands within the PDA.

Local Assessment Area

The local assessment area (LAA) for the assessment of effects on heritage resources includes the PDA and a 1 km buffer from the centre of the PDA, an area of 14,989 ha.

Regional Assessment Area

The regional assessment area (RAA) for the assessment of effects on heritage resources includes the PDA and LAA and a 20 km buffer from the centre of the PDA, an area of 46,987 ha.

Temporal Boundary

The temporal boundary for the assessment of effects on heritage resources covers the duration of the construction and operation phases of the Project. The construction duration is estimated to occur over 2.5 to 3 years with approximately 1 to 2 years for post construction-related works (Chapter 3, Section 3.6). During construction, heritage resources (e.g., cemeteries) may be affected by access restrictions within construction areas and the presence of the workforce noise associated with operating heavy equipment. It is unlikely that the Project will affect additional heritage resources throughout operation and maintenance because of permanent take up of lands used for channel construction and associated works. Operations may reduce the likelihood of flooding that can restrict access to cemeteries; this phase is indefinite because the Project is expected to be a permanent installation for mitigating floods.

9.6.1.5 Residual Effects Characterization

In the absence of mitigation, there is a potential for loss by removal of a segment of the historic Fairford Trail without benefit of archaeological assessment, mapping and potential salvation excavation. Known cemeteries may experience indirect effects during funerals and ceremonies through construction dust and noise. Currently undiscovered archaeological sites could be removed by construction activities, again without benefit of archaeological assessment, mapping and potential salvage excavation.

Table 9.6-2 presents definitions for the characterization of residual environmental effects on heritage resources. The criteria describe the potential residual effects that remain after mitigation measures have been implemented. An HRIA is not completed or approved by HRB for the Project and, therefore, potential residual effects on heritage resources are possible.

Table 9.6-2 Characterization of Residual Effects on Heritage Resources

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change to heritage resources (avoided) or cemeteries
	Negative	A reduction in the number of known heritage resources, including cemeteries, listed in the database inventory in the PDA and LAA through the disturbance of known and the disturbance to previously unknown sites inadvertently exposed by the Project or disruption of use of active cemeteries
	Positive	Net benefit (or desirable change) on the VC.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities that reduce the number of heritage resources, including cemeteries, or disruption of use of active cemeteries
	Long-Term	The potential effect is permanent. heritage resources or cemeteries are irreversible removed
Magnitude (degree or intensity of the change)	Negligible or Low	No change to number of or integrity of heritage resources or cemeteries
	High	Heritage resources or cemeteries are disturbed or destroyed. Use of cemeteries is interrupted.
	No Sensitivity	Timing does not affect the VC
Timing[1]	High Sensitivity	Timing disrupts use of active cemeteries
	Project Footprint	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated RoWs, and permanent and temporary facilities (e.g., borrow pits and quarries)
Extent (Spatial Boundary)	LAA	Area within which potential Project effects are measurable and extending beyond the Project Footprint to, but not beyond, the LAA.
	RAA	The anticipated regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA.
	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).

Table 9.6-2 Characterization of Residual Effects on Heritage Resources

Characterization	Range of Criteria	Level of Effect and Definition
Frequency (how often the effect occurs)	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project (e.g., blasting at quarries; site-specific construction equipment noise; potential wildlife-vehicle collisions).
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project (e.g., noise associated with vehicle traffic along the realigned portions of PR 239).
Reversibility (the degree of permanence)	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> than five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
	Undisturbed	Ecological: Area is relatively undisturbed or not adversely affected by human activity.
Ecological and Social Context (resilience of a VC to adapt to changes as a result of the project)	Disturbed	Ecological: Area has been substantially previously disturbed by human development or human development is still present.
	Resilient	Social: Indigenous people/communities are able to adapt and maintain pre-project activities in the region.
	Not Resilient	Social: Indigenous people/communities will not be able to adapt to changes or maintain pre-project activities in the region.

9.6.1.6 Significance Definition

A significant effect on heritage resources is one that results in the unmitigated alteration or destruction of a resource. For cemeteries, significant effects are any disruption (e.g., by ground disturbance or flooding/dewatering) or disruption of use of an active cemetery.

9.6.2 Existing Conditions for Heritage Resources

9.6.2.1 Methods

Section 5 of CEAA 2012 defines environmental effects as:

- with respect to Aboriginal peoples, an effect of any change that may be caused to the EIS will identify VCs linked to section 5 of CEAA 2012 including the ones identified in Section 6.2 (Part 2) of these guidelines that may be affected by changes in the environment,
- Section 5 of CEAA 2012 defines environmental effects as:

  - a change that may be caused to the environment on federal lands, in another province or outside Canada;

- with respect to Aboriginal peoples, an effect of any change that may be caused to the physical and cultural heritage;

  - the current use of lands and resources for traditional purposes; or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

- a change, other than the ones mentioned above, that may be caused to the environment and that is directly linked or necessarily incidental to the exercise of the federal power or the performance of a duty or function; and

- the effect of that change, other than the effects mentioned above, on

  - physical and cultural heritage, or

  - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The method described below addresses these potential environmental effects as they pertain to heritage resources.

Sources of Information

Existing conditions for heritage resources are based on two Project-specific studies done in 2016 (Petch 2017a and 2017b) and as well as the following other sources of information:

- Preliminary baseline data to establish existing conditions were acquired from the HRB and consisted of previously recorded archaeological sites and Centennial Farms. These data were augmented by a list of provincially and municipally designated sites within the PDA, LAA, and RAA obtained by accessing the Province of Manitoba's HRB database of designated sites (Province of Manitoba 2017).

- The Provincial Archives of Manitoba Keystone Archives Descriptive Database was accessed to review Dominion Lands Office township plans that were compiled during the first land surveys of Manitoba between 1872 and 1910 (Archives of Manitoba 2017). The township plans contain information such as topography and vegetation, location of cart trails, developed and undeveloped rail lines, and stream courses.

- Original landowner data were collected from Land Grants of Western Canada (1870 to 1930) on the Library and Archives Canada website (Government of Canada 2014). These records indicate the type of land acquisition such as Metis Land Grant or sale. *The Manitoba Act* (1870), recognized Metis rights and granted 566,660 ha (1.4 million acres) of land for dispersal among Metis families (Ens 1983). Individuals who were granted lands are identified in the Library and Archives database.

- Topographic maps (1:50,000 scale) were accessed on the Natural Resources Canada website to plot cemetery locations on the map of heritage features (Appendix 9A, Figure 9.6A-2) (Natural Resources Canada 2016). These locations were subsequently located on Google Earth Pro® imagery to obtain a georeferenced location for the centre point of the cemetery.
- The Cemetery Project interactive website was accessed (CanGen Web's Cemetery Project 2019a).
- Data pertaining to cemetery locations, historical sites and school locations were also collected by reviewing the interactive map of historic sites produced by the Manitoba Historical Society (Manitoba Historical Society 2019). These sites were subsequently located on Google Earth Pro® imagery to obtain a georeferenced location for the site or centre point of the cemetery.

9.6.2.2 Overview of Heritage Resources Context

Archaeology and History of the RAA

Petch (2017a and 2017b) compiled a precontact and early post-contact history of the RAA (see Appendix 9.6A and 9.6B). HRB reviewed these reports (Tsukamoto 2019). The following summarizes Petch's (2017a and 2017b) literature and desktop review recognizing that field study results are unavailable.

Indigenous peoples likely began to occupy the region by 7,000 to 8,000 years ago, soon after Glacial Lake Agassiz drained but there is little evidence of their presence here, likely due to a limited number of archaeological surveys having been previously conducted in the RAA. There is a potential for evidence of Precontact Period activity in the RAA to be discovered in future studies and, based on a conservative approach it is assumed that an archaeological survey of the PDA and LAA could reveal some of this evidence. It is further assumed that there was a presence in the area, at least periodically, of Indigenous peoples throughout the Precontact Period. Table 9.6-3 below lists the known archaeological resources of the RAA and LAA (there are none currently recorded in the PDA)

Table 9.6-3 Recorded Archaeological and Paleontological Sites in the LAA and RAA

Site	Location	LAA/RAA	Type	Condition
EjLp-1	Data Confidential	RAA	Surface Collection	Disturbed
EjLq-4	Data Confidential	RAA	Surface Collection	Decayed
EjLq-3	Data Confidential	RAA	Geophysical Survey	Disturbed
EgLo-4	Data Confidential	RAA	Surface Collection	Disturbed
EgLo-9	Data Confidential	RAA	Palaeontological	Disturbed
EgLo-10	Data Confidential	RAA	Palaeontological	Disturbed
EjLq-5	Data Confidential	RAA	Surface Collection	Disturbed
EhLp-2	Data Confidential	RAA	Surface Collection	Disturbed
EgLq-13	Data Confidential	RAA	Surface Collection	Disturbed
EiLq-1	Data Confidential	RAA	Surface Collection	Disturbed

Table 9.6-3 Recorded Archaeological and Paleontological Sites in the LAA and RAA

Site	Location	LAA/RAA	Type	Condition
EgLp-2	Data Confidential	RAA	Palaeontological	Disturbed
EgLo-1	Data Confidential	RAA	Surface Collection	Disturbed
EjLq-1	Data Confidential	RAA	Surface Collection	Disturbed
EjLq-2	Data Confidential	RAA	Surface Collection	Disturbed
ElLl-1	Data Confidential	RAA	Surface Collection	Disturbed
ElLm-1	Data Confidential	RAA	Surface Collection	Disturbed
EiLp-1	Data Confidential	LAA	Surface Collection	Unknown
EhLp-1	Data Confidential	RAA	Surface Collection	Disturbed

In the 2016 reviews of the Lake St. Martin and Lake Manitoba Outlet Channels (Petch (2017a,b) reports that the Provincial Archaeological Site Inventory has six registered archaeological sites within that regional study area (the regional study areas for Petch (2017a; see Appendix 9.6A, Figure 1) differ from the RAA defined for this heritage resources assessment). Five of the sites are within the lands of the Pinaymootang First Nation, and one site within the lands of the Dauphin River First Nation. Four of the sites date to the Historic Period and contained fur trade and homestead artifacts. The other two sites are Middle to Late Woodland Period (c.a. 2,000 – 350 years ago), according to identified lithic tools and Precontact Period pottery.

A 2019 review of heritage resources in the RAA revealed 15 archaeological sites (all but one in a disturbed context) and three palaeontological sites. The existing heritage resources are illustrated in Appendix 9A, Figure 9.6A-1 to compare with the PDA, LAA, and RAA. There are no recorded sites in the PDA and one in the LAA. This site was related to the discovery of a hollow cannon ball collected on the surface.

Contact with Europeans in Manitoba may have begun with Henry Kelsey in 1691 and the Interlake region of Manitoba was well known to European traders by the early 18th century because of the explorations of Joseph Smith and La Vérendrye. North West Co. (NWC) and independent fur trade posts were established in the Fairford area by the late 18th century and the Hudson Bay Co. (HBC) by the early 19th century (Petch 2017a). Appendix 9A, Figure 9.6A-2 shows the Fairford Trail, an overland route that connected the fur trade post and mission at Fairford with the Red River Settlement, which was the basis for present-day Winnipeg.

Dominion Land surveyors began laying out river lots in the 1870s at Fairford and, in 1871, the Indigenous peoples of the Interlake signed Treaty 2. Earlier European traders and explorers described the Indigenous peoples of the area as Swampy Cree but, by the time of treaty, they identified as Ojibwa or Anishinaabeg (Petch 2017). The Fairford Trail is illustrated in Appendix 9A, Figure 9.6A-2. A 465 m segment of this trail intersects with the PDA at the shore of Lake Manitoba.

Homestead settlement began in the early 1900s with a wave of Swedish immigrants whose names influenced place names in the region. Fairford Post closed in 1912. Local Indigenous peoples' economy

began to rely on a combination of agriculture including potatoes and root crops, cattle and haying with continued traditional subsistence from hunting, fishing, gathering plants, and fur trapping (Petch 2017a). With the homestead came the conversion to agricultural lands that covers a large portion of the RAA for the LMOC, south and west of Lake St. Martin. The LSMOC portion of the RAA north and east of Lake St. Martin has no agricultural conversion. Table 9.6-4 illustrates settlement era features such as rural schools, churches and cemeteries in the RAA.

Bayton St. Thomas Lutheran Cemetery is in SW20-27-8-W1 in the LAA and is within 25 m of the west boundary of the LMOC PDA. The earliest known interment in the cemetery is 1921 (CanGen Web's Cemetery Project 2019b) and the most recent reported is December 31, 2016 (Winnipeg Free Press 2016). Based on this, the assumption is that this is an active cemetery. According to the Interlake Reserves Tribal Council October Phase 1 Traditional Land Use and Traditional Knowledge Report (Golder 2018), there is a cemetery in or near the north side of the LAA on Sturgeon Bay. Bissell Memorial United Church is within the LAA in Grahamdale, SE 15-28-8-W1M, and is 660 m from the PDA. Table 9.6-4 below lists the historic features on the LAA.

There are no centennial farms located in either the PDA or the LAA. There is one centennial farm in SE 6-26-7 W1 in the RAA.

Table 9.6-4 Historic Features in the PDA and LAA

Historic Feature	Location	Distance to PDA (m)	Active/ Inactive
Bayton St. Thomas Lutheran Cemetery	SW20-27-8-W1	25	Active
Bissell Memorial United Church	Grahamdale	660	Active
Fairford Trail	NE 30-26-8-W1 SW 31-26-8-W1	0	Portions active
Unnamed Trail	NW 10-29-8-W1	400	Portions active
Carn Ridge School	NW 7-28-8-W1	27	Inactive
Grahamdale School	Grahamdale	762	Active
Grahamdale (2) School (country)	NW 31-27-8-W1	747	Inactive
New Hamburg School/Bayton School	SW20-27-8-W1	147	Active
EiLp-1	Data Confidential	267	Inactive

Appendix 9A, Figure 9.6A-1 illustrates the relationship of the Project to major landscapes and water bodies and water courses in the RAA, including Sturgeon Bay on Lake Winnipeg, Lake St. Martin and Watchorn Bay on Lake Manitoba. Water courses include the Fairford and Dauphin Rivers as well as Watchorn Creek. The LSMOC crosses primarily low peat lands while the LMOC crosses a drumlin field characterized by ridges and swales. Heritage resources in the RAA have been affected by past activities, especially conversion to agriculture and residential lands as well as resource extraction and infrastructure and utilities rights-of-way covering a large portion of the RAA for the LMOC. The RAA for the LSMOC has no agricultural lands and limited residential conversion, resource extraction, and infrastructure.

9.6.3 Project Interactions with Heritage Resources

Table 9.6-5 identifies for each potential effect, the Project components and physical activities that might interact with heritage resources and cemeteries during construction and operations and result in the identified environmental effect. Heritage resources are directly affected by construction activities and, while unmarked cemeteries can be affected by Project activities, active cemeteries are more likely to be affected by the noise and dust of construction during funeral services and other ceremonies. These interactions are identified by check marks and are discussed in detail in Section 9.5.4.2 and 9.5.4.3 in the context of effects pathways, standard and project-specific mitigation, and residual effects. A justification for no effect is provided following the table.

Table 9.6-5 Project-Environment Interactions with Heritage Resources During Construction and Operations

Project Components and Physical Activities	Environmental Effects	
	Change in Heritage Resources	Change in Cemeteries
Construction		
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])		
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	-	
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)		
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])		
Water Development and Control (dewatering and realignment of existing water works)		
Reclamation	-	-
Operations and Maintenance		
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure [e.g., water control structures] are either gates open or gates closed)	-	
Operation and Maintenance of other Project Components[1] (normal operations conditions associated with PR 239 and municipal road realignments, distribution line, and bridges and culverts)	-	-
Project-related transportation within the LAA	-	

Table 9.6-5 Project-Environment Interactions with Heritage Resources During Construction and Operations

Project Components and Physical Activities	Environmental Effects	
	Change in Heritage Resources	Change in Cemeteries
(movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)		
Operation, maintenance, and reclamation of quarries	-	

NOTES:

indicates a potential interaction.

– indicates no potential interactions are expected.

[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas, and quarries.

Construction and operation and maintenance phases Project-related transportation within the LAA have no effect on heritage resources it does not include ground-disturbing activities.

Reclamation, operation and maintenance of the outlet channels, PR 239 and municipal road realignments, bridges and culverts), reclamation of quarries have no effect on heritage resources because any ground disturbance that affects heritage resources occurs irreversibly during construction phase. No new effects during operation and maintenance phase.

Reclamation has no effect on cemeteries as Any ground disturbance that affects heritage resources occurs irreversibly during construction phase. No new effects during reclamation. Operation and Maintenance of other Project Components (normal operations conditions associated with PR 239 and municipal road realignments, and bridges and culverts) will have no effect on cemeteries as there are no cemeteries within other Project Components' LAA.

9.6.4 Assessment of Residual Environmental Effects on Heritage Resources

9.6.4.1 Analytical Assessment Techniques

The approach to assessment of residual environmental effects is to examine the heritage resource and historical information, and available traditional knowledge at the desktop level. The heritage data is plotted on maps showing the Project PDA and LAA (see Appendix 9A, Figures 9.6A-1 and 9.6A-2) to assess feature locations in the context of the Project. Change in Heritage Resources

Project Pathways

Construction

Ground-disturbing Project activities, such as vegetation clearing and initial earthworks, development of temporary construction camp and staging areas, have the potential to interact with heritage resources by sub-surface disturbance and alteration of the horizontal and vertical locations of any intact archaeological features or objects contained therein. Furthermore, removal of vegetation in outlet channels rights-of-way, the quarries and the PR 239 and municipal road realignments rights-of-way may create unstable soil conditions that could result in displacement of exposed heritage objects.

Physical construction of utilities, infrastructure and other facilities, quarry development, and realignment of existing water works have the potential to interact with heritage resources by sub-surface disturbance and alteration of the horizontal and vertical locations of any intact archaeological features or objects contained therein. These include the LMOC PDA (1052.22 ha), the PR 239 PDA (55.95 ha) and the LSMOC PDA (992.56 ha). Quarry locations and areas are currently unknown. Quarry development by others may interact with heritage resources at the topsoil removal stage and construction of new access. Effects of quarry development will be addressed through a preconstruction HRIA in accordance with provincial regulations. If required, a Quarry Management Plan will be developed as part of the Environmental Management Program (Section 3.7).

Operation

Effects beyond the PDA are not anticipated during the operation phase of the Project. An approved preconstruction HRIA will facilitate the mitigation of any effects to heritage resources during the operation and maintenance phase (see Mitigation section below).

Based on the desktop review, a historical feature, the Fairford Trail, crosses the PDA within 380 m of the confluence of Watchorn Creek and Watchorn Bay on Lake Manitoba. Construction of the Project will remove a 465 m long segment of this feature. A section of the trail is within 130 m of the lake and therefore, as a historic travel route near a major waterbody, there is the potential for heritage resources related to the use of the trail to be present. This will be determined by a preconstruction HRIA, which will also innumerate how many heritage resources will interact with the Project.

There are no recorded heritage resource sites within the PDA and one in the LAA. Table 9.6-3illustrates the locations of the sites in the LAA and RAA.

Mitigation

Because of the nature of archaeological sampling, a preconstruction HRIA may not identify all heritage resources, and there is an unlikely chance of encountering previously undiscovered features and objects during construction. Manitoba Infrastructure is developing an Environmental Protection Program (EMP) to address mitigation and monitoring requirements (see Section 3.7). The EMP will include a Cultural and

Heritage Resources Protection Plan developed to specifically deal with potential effects. It will include the following measures:

- The HRB will be informed immediately if any heritage resources, or objects thought to be heritage resources, are discovered during site preparation and construction.
- Protective barriers will be placed around heritage resource sites that are inadvertently found during construction if required so that the area can be protected while work proceeds.
- All heritage resources discovered during site preparation and construction will be left in their original position until HRB is contacted and provides instruction.
- Orientation for Project staff working in construction areas will include heritage resource awareness and training including the nature of heritage resources and the management of any resources encountered.
- Orientation information will include typical heritage resource materials and reporting procedures.
- The Contractor will report heritage resource materials immediately to the Construction Supervisor and will cease construction activities in the immediate vicinity until the Project Archaeologist is contacted and prescribes instruction.
- The Culture and Heritage Resource Protection Plan will be adhered to during construction and operations phases of the Project.

In addition, mitigation for change to heritage resources will be the completion and approval by the HRB of a preconstruction HRIA.

Project Residual Effects

HRB's response the Petch 2017 reports (Tsukamoto 2019) indicates that no Project-specific heritage resource baseline data are currently available. Therefore, except for the effect on the Fairford Trail, potential effects on heritage resources are unknown until a preconstruction HRIA of the PDA is conducted under a valid permit. An HRIA will use predictive modelling to indicate locations of high heritage potential and examine and test those locations for heritage resources. If heritages resources are discovered at any of those locations, assessment by systematic testing will determine whether the resources are intact or disturbed. Intact resources, if required by HRB, will be mitigated through scientific salvage excavation.

Residual effects are reduced through mitigation measures and the Cultural and Heritage Resources Protection Plan. Furthermore, through review of recommendations and mitigation measures outlined in past and future HRIA reports, provincial regulators can either concur or request additional mitigation measures to be conducted. These additional measures are usually summarized as regulatory conditions of *The Environment Act* license.

Without implementation of mitigation measures described above, residual effects for change in heritage resources during construction are characterized (as per the terms in Table 9.6-2) as the following:

- direction is adverse because there will be a net loss of a 485 m segment of the Fairford Trail and any currently unknown heritage resources (if any) in the PDA
- duration is long-term (permanent)
- magnitude for heritage resources, including is high as the Fairford Trail and any currently unknown heritage resources (if any) will be removed within the PDA
- residual effects will not extend to the LAA
- frequency of effects will be short term (single event) over the construction phase
- direct effects on heritage resources will be irreversible (Project is permanent)

However, approval of a completed HRIA and any subsequent mitigations of heritage resources will indicate that there are no residual effects on heritage resources.

There is, however, the potential for other cultural and heritage resources to be discovered during construction. Any inadvertent discoveries of heritage resources will be reported to provincial authorities, as required under provincial heritage legislation.

If a cultural or heritage resource is discovered, the protection measures for the resource(s) will be determined through processes outlined in the Cultural and Heritage Resources Protection Plan. Recorded cultural and heritage resources and their protection measures have been incorporated into the applicable environmental protection plan. The Operations and Maintenance Environmental Protection Plans will also include the site and protection measures to be used for the ongoing protection of cultural and heritage resources during operations. Measures including educating construction crews on the identification of heritage resources and the actions required upon their discovery regarding stop work and notification protocols.

9.6.4.2 Change in Cemeteries

Project Pathways

Construction

Physical construction of utilities, infrastructure, and other facilities, quarry development, and realignment of existing water works, have the potential to interact with cemeteries by creating noise and dust that interfere with funeral ceremonies and visits to pay respects at existing graves. If there are unmarked graves outside the known cemetery boundaries, a common historical occurrence, ground disturbing activities could expose burials.

Operation

Project-related transportation within the LAA for all phases including movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA have the potential to interact with cemeteries by creating noise and dust that interfere with funeral ceremonies and visits to pay respects at existing graves.

For all phases, emissions, discharges and wastes have the potential to interact with cemeteries by creating noise and dust that interfere with funeral ceremonies and visits to pay respects at existing graves.

Water development and control dewatering and realignment of existing water works have the potential to interact with cemeteries by changing the typical groundwater regime. Dewatering can cause collapse of grave shafts creating depressions, causing headstones to tip and grave covers to tilt or crack. Increase in the water table or flooding can cause recent burials to float, pushing up on the grave shaft and potentially tipping headstones and cracking and tilting grave covers. Through flood control facilitated by the Project, it is anticipated that the likelihood of this effect will be reduced.

The Bayton St. Thomas Lutheran Cemetery is in the LAA and the east cemetery boundary is within 25 m of the west edge of the LMOC PDA. The ROW was altered to avoid the known boundaries of this cemetery; however, it is not currently known whether there are unmarked graves outside the cemetery boundaries.

An issue that may be of relevance to this cemetery is that the presence of the channel will alter local surface and subsurface flow paths. This could result in wetting up of soils upgradient side (west) of the channel and drying down of soils on the downgradient side (east). The effects on drainage along the upgradient side of the LMOC are not expected to extend beyond the PDA. Chapter 6.3.4 Soils and Chapter 6.4.7 Groundwater and Surface Water discuss these topics in more detail.

According to the Interlake Reserves Tribal Council October Phase 1 Traditional Land Use and Traditional Knowledge Report (Golder 2018), this cemetery is in or near the north side of the LAA on Sturgeon Bay.

Mitigation

To avoid interrupting funerals or other ceremonies in Bayton St. Thomas Lutheran Cemetery, attempts will be made to notify the St. Thomas Lutheran Church of construction and maintenance schedules to facilitate avoiding noise and dust nuisances at particular times. Contact information could also be posted at the cemetery, at least during construction, so individuals planning funerals or other ceremonies can contact the appropriate construction contractors to advise them when an event is being held to avoid interruptions by noise and dust.

To mitigate any residual effects of changes to the Bayton St. Thomas Lutheran Cemetery because of altered surface or ground water flow, it is recommended that the extant burials be periodically checked for

evidence of tilting headstones and monitoring could include a baseline photographic survey that is used as a comparative model to periodically check the cemetery as part of a follow up and monitoring program.

Though it is not anticipated that the Project will interact with this site, to mitigate any residual effects of changes to the cemetery reported on Sturgeon Bay by Dauphin River First Nation, a preconstruction visit to the site with Knowledge Holders from the First Nation has been offered to facilitate avoidance by an appropriate distance.

Project Residual Effects

With the mitigations described above in place, no adverse residual effects regarding dust and noise, altered surface and ground water, or unmarked graves are not anticipated.

9.6.4.3 Summary of Project Residual Effects

Table 9.6-6 summarizes the residual environmental effects on heritage resources during construction and operations.

Table 9.6-6 Summary of Project Residual Effects on Heritage Resources

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Ecological and Socio-economic Context
Change to Heritage Resources	C	A	LT	H	NS	PDA	IF	I	U, D, NR
Change to Cemeteries	C, O	N	ST	NL	NS	LAA	IF	RS	R

KEY See Table 9.6-2 for detailed definitions	*NL: Negligible or Low* *M: Moderate* H: High	*IF: Infrequent* *SI: Sporadic/Intermittent* *RC: Regular/Continuous*
C: Construction *O: Operation* *D: Decommissioning*	*NS: No sensitivity* *MS: Moderate sensitivity* *HS: High sensitivity*	*RS: Reversible (short-term)* *RL: Reversible (long-term)* *I: Irreversible*
P: Positive *A: Adverse* *N: Neutral*	*PDA: Project Development Area* *LAA: Local Assessment Area* *RAA: Regional Assessment Area*	*U: Undisturbed* *D: Disturbed* *R: Resilient*
ST: Short-term *MT: Medium-term* *LT: Long-term*	*N/A: Not applicable*	*NR: Not resilient*

9.6.5 Determination of Significance

9.6.5.1 Significance of Residual Environmental Effects from the Project

A significant effect on heritage resources is one that results in the removal of the resource. For cemeteries a significant effect is any disruption by ground disturbance or flooding/dewatering or disruption of use of an active cemetery.

The determination of significance assumes that a preconstruction HRIA, based on an HRB approved predictive model to target field survey locations, of the PDA will be completed and approved by the HRB and mitigations described above regarding the St. Thomas Lutheran Cemetery.

Based on the assessment of the proposed effects of the Project on heritage resources and the proposed mitigation measures, the residual effects are considered not significant.

9.6.6 Potential Effects on Federal Lands

The potential effects on heritage resources for the Project are limited to the PDA and potential effects on the St. Thomas Lutheran Cemetery extend 50 m into the LAA. Neither the PDA nor the LAA for heritage resources interact with federal lands (First Nation Reserves) so effects on federal lands are not anticipated.

9.6.7 Prediction Confidence

A conservative approach is taken in the evaluation of potential environmental effects on heritage resources. Prediction confidence is high based on the low number of previously recorded archaeological sites within the PDA and LAA, the low number of cemeteries within the PDA and LAA, past land uses within the PDA and LAA have disturbed a major portion of the landscape, and the results of the desktop assessment within the PDA and LAA.

9.6.8 Follow-Up and Monitoring

Follow-up and monitoring for heritage resources will include:

- HRIA to be completed and approved prior to Project construction
- Construction monitoring of areas of high heritage resource potential based on the results of the HRIA and any follow-up that is required by HRB if a heritage resource is discovered.
- Periodic post-construction monitoring of the Bayton St. Thomas Lutheran Cemetery to ensure no alteration to headstones based on the groundwater regime has occurred.

9.6.9 Conclusions

9.6.9.1 Change in Heritage Resources

In advance of a pre-construction HRIA approved by the HRB, it is concluded that change in heritage resources will be negligible. The Project has a low potential remove a known or inadvertently exposed heritage resource.

9.6.9.2 Change in Cemeteries

It is concluded that change to existing cemeteries or unmarked burials adjacent to existing cemeteries will be negligible.

9.6.9.3 Cumulative Effects

Approval by the HRB, of an HRIA of the PDA conducted under a valid permit will indicate that there are no residual effects and therefore no cumulative effects on heritage resources therefore it is anticipated that the Project has a low potential to remove a known or inadvertently exposed Heritage Resource and will not act cumulatively on change to heritage resources.

It is not anticipated that the Project will act cumulatively on change to cemeteries.

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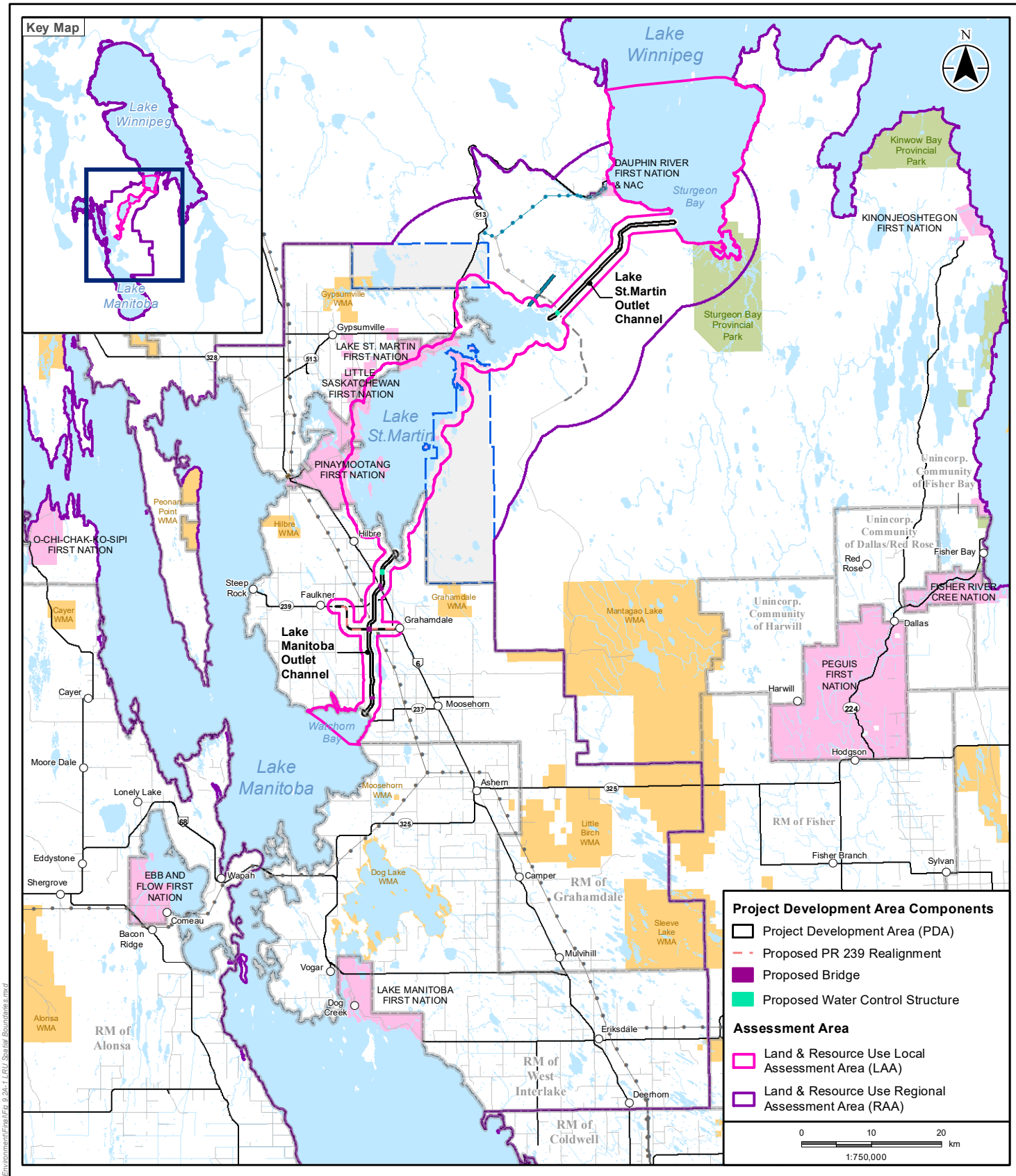
Appendix 9A FIGURES

Appendix 9A FIGURES

LIST OF FIGURES



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
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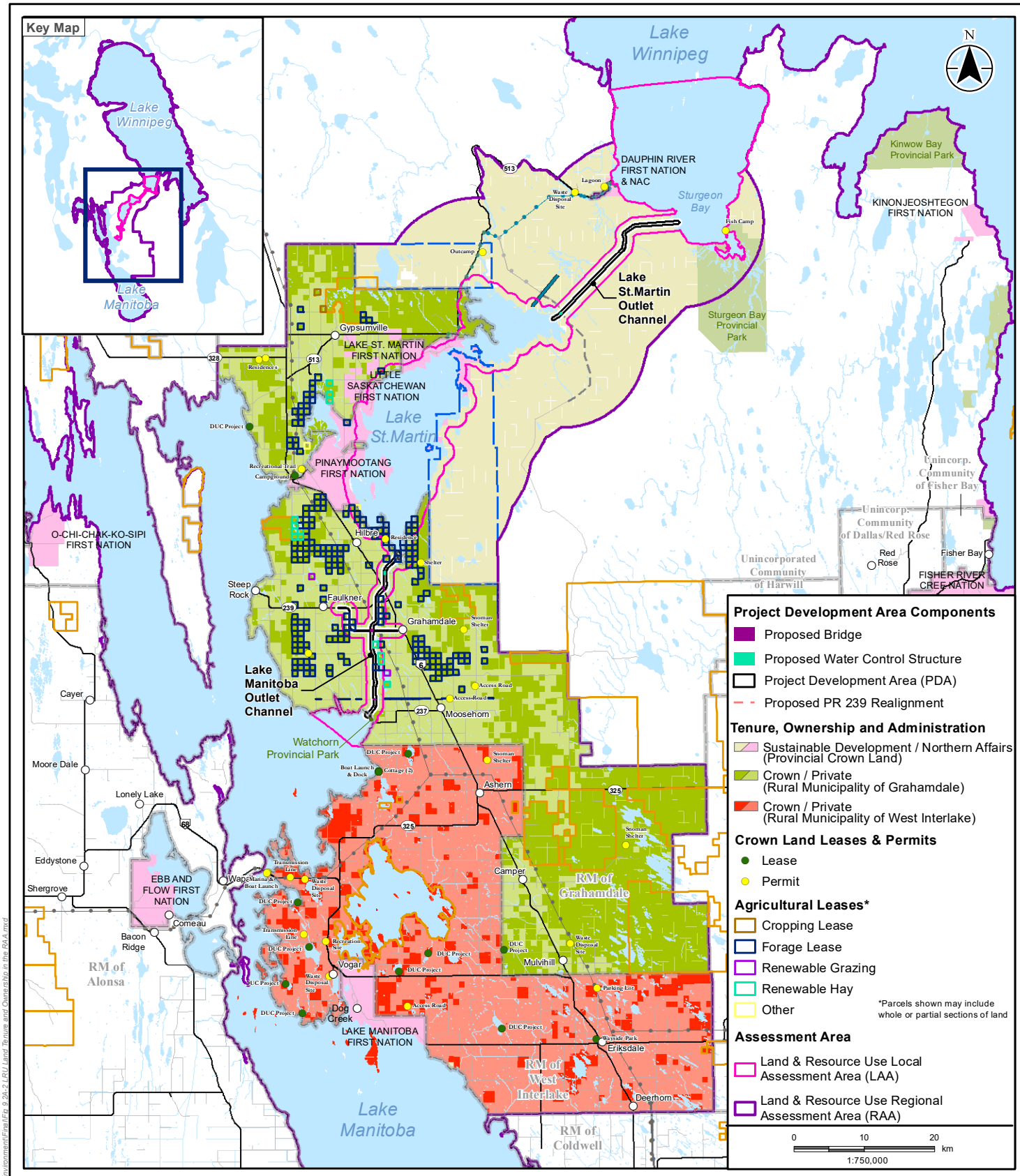
Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Land & Resource Use Assessment Areas

Figure 9.2A-1

G:_GIS_Project_Folder\11475120\Figures\Ch9 Human Environment\Fins\Fig 9.2A-1 LRU Spatial Boundaries.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Planned Distribution Line
- Existing Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Provincial Park
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/20/2019 11:47:28 AM

Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Land Tenure & Ownership in the RAA

Figure 9.2A-2

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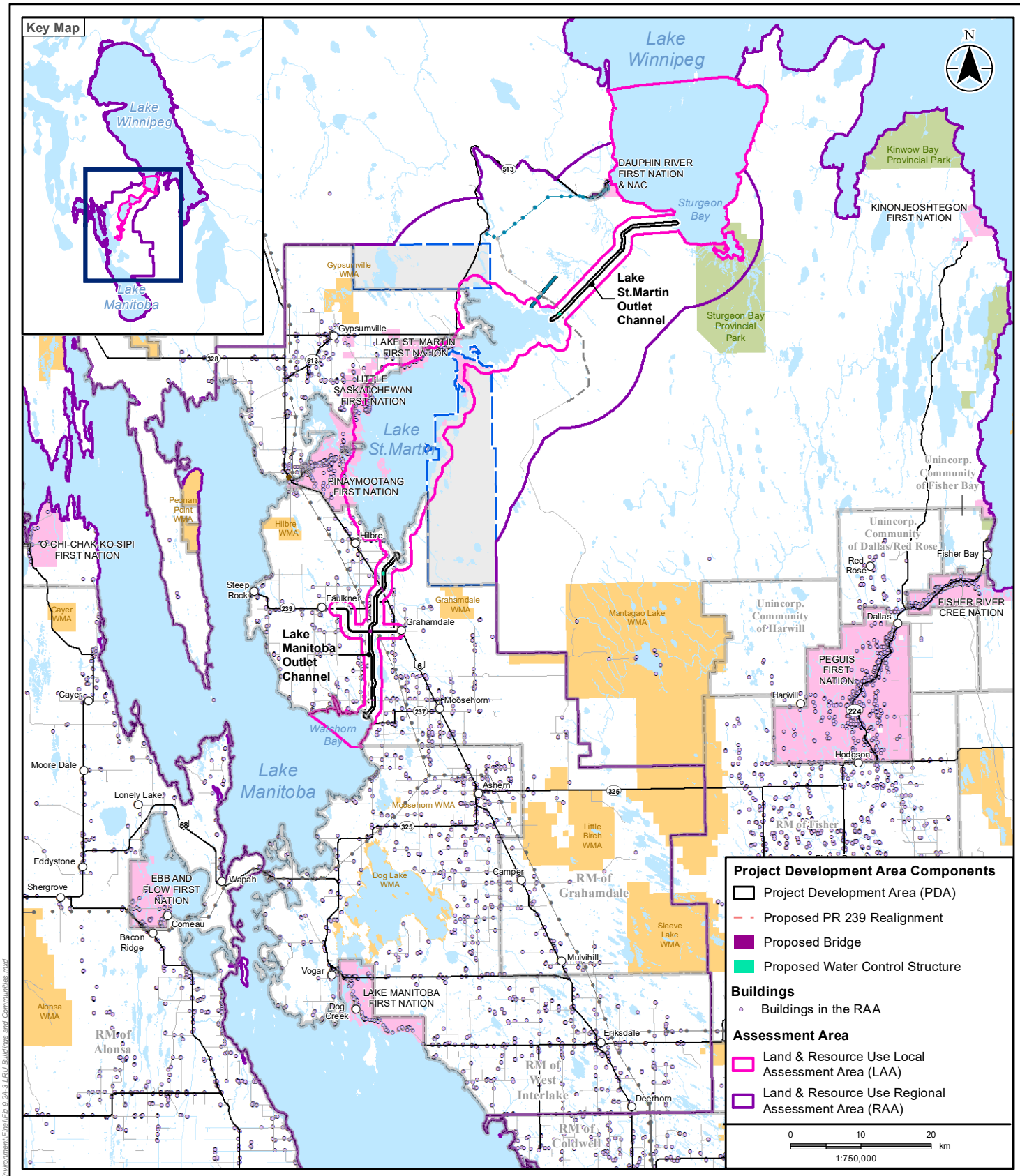

Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
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Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Buildings and Communities in the RAA

Figure 9.2A-3

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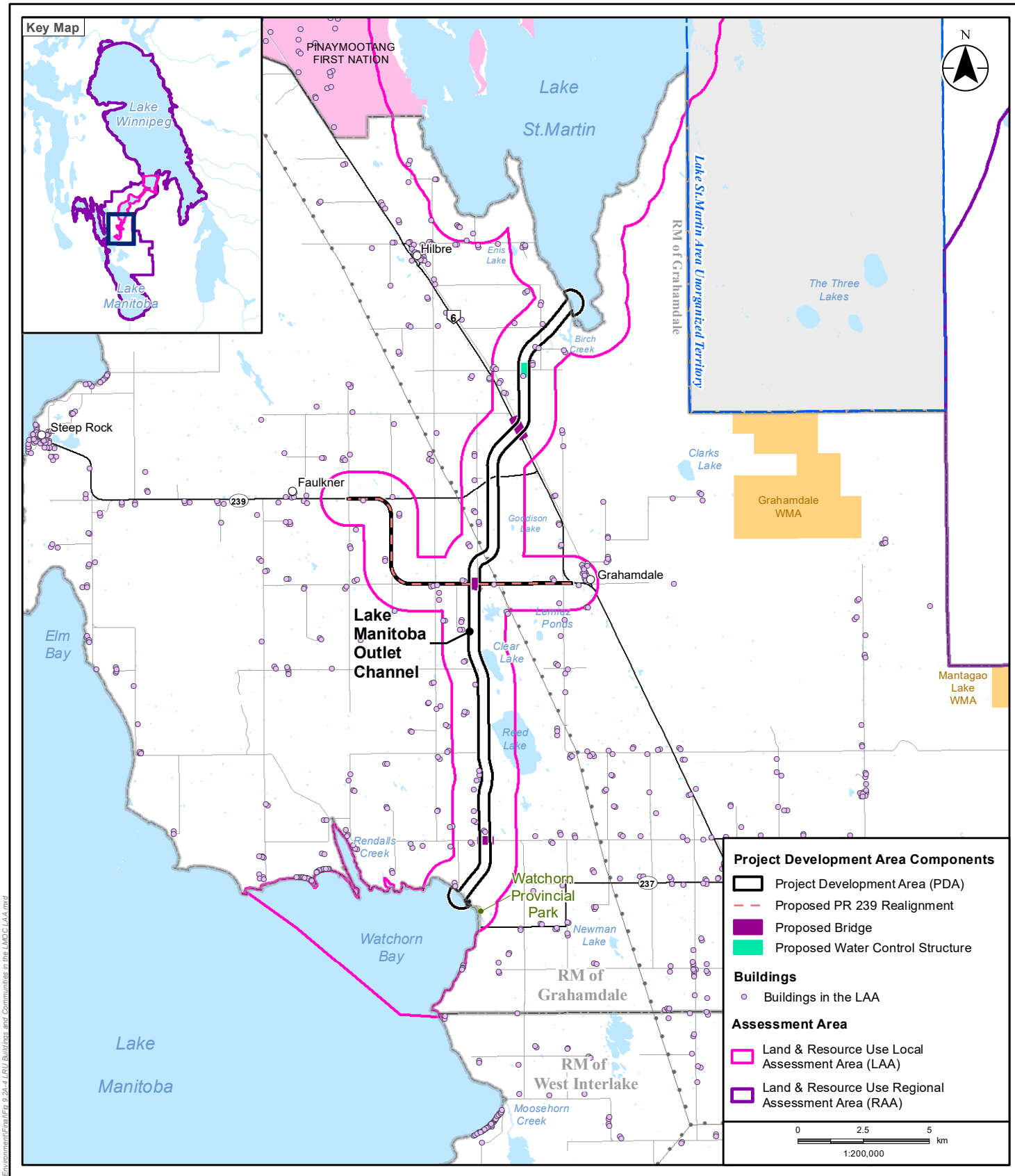

Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/16/2019 3:18:36 PM

Manitoba

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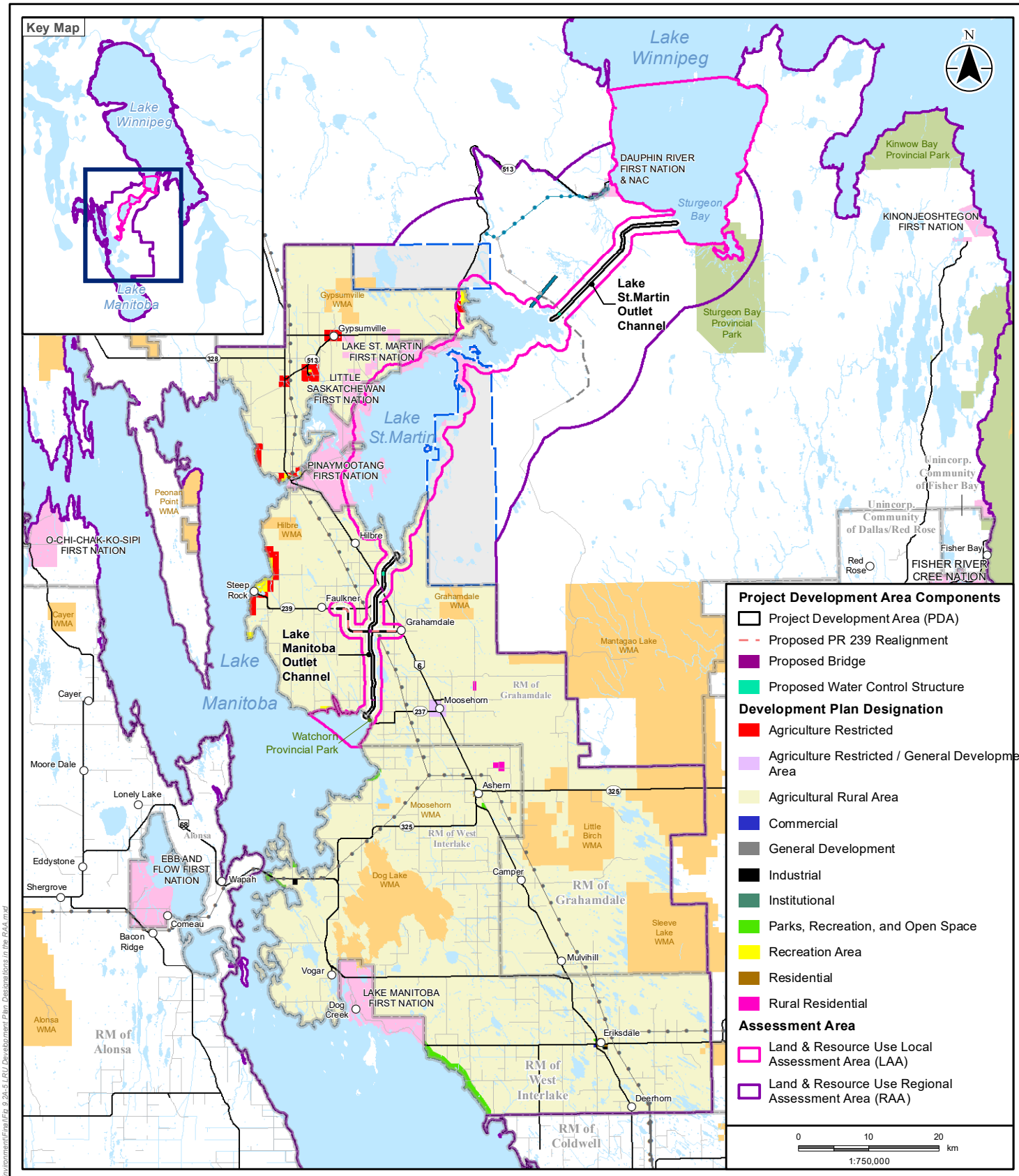
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Buildings within the LMOC Local Assessment Area (LAA)

Figure 9.2A-4

G:\ GIS Project Folder\11147\100\figures\Ch9 Human Environment\Fina\Fig 9.2A-4 LRU Buildings and Communities in the LMOC LAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Provincial Park
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, RM of Grahamdale
3. Last Update: 8/20/2019 11:43:57 AM

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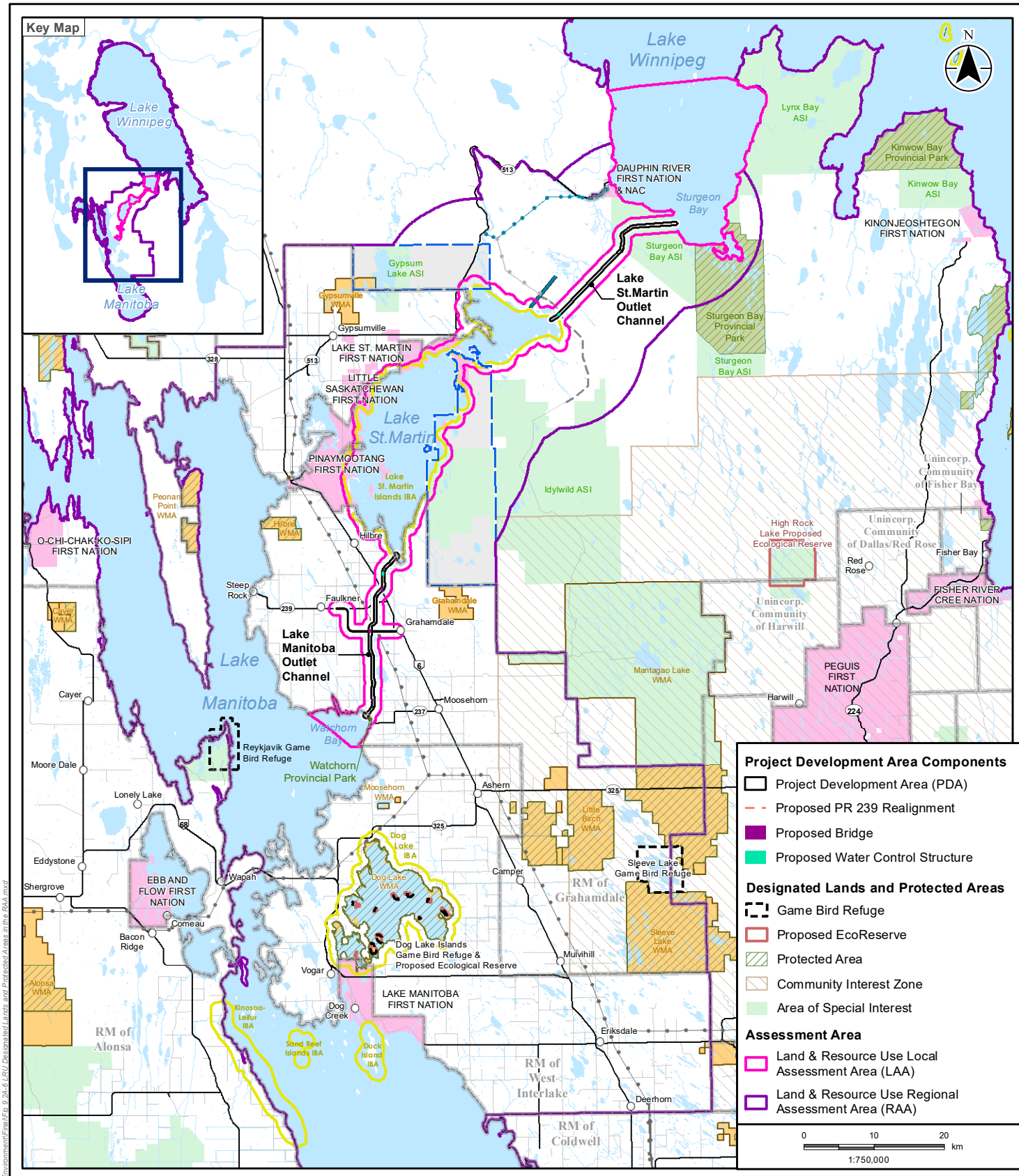
Environmental Impact Statement

Development Plan Designations in the RAA

Figure 9.2A-5

G:\ GIS_Project_Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.2A-5 LRU Development Plan Designations in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park
- Important Bird Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/20/2019 11:47:57 AM

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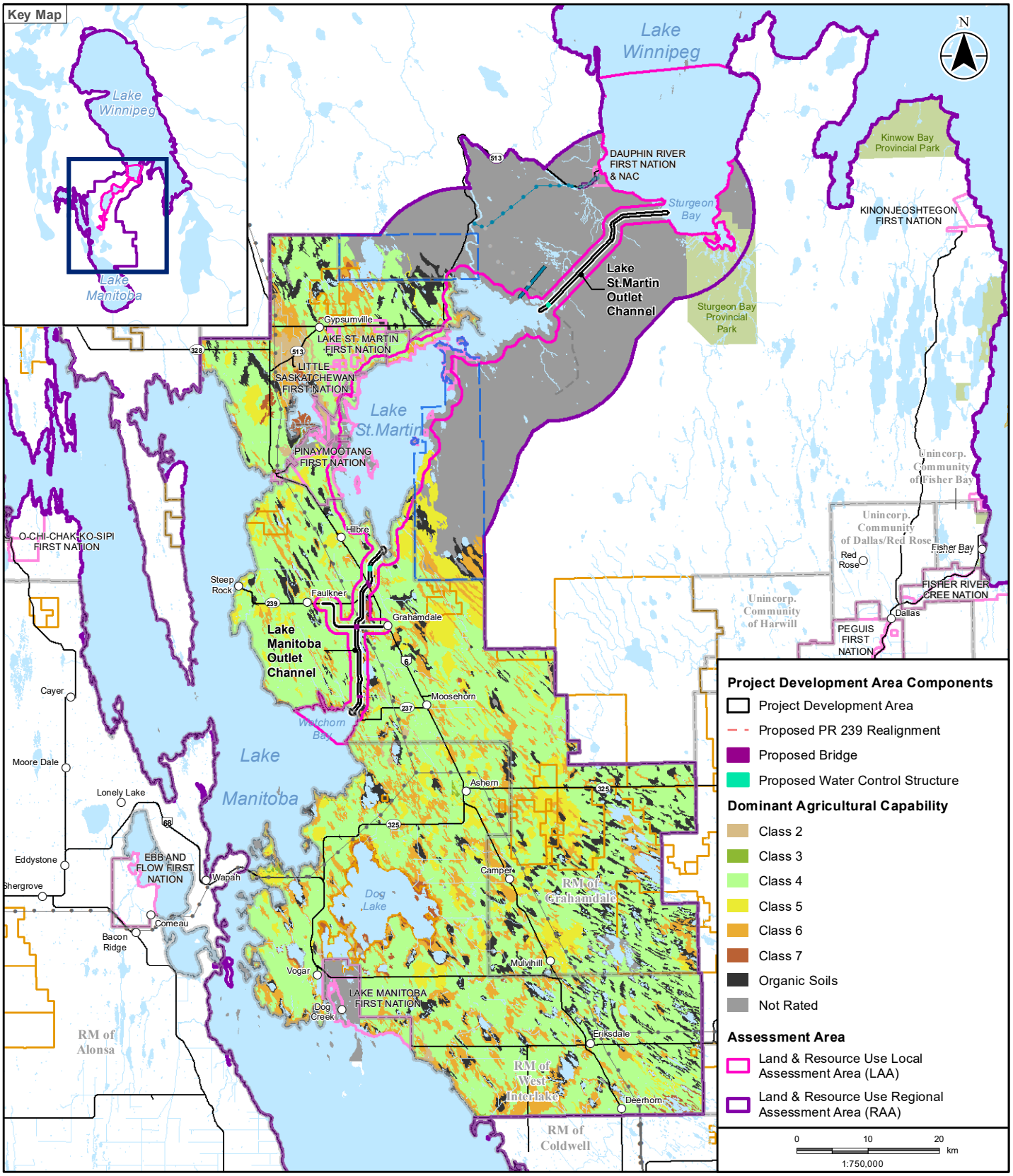
Environmental Impact Statement

Designated Lands and Protected Areas in the RAA

Figure 9.2A-6

G:\ GIS_Project_Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-6 LRU Designated Lands and Protected Areas in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community
- First Nation
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/20/2019 5:19:59 PM

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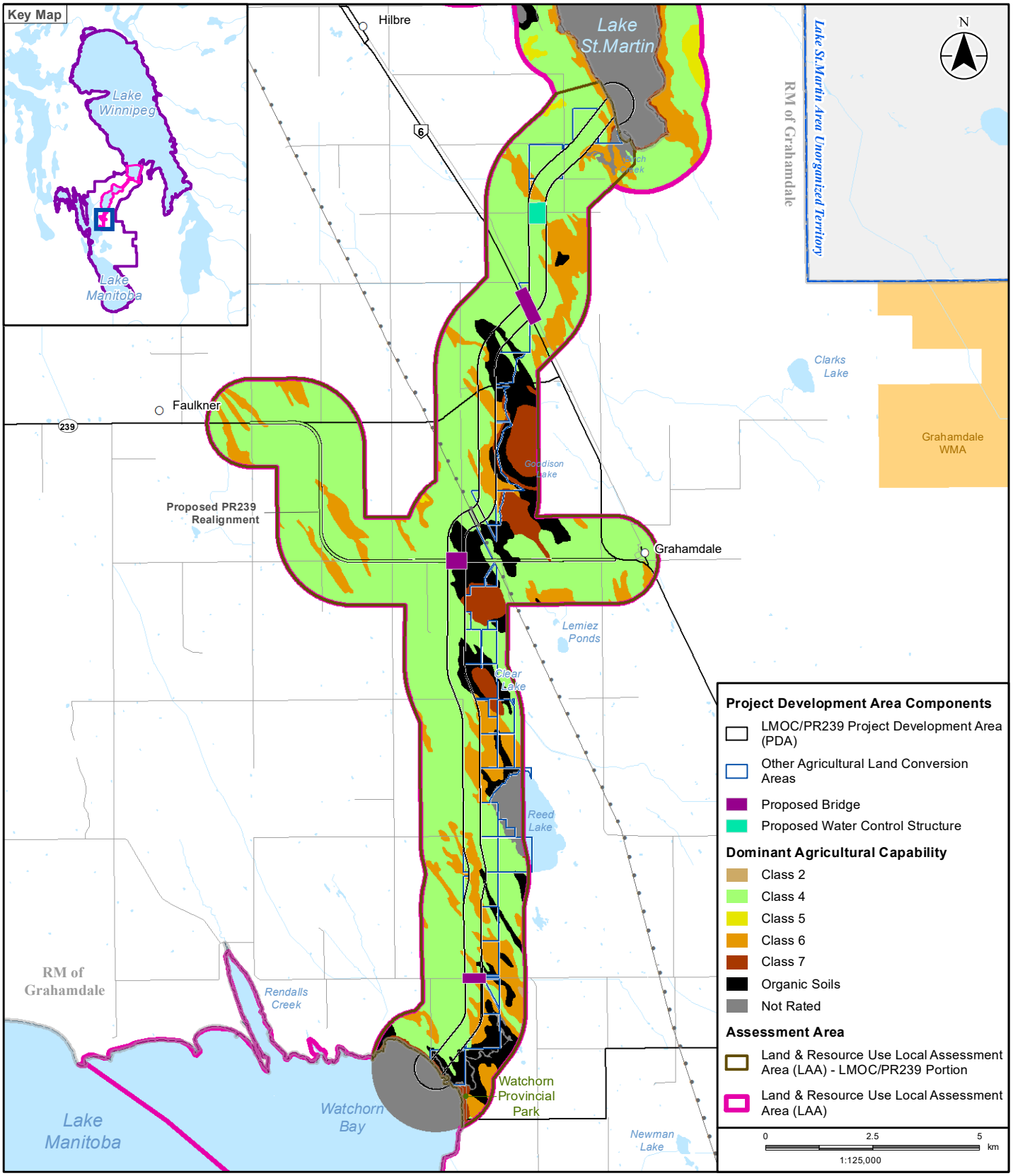
Environmental Impact Statement

Agricultural Capability in the RAA

Figure 9.2A-7

G:\ GIS_Project_Folder\1147\5120\figures\Ch9 Human Environment\Fina\Fig 9.2A-7 LRU Agricultural Capability in the RAA.mxd



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, CanSIS 2019, MLI 2019
3. Last Update: 8/23/2019 3:31:05 PM

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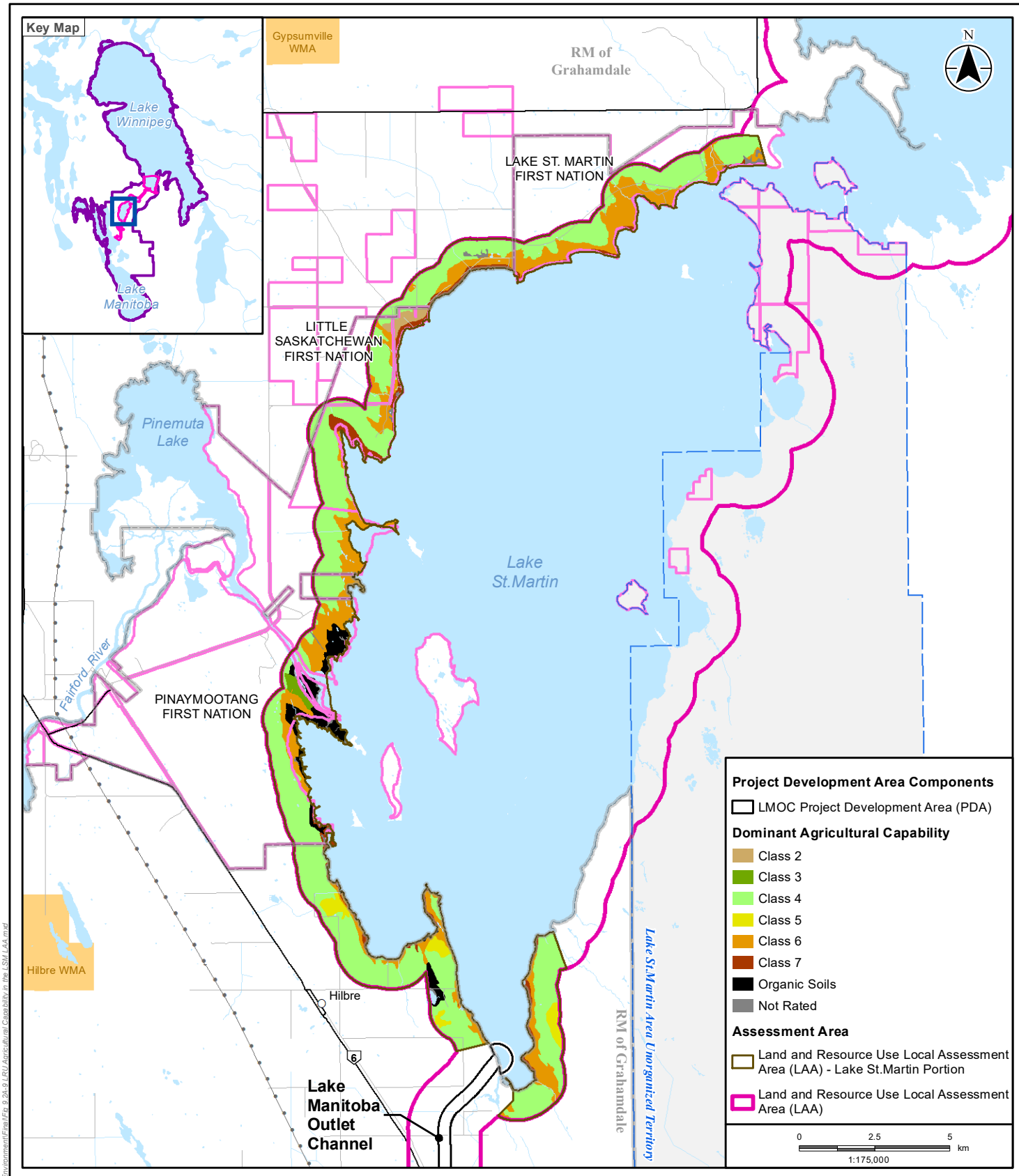
Environmental Impact Statement

Agricultural Capability in the LMOC Portion of the LAA

Figure 9.2A-8

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-8 LRU Agricultural Capability in the LMOC LAA.mxd



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- First Nation
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, CanSIS 2019, MLI 2019
3. Last Update: 8/21/2019 9:52:33 AM

G:\ GIS_Project_Folder\114715200\figures\Ch9 Human Environment\Final\Fig 9.2A-9 LRU Agricultural Capability in the LSM LAA.mxd

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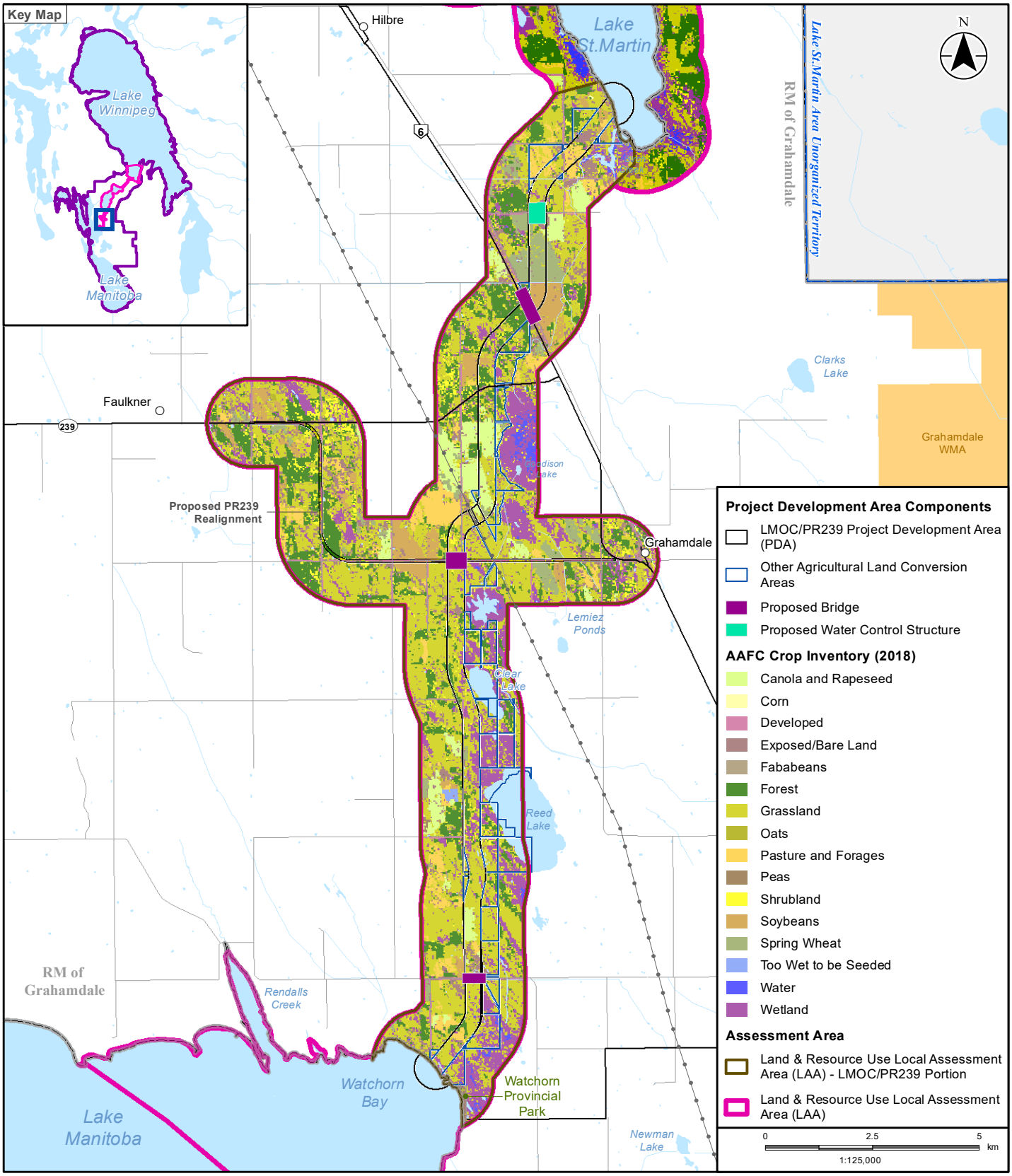
Environmental Impact Statement

Agricultural Capability in the Lake St. Martin Shoreline Portion of the LAA

Figure 9.2A-9



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, CanSIS 2019, MLI 2019
3. Last Update: 8/23/2019 3:32:49 PM

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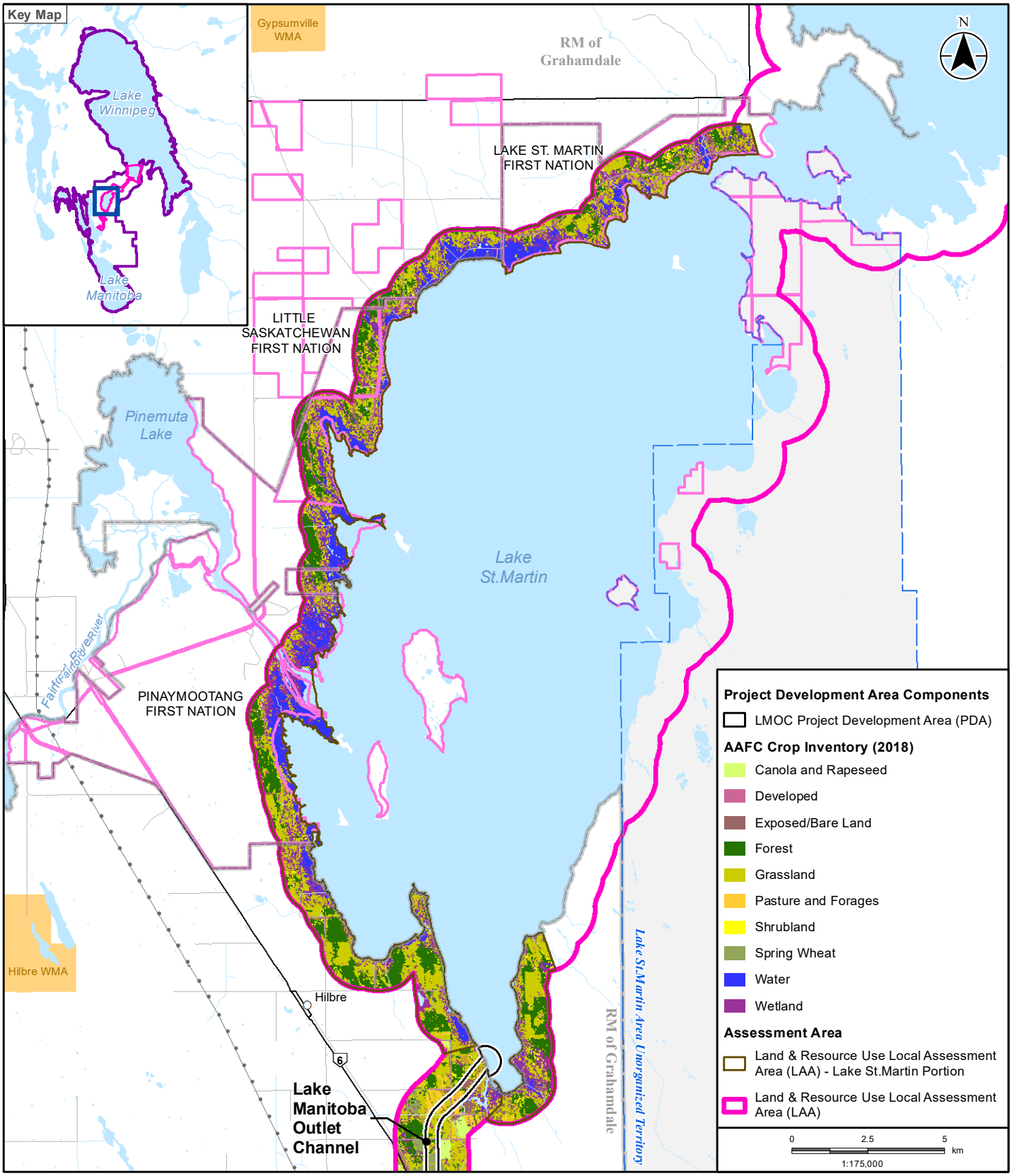
Environmental Impact Statement

Crop Type Distribution in the LMOC Portion of the LAA

Figure 9.2A-10

G:\ GIS_Project_Folder\114751201\figures\Ch9 Human Environment\Final\Fig 9.2A-10 LRU Crop Type Distribution in the LMOC LAA.mxd



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- First Nation
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, AAFC 2018
3. Last Update: 8/20/2019 5:20:08 PM

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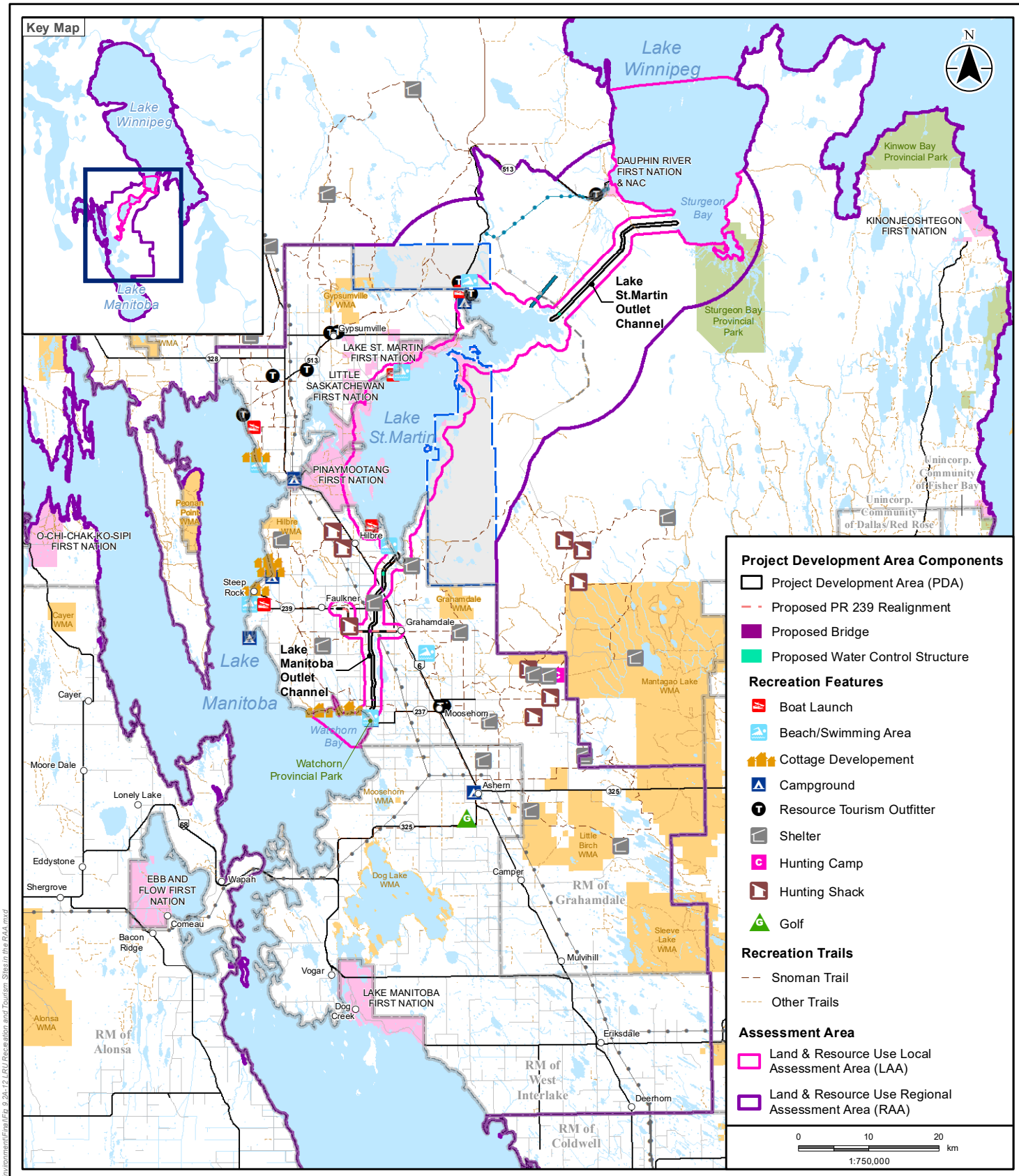
Environmental Impact Statement

Crop Type Distribution in the Lake St. Martin Shoreline Portion of the LAA

Figure 9.2A-11

G:\ GIS_Project_Folder\11473120\Figures\Ch9 Human Environment\Final\Fig 9.2A-11 LRU Crop Type Distribution in the LSM LAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, RM of Grahamdale
3. Last Update: 8/20/2019 11:48:02 AM

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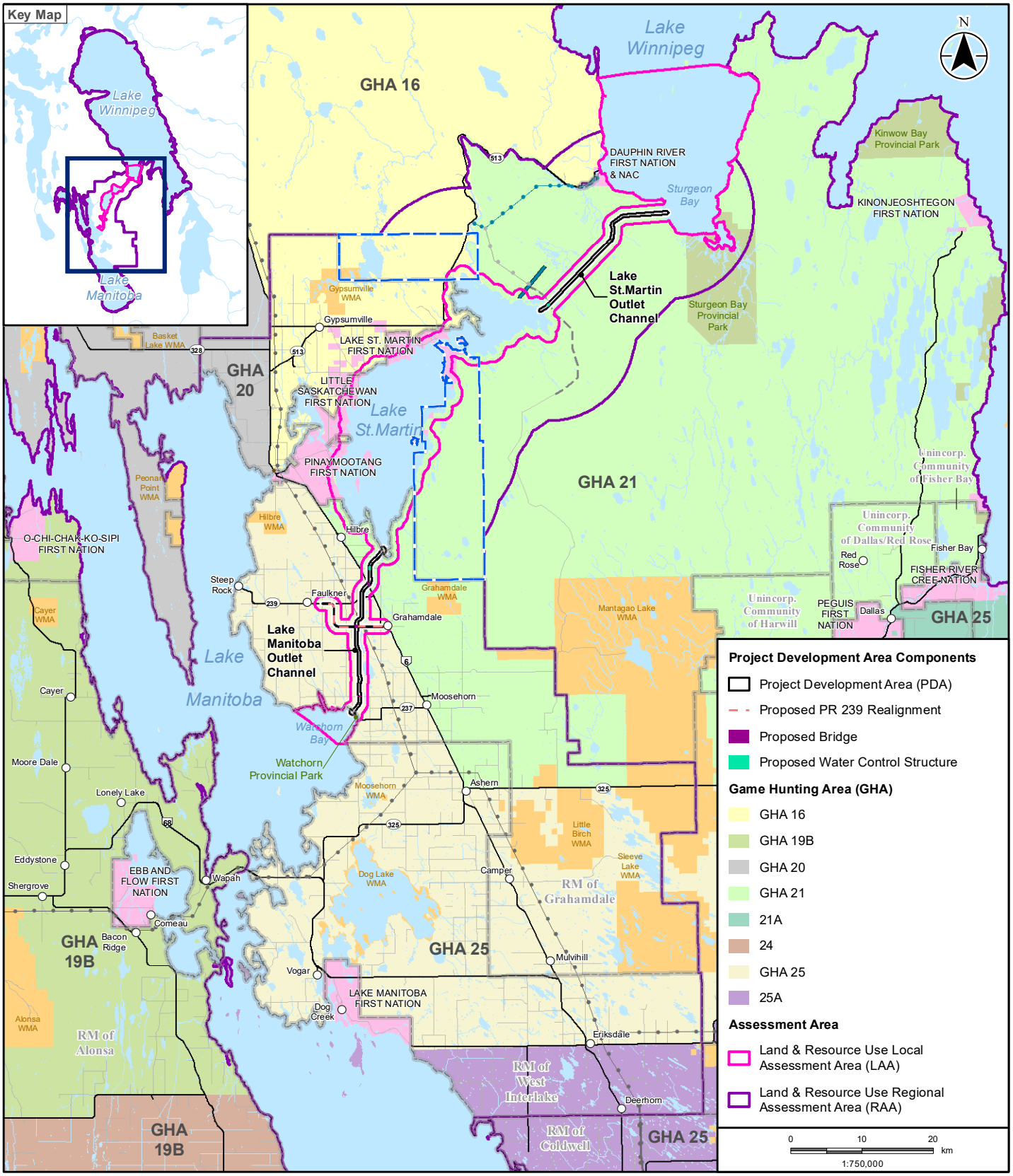
Environmental Impact Statement

Recreation and Tourism Sites in the RAA

Figure 9.2A-12

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-12 LRU Recreation and Tourism Sites in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St.Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Provincial Park
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:38:48 AM

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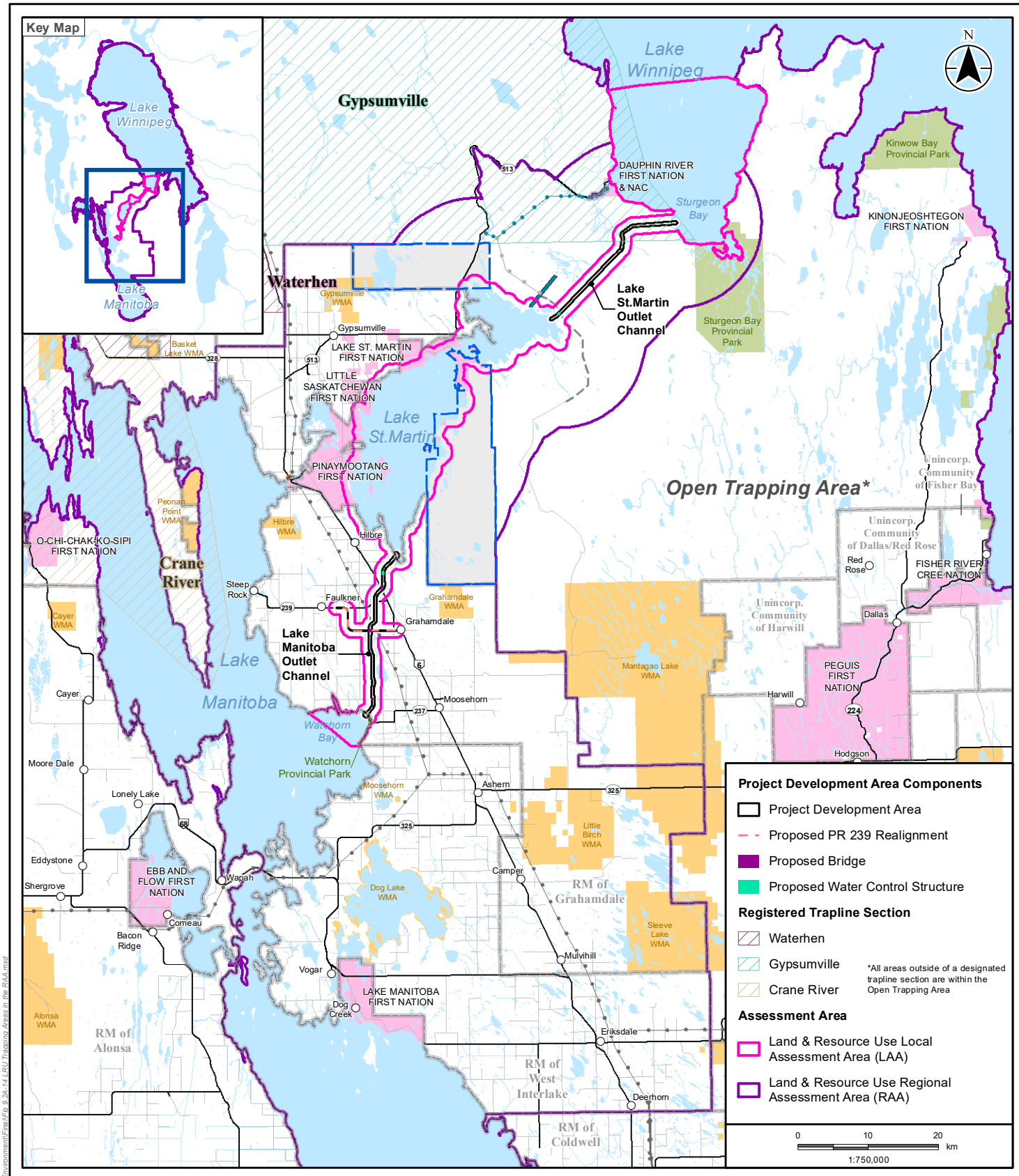
Environmental Impact Statement

Game Hunting Areas in the RAA

Figure 9.2A-13

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.2A-13 LRU Game Hunting Areas.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Provincial Park
- Wildlife Management Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:38:55 AM

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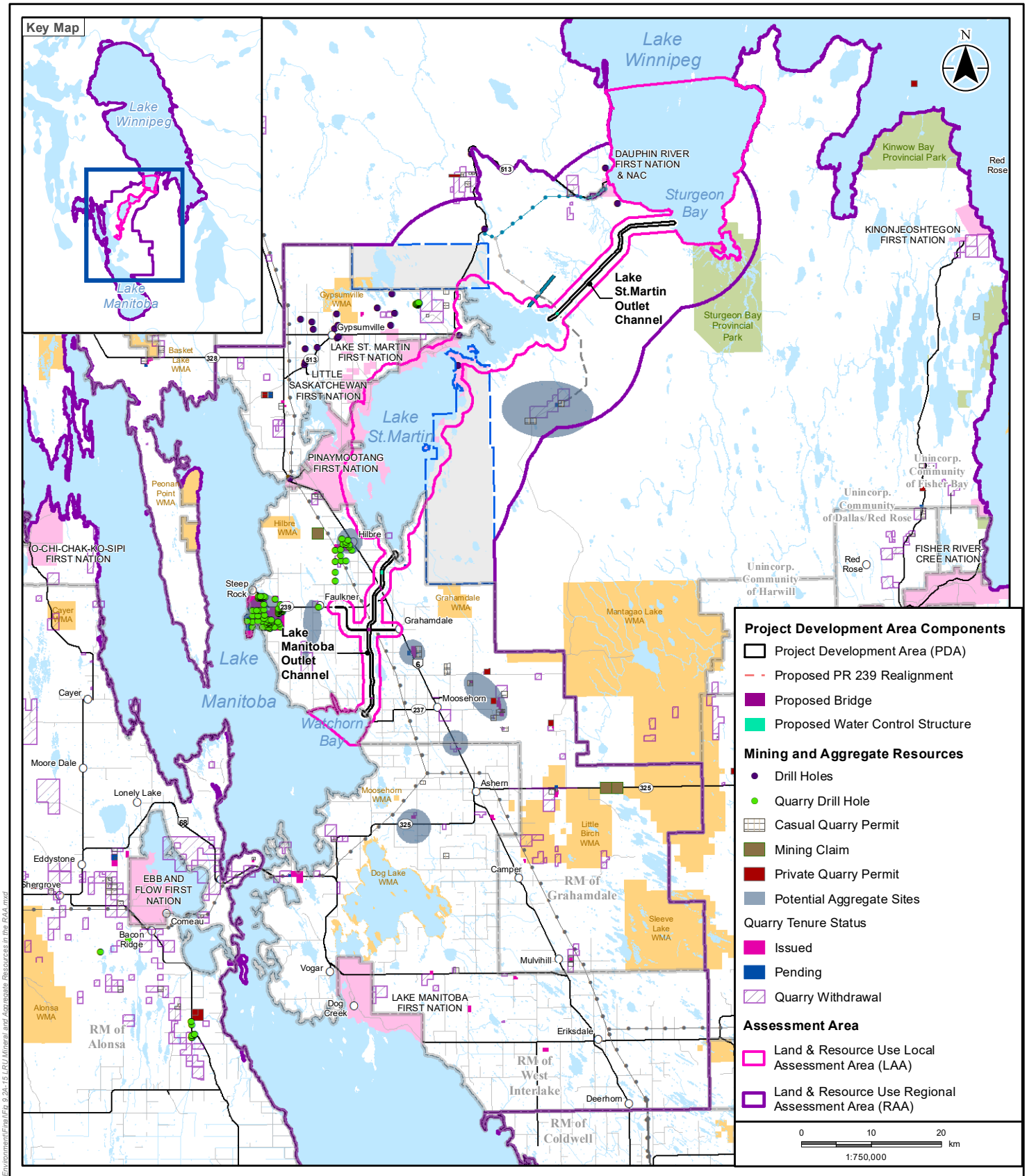
Trapping Areas in the RAA

Figure 9.2A-14

G:\ GIS_Project_Folder\114751200\figures\Ch9 Human Environment\Final\Fig 9.2A-14 LRU Trapping Areas in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:51:15 PM

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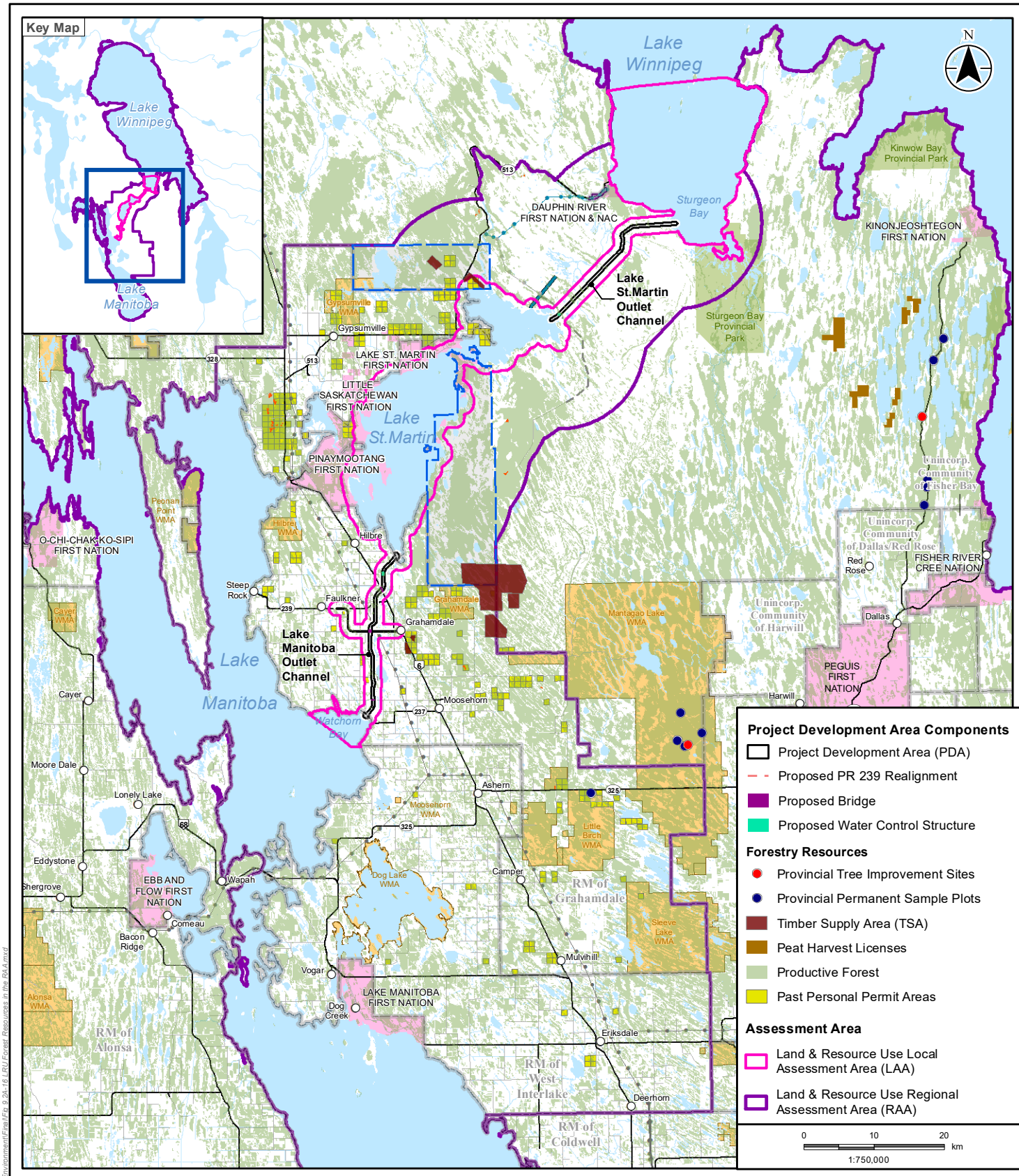
Environmental Impact Statement

Mineral and Aggregate Resources in the RAA

Figure 9.2A-15

G:\ GIS_Project_Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.2A-15 LRU Mineral and Aggregate Resources in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community
- First Nation
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:39:15 AM

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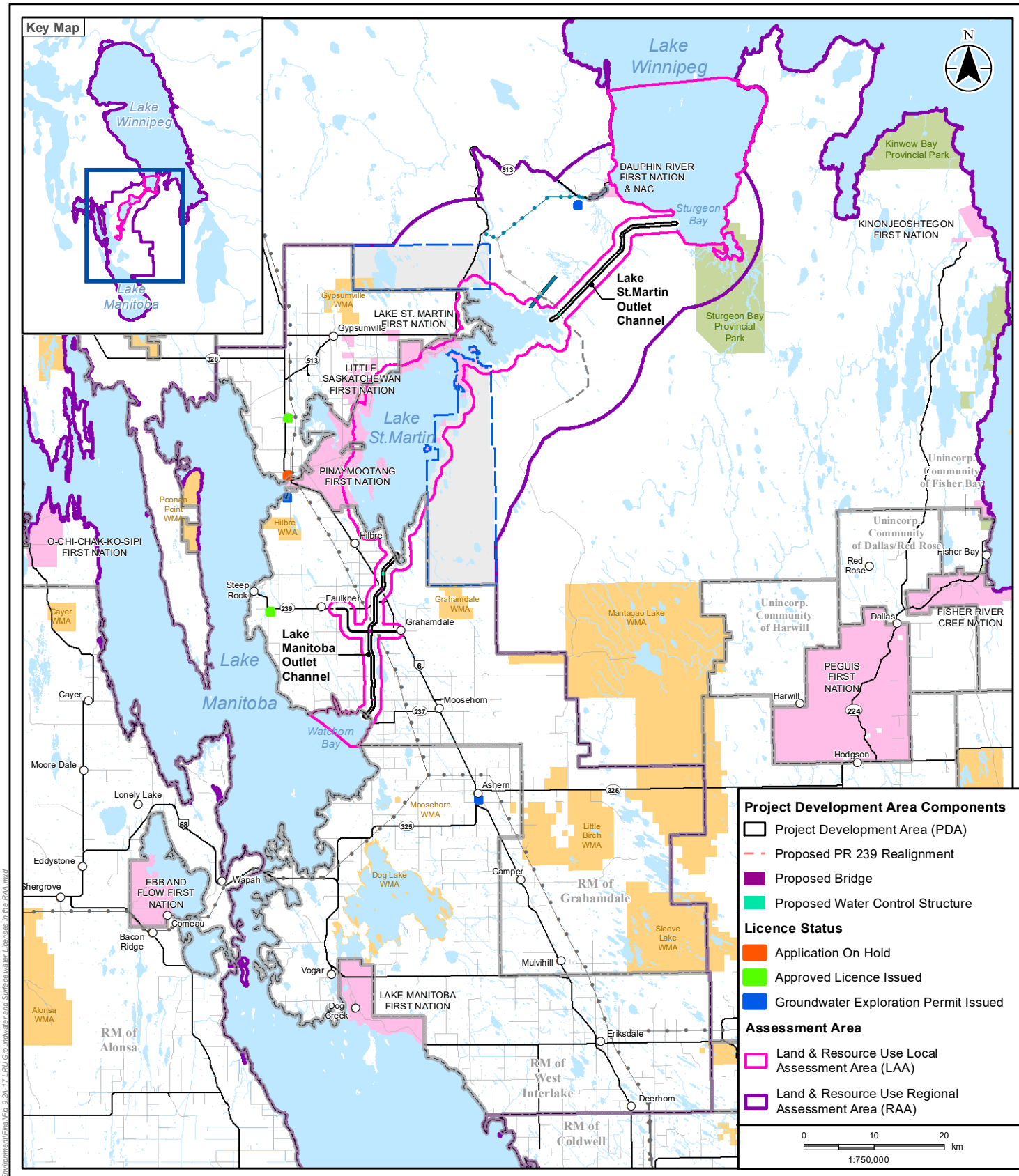
Environmental Impact Statement

Forestry Resources in the RAA

Figure 9.2A-16

G:\ GIS_Project_Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-16 LRU Forest Resources in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community
- First Nation
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:39:22 AM

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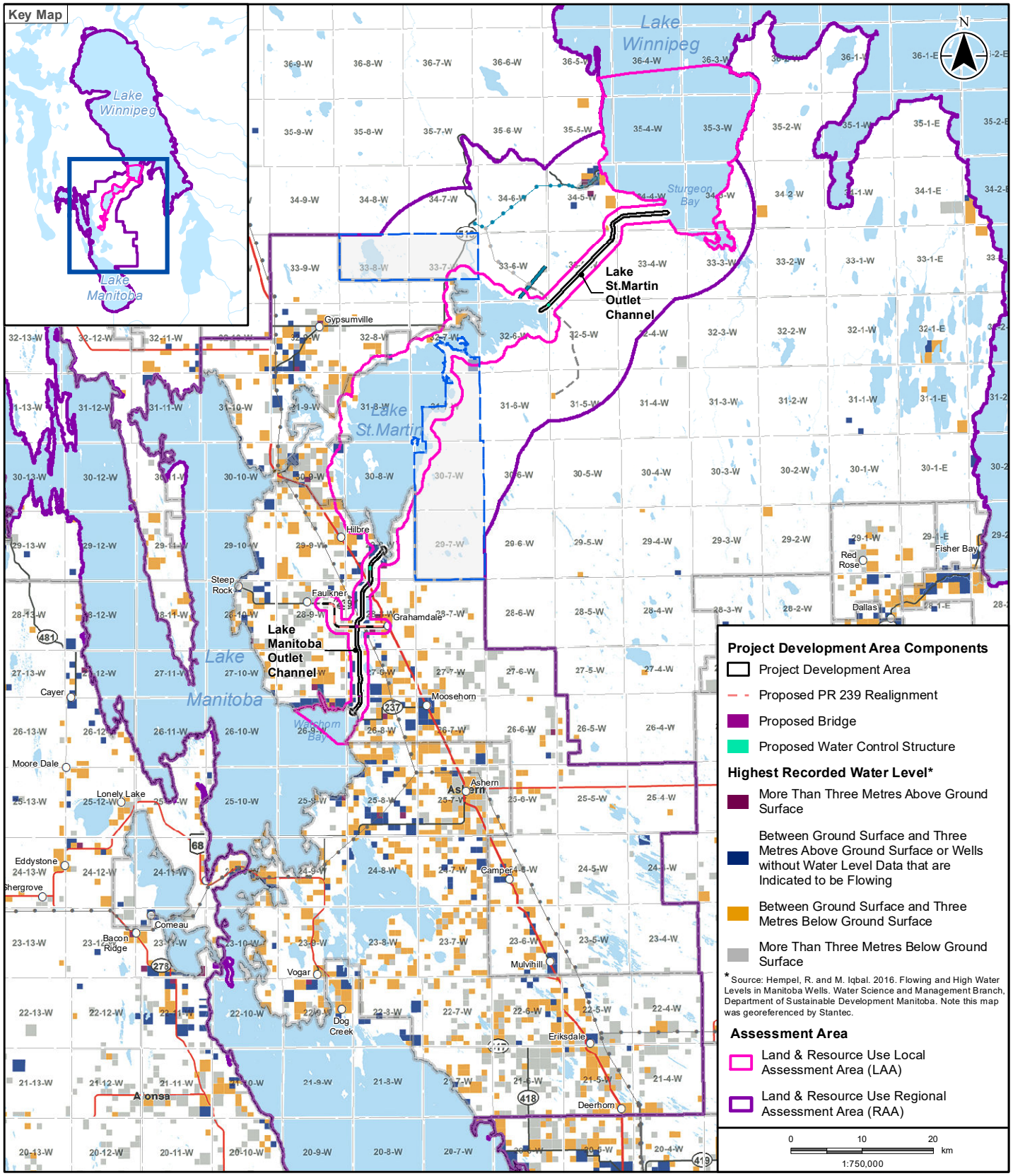
Environmental Impact Statement

Groundwater and Surface Water Licenses in the RAA

Figure 9.2A-17

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.2A-17 LRU Groundwater and Surface water Licenses in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St. Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Rural Municipality
- Lake St. Martin Area Unorganized Territory
- Townships/Ranges

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:54:19 PM

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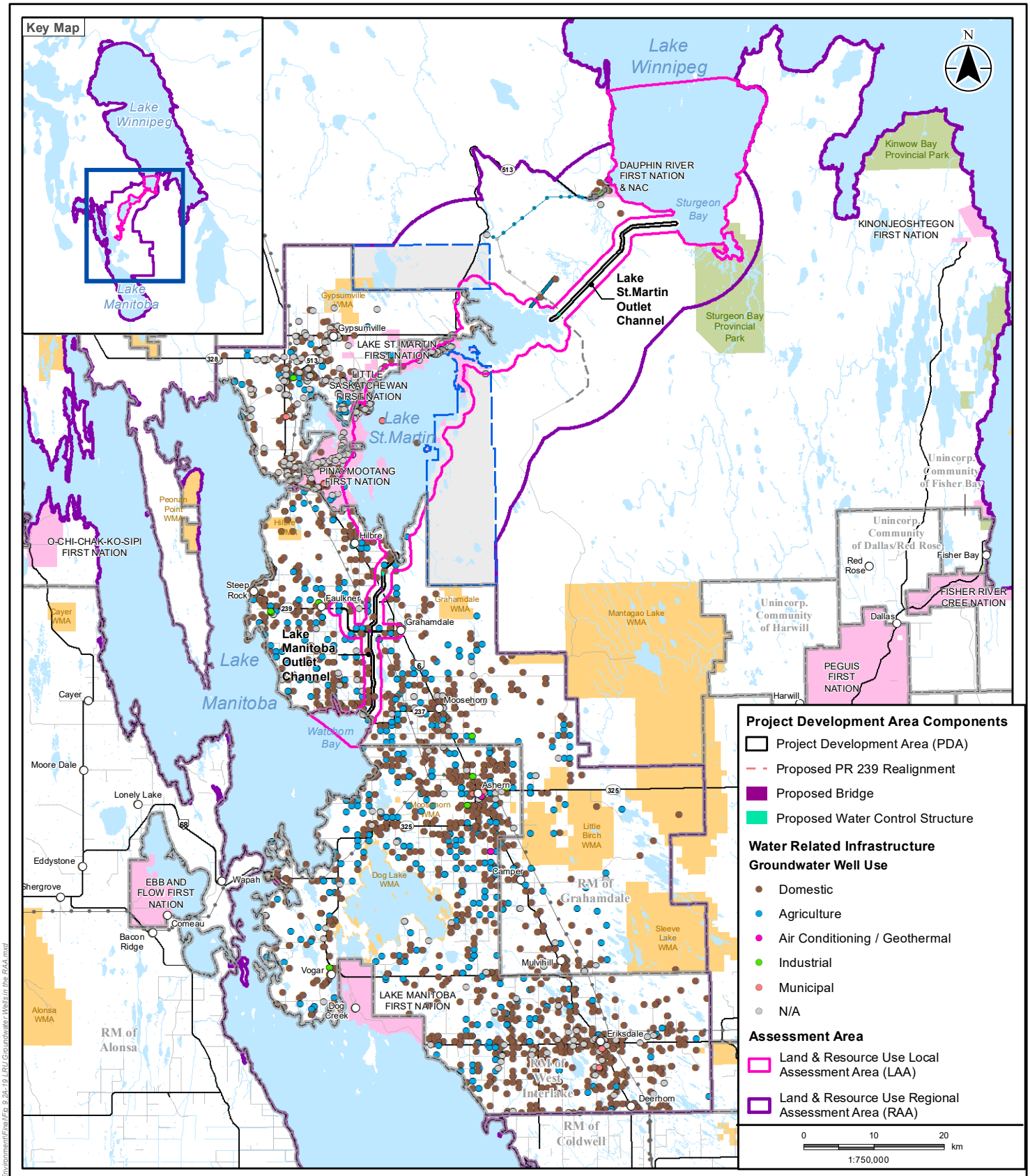
Environmental Impact Statement

Flowing and High Water Level Wells in the RAA

Figure 9.2A-18

G:\ GIS_Project_Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-18 LRU Flowing and High Water Level Wells in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:39:46 AM

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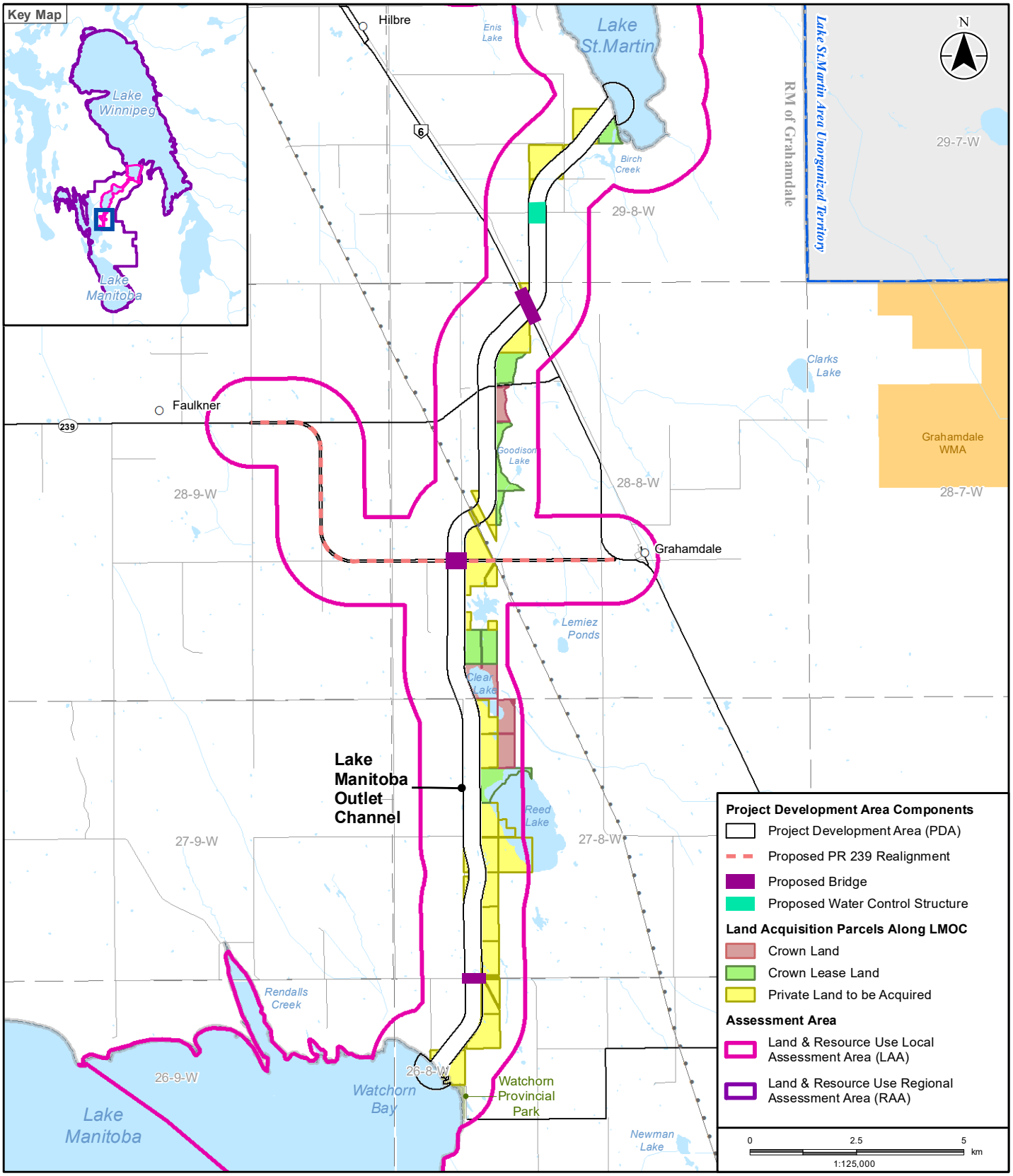
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Groundwater Wells in the RAA

Figure 9.2A-19

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.2A-19 LRU Groundwater Wells in the RAA.mxd



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Township/Range
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:34:29 PM

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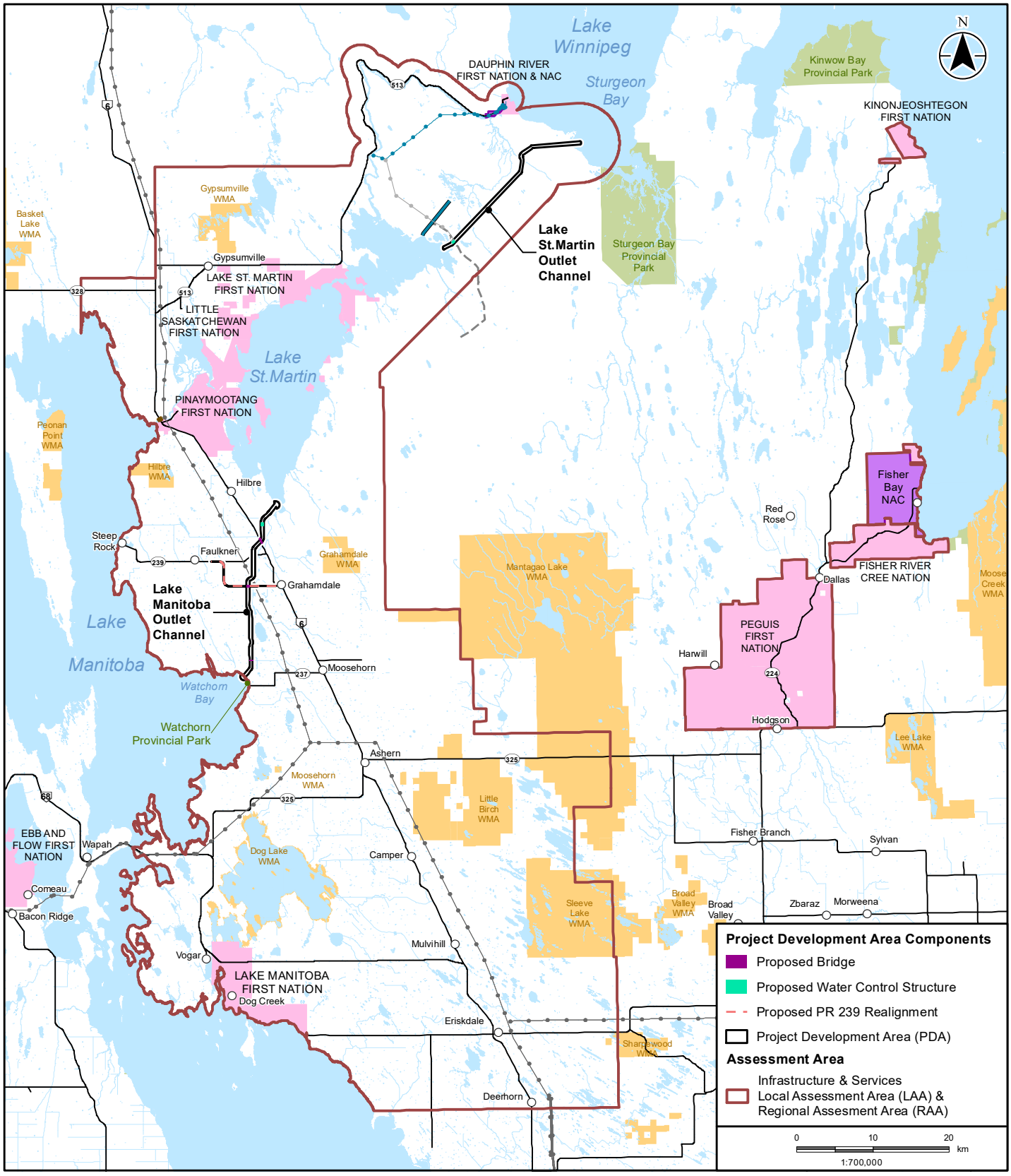
Environmental Impact Statement

Land Acquisition Parcels Along the LMOC

Figure 9.2A-20

G:\ GIS_Project_Folder\11473120\figures\Ch9 Human Environment\Final\Fig 9.2A-20 LRU LandAcquisition Parcels.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/16/2019 2:53:23 PM

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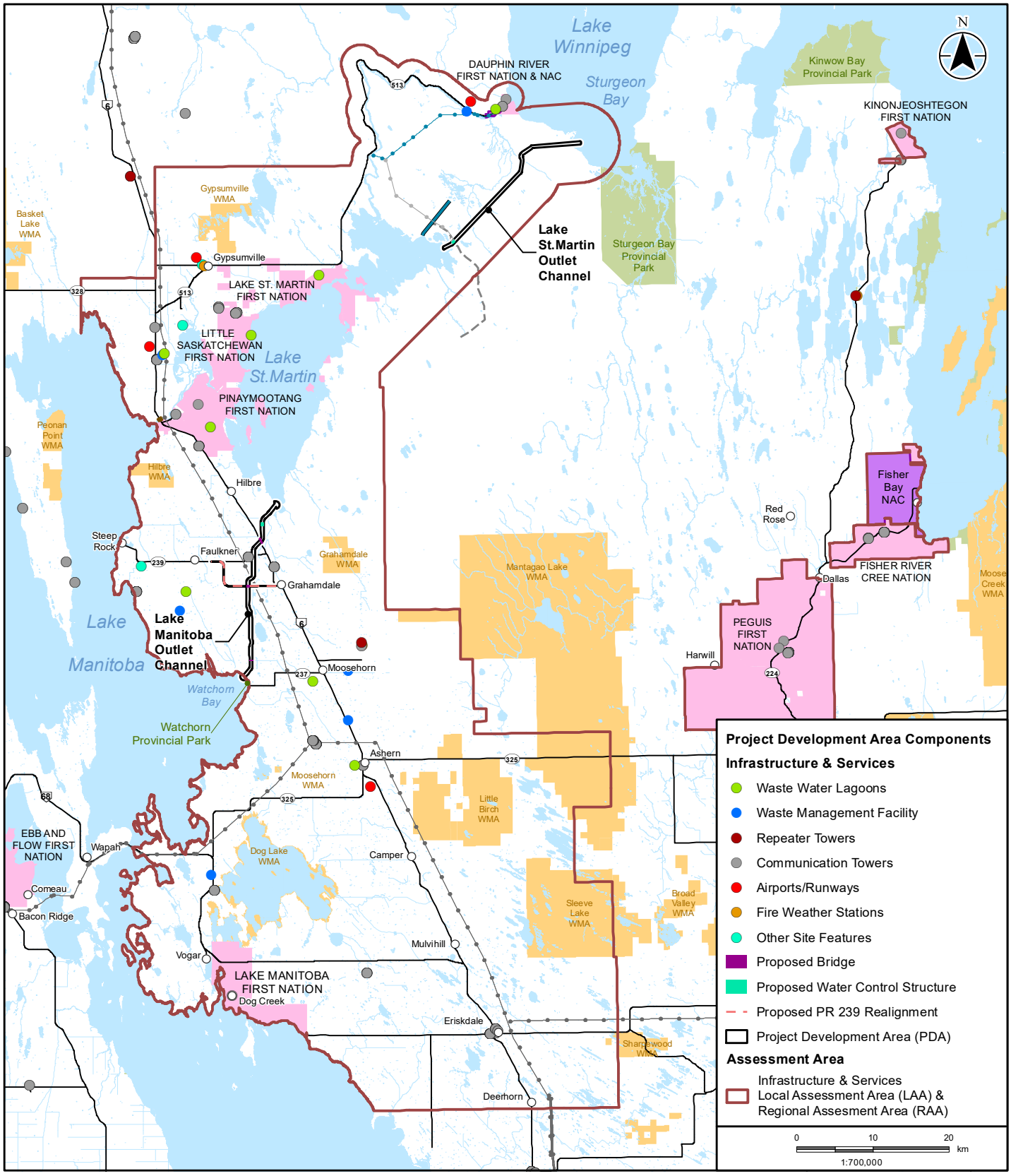
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Infrastructure and Services Spatial Boundaries

Figure 9.3A-1

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.3A-1 IS Infrastructure and Services Spatial Boundaries.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:41:48 PM

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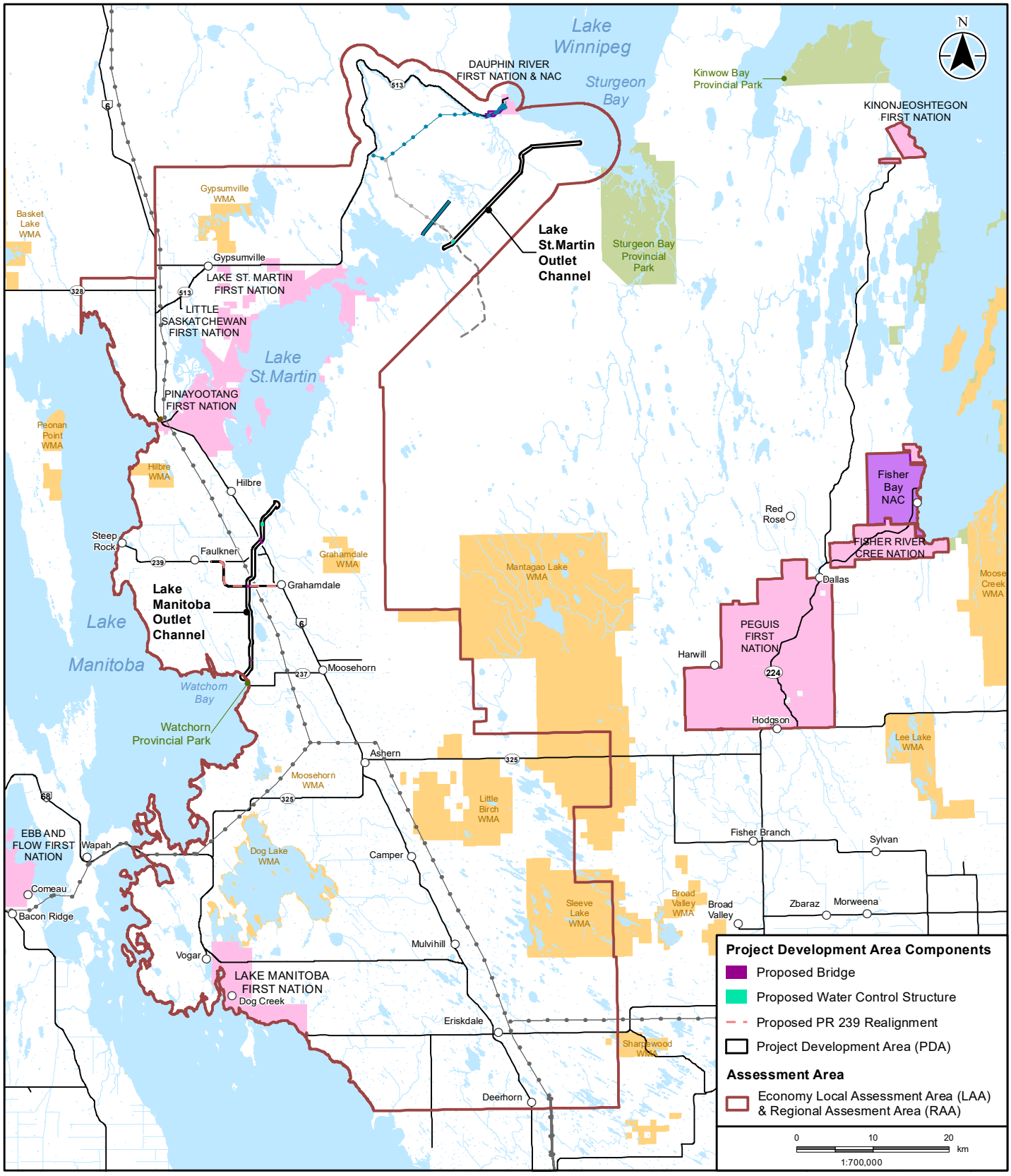
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Infrastructure and Services

Figure 9.3A-2

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Final\Fig 9.3A-2 IS Infrastructure and Services in the LAA RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:46:59 PM

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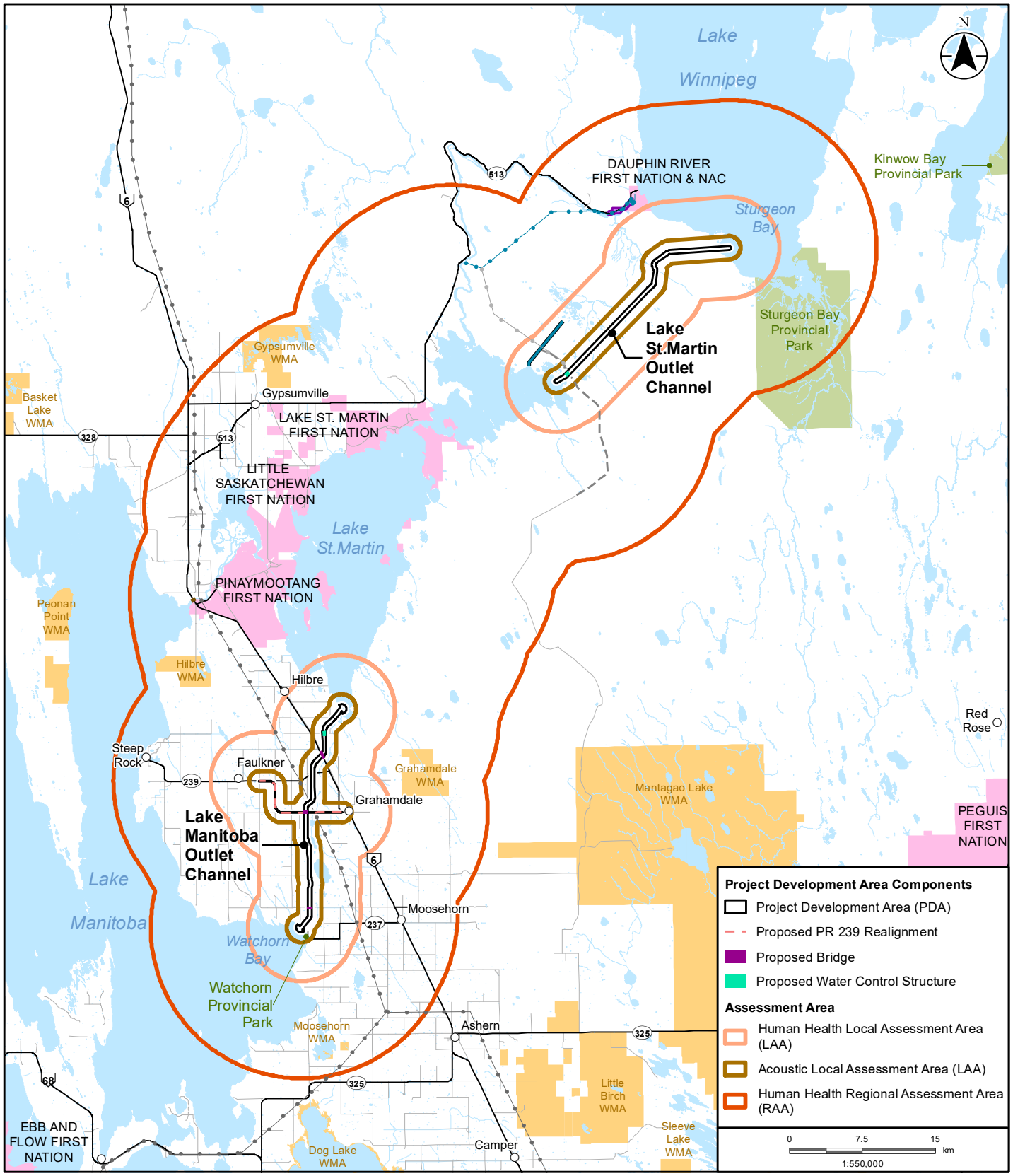
Environmental Impact Statement

Economy Spatial Boundaries

Figure 9.4A-1

G:\ GIS Project Folder\11475120\figures\Ch9 Human Environment\Fina\Fig 9.4A-1 ECON Economy Spatial Boundaries.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/16/2019 2:55:12 PM

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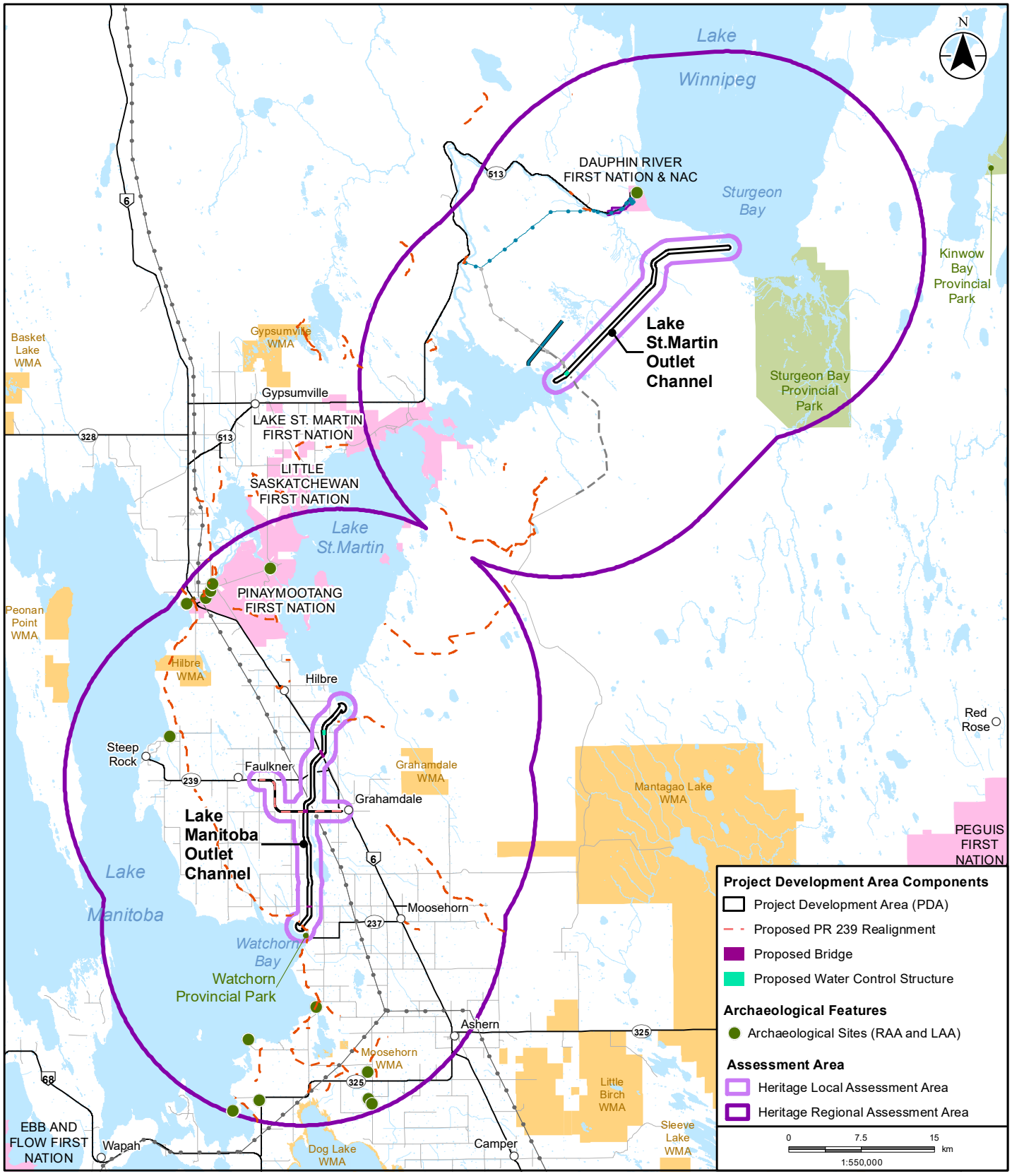
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Human Health Spatial Boundaries

Figure 9.5A-1

G:\ GIS Project Folder\11475120\Figures\Ch9 Human Environment\Final\Fig 9.5A-1 HH Human Health Spatial Boundaries.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St. Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:47:49 PM

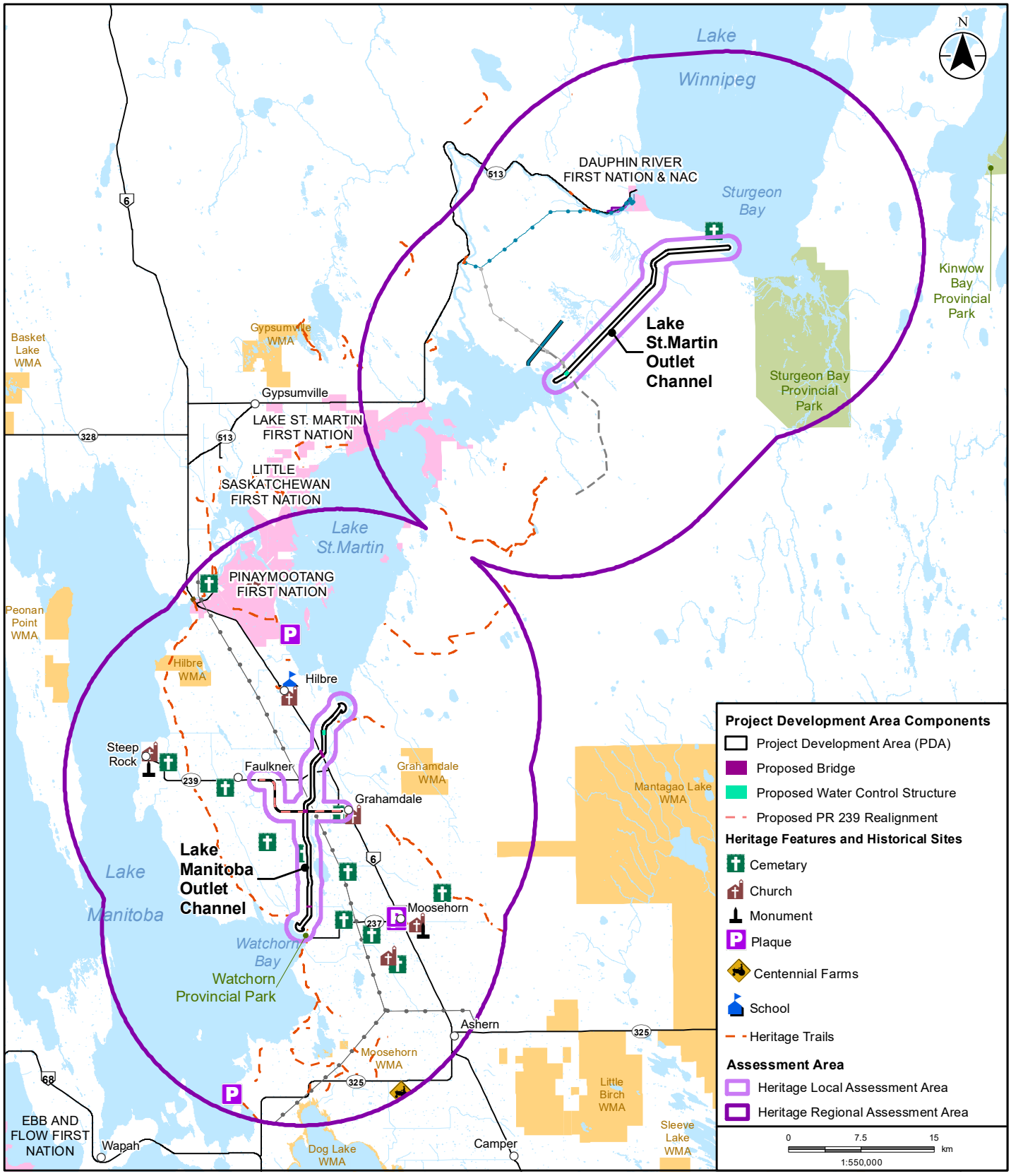
Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Heritage Assessment Areas and Heritage Resources: Archaeological Sites in the RAA

Figure 9.6A-1

G:\ GIS Project Folder\114715100\figures\Ch9 Human Environment\Final\Fig 9.6A-1 Heritage Assessment Areas and Heritage Resources Archaeological Sites in the RAA.mxd



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St. Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:48:26 PM

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Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Heritage Assessment Areas and Historical Features in the RAA

Figure 9.6A-2

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LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS PROJECT
Environmental Impact Statement

CHAPTER 10

INDIGENOUS PEOPLES

March 2020

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

10.0 INDIGENOUS PEOPLES

10.1 OVERVIEW OF CHAPTER

This chapter discusses the environment and socioeconomic setting and the potential effects that the Project will have on the Indigenous[1] peoples. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of this EIS. Manitoba Infrastructure is committed to provide details regarding ongoing and future Indigenous engagement and consultation. The results of the processes that have been conducted to date and the approach and methodology for the collection of further information to support this chapter is further described in the Indigenous Consultation Approach and Current Status (ICACS) report (Appendix 5C).

Section 2.3 of Part 1 of the Agency Environmental Impact Statement (EIS) Guidelines for the Project (CEA Agency 2018a) discusses the need to fulfil the statutory obligations of the *Canadian Environmental Assessment Act 2012* (CEAA 2012) to assess environmental effects of the proposed Project on Aboriginal peoples; and assist the Agency fulfilling the Crown's constitutional obligations to consult with potentially impacted Indigenous groups on potential impacts to potential or established Aboriginal or Treaty rights. Section 6 of Part 2 of the EIS Guidelines describes the requirements to address impacts to potential or established Aboriginal or Treaty rights. Section 7.1.10 of Part 2 of the EIS Guidelines lays out the requirements to address current use of lands for Traditional purposes, health and social conditions, physical and cultural heritage, and baseline data for Indigenous knowledge. Section 7.3.3 of Part 2 describes the needs for addressing current use of lands for traditional purposes, and physical and cultural heritage.

Section 3.4.1 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018a) submitted to Manitoba Sustainable Development indicates that the EIS will contain information on Indigenous peoples, including community information such as population and services; resource use including hunting, fishing, trapping and gathering; other economic activities; Traditional and cultural activities, and heritage and cultural resources.

In order to characterize changes and effects to Indigenous peoples in a structured way, the following Indigenous peoples valued components (VCs) and associated effects have been established:

- Traditional Land and Resource Use
  - change in availability of lands and resources currently used for traditional purposes
  - access to Traditional resources and areas for current use

[1] The use of the term "Indigenous" has the meaning assigned by the definition of "aboriginal peoples of Canada" in subsection 35(2) of the *Constitution Act, 1982* which states: In this Act, "aboriginal peoples of Canada" includes the Indian, Inuit, and Métis peoples of Canada.

  - change to cultural and spiritual sites or areas
  - change to cultural value or importance associated with current use
- Indigenous Health and Socioeconomic Conditions
  - Indigenous health
  - noise levels
  - parks and tourism
  - accommodations
  - community infrastructure
  - road traffic
  - regional labour force
  - regional economy
- Aboriginal and Treaty Rights

For each VC, information is provided on the scope of assessment, existing conditions, Project interactions, assessment of residual environmental effects, and any follow up and monitoring requirements. A significance determination is provided for the assessment of TLRU and Indigenous health and socio-economic conditions.

10.2 ASSESSMENT OF POTENTIAL EFFECTS ON TRADITIONAL LAND AND RESOURCE USE

10.2.1 Scope of the Indigenous Peoples Assessment

This environment assessment for the traditional land and resource use (TLRU) is in accordance with the requirements described in both federal and provincial guidance documents for the Project. As indicated, Concordance tables, demonstrating where EIS Guidelines are addressed, are at the beginning of the EIS.

The scope of the assessment of TLRU involves examining potential changes in availability of lands and resources currently used for traditional purposes, access to Traditional resources and areas for current use, cultural and spiritual sites or areas, and cultural value or importance associated with current use. These indicators were selected to address the regulatory requirements. Section 7.1.10 of Part 2 of the Canadian Environmental Assessment Agency (CEA Agency) Environmental Impact Statement (EIS) Guidelines for the Project (CEA Agency 2018) lays out the requirements to address current use of lands for Traditional purposes, physical and cultural heritage, and baseline data for Indigenous knowledge.

Section 7.3.3 of Part 2 describes the needs for addressing current use of lands for traditional purposes, and physical and cultural heritage. Section 3.4.1 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018a) indicates that the EIS will contain information on Indigenous peoples that includes resource use (hunting, fishing, trapping and gathering) as well as Traditional and cultural activities and heritage and cultural resources.

Chapter 4, Section 4.4.1 of the EIS describes VCs as features that may be affected by the Project as related to the role of the VC in the ecosystem and the value people place on it. TLRU is a VC because of the potential for the Project to affect traditional activities, sites and resources practiced and used by Indigenous groups. This assessment assumes that the exercise of traditional activities depends on the health and abundance of traditionally harvested species and the continued availability of and access to traditional use sites and areas. A review of information gathered during the Indigenous engagement program for the Project (see Chapter 5), results of traditional knowledge (TK) studies conducted for the Project, and publicly available literature, as well as the analysis of relevant biophysical and socio-economic assessments in the EIS, indicates that the Project has the potential to affect traditional activities, sites and resources identified by Indigenous groups. As noted above, indicators of change for TLRU consist of the following:

- potential changes in availability of lands and resources currently used for traditional purposes
- access to Traditional resources and areas for current use
- cultural and spiritual sites or areas
- cultural value or importance associated with current use.

In addition to describing the scope of the assessment, this section includes a description of existing conditions, Project interactions, assessment of residual environmental effects, determination of significance, cumulative effects, effects to federal lands, and any follow up and monitoring requirements.

10.2.1.1 Regulatory and Policy Setting

Federal Regulations and Policy

The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) discusses Indigenous peoples in section 5(1), regarding “the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project.” As set out in section 5(1)(c) these are to be addressed “with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on:

- health and socio-economic conditions
- physical and cultural heritage
- the current use of lands and resources for traditional purposes

- any structure, site or object that is of historical, archaeological, paleontological or architectural significance

Provincial Regulations and Policies

The *Northern Affairs Act*, established by the Manitoba Government in 1966 and most recently revised in 2006, provides the framework through which designated northern communities located within an unorganized territory of Manitoba with municipal services and to coordinate interprovincial and interjurisdictional initiatives, policies and strategies affecting northern Manitoba.

Manitoba's Department of Indigenous and Northern Relations (MINR) has developed an interim provincial policy for Crown consultations with First Nations, Metis Communities and Other Aboriginal Communities (MINR n.d.). This policy recognizes Manitoba's duty to consult First Nations, Métis communities and other Aboriginal communities when any proposed actions including land management and resource development have the potential to adversely affect the exercise of a Treaty or Aboriginal rights.

10.2.1.2 Indigenous Engagement and Consultation Process

A discussion of the Indigenous and public engagement process (IPEP) is provided in Chapter 5. Following the design and alignment of the Project, 31 communities were identified to be engaged by Manitoba Infrastructure and INRM based on geographic area, proximity to the Project, traditional territory, rights-based activities, previous consultations, community protocols and other knowledge of community land use.

Of these 31 communities, twelve Indigenous communities located on Lake Manitoba, Lake St. Martin and Lake Winnipeg have used or are currently using land within and adjacent to the Project area to exercise Aboriginal and Treaty Rights. They include the following, in alphabetical order:

- Dauphin River First Nation
- Dauphin River NAC
- Ebb and Flow First Nation
- Fisher River Cree Nation
- Kinonjeoshtegon First Nation
- Lake Manitoba First Nation
- Lake St. Martin First Nation
- Little Saskatchewan First Nation
- Manitoba Metis Federation
- O-Chi-Chak-Ko-Sipi First Nation
- Peguis First Nation
- Pinaymootang First Nation

Pinaymootang First Nation is located about 9.3 km away from the LSMOC. Dauphin River First Nation and Lake St. Martin First Nation reserve boundaries are located approximately 4.6 km and 12.0 km (respectively) from the LSMOC. Peguis First Nation has published a comprehensive community plan and

has an identified Community Interest Zone which overlaps with the south-eastern portions of the Project and the Regional Assessment Area (see Chapter 4). Peguis First Nation is a signatory to Treaty 1 but its Community Interest Zone (CIZ) is located in Treaty 2 territory.

In 2018, the EIS Guidelines (CEA Agency 2018) and a subsequent letter dated December 21, 2018[1], identified the 22 groups to be most affected by the Project. These 22 communities listed by CEA Agency were part of the 31 communities identified and contacted by MI. The 22 groups are listed below:

- Manitoba Metis Federation
- Dauphin River First Nation
- Lake St. Martin First Nation
- Little Saskatchewan First Nation
- Pinaymootang First Nation
- O-Chi-Chak-Koo-Sipi First Nation
- Ebb and Flow First Nation
- Lake Manitoba First Nation
- Skownan First Nation
- Peguis First Nation
- Sandy Bay First Nation
- Fisher River Cree Nation
- Kinonjeoshtegon First Nation
- Bloodvein First Nation
- Norway House Cree Nation
- Berens River First Nation
- Hollow Water First Nation
- Brokenhead Ojibway Nation
- Sagkeeng First Nation
- Black River First Nation
- Poplar River First Nation
- Misipawistik Cree Nation

The list of the 22 most affected Indigenous groups was expanded by CEA Agency in a letter dated August 16, 2018, with the addition of Keeseekoowenin Ojibway First Nation. The same letter added the following Indigenous groups stating they may be affected by the Project but to a lesser degree. A letter from CEA Agency dated June 27, 2019 revised the classification of 5 of these Indigenous groups to include them

[1] In a letter dated December 21, 2108, CEA Agency reclassified the following five communities from Indigenous groups that may be affected by the Project but to a lesser degree, to Indigenous groups that may most be affected by the Project: Brokenhead Ojibway Nation; Sagkeeng First Nation; Black River First Nation; Poplar River First Nation; and Misipawistik Cree Nation.

with the Indigenous communities and groups that are expected to be most affected by the Project. These are:

- Fox Lake Cree Nation
- Pimicikamak Okimawin (Cross Lake Band of Indians)
- York Factory Cree Nation
- Tataskweyak Cree Nation
- Council of Chiefs of Anishinaabe Agowidiiwinan

In addition to the 27 Indigenous groups identified in the EIS Guidelines (CEA Agency 2018), and subsequent letters, Manitoba Infrastructure had met with and/or corresponded with 11 Northern Affairs Communities (NAC), including:

- Aghaming NAC
- Berens River NAC
- Dauphin River NAC
- Fisher Bay NAC
- Loon Straits NAC
- Manigotagan NAC
- Matheson Island NAC
- Norway House NAC
- Pine Dock NAC
- Princess Harbour NAC
- Seymourville NAC

Engagement feedback from Indigenous groups has been an important consideration in identifying issues of concern, framing the scope of the EIS baseline and effects assessments, and in identification of specific mitigation measures, where provided. Indigenous input and community concerns contributed to selecting the channel routes for the Project, including avoiding areas described as important, such as the Johnson Beach area and Buffalo Lake. Key issues regarding TLRU identified through the engagement process and the sections of the EIS where they are addressed are summarized in the following sub-sections. Traditional knowledge including information about existing conditions, potential effects and mitigation measures has also been provided by Indigenous groups through Project-specific studies and has been incorporated throughout this chapter.

Manitoba Infrastructure will work with Indigenous groups to design, construct, and operate the proposed Project in a manner which avoids or minimizes potential adverse residual effects to Aboriginal and Treaty Rights in the area. Manitoba Infrastructure will engage with any Indigenous community or group that has concerns with the Project and will consult with communities or groups whose Aboriginal or Treaty Rights are potentially affected by the Project.

A summary of the TLRU concerns raised by multiple Indigenous groups is provided in Table 10.2-1.

Table 10.2-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous Group	Addressed in EIS Section
Effects to fishing grounds (e.g., depleting fish stocks, project debris, contamination of fish)	Black River First Nation; Interlake Reserves Tribal Council; Hollow Water First Nation; Fisher River Cree Nation; Ebb and Flow First Nation; Peguis First Nation; Dauphin River First Nation; Manitoba Metis Federation; Lake St. Martin First Nation; Norway House First Nation; Black River First Nation; Pinaymootang First Nation; Seymourville Community Council; O-Chi-Chak-Ko-Sipi First Nation; Lake Manitoba First Nation; Keewahtinook Fishers of Lake Winnipeg	Effects on availability of fish resource are discussed in Section 10.2.4.4 Change in availability of traditional resources for current use Effects on access to fishing resource are discussed in Section 10.2.4.5 Change in access to traditional resources for current use Effects on quality of fish resource are discussed in Section 10.2.4.7 Changes to cultural value or importance associated with current use
Damage to fishing equipment from debris in Lake Winnipeg affecting traditional fishing grounds	Keewahtinook Fishers of Lake Winnipeg, Black River First Nation, Interlakes Region Tribal Council; Hollow Water First Nation; Fisher River Cree Nation; Ebb and Flow First Nation; Fisher River Cree Nation; Dauphin River First Nation; Lake St. Martin First Nation	Effects on commercial fishing viability are discussed in Section 10.3 Indigenous Health and Socio-economics
Effects on hunting and trapping (e.g., reduction in vegetation; moose populations)	Dauphin River First Nation; Interlake Reserves Tribal Council; Lake St. Martin First Nation; Peguis First Nation; Manitoba Metis Federation; Fisher River Cree Nation; Pinaymootang First Nation; Lake Manitoba First Nation	Effects on availability of hunting and trapping resources are discussed in Section 10.2.8.3 Change in availability of traditional resources for current use Effects on access to hunting and trapping resources are discussed in Section 10.2.8.4 Change in access to traditional resources for current use Effects on quality of hunting and trapping resources are discussed in Section 10.2.8.6 Changes to cultural value or importance associated with current use
Effects on gathering traditional plants for medicine	Dauphin River First Nation; Interlake Reserves Tribal Council; Lake St. Martin First Nation; Peguis First Nation; Fisher River Cree Nation; Pinaymootang First Nation	Effects on availability of traditional plants are discussed in Section 10.2.8.3 Change in availability of traditional resources for current use Effects on access to traditional plants are discussed in Section 10.2.8.4 Change in access to traditional resources for current use Effects on quality of traditional plants are discussed in Section 10.2.8.6 Changes

Table 10.2-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous Group	Addressed in EIS Section
		to cultural value or importance associated with current use
Effects of development leading to the loss of traditional lands and resources	Dauphin River First Nation; Fisher River Cree Nation	Effects on availability of traditional lands and resources are discussed in Section 10.2.8.3 Change in availability of traditional resources for current use Effects on access to traditional lands and resources are discussed in Section 10.2.8.4 Change in access to traditional resources for current use Effects on cultural and spiritual sites are discussed in Section 10.2.8.5 Changes to Cultural and Spiritual sites or areas Effects on quality of traditional lands and resources are discussed in Section 10.2.8.6 Changes to cultural value or importance associated with current use
Effects on traditional foods (e.g., berry picking)	Peguis First Nation; Interlake Tribal Council; Lake Manitoba First Nation	Effects on availability of traditional foods are discussed in Section 10.2.8.3 Change in availability of traditional resources for current use Effects on access to traditional foods are discussed in Section 10.2.8.4 Change in access to traditional resources for current use Effects on quality of traditional foods are discussed in Section 10.2.8.6 Changes to cultural value or importance associated with current use
Protection of eagle feather gathering	Peguis First Nation	Effects on cultural and spiritual sites are discussed in Section 10.2.8.5 Changes to Cultural and Spiritual sites or areas
Reduced land use activities and harvesting opportunities	Manitoba Metis Federation; Peguis First Nation; Interlake Reserves Tribal Council; Dauphin River Nation; Black River First Nation; Fisher River Cree Nation; Lake St. Martin First Nation; Peguis First Nation; and Pinaymootang First Nation	Effects on availability of traditional lands and resources are discussed in Section 10.2.8.3 Change in availability of traditional resources for current use Effects on access to traditional lands and resources are discussed in Section 10.2.8.4 Change in access to traditional resources for current use

Table 10.2-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous Group	Addressed in EIS Section
		Effects on quality of traditional lands and resources are discussed in Section 10.2.8.6 Changes to cultural value or importance associated with current use

10.2.1.3 Potential Effects, Pathways and Measurable Parameters

In order to effectively assess changes to TLRU resulting from the Project, it is necessary to establish indicators with which to characterize this change and quantify it, if possible. As indicated in Section 10.2.1, CEAA 2012 identifies "current use of lands and resources for traditional purposes" as an environmental effect to be taken into account in an environmental assessment, and the EIS Guidelines (CEAA 2012).for the Project indicate that current use of lands and resources for traditional purposes may include activities such as hunting, trapping, fishing, and plant gathering.

Current use encompasses various traditional activities, practices, sites, areas, and resources, including hunting, trapping, fishing, plant gathering, use of trails and travelways (including navigation), use of habitation areas (e.g., cabins, campsites, temporary shelters), and use of cultural and spiritual sites and areas. Current use also accounts for the conditions of use, seasonal cycles, intergenerational knowledge transmission, landforms and named places, and other factors that provide context, setting or understanding for the practice of current use activities. Current use must be understood in the context of past and future use. Past TLRU information and information based on community members' living memory situates contemporary activities and long-term observations of existing conditions. Future use pertains to the opportunities for generations of descendants of the Indigenous groups to continue to practice cultural traditions in a modern form. Framing traditional activities and practices in this way serves to acknowledge that TLRU—while having continuity with historic practices, traditions, or customs—is dynamic and changing. Conceived of in this way, current use situates long-standing cultural practices in a contemporary context

Given the context explained above, the following potential Project-related effects were identified by considering potential interactions between Project components and TLRU:

- change in availability of traditional resources for current use
- change in access to traditional resources or areas for current use
- change to cultural and spiritual sites or areas
- change to the cultural value or importance associated with current use of lands and resources.

Characterizing the effects of the Project on TLRU relies on parameters that evaluate each type of predicted effect. As indicated, ideally, these parameters are measurable and quantifiable (e.g., availability of habitat for harvested species). However, some effects on TLRU lack defined measurement parameters

and are therefore evaluated qualitatively based on comments received from Indigenous groups, past project experience, and professional judgment. Potential effects, effects pathways and measurable parameters used to characterize and assess effects on TLRU are provided in Table 10.2-2.

Table 10.2-2 Potential Effects, Effect Pathways and Measurable Parameters for TLRU

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in availability of traditional resources for current use	• Vegetation clearing associated with Project construction could result in a loss of habitat for species of traditional importance, including plants and animals relied on for traditional hunting, trapping, or plant harvesting. • Loss or alteration of fish habitat resulting from disturbance to watercourses • An increase in hunting or fishing pressure by non-Aboriginal people has the potential to affect the availability of traditionally used species (e.g., influx of a project workforce) • Change in surface water quality or quantity • Sensory disturbance from Project construction and /or operation has the potential to affect the availability of habitat for species of traditional importance • Potential effects on wildlife health which could affect the availability of traditional resources	• Change in availability of habitat (ha) for traditionally used plant or animal species • Change in availability of habitat for fish species • Qualitative evaluation of change in hunting and fishing pressure as a result of the Project and other planned developments • Change in surface water quality parameters (i.e., total suspended solids), stream discharge, natural drainage (flow or volumes)
Change in access to traditional resources and areas for current use	• Loss or alteration of trails and travelways • Restriction on ability to navigate to and through current use areas (including landmarks)	• Number of trails and travelways temporarily or no longer accessible • Area (hectares) with increased or new access, e.g. linear disturbance • Area (hectares) with access restrictions • Identification of change in safe and predictable access by participating Indigenous groups
Change to cultural and spiritual sites or areas	• Loss or alteration of current use harvesting, habitation, and cultural or sacred sites and areas • Effects on air quality and noise that have the potential to influence the conditions for current use	• Number or area (hectares) of identified sites and areas affected • Identification of change in sites or areas by participating Indigenous groups • Identification of change in use of sites or areas from participating Indigenous groups
Change to the cultural value or importance	• Indirect effects on the experience of Indigenous peoples which adversely alter the	• Regional context for traditional use, and the value of the

Table 10.2-2 Potential Effects, Effect Pathways and Measurable Parameters for TLRU

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
associated with current use	perceived values of current use sites or areas that make it important • Presence of worker or increased access to the area by non-Indigenous peoples • Sensory disturbance from Project construction and operations has the potential to affect changes that could detract from use of the area or lead to avoidance of the area as a result of real and perceived disturbance of the environment	Project area in that regional context • Feedback and concerns regarding current use shared by participating Indigenous groups

Change to cultural value or importance associated with current use reflects values or attributes of the area that make it important as a place of intergenerational teaching of language or traditional practices, communal gatherings, or integrity of preferred traditional practice areas. The value or importance of these components are subjective and conditional and are contingent on beliefs, perceptions, values, and qualitative experience of Indigenous land users. Therefore, change to cultural value or importance associated with current use will be included when an Indigenous group identifies potential effects to experiential values (spiritual and cultural experiences of activities or practices, sense of place and wellbeing, transmission of Indigenous knowledge, laws, customs and traditions), and these will be considered narratively (e.g., include a qualitative discussion) and in in the larger context of the Project. This approach will be applied to the assessment of changes to the cultural value or importance associated with current use. Both tangible and identified intangible values contribute to the conclusions for the TLRU assessment.

10.2.1.4 Boundaries

Spatial Boundaries

Spatial boundaries for Indigenous Peoples were determined through a review of Project-specific TK information, related biophysical VCs, and professional judgement. There are demonstrable links between TLRU activities identified by Indigenous groups and biophysical VCs (e.g., hunting and the wildlife VC); therefore, aligning the TLRU boundaries with those of related VCs provides consistent and relevant boundaries throughout the EIS, and defines the predicted extent for project effects. The Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on TLRU are shown in Appendix 10B, Figure 10.2B-1.

Some of the Indigenous groups engaged on the Project have reserve lands and communities located outside of the LAA and RAA established for this assessment. Activities associated with TLRU (hunting, fishing, plant harvesting) can take place throughout a traditional territory, within treaty lands, on unoccupied Crown land, and on private or occupied Crown land to which an Indigenous group or individual has access. All the Indigenous groups engaged on the Project may undertake TLRU activities

within the LAA and RAA. The LAA is the maximum area within which Project environmental effects on TLRU can be predicted with a reasonable degree of accuracy and confidence. However, members of Indigenous groups whose reserves or communities are located outside of the LAA or RAA may travel to areas within the LAA and RAA to practice TLRU activities. When located within the LAA and RAA, the ability to practice TLRU activities may be affected by the Project.

Project Development Area

The project development area (PDA) is an area of 2,099 ha and is the area in which the Project components and activities are located. The PDA includes the Lake Manitoba Outlet Channel (LMOC), the realignment of PR 239, and the Lake St. Martin Outlet Channel (LSMOC).

Local Assessment Area

The local assessment area (LAA) is the maximum area within which Project environmental effects, both direct and indirect, can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA includes the PDA and adjacent areas where environmental effects may reasonably be expected to occur. Due to the interrelatedness of TLRU to the VCs related to those resources, the LAA for TLRU encompasses the PDA and the largest extent of the LAAs established for related VCs (Vegetation, Wildlife, Groundwater and Surface Water, Fish and Fish Habitat, Land and Resource Use, and Heritage).

Regional Assessment Area

The regional assessment area (RAA) for the assessment of effects on TLRU includes the PDA and LAA and the largest extent of the RAAs established for related VCs (Vegetation, Wildlife, Groundwater and Surface Water, Fish and Fish Habitat, Land and Resource Use, and Heritage). The RAA is the area that provides context to the changes occurring in the LAA for each VC. The LAA and RAA for each VC depend on physical and biological conditions and the type and location of other past, present, or reasonably foreseeable projects or activities that have been or will be carried out.

Temporal Boundary

The temporal boundary for the assessment of effects on TLRU covers the duration of the construction and operation and maintenance phases of the Project. Construction is tentatively expected to occur over a period of approximately 2.5 to 3 years with approximately 1 to 2 years for post construction-related works, such as site clean-up, survey, and reclamation. It is currently estimated that construction would occur from fall 2020 to spring/summer 2023, with operation and maintenance starting in Fall 2022. The overall schedule is contingent largely on receipt of the final regulatory approvals in 2020. Once construction is complete, the Project would be ready for operational usage on an as-required basis. The operation and maintenance phase of the Project is expected to be indefinite as there are no plans to terminate operations.

The temporal boundary for current use also considers each local Indigenous group's current and future use of lands and resources for traditional purposes during the Project construction, operation and

maintenance. Current use is defined as extending back from the present time to within the last 25 years (or one generation); therefore, information regarding existing conditions with associated temporal details is limited to 1992 to present and into the reasonably foreseeable future. Twenty-five years was chosen as the temporal boundary for considering effects of a change in the environment on Indigenous people because knowledge about traditional practices or locales may be lost or may not be passed on to younger members of the community if it goes unused for a generation. Future use pertains to the opportunities for generations of descendants to practice traditional activities (in modern form) and maintain traditional cultural and spiritual values.

10.2.1.5 Residual Effects Characterization

Table 10.2-3 presents definitions for the characterization of residual environmental effects on TLRU. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table 10.2-3 Characterization of Residual Effects on Traditional Land and Resource Use

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change on the TLRU.
	Adverse	Net loss (adverse or undesirable change) on the TLRU.
	Positive	Net benefit (or desirable change) on the TLRU.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of several months up to one year).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities (i.e., > 1 year to 5 years).
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project (i.e., a timeframe of greater than 5 years).
Magnitude (degree or intensity of the change)	Negligible or Low	**Negligible** – No measurable change from existing conditions and current use is able to continue at current levels. No alteration of behaviour is required to continue current traditional land and resource use practices. **Low** – Minor change from existing conditions and current use is able to continue at current levels. Minor alteration of behaviour is required to continue current traditional land and resource use practices.
	Moderate	A measurable change from existing conditions but current use is able to continue at a reduced level or with; • some restrictions on current practices;

Table 10.2-3 Characterization of Residual Effects on Traditional Land and Resource Use

Characterization	Range of Criteria	Level of Effect and Definition
		• some alteration of behaviour is required to continue current practice in preferred ways or at preferred use locations.
	High	A measurable change from existing conditions such that current use cannot continue or cannot continue without; • substantial changes to current practices; • substantial restrictions on the ability to continue current practices in preferred ways or at preferred use locations.
Timing	No Sensitivity	No effect on TLRU related to timing.
	Moderate Sensitivity	Effect on TLRU seasonality (i.e., hunting/trapping, fishing, plant gathering) may occur during a lower sensitivity timing period, as identified by related VC's and/or Indigenous groups.
	High Sensitivity	Effect on TLRU seasonality (i.e., hunting/trapping, fishing, plant gathering) may occur during a higher sensitivity timing period, as identified by related VC's and/or Indigenous groups.
Extent (Spatial Boundary)	Project Development Area	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities (e.g., borrow pits and quarries)
	LAA	Area within which potential Project effects are measurable and extending beyond the Project Development Area to, but not beyond, the LAA.
	RAA	The anticipated regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA.
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project (e.g., blasting at quarries; site-specific construction equipment noise; potential wildlife-vehicle collisions).
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project (e.g., noise associated with vehicle traffic along the realigned portions of PR 239).
Reversibility (the degree of permanence)	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (< than five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> than five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.

Table 10.2-3 Characterization of Residual Effects on Traditional Land and Resource Use

Characterization	Range of Criteria	Level of Effect and Definition
Ecological and Social Context (resilience of a VC to adapt to changes as a result of the Project)	Undisturbed	Ecological: Area is relatively undisturbed or not adversely affected by human activity.
	Disturbed	Ecological: Area has been substantially previously disturbed by human development or human development is still present.

10.2.1.6 Significance Definition

Under CEAA 2012, there is a requirement to make a determination of significance for residual environmental effects on TLRU. The lack of laws, policies, management plans or standard industry practice regarding thresholds for effects on TLRU makes selecting and applying significance thresholds challenging. The subjective nature of describing and understanding the importance of effects on current use of lands and resources for traditional purposes means that selected thresholds might not evenly apply across Indigenous groups and circumstances. Indigenous groups themselves may have differing views on the meaning of significance that reflect oral history traditions and holistic understandings of natural phenomena.

Given these considerations, a significant adverse effect on TLRU is defined as a long-term loss of traditional use resources or access to lands relied on for current use practices or current use sites and areas, such that current use is critically reduced or eliminated from the LAA. This may include disruption to current use activities and practices where biological resources, or physical sites are not significantly affected in the LAA.

10.2.2 Existing Conditions for Traditional Land and Resource Use

10.2.2.3 Methods

Existing conditions for TLRU are derived from Project-specific TK studies and Indigenous engagement programs associated with the Project and the EOC. In addition, information was gathered through a review of publicly available literature containing TLRU information for Indigenous groups engaged on the Project to provide context on the nature and extent of current use by these Indigenous groups. Additional TK studies, land use and management plans, and academic resources are anticipated to become available in the future as products of Manitoba Infrastructure's ongoing engagement program and other sources. This assessment is based on information available prior to filing, and as a result, such forthcoming studies have not been incorporated into this assessment, although in cases where studies are anticipated they are mentioned. Confidential studies regarding TLRU or those stipulating one-time use were excluded from the literature review. The following types of information sources were considered:

- regulatory traditional use studies (TUS) conducted by Indigenous groups
- TLRU regulatory assessments, supplemental filings, and hearing evidence for other developments

- government reports and databases
- historical and ethnographic literature
- relevant internet sources (such as Indigenous group websites).

The review considered the baseline information, issues and concerns, potential effects, and residual effects that are relevant to the potentially affected Indigenous communities' resource use and traditional activity. Mitigation measures recommended by Indigenous communities for other projects are also included. Locations of sites and areas that are identified through the literature review are discussed in the existing conditions section for each current use activity (e.g., hunting, trapping, fishing, plant harvesting). A list of species used by Indigenous groups engaged on the Project for consumptive, ceremonial or utilitarian purposes was developed and is located in Appendix 10A, Table 10A.2-1. This species list informed existing conditions for the assessment of TLRU as well as other VCs (vegetation, wildlife, and fish and fish habitat, land and resource use).

The literature review provides an overview of TLRU in the RAA as general background and context for the assessment. The results of the literature review should not be considered comprehensive representations of TLRU by participating Indigenous communities. A lack of information about TLRU does not necessarily indicate the absence of TLRU resources, activities, and sites in the RAA. In the absence of community information pertaining to traditional use, the EIS conservatively assumes that TLRU is practiced throughout the Project area. Manitoba Infrastructure will continue to solicit TLRU information from Indigenous groups and review any subsequent information provided for incorporation into the Project, as appropriate.

10.2.2.4 Existing Conditions by Indigenous Group

This section provides a summary of TLRU for the Indigenous groups engaged on the Project, as named in Section 10.2.1.4.

While most of these communities had received some level of engagement with MI, several communities are still in the preliminary phases of engagement and the amount of information available is less than those who have been engaged for several years. Following a community overview for each Indigenous group, information is presented on TLRU, including hunting, trapping, fishing, plant gathering, cultural and spiritual sites, habitation areas, and trails and travelways that summarize publicly available information, as available. Manitoba Infrastructure will continue to engage with potentially affected Indigenous groups to understand issues or concerns, and to learn about traditional use sites or features to be incorporated into Project planning, as appropriate.

Dauphin River First Nation

Overview

Dauphin River First Nation No. 316 (CIRNAC 2019a) is an Ojibway Treaty 2 Nation located in the Interlake Region, and situated on the north shore of the Dauphin River, approximately 4 km from the

PDA. Dauphin River First Nation is adjacent the Dauphin River Northern Affairs Community. As of May 2019, Dauphin River First Nation had a registered population of 388 (CIRNAC 2019a). The Nation has one reserve (48a), which covers an area of 325.8 ha (CIRNAC 2019a). Dauphin River First Nation is a member of Interlake Reserves Tribal Council (IRTC 2019a) and is governed by a Chief and two Councilors who are elected according to a custom electoral system (CIRNAC 2019a). Local medical services are provided by a community health worker, while the nearest hospital is in Ashern, approximately 150 km south. In 2018, Dauphin River First Nation celebrated the opening of a K-8 school on its reserve (Government of Manitoba 2016c).

TLRU Information

Moose (*Alces alces*) and white-tailed deer (*Odocoileus virginianus*) are important species for subsistence hunting for Indigenous groups in the Interlake area, including Dauphin River First Nation. Dauphin River First Nation hunt and trap along the shoreline of Lake Winnipeg and along Buffalo Creek, with moose and deer habitat found in both areas (Golder Associates 2018). The province of Manitoba is divided into game hunting areas (GHAs) that are applicable to all Indigenous and Non-Indigenous resource users. The proposed Project is near GHA 21, GHA 16, and GHA 25 to the southeast (Manitoba Infrastructure 2019b). Upland game bird and waterfowl hunting by Dauphin River First Nation focuses on a variety of species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Through the Indigenous engagement program for this Project, Dauphin River First Nation indicated that moose and deer habitat and hunting areas along Lake Winnipeg and Buffalo Creek were affected by operation of the EOC.

Dauphin River First Nation trap furbearers such as marten and fisher along PR 513 and beaver and muskrat along the proposed Lake St. Martin channel route (Golder Associates 2018:5). Through the Indigenous engagement program for this Project, Dauphin River First Nation indicated that trapping areas were affected by operation of the EOC.

Dauphin River First Nation reported subsistence and recreational fishing occur at Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike (*Esox lucius*), walleye (*Sander vitreus*), and lake whitefish (*Coregonus clupeaformis*) as well as a variety of other species important to the Dauphin River First Nation (see Appendix 10A, Table 10A.2-1; Manitoba Infrastructure 2019b).

Dauphin River First Nation fish for walleye (pickerel) along Lake Winnipeg and have identified a spawning area at the south end of that lake (see Golder Associates 2018).

Dauphin River First Nation previously gathered berries and medicinal plants in their traditional territory, but the 2011 flood removed much of the desired vegetation (Golder Associates 2018). Through the Indigenous engagement program for this Project, Dauphin River First Nation indicated that medicinal plant gathering areas were affected by operation of the EOC.

Dauphin River First Nation noted two historic settlements on the west shore of Lake Winnipeg. Graves are located at one of these settlements, north of the EOC (Golder Associates 2018). A pulp mill was also noted by Dauphin River First Nation at the south end of Lake Winnipeg, and a snowmobile trail was mapped that crosses the EOC (Golder Associates 2018). Six registered archaeological sites were identified in the Interlake region from the Provincial Archaeological Site Inventory: "Four of the sites were identified as historic period and included sites of fur trade and homestead influence; the two remaining sites were identified as Middle to Late Woodland Period (ca. 2,000 to 350 years ago) based on the stone tools and Native ceramics" (Manitoba Infrastructure 2019b:4-50). One of these sites is located on Dauphin River First Nation lands (Manitoba Infrastructure 2019b).

Dauphin River First Nation reported the existence of a snowmobile trail that intersects the proposed LSMOC (Golder Associates 2018). The recent Lake St. Martin Access Road Project has caused concern for Dauphin River First Nation regarding the road's location, whether or not it will be gated, and potential for impacts to road maintenance (Manitoba Infrastructure 2019a).

Dauphin River Northern Affairs Community

Overview

Dauphin River Northern Affairs Community lies in the Interlake Region. It was recognized in 1970 and is represented by a mayor and council under the *Northern Affairs Act* (Government of Manitoba 2016c). It is located at the mouth of the Dauphin River at Lake Winnipeg, approximately 5 km from the PDA. Dauphin River Northern Affairs Community is adjacent to the Dauphin River First Nation community. Access is provided by PR 513 (Government of Manitoba 2016c). Dauphin River NAC has a Mayor and two Councilors elected under the *Northern Affairs Act*, as well as other community-based personnel (Northern Association of Community Councils 2019). As of 2011, the population numbered 30, distributed among 15 housing units (Government of Manitoba 2016c). The local economy is closely linked to fishing and trapping, with some tourism (Government of Manitoba 2016c). Local services include a community health worker, an airstrip, a restaurant, fishing guides, recreational facilities, and a community hall (Government of Manitoba 2016c). The community of Gypsumville, some 70 km to the southwest, provides postal, police, grocery, gasoline, and mechanical service to Dauphin River NAC (Dauphin River 2010). Educational services are provided by Frontier School Division (Government of Manitoba 2016c). The nearest hospital is located in Ashern, approximately 160 km to the south (Dauphin River 2010).

TLRU Information

In a report on the effects of the operation of the EOC, the Dauphin River Northern Affairs Community indicated that the EOC has caused loss of habitat for wildlife, such as moose and deer, who have now moved elsewhere. There has been an increase in problem bears as a result of habitat disturbance and displacement (Einarsson 2017).

Dauphin River Northern Affairs Community indicated that due to the operation of the EOC, water levels have changed. The water has become too deep for muskrat and beavers, and their structures were destroyed by the Province during the 2011 flood and EOC operation, which kept water moving. As a

result, Dauphin River Northern Affairs Community stated that trapping areas have been wiped out (Einarsson 2017).

The Dauphin River Northern Affairs Community indicated that as a result of the 2011 flood and subsequent EOC operation, “Our equipment was damaged, fish stocks were depleted by the loss of spawn in 2011, 2012 and 2014. Thousands of mature fish were killed when trapped in the channel” (Einarsson 2017).

Dauphin River Northern Affairs Community reported that the availability of berries and other edible plants have been negatively affected by flooding and use of the EOC (Einarsson 2017).

The recent Lake St. Martin Access Road Project has caused concern for Dauphin River Northern Affairs Community regarding the road’s location, whether it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Ebb and Flow First Nation

Overview

Ebb and Flow First Nation No. 280 (CIRNAC 2019a) is an Anishinabe-speaking Treaty 2 Nation located northeast of Riding Mountain National Park along the western shores of Lake Manitoba, approximately 35 km from the PDA. Ebb and Flow First Nation holds membership in the West Region Tribal Council Inc. (CIRNAC 2019a), and as of June 2019, had a population of 3,225 (CIRNAC 2019a). Ebb and Flow First Nation has one reserve (Ebb and Flow 52) that comprises an area of 4,663.80 ha (CIRNAC 2019a). Ebb and Flow First Nation is governed by a Chief and four Councillors who are elected under the *Indian Act* Election System (CIRNAC 2019a).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Ebb and Flow First Nation. Further engagement may provide information on interactions between Princess Ebb and Flow First Nation’s TLRU and the Project, if any.

Fisher River Cree Nation

Overview

Fisher River Cree Nation No. 264 (CIRNAC 2019a) is a Cree-speaking community, located near the south-western shores of Lake Winnipeg, approximately 59 km from the PDA (FRCN 2019). A signatory to Treaty 5, Fisher River Cree Nation is comprised of two reserves, Fisher River 44 and Fisher River 44A, which encompass an area of 5541.9 ha and 777 ha, respectively (CIRNAC 2019a). As of June 2019, Fisher River Cree Nation had a registered population of 4,012 (CIRNAC 2019a). Local facilities include a health centre, administration office, high school, water and sewer plant, recreation centre, and radio station (FRCN 2019). Fisher River Cree Nation operates its own Board of Education, Housing Authority,

and the Ochekwi Sipi Cree Nation Personal Care Home to provide services for Fish River Cree Nation members. Fisher River Cree Nation also participates in the Intertribal Child and Family Services. Fisher River Economic Development Corporation operates several subsidiary companies with the goal of increasing community investment and employment (FRCN 2019). Companies listed on the Fisher River Cree Nation website include: Fisher River Outfitters, Bay River Inn & Suites, Fisher River Building Supplies, Bay River Developments, Fisher River Grocery, Fisher River Car Wash & Laundromat, and First Nation Builders (FRCN 2019). Fisher River Cree Nation is governed by a Chief and four Councillors who are elected under the *Indian Act* Election System (CIRNAC 2019a). Fisher River Cree Nation operates the Fisher River Health Centre; the nearest hospital is located in Hodgson, some 30 km to the southwest (Road on Map 2019).

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Fisher River Cree Nation. Fisher River Cree Nation hunt and trap along the shoreline of Lake Winnipeg and along Buffalo Creek, with moose and deer habitat found in both areas (Golder Associates 2018:5). The proposed Project is adjacent to GHA 21, GHA 16, and GHA 25 to the southeast (Manitoba Infrastructure 2019b). Upland bird and waterfowl hunting by Fisher River Cree Nation focuses on a variety of species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Fisher River Cree Nation reported trapping-related concerns including a reduction in access to trapping areas; wildlife disturbance due to Project construction; disruption of wildlife movement patterns; and increased wildlife mortality due to increased vehicular traffic (Fisher River Cree Nation 2018a:3).

Fisher River Cree Nation reported that subsistence and recreational fishing occurs on Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike, walleye, and lake whitefish as well as a variety of other species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Fisher River Cree Nation fish for walleye (pickerel) along Lake Winnipeg and have recorded a spawning area at the south end of that lake (Golder Associates 2018).

Fisher River Cree Nation noted through the Indigenous engagement program that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018a).

The recent Lake St. Martin Access Road Project has caused concern for Fisher River Cree Nation regarding the road's location, whether or not it will be gated, and potential for impacts to road maintenance (Manitoba Infrastructure 2019a).

Kinonjeoshtegon First Nation

Overview

Kinonjeoshtegon First Nation No. 268 (CIRNAC 2019a) is a Treaty 5 Chippewa Nation, located near the western shores of Lake Winnipeg, approximately 39 km from the PDA. Kinonjeoshtegon First Nation is a member of the Interlake Reserves Tribal Council (IRTC 2019a) Governance is provided under the *Indian Act* (CIRNAC 2019a), with an elected Chief and four Councilors (Interlake Reserves Tribal Council 2019). As of June 2019, the registered population for Kinonjeoshteogon First Nation was 788 (CIRNAC 2019a). Kinonjeoshtegon First Nation has two reserves, Jackhead 43, which is approximately 1200 ha in size, and Jackhead 43A, approximately 140 ha in size (CIRNAC 2019a). A renal health centre located in the Hodgson region provides service to Kinonjeoshtegon First Nation, as well as other First Nations in the area (Interlake-Eastern Regional Health Authority 2012). The nearest hospital is located in Arborg, approximately 70 km south-east.

Members of Kinonjeoshtegon First Nation were impacted by a 2011 flood. As a result, the province of Manitoba committed to constructing permanent dikes to protect Manitoba First Nations, including Kinonjeoshtegon First Nation, from flooding (Government of Canada 2019a).

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Kinonjeoshtegon First Nation. The proposed Project is adjacent to GHA 21, GHA 16, and GHA 25 to the southeast (Manitoba Infrastructure 2019b). Upland game bird hunting and water bird hunting by Kinonjeoshtegon First Nation focuses on a variety of species (Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Kinonjeoshtegon First Nation indicated that trapping takes place in the RAA and LAA, with species taken including marten, lynx, rabbit, wolf, beaver, coyote, fox, fisher, mink, otter, squirrel, wolverine, weasel, and bear (Golder Associates 2018).

Kinonjeoshtegon First Nation reported Subsistence and recreational fishing occur Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on a variety of species important to Kinonjeoshtegon First Nation (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Kinonjeoshtegon First Nation fish for subsistence in the RAA, and reported taking walleye, lake whitefish, burbot, northern pike, sucker, perch, and lake sturgeon (Golder Associates 2018). Fish spawning areas in Lake St. George, Lake St. Andrew, and Lake St. David also were reported by Kinonjeoshtegon First Nation (Golder Associates 2018).

Kinonjeoshtegon First Nation gather berries and plants in the RAA, including saskatoon berries, blueberries, raspberries, cranberries, weekey, and muskeg tea (Golder Associates 2018). Kinonjeoshtegon First Nation indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

Kinonjeoshtegon First Nation reported the use of cabins and campsites northeast of the RAA (Golder Associates 2018).

Kinonjeoshtegon First Nation indicated the existence of gravesites located along the shore of Lake Winnipeg and on both sides of the Jackhead River (Golder Associates 2018).

Kinonjeoshtegon First Nation reported that trails or access routes used by the community exist, but these have not been recorded (Golder Associates 2018). The recent Lake St. Martin Access Road Project has caused concern for Kinonjeoshtegon First Nation regarding the road's location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Lake Manitoba First Nation

Overview

Lake Manitoba First Nation No. 271 (CIRNAC 2019a) is an Ojibway-speaking Treaty 2 Nation located on the northeast shore of Lake Manitoba, approximately 34 km from the PDA. As of June 2019, Lake Manitoba First Nation had a registered population of 2,138 (CIRNAC 2019a) and is a member of the Interlake Reserves Tribal Council (IRTC 2019a). Lake Manitoba First Nation has one reserve (Dog Creek 46), which encompasses 3,770.6 ha (CIRNAC 2019a). Local facilities include a band office and fire hall (Government of Canada 2013). Lake Manitoba First Nation is governed by a Chief and four Councilors who are elected under the *Indian Act* Election System (CIRNAC 2019a; IRTC 2019a). The nearest hospital is in Eriksdale, approximately 40 km to the west. Police services are located in Ashern, approximately 50 km to the northwest.

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Lake Manitoba First Nation. Upland game bird and waterfowl hunting by Lake Manitoba First Nation focuses on a variety of species (Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Lake Manitoba First Nation indicated that trapping takes place in the RAA and LAA, especially around Lake Manitoba, as well as to the south and east of the proposed EOC access road (Golder Associates 2018).

Lake Manitoba First Nation reported Subsistence and recreational fishing occur Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike, walleye, and lake whitefish as well as a variety of other species (see Appendix 10A,

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Lake Manitoba First Nation indicated that fishing takes place in the Project Development Area, including within the Lake Manitoba channel and in Lake Winnipeg (Golder Associates 2018:8).

Lake Manitoba First Nation gather plants and berries in the RAA, noting that berry availability had decreased following the 2011 flood (Golder Associates 2018). Lake Manitoba First Nation also indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

The recent Lake St. Martin Access Road Project has caused concern for Lake Manitoba First Nation regarding the road's location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Lake St. Martin First Nation

Overview

Lake St. Martin First Nation No. 275 (CIRNAC 2019a) is an Anishinabe Treaty 2 community with reserve land located along the northwestern shore of Lake St. Martin, approximately 10 km from the PDA. Lake St. Martin First Nation retains an administration building in the City of Winnipeg and a band office in Gypsumville (Manta 2019). Governance is provided for under the *First Nations Election Act* (CIRNAC 2019a). As of June 2019, the registered population was 2,864 (CIRNAC 2019a). Lake St. Martin First Nation has three reserves: Obushkudayang, approximately 320 ha in size; The Narrows 49, approximately 2600 ha in size; and The Narrows 49A, approximately 980 ha in size (CIRNAC 2019a). Health services can be accessed in the community one day per week via a mobile clinic (Interlake-Eastern Regional Health Authority n.d.). The nearest hospital is in Arborg, approximately 120 km to the southeast.

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Lake St. Martin First Nation. Upland bird and waterfowl hunting by Lake St. Martin First Nation focuses on a variety of species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Lake St. Martin First Nation noted Subsistence and recreational fishing occur Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike, walleye, and lake whitefish as well as a variety of other species (see Appendix 10A, Table10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Lake St. Martin First Nation indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

The recent Lake St. Martin Access Road Project has caused concern for Lake St. Martin First Nation regarding the road's location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Little Saskatchewan First Nation

Overview

Little Saskatchewan First Nation No. 274 (CIRNAC 2019a) is a Treaty 2 Ojibway Nation located along the western shoreline of Lake St. Martin, approximately 16 km from the PDA. Little Saskatchewan First Nation holds membership in the Interlake Reserves Tribal Council (IRTC 2019a). The community is accessible from the north by PR 513 or from the south via passage through Pinaymootang First Nation. The governance system for Little Saskatchewan First Nation consists of a Chief and four Councilors, who are elected under the *Indian Act* Election system (CIRNAC 2019a). As of June 2019, Little Saskatchewan First Nation had a registered population of 1,322 (CIRNAC 2019a). Little Saskatchewan First Nation has two reserve parcels: Little Saskatchewan 48, which has an area of 1,310.80 ha, and Little Saskatchewan 48B, which has an area of 97.50 ha (CIRNAC 2019a). The community has a fire hall and band office (Government of Canada 2013). Little Saskatchewan First Nation has its own health centre (Little Saskatchewan Health Centre n.d.). The nearest hospital is in Ashern, approximately 70 km south.

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Little Saskatchewan First Nation. The proposed Project is adjacent to GHA 21, GHA 16, and GHA 25 to the southeast (Manitoba Infrastructure 2019b). Upland bird and waterfowl hunting by Little Saskatchewan First Nation focuses on a variety of species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b). Little Saskatchewan First Nation hunt in the RAA and LAA, including an area southwest of Lake St. Martin that overlaps with the Lake St. Martin channel access road (Golder Associates 2018).

Little Saskatchewan First Nation reported trapping muskrats in the RAA (Golder Associates 2018).

Little Saskatchewan First Nation reported subsistence and recreational fishing occur in Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike, walleye, and lake whitefish as well as a variety of other species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Little Saskatchewan First Nation gathers plants and berries in the RAA and LAA. Little Saskatchewan First Nation members indicated that berry picking takes place near Lake St. Martin. It was also reported that prior to the 2011 flood, raspberries, chokecherries, strawberries, and gooseberries were gathered (Golder Associates 2018). Other berry-gathering places that were actively used prior to the 2011 flood include Little Saskatchewan 48 Reserve and The Narrows 49 Reserve (Golder Associates 2018). Seneca root and weekey, medicinal plants, are both gathered on the Reserve (Golder Associates 2018).

Little Saskatchewan First Nation also indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

Little Saskatchewan First Nation reported the presence of a cemetery on the Reserve. This cemetery is important to Little Saskatchewan First Nation, and a desire to have a dike installed to protect it in the event of flooding was expressed (Golder Associates 2018).

The recent Lake St. Martin Access Road Project has caused concern for Little Saskatchewan First Nation regarding the road's location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Manitoba Métis Federation

Overview

The Manitoba Métis Federation was founded in 1967 to represent Métis interests in Manitoba. The Federation, which is organized into seven regions across Manitoba, has an elected President and a Board of Directors (Manitoba Métis Federation 2019). Each Region has community-level "Locals", administered by a chairperson, a vice-chairperson, and a secretary-treasurer (Manitoba Métis Federation 2019). The Federation caucus is made up of Ministers that have portfolios in various departments, including Energy and Infrastructure, Health and Wellness, Housing and Property Management, Citizenship, Metis Community Liaison, Metis Employment and Training, Metis Justice Institute, Natural Resources, and Tripartite Self-Government Negotiations (Manitoba Metis Federation 2019). Federation objectives include cultural translation, education awareness, and promotion of member interests (Manitoba Metis Federation 2019). The Project falls within the Manitoba Métis Federation Interlake Region, which is home to 12 Métis Locals.

TLRU Information

The Manitoba Métis Federation hunts for a variety of species, with the most commonly harvested being deer, moose, ruffed grouse, Canada geese, mallard duck, and sharp-tailed grouse (Caillou Group 2016). The Manitoba Métis Federation reports that harvesting of moose, elk, and deer occurs primarily in the fall season, and secondarily in the winter seasons as the seasonality of moose, deer, and elk harvesting patters are similar (Manitoba Hydro 2011a). Most big game hunting by Manitoba Métis Federation occurs on the west side of Lake Winnipegosis and Lake Manitoba (Manitoba Hydro 2011a; 2011d).

Members of the Manitoba Métis Federation abide by the "Laws of the Harvest" as well as provincial regulations concerning sport hunting seasons. Moose are hunted in several areas, including the Interlake Region (Manitoba Hydro 2011a:39). Small animal harvesting by Manitoba Métis Federation includes upland birds, such as grouse, partridge, ptarmigan, as well as ducks, geese, and rabbits. Manitoba Métis Federation stated the harvesting of small animals occurs primarily in the fall season and secondarily in the winter (Manitoba Hydro 2011a). The harvesting of small animals for food purposes by Manitoba Métis Federation mostly occurs along the westerly side of Lake Manitoba and Lake Winnipegosis (Manitoba Hydro 2011a).

Species trapped by the Manitoba Métis Federation include beaver, coyote, fisher, fox, lynx, marten, mink, muskrat, otter, rabbit, raccoon, squirrel, weasel, wolf, and wolverine. Trapping areas focus on muskrat, weasel, beaver, coyote, and fox harvesting (Manitoba Hydro 2011a).

Manitoba Métis Federation members often fish for sustenance, with the primary species harvested being walleye, northern pike, trout, and suckers (Manitoba Hydro 2011a). Manitoba Métis Federation explained that fishing occurs mainly in summer but can take place year-round (Manitoba Hydro 2011a). Lake Winnipeg and Lake Manitoba contain a wide range of fish species harvested by Manitoba Métis Federation (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Shared Value Solutions 2018). Manitoba Métis Federation citizens indicated that their most commonly fished species included walleye, northern pike, sauger, and channel catfish (Caillou Group 2016). Fishing by Manitoba Métis Federation in the Local Assessment Area is documented on Lake St. Martin and the Dauphin River to its mouth at Lake Winnipeg (Manitoba Hydro 2011a).

Manitoba Métis Federation indicated that berries and other edible plants are harvested from late summer through to fall freeze-up, with medicines harvested throughout the year (Manitoba Hydro 2011a). Berries, wood products, roots, nuts, mushrooms, and medicines are collected in the summer and fall seasons, with fuel wood being harvested throughout the year, and certain root plants being harvested in the spring (Manitoba Hydro 2011a). Berries gathered by Manitoba Métis Federation include blueberries, raspberries, saskatoons and chokecherries, strawberries, cranberries, goose berries, pin cherries, moss berries, elder berries, blackberries, and nanny berries (Manitoba Hydro 2011a). Manitoba Métis Federation also harvest certain types of roots, nuts, and plants are edible and/or medicinal, including hazel nuts, bear nuts, mushrooms, fiddle heads, horse radish, wild tea, Seneca root, sweet grass, sage, weekis or weeka root, balsam bark, red willow, and back poplar bud (Manitoba Hydro 2011a). Manitoba Métis Federation related that commonly collected trees and tree products include jack pine, white (paper) pine, balsam poplar, Manitoba maple, tamarack (larch) and bur oak (Calliou Group 2016). Gathering locations identified by Manitoba Métis Federation include areas to the west of Lake Winnipegosis and to the southeast of Lake Manitoba (Manitoba Hydro 2011a).

Manitoba Métis Federation has identified the general location of a number of culturally important sites or places including ceremonial, burial, and other sacred or spiritual places (e.g., Thunderbird nest and Manipogo sighting area) and an intergenerational family camp within an area between Lake Winnipegosis and Lake Manitoba (Manitoba Hydro 2011a). Porcupine Hills and Duck Mountain have also been identified by Manitoba Métis Federation as areas of extensive traditional use (Manitoba Hydro 2011a).

Manitoba Métis Federation has identified the general location of historic fur trade posts, Métis cart trails, and York boat routes as the area between Lake Winnipegosis and Lake Manitoba (Manitoba Hydro 2011a).

Peguis First Nation

Overview

Peguis First Nation No. 269 (CIRNAC 2019a) is a Cree and Ojibway Nation and a member of Treaty 1. Peguis First Nation also holds membership in the Interlake Reserves Tribal Council (IRTC 2019a). The main Peguis First Nation reserve, Peguis 1B, is located approximately 54 km from the PDA (CIRNAC 2019a). Peguis First Nation has nine reserves, with the largest of these, Peguis 1B, comprising 30,001.7 ha (CIRNAC 2019a). As of June 2019, Peguis First Nation's registered population was 10,369 (CIRNAC 2019a), making it the largest First Nation community in Manitoba. Peguis First Nation utilizes a First Nations Election Act, with governance provided by a Chief and six Councilors (Peguis First Nation 2018). Community services include a radio station, recreation facilities, educational facilities, a gaming commission, and health centre (Peguis First Nation 2018). Peguis First Nation also operates its own investment corporation based in Winnipeg (Chief Peguis Investments 2019).

TLRU Information

Peguis First Nation indicated that current hunting for moose, deer, and elk takes place in a large area east of Lake St. Martin, an area that at least one community member relies upon entirely for moose (Golder Associates 2018). Peguis First Nation also reported hunting near Mantagao (Birch) Lake (Golder Associates 2018).

Upland game bird and waterfowl hunting by Peguis First Nation focuses on a variety of species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Peguis First Nation reported trapping lynx, mink, and otter in an area south of Lake Winnipeg. Two traplines, one south of Lake Winnipeg and the other west of Peguis 1B Reserve, have been recorded (Golder Associates 2018). Subsistence and recreational fishing by Peguis First Nation occur Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on northern pike, walleye, and lake whitefish as well as a variety of other species (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Peguis First Nation reported fishing in several lakes, including Lake St. Martin, Lake Manitoba, Lake Winnipeg, and Mantagao (Birch) Lake, taking jackfish, northern pike, and pickerel (Golder Associates 2018).

Peguis First Nation pick berries and medicines in various locations, with a high value area located east of the proposed EOC access road (Golder Associates 2018:10). Peguis First Nation indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

Peguis First Nation indicated that an area where eagle feathers were gathered is located near the proposed EOC access road (Golder Associates 2018).

Peguis First Nation rely upon existing roads in the area as access trails to game, including the Lake St. Martin access road and road that runs west of it (Golder Associates 2018). The recent Lake St. Martin Access Road Project has caused concern for Peguis First Nation regarding the road's location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

Pinaymootang First Nation

Overview

Pinaymootang First Nation No. 272 (CIRNAC 2019a) is a Treaty 2 Ojibway Nation located between Lake Manitoba and Lake St. Martin, approximately 8 km from the PDA (IRTC 2019a). Pinaymootang First Nation is a member of the Interlake Reserves Tribal Council (IRTC 2019a). Pinaymootang First Nation has a single reserve, Fairford 50, which is approximately 7,412 ha (CIRNAC 2019a). The registered population of Pinaymootang First Nation was 3,110 as of June 2019 (CIRNAC 2019a). Pinaymootang First Nation is governed by a Chief and six Councilors, elected under the *Indian Act* Election System (CIRNAC 2019a). Pinaymootang First Nation has a fire hall and a band office (Government of Canada 2013), as well as a health centre (Pinaymootang Health Centre n.d.). The nearest hospital is located in Ashern, approximately 50 km to the southwest.

TLRU Information

Moose and white-tailed deer are important species to Indigenous groups in the Interlake area for subsistence hunting, including Pinaymootang First Nation, who hunt in the RAA and LAA. Moose sighting near the Pinaymootang First Nation are uncommon, therefore hunting is focused on white-tail deer harvest in fall and winter (Golder and Associates 2018). A variety of upland bird and waterfowl are hunted by Pinaymootang First Nation (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Pinaymootang First Nation reported trapping in the RAA, with species including fisher, marten, muskrat, otter, rabbit, and weasel (Golder Associates 2018:13). Factors affecting trapping include fewer animals to trap, participation in the workforce, and low fur prices (Golder Associates 2018).

Pinaymootang First Nation reported that subsistence and recreational fishing occur in Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Fishing focuses on a variety of species important to the community (see Appendix 10A, Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project; Manitoba Infrastructure 2019b).

Pinaymootang First Nation engage in plant and berry gathering in the RAA and LAA. Plants and berries gathered include saskatoon berries, cranberries, chokecherries, weekey, Seneca root, and nuts (Golder Associates 2018). Pinaymootang First Nation indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

Pinaymootang First Nation visit and use cabins and campgrounds in the RAA. No Pinaymootang First Nation cabins or campsites were recorded within the Project Development Area (Golder Associates 2018).

Pinaymootang First Nation indicated the existence of grave sites and ceremonial or spiritual sites in the Project area (Golder Associates 2018). Six registered archaeological sites were identified in the Interlake region from the Provincial Archaeological Site Inventory: “Four of the sites were identified as historic period and included sites of fur trade and homestead influence; the two remaining sites were identified as Middle to Late Woodland Period (ca. 2,000 to 350 years ago) based on the stone tools and Native ceramics” (Manitoba Infrastructure 2019:4-50). Five of the six identified sites occur within Pinaymootang traditional lands, or adjacent to Pinaymootang traditional lands (Manitoba Infrastructure 2019b).

Pinaymootang First Nation reported important trails or access routes in the Project area, including a snowmobile trail used to access Lake St. Martin fishing areas (Golder Associates 2018). The recent Lake St. Martin Access Road Project has caused concern for Pinaymootang First Nation regarding the road’s location, whether or not it will be gated, and if there will be impacts to road maintenance (Manitoba Infrastructure 2019a).

O-Chi-Chak-Ko-Sipi First Nation

Overview

O-Chi-Chak-Ko-Sipi First Nation No. 279 (CIRNAC 2019a) is a Treaty 2 Nation located on Crane River Reserve 51, approximately 40 km from the PDA. O-Chi-Chak-Ko-Sipi First Nation has one reserve, Crane River 51, that is 3522.5 ha in size (CIRNAC 2019a). As of June 2019, the registered population was 1,196 (CIRNAC 2019a). O-Chi-Chak-Ko-Sipi First Nation elects a Chief and three Councilors under the *Indian Act* Election System (CIRNAC 2019a). O-Chi-Chak-Ko-Sipi First Nation operates a Kindergarten-to-Grade-8 school and a daycare and offers employment and training services to band members (OCCFN 2019).

TLRU Information

O-Chi-Chak-Ko-Sipi First Nation indicated that the flooding of Lake St. Martin has resulted in impacts to the harvest of medicinal herbs and plants (Manitoba Infrastructure 2018b).

Berens River First Nation

Overview

Berens River First Nation No. 266 (CIRNAC 2019a) is a Treaty 5 Anishinabe Nation located on the eastern shore of Lake Winnipeg near the mouth of the Berens River approximately 73 km from the PDA. As of June 2019, Berens River First Nation had a registered population of 3,514 (CIRNAC 2019a). Berens River First Nation is comprised of two reserves, Berens River 13 which is 2,546.9 ha in size, and Pigeon River 13A which is 344.8 ha in size (CIRNAC 2019a). Berens River First Nation is a member of the Southeast Resource Development Council Corp, which represents eight First Nation members in

southeastern Manitoba and promotes economic development and capacity building (SERDC 2019). Berens River First Nation is governed by a Chief and five Councilors under an *Indian Act* Election System (CIRNAC 2019a). Geographically isolated, the community was only accessible by air until the completion of an all-weather road in 2017. Facilities on the reserve include a band office, day care, nursing station, Northern Store, Berens River School, and Berens River Log Inn (SERDC 2019).

TLRU Information

For the environmental assessment for the Manitoba Floodway and East Side Road Authority (2014), Berens River First Nation reported that the east side of Lake Winnipeg had been used for traditional activities including travel routes, fishing, hunting, trapping, camping, plant harvesting, timber harvest for firewood, and sacred/ceremonial places (CEA Agency 2017). Hunting was acknowledged to be an important activity for Indigenous groups in this area including Berens River First Nation. The area described is borders the eastern shores of Lake Winnipeg included in the Project RAA.

A description of fishing locations used by the Berens River First Nation was provided by CEA Agency (2017). In addition to Lake Winnipeg, reaches of the Berens, Etomami and North Etomami rivers were noted to be important fishing areas for Berens River First Nation (CEA Agency 2017).

Berens River First Nation harvests berries, plants and wild rice along the Berens River and several other areas in the vicinity of the reserve.

Black River First Nation

Overview

Black River First Nation No. 260 (CIRNAC 2019a) is a Treaty 5 Anishinabe Nation located on the eastern shore of Lake Winnipeg at the confluence of the O'Hanley and Black Rivers, approximately 162 km from the PDA. As of June 2019, Black River First Nation had a registered population of 1,432 (CIRNAC 2019a), Black River First Nation is a member of the Southeast Resource Development Council Corp (SERDC 2019). Black River First Nation has one reserve with an area of 809.3 ha and is accessible year-round by a paved road (CIRNAC 2019a; SERDC 2019). Black River First Nation is governed by a Chief and three Councillors who are elected under the *First Nations Elections Act* System (CIRNAC 2019a). As of 2019, 985 members reside on-reserve. Black River First Nation members are involved in a range of economic activities such as trapping, agricultural development, wild rice harvesting, hunting and commercial fishing. Facilities on the reserve include a nursery-to-Grade-9 school, water treatment facility, window plant, truss plant, and general store (Black River First Nation 2009; SERDC 2019).

TLRU Information

Hunting and trapping remain an important subsistence and cultural activity for the Black River First Nation (MMTP 2015). The health and abundance of wildlife is critical for the culture and way of life of Black River First Nation (MMTP 2015). The presence of highway and road activity has been noted by Black River First Nation as having a negative effect on the vegetation which wildlife relies upon (MMTP 2015). Black

River First Nation report that hunting has been negatively affected by clear cutting, farming and gas lines, oil pipeline, railways, highways, power lines, and wind farms (Manitoba Hydro 2015b).

Black River First Nation use many different plants for traditional medicines. Berries and other plants are gathered by Black River First Nation, including but not limited to, wild rice and weekey (also known as sweet flag; MMTP 2015).

Bloodvein First Nation

Overview

Bloodvein First Nation No. 267 (CIRNAC 2019a) is a Treaty 5 Anishinabe Nation located on the eastern shore of Lake Winnipeg, directly north of the Bloodvein River, approximately 83 km from the PDA. As of June 2019, the community had a registered population of 1,902 (CIRNAC 2019a), Bloodvein First Nation holds membership in the Southeast Resource Development Council Corporation, which represents eight First Nation members in southeastern Manitoba and promotes economic development and capacity building (SERDC 2019). Bloodvein First Nation's Reserve encompasses an area of 1,625.2 ha (CIRNAC 2019a). The community is accessible by air year-round via a gravel airstrip. In the summer months, the community can also be accessed by a ferry/barge system. On-reserve facilities include a band office, a Kindergarten-to-Grade-9 School, Health Centre, arena, and RCMP Detachment (SERDC 2019). Bloodvein First Nation is governed by a Chief and four Councilors who are elected under the *Indian Act* Election System (CIRNAC 2019a).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Bloodvein First Nation. Further engagement may provide information on interactions between Bloodvein First Nation's TLRU and the Project, if any.

Brokenhead Ojibway Nation

Overview

Brokenhead Ojibway Nation No. 261 (CIRNAC 2019a) is a Treaty 1 Anishinabe Nation located on the southern shores of Lake Winnipeg, approximately 167 km from the PDA. As of June 2019, Brokenhead Ojibway Nation had a population of 2,107 members, of which 794 community members lived on-reserve (CIRNAC 2019a). Brokenhead Ojibway Nation is comprised of three reserves, Birch Landing (272 ha), Na-Sha-Ke-Penais (3 ha) and Brokenhead 4 (5,412.8 ha). The main reserve is Brokenhead 4, which is accessible by an all-weather road PR 59 (SERDC 2019). Brokenhead Ojibway Nation is governed by a Chief and four Councillors who are elected under the *Indian Act* Election System (CIRNAC 2019a; SERDC 2019). Brokenhead Ojibway Nation is a member of the Southeast Resource Development Council Corporation, which represents eight First Nation members in southeastern Manitoba and promotes economic development and capacity building (SERDC 2019). On-reserve facilities include a

band office, Kindergarten-to-Grade-9 school, recreational centre, daycare, and health centre (CIRNAC 2019a).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Brokenhead Ojibway Nation. Further engagement may provide information on interactions between Brokenhead Ojibway Nation's TLRU and the Project, if any.

Hollow Water First Nation

Overview

Hollow Water First Nation No. 263 (CIRNAC 2019a) is a Treaty 5 Anishinabe Nation located on the eastern shores of Lake Winnipeg, approximately 134 km from the PDA. Hollow Water First Nation is a member of the Southeast Resource Development Council Corporation, which represents eight First Nation members in southeastern Manitoba and promotes economic development and capacity building (SERDC 2019). As of June 2019, Hollow Water First Nation had a population of 2,019 (CIRNAC 2019a), of which 1,049 members live on-reserve. Hollow Water First Nation has one reserve (Reserve Hole or Hollow Water 10), which encompasses an area of 1,622.9 ha. Hollow Water First Nation is accessible by an all-weather road (SERDC 2019). Hollow Water First Nation is governed by a Chief and four Councilors who are elected under the *Indian Act* Election System (CIRNAC 2019a). Facilities on the reserve include a band office, health centre, water treatment plant, daycare, and fueling station (SERDC 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Hollow Water First Nation. Further engagement may provide information on interactions between Hollow Water First Nation's TLRU and the Project, if any.

Misipawistik Cree Nation

Overview

Misipawistik Cree Nation No. 310 (CIRNAC 2019a) is a Treaty 5 Cree Nation located near Grand Rapids, approximately 157 km from the PDA. It is accessible from PTH 6. As of June 2019, Misipawistik Cree Nation had a registered population of 2,131 persons (CIRNAC 2019a). Misipawistik Cree Nation has two reserves, Grand Rapids 33 and Masikiskahk Indian Reserve, that comprise approximately 1,873 ha (CIRNAC 2019a). As of April 2019, Misipawistik Cree Nation had a registered population of 2,131 persons (CIRNAC 2019a). Governance is provided by a custom electoral system, and is comprised of a Chief and 3 Councillors, elected under the Misipawistik Cree Nation Election Policy (Misipawistik Cree Nation 2018). Education needs are managed by Frontier School Division, with N-12 students attending Grand Rapids School (Misipawistik Cree Nation 2018). The Misipawistik Cree Nation Health Authority is based in Grand Rapids and has provided programs such as the Misipawistik Wechetowin Healing Project,

aimed at community healing and trust building (Aboriginal Health Foundation 2019). Misipawistik Cree Nation is home to a number of services and businesses, including a grocery store, an internet provider, two gas bars, a highway rest stop and restaurant, and a credit union (Misipawistik Cree Nation 2018). Misipawistik Cree Nation is also involved in several business ventures and partnerships, including Aseneskak Casino, Tipi Insurance, Swampy Cree Holdings and Nisokapawino Forestry Management Corporation (Misipawistik Cree Nation 2018).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Misipawistik Cree Nation. Further engagement may provide information on interactions between Misipawistik Cree Nation's TLRU and the Project, if any.

Poplar River First Nation

Overview

Poplar River First Nation No. 277 (CIRNAC 2019a) is a Treaty 5 Ojibway (Anishinabe) First Nation located on the east side of Lake Winnipeg, at the mouth of the Poplar River, approximately 125 km from the PDA. Poplar River First Nation has a single reserve, Poplar River 16, which is 1,537.8 ha in size (CIRNAC 2019a). There is no permanent access to Poplar River First Nation; a winter road exists, and charter flights and barges make the journey (SERDC 2019). As of June 2019, the registered population of Poplar River First Nation is 1,930 (CIRNAC 2019a). Poplar River First Nation is governed by a Chief and 6 Councilors, under the *Indian Act* (CIRNAC 2019a; SERDC 2019). Poplar River First Nation is home to several commercial services and businesses, including restaurants, an airport, education and daycare facilities, and grocery and hardware stores. Poplar River First Nation is also a member of the Southeast Resources Development Council Corporation, which provides education, health, financial, and community services to its membership (SERDC 2019).

TLRU Information

For the environmental assessment for the Manitoba Floodway & East Side Road Authority (2014), Poplar River First Nation reported that the east side of Lake Winnipeg had been used for traditional activities including travel routes, fishing, hunting, trapping, camping, plant harvesting, timber harvest for firewood, and sacred/ceremonial places (CEA Agency 2017). Hunting was acknowledged to be an important activity for Indigenous groups in this area including Poplar River First Nation. The area described is distant from the Project LAA though it borders the east-side shores of Lake Winnipeg included in the RAA.

A description of fishing locations used by Poplar River First Nation was provided by CEA Agency (2017). In addition to Lake Winnipeg, the Poplar River and Weaver Lake were noted to be important fishing areas for Poplar River First Nation (CEA Agency 2017).

Poplar River First Nation harvests berries, plants, and wild rice in local creeks and muskeg areas in the vicinity of the community (CEA Agency 2017).

Norway House Cree Nation

Overview

Norway House Cree Nation No. 278 (CIRNAC 2019a) is a Treaty 5 Cree Nation located at the confluence of Nelson River and Lake Winnipeg, approximately 212 km from the PDA. The community can be accessed by PR #373 and PR #6 (Norway House 2010). Norway House Cree Nation are located on more than six dozen reserves comprising over 27,000 ha (CIRNAC 2019a). The largest of these, Norway House 17, had a 2016 population of 4,927 persons (Statistics Canada 2016). As of June 2019, Norway House Cree Nation had a registered population of 8,349 persons (CIRNAC 2019a). Norway House Cree Nation utilizes a custom electoral system, with a Chief and 6 Councillors (CIRNAC 2019a). Economic activities include commercial fishing and trapping, and Norway House Cree Nation is home to a hospital, personal care home, education facilities, including post-secondary, public works facilities, and businesses. Services include a pharmacy, dental clinic, shopping mall, and recreation centre (Norway House Cree Nation 2019). Under the 1997 Manitoba TLE Framework Agreement (MFA 1997), Norway House Cree Nation has an active Treaty Land Entitlement, with a total of 104,784 acres. As of 2017, 42,045.6 acres had been converted to Reserve (CIRNAC 2019a). Norway House Cree Nation co-manages natural resources in its traditional territory through membership in a Resource Management Board (Government of Manitoba 2019).

TLRU Information

Information on traditional land use was not located; however, Norway House Cree Nation has expressed concerns that Lake Winnipeg has changed over time with more sediments, increased turbidity, blue green algae and invasive species. Residents suspect that additional channel projects may aggravate these changes and affect water supply for Norway House Cree Nation (Manitoba Infrastructure 2018b).

Sandy Bay First Nation

Overview

Sandy Bay First Nation No. 283 (CIRNAC 2019a) is a Treaty 1 Ojibway Nation situated on Reserve No. 5, located along the western shore of Lake Manitoba, approximately 76 km from the PDA which covers an area of 6659.60 ha (CIRNAC 2019a). As of June 2019, the registered population was 6,830 (CIRNAC 2019a). 80% of Sandy Bay First Nation's population identify as Ojibway language speakers (Sandy Bay First Nation n.d.). Sandy Bay First Nation is governed by a Chief and four Councilors elected according to the *Indian Act* Election System and is a member of the Dakota Ojibway Tribal Council, which offers First Nation members capacity-building programs in finance, education, housing, child and family services, and social development (CIRNAC 2019a; Dakota Ojibway Tribal Council 2017). Sandy Bay First Nation provides social services, a radio station, civic services, learning and health centers, a nursing centre, a

fire hall and police service, employment training, a gas bar, and child and family services (Sandy Bay First Nation n.d.).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Sandy Bay First Nation. Further engagement may provide information on interactions between Sandy Bay First Nation's TLRU and the Project, if any.

Sagkeeng First Nation

Overview

Sagkeeng First Nation No. 262 (CIRNAC 2019a), also known as Fort Alexander, is a Treaty 1 Anishinabe Nation located adjacent the town of Pine Falls, approximately 169 km from the PDA. Sagkeeng First Nation is also a member of the Ojibway "Grand Council of Treaty #3" (MMTP 2015). As of June 2019, the registered population of Sagkeeng First Nation was 8,034 (CIRNAC 2019a). Sagkeeng First Nation has a single reserve, Fort Alexander Indian Reserve #3, located along both shores of the Winnipeg River (Sagkeeng First Nation n.d.) with a size of approximately 8,770 ha (CIRNAC 2019a). Sagkeeng First Nation utilizes a custom electoral system, and community members are governed by an elected Chief and 6 Councillors (Sagkeeng Anicinabe n.d.). Sagkeeng First Nation provides a number of health, education, and financial services to its community members (Sagkeeng Anicinabe n.d.).

TLRU Information

Sagkeeng First Nation reports that hunting takes place between Lake Winnipeg and Nopiming Provincial Park, extending further south of the Piney area as well. A small area south of Selkirk in and around Birds Hill Park is also utilized (Sagkeeng O-Pimatiziiwin 2 2016).

Sagkeeng First Nation stated that medicinal plant gathering occurs at several sites east and southeast of Winnipeg (Sagkeeng O-Pimatiziiwin 2 2016). Sagkeeng First Nation note that development increasingly has impacts on the harvesting of traditional plants and medicines (Sagkeeng O-Pimatiziiwin 2 2016). For Sagkeeng First Nation, there is a natural interdependence among all things, and members are increasingly forced to find other places for harvesting, due to continued species decline in other areas. (MMTP 2015). Sagkeeng First Nation is also reluctant to disclose information about traditional medicines due to the risk of others appropriating traditional medicines and plants used by traditional healers (MMTP 2015). Members prefer that plants harvested for medicines not be identified by name because of concerns that identifying plant species will result in harvesting by others and a depletion of scarce resources used by First Nations. Sagkeeng First Nation members believe that development is increasingly making it more difficult to find healthy plant life (MMTP 2015).

Sagkeeng First Nation are connected to their physical environment in ways that value the experience of life, land, and water over the generation of profit (MMTP 2015). Members who use lands for ceremony or for harvesting of medicines expressed reluctance to identify specific sites. Consequently, mapping of

ceremonial sites or traditional medicine harvesting locations will not be shared (MMTP 2015). Sagkeeng First Nation are concerned about disclosing the nature of ceremonial and traditional practice to those outside the immediate community, and as a result, several community members have chosen not to participate in interviews or mapping sessions associated with previous projects (MMTP 2015).

Sagkeeng First Nation have an attachment to their traditional lands and waterways and believe that these lands and waters are key to sustaining the Sagkeeng First Nation way of life (MMTP 2015). Water is described by Sagkeeng First Nation as important for the sustenance of life and essential to traditional practices and beliefs (MMTP 2015). Sagkeeng First Nation are dependent on traditional lands and resources and feel a responsibility to care for the lands and waterways (MMTP 2015).

Skownan First Nation

Overview

Skownan First Nation No. 281 (CIRNAC 2019a) is a Treaty 2 Ojibway Nation located North of Lake Manitoba and on the Southwest bank of Waterhen Lake, approximately 85 km from the PDA (StatsCan 2016). Skownan First Nation is accessible year-round by PTH 276 (CIRNAC 2019a). As of April 2019, the registered population of Skownan First Nation was 1,540 people (CIRNAC 2019a). Skownan First Nation has one reserve, Waterhen 45 (1865.7 ha), located approximately 288 km Northwest of Winnipeg (CIRNAC 2019a). As of June 2019, Skownan First Nation's registered population was 1,550 people (CIRNAC 2019a). Governance of the community is provided by a Chief and four Councilors, elected every four years under the Skownan First Nation Band Custom Election Code (Skownan First Nation 2019). Skownan First Nation is a member of the West Region Tribal Council (CIRNAC 2019a). The Skownan Development Corporation, overseen by an elected board of directors, operates within Skownan First Nation and acts to create economic and business initiatives and employment opportunities that support self-reliance (Skownan First Nation 2019). Skownan First Nation has a Pre-K-to-9 school as well as a health center (Skownan First Nation 2019). Other businesses and services include a fire hall, water utility, an outfitting company, and a local radio station (Skownan First Nation 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Skownan First Nation. Further engagement may provide information on interactions between Skownan First Nation's TLRU and the Project, if any.

Aghaming Northern Affairs Community

Overview

Aghaming Northern Affairs Community is a settlement (as defined under the *Northern Affairs Act*) located on the eastern shore of Lake Winnipeg, approximately 138 km from the PDA. As of 2011, it had a population of 15 (Northern Association of Community Councils 2019). It lies in a 16 km2 area shared by Wanipigow, Seymourville, and Manigotagan, and as of May 2016, had 6 housing units (Government of

Manitoba 2016a). Governance is provided by a contact person (Government of Manitoba 2016a). Police and medical services are located in Powerview-Pine Falls, approximately 80 km south (Government of Manitoba 2016a). Aghaming Northern Affairs Community has a small recreational facility, while education services are located in Wanipigow (Government of Manitoba 2016a). Manigotagan provides accommodation services in the form of a motel (Government of Manitoba 2016a).

TLRU Information

The Indigenous engagement program efforts to date and publicly available literature have not revealed information on TLRU for Aghaming Northern Affairs Community. Further engagement may provide information on interactions between Aghaming Northern Affairs Community's TLRU and the Project, if any.

Berens River Northern Affairs Community

Overview

Berens River Northern Affairs Community, recognized under the *Northern Affairs Act* in 1970, is located on the eastern shore of Lake Winnipeg, and lies approximately 75 km from the PDA. The community is not accessible year-round and relies on a winter road as well as air and barge transport for access (Government of Manitoba 2016b). According to Statistics Canada, as of 2016 there were 46 persons residing in 28 housing units at Berens River Northern Affairs Community (Statistics Canada 2016). Berens River Northern Affairs Community has a Mayor and two Councilors, as well as other community personnel (Northern Association of Community Councils 2019). Fire services are absent in the community, with police services accessible through Selkirk RCMP, located some 240 km south, and medical services available through the federal nursing station located on the adjacent Berens River First Nation reserve (Government of Manitoba 2016b). Berens River Northern Affairs Community has several local services, including a nursing station, an airstrip, an arena, two eating and lodging facilities, a grocery store, a building supply store, and community hall (Government of Manitoba 2016b). Education services are provided by Frontier School Division, which operates the N-9 Berens River School, located on the adjacent Berens River First Nation reserve (Government of Manitoba 2016b).

TLRU Information

For the environmental assessment for the Manitoba Floodway & East Side Road Authority (2014), Berens River Northern Affairs Community reported that the east side of Lake Winnipeg had been used for traditional activities including travel routes, fishing, hunting, trapping, camping, plant harvesting, timber harvest for firewood, and sacred/ceremonial places (CEA Agency 2017). Hunting was acknowledged to be an important activity for Indigenous groups in this area including Berens River Northern Affairs Community. The area described is outside the Project Development Area, although it borders the eastern shores of Lake Winnipeg included in the RAA.

Lake Winnipeg is a preferred fishing location used by Berens River Northern Affairs Community (CEA Agency 2017).

Fisher Bay Northern Affairs Community

Overview

Fisher Bay Northern Affairs Community lies on the western shore of Lake Winnipeg, approximately 55 km from the PDA. Under the *Northern Affairs Act*, it is presided over by a Mayor and two Councilors, and also retains a Community Administrative Officer (Northern Association of Community Councils 2019). As of 2011, the recorded population was 35 persons, distributed among 16 housing units (Government of Manitoba 2016d). The local economy is reliant on commercial fishing, with trapping and logging also contributing (Government of Manitoba 2016d). Local services are limited to a mechanical field-service company and recreation facilities (Government of Manitoba 2016d). The Frontier School Division busses students to a K-12 school located on the adjacent Fisher Bay Cree Nation reserve (Government of Manitoba 2016d). Fire services are also provided by adjacent Fisher River Cree Nation, while policing services are available from Fisher Branch, approximately 60 km south. The nearest hospital is in Hodgson, approximately 45 km south.

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Fisher Bay Northern Affairs Community. Further engagement may provide information on interactions between Fisher Bay Northern Affairs Community's TLRU and the Project, if any.

Loon Straits Northern Affairs Community

Overview

Loon Straits Northern Affairs Community is located on Lake Winnipeg's eastern shore, approximately 99 km from the PDA. It is a defined as a settlement under the *Northern Affairs Act*, and access to the community is by seasonal roads, boats, and aircraft (Government of Manitoba 2016e). The community retains a contact person but no other governance (Northern Association of Community Councils 2019). According to the 2016 Canadian Census, the population of Loon Straits was 10, with 27 private dwellings (Statistics Canada 2016). The local economy is mostly comprised of commercial fishing and trapping (Government of Manitoba 2016e). Local fire-fighting services are limited to portable equipment, while police support is based in Selkirk, approximately 215 km south (Government of Manitoba 2016e). Local medical support is limited to basic First Aid, and community services are limited to a small, summer-use non-licensed airstrip (Government of Manitoba 2016e).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Loon Straits Northern Affairs Community. Further engagement may provide information on interactions between Loon Straits Northern Affairs Community's TLRU and the Project, if any.

Manigotagan Northern Affairs Community

Overview

Manigotagan Northern Affairs Community is situated on the east shore of Lake Winnipeg, approximately 137 km from the PDA. It is accessible by PR 304 (Government of Manitoba 2016f). Under the *Northern Affairs Act*, Manigotagan Northern Affairs Community is represented by a Mayor and four Councillors, as well as other community representatives (Northern Association of Community Councils 2019). Manigotagan Northern Affairs Community has a diverse economy, with forestry, logging, commercial fishing, trapping, hunting, wild rice gathering, and tourism all represented (Government of Manitoba 2016f). As of 2011, the population for Manigotagan Northern Affairs Community was 213, with 83 housing units (Government of Manitoba 2016f). Local emergency services consist of fire response, with police and medical based in Powerview-Pine Falls, approximately 70 km to the south (Government of Manitoba 2016f). Local recreation facilities include a baseball field, curling rink, and community hall. Educational services are provided by Frontier School Division, with students attending Wanipigow School on the Hollow Water Reserve (Government of Manitoba 2016f). Local businesses are focused on logging and mechanical operations (Government of Manitoba 2016f).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Manigotagan Northern Affairs Community. Further engagement may provide information on interactions between Manigotagan Northern Affairs Community's TLRU and the Project, if any.

Matheson Island Northern Affairs Community

Overview

Matheson Island Northern Affairs Community is located on an island situated near the Narrows on Lake Winnipeg, approximately 68 km from the PDA. The community was recognized under the *Northern Affairs Act* in 1969 and is accessible by ferry and by PR 234 and PTH 8 (Government of Manitoba 2016g). Matheson Island Northern Affairs Community is governed by a Mayor and 4 Councilors, and employs a community administrative officer, volunteer fire chief, and two public works personnel (Government of Manitoba 2016g; Northern Association of Community Councils 2019). As of 2011, the population of Matheson Island Northern Affairs Community was 103, with 69 housing units (Government of Manitoba 2016g). Educational services are provided by Frontier School Division, which operates the Matheson

Island School (Government of Manitoba 2016g). The community has local fire response capability, with police and medical services located in Arborg, approximately 130 km south. Local services include an airstrip, two ferries, recreational facilities, a fish plant, and bakery (Government of Manitoba 2016g). Matheson Island Northern Affairs Community is also home to Matheson Island Marketing Co-op, focused on commercial fishing.

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Matheson Island Northern Affairs Community. Further engagement may provide information on interactions between Matheson Island Northern Affairs Community's TLRU and the Project, if any.

Pine Dock Northern Affairs Community

Overview

Pine Dock Northern Affairs Community is in the Narrows region, along the western shore of Lake Winnipeg, approximately 80 km from the PDA. Recognized under the *Northern Affairs Act* in 1972, Pine Dock is accessible by PR 234 and PTH 8 (Government of Manitoba 2016h). As of 2011, Pine Dock Northern Affairs Community had a registered population of 50 persons and 50 housing units and is served by a Mayor and 4 Councilors (Northern Association of Community Councils 2019). Pine Dock Northern Affairs Community also has a community council and staff (Northern Association of Community Councils 2019). Pine Dock Northern Affairs Community offers recreational services, including a baseball field, community hall, and outdoor rink (Government of Manitoba 2016h). Pine Dock Northern Affairs Community has its own fire truck, and police and medical services can be accessed in Arborg, approximately 110 km to the southwest. A local resort provides meal and accommodation services (Government of Manitoba 2016h).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Pine Dock Northern Affairs Community. Further engagement may provide information on interactions between Pine Dock Northern Affairs Community's TLRU and the Project, if any.

Princess Harbour Northern Affairs Community

Overview

Princess Harbour Northern Affairs Community is located on a peninsula of the eastern shore of Lake Winnipeg, approximately 71 km from the PDA. Recognized in 1972 under the *Northern Affairs Act*, the settlement is not easily accessible, as there is no permanent road, and air and ferry services were halted in 2015 (Government of Manitoba 2016i). Princess Harbour Northern Affairs Community representation

occurs through a contact person, and the 2011 population was 10, with 6 housing units (Government of Manitoba 2016i). Police and medical services are accessible at the Bloodvein Reserve, approximately 17 km southeast. Local services include a bed and breakfast and freight company (Government of Manitoba 2016i).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Princess Harbour Northern Affairs Community. Further engagement may provide information on interactions between Princess Harbour Northern Affairs Community's TLRU and the Project, if any.

Seymourville Northern Affairs Community

Overview

Seymourville Northern Affairs Community incorporated in 2004 under the *Northern Affairs Act* (Government of Manitoba 2016k) and is one of a group of five incorporated communities located in Wanipigow, MB, approximately 134 km from the PDA. As of 2016, Seymourville Northern Affairs Community had a population of 118 persons, with 37 housing units (Government of Manitoba 2016k). Seymourville Northern Affairs Community is governed by a Mayor and 4 Councillors (Northern Association of Community Councils 2019). Seymourville Northern Affairs Community personnel include a public works person and volunteer fire chief (Government of Manitoba 2016k). Seymourville Northern Affairs Community has a small fire-fighting vehicle, with police services accessible and comprehensive medical services in Pine Falls, approximately 85 km south. Educational services are provided by Wanipigow School (Government of Manitoba 2016k). Local recreation facilities include baseball diamond, recreation building, and outdoor rink, with local business services including a fish-packing plant and general repair (Government of Manitoba 2016k).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Seymourville Northern Affairs Community. Further engagement may provide information on interactions between Seymourville Northern Affairs Community's TLRU and the Project, if any.

Fox Lake Cree Nation

Overview

Fox Lake Cree Nation No. 305 (CIRNAC 2019a) is a Treaty 5 Cree Nation located near Gillam, Manitoba, and located approximately 425 km from the PDA (KTC 2019). Fox Lake Cree Nation is one of two Bands established from the main body of York Factory First Nation (KTC 2019). Formerly known as the Gillam Band, Fox Lake Cree Nation was renamed in 1947 (Fox Lake Cree Nation n.d.). As of June 2019, the

registered population of Fox Lake Cree Nation was 1,280 (CIRNAC 2019a). Fox Lake Cree Nation has four reserves, Fox Lake 1 (561.7 ha), Fox Lake 2 (39.5 ha), Fox Lake West 3 (1138.8 ha), and A Kwis Ki Mahka Indian Reserve (1.3 ha) (CIRNAC 2019a). Fox Lake Cree Nation is a member of the Keewatin Tribal Council, an economic, education, and finance development council that represents eleven member Reserves in Northern Manitoba (KTC 2019). Governance occurs under an *Indian Act* custom electoral system, which includes a Chief and two Councilors (CIRNAC 2019a). As a result of the 1997 Manitoba TLE Framework Agreement, Fox Lake Cree Nation has an active Treaty Land Entitlement and is entitled to 26,391 acres of land (CIRNAC 2019a). Fox Lake Cree Nation co-manages natural resources in its traditional territory through membership in a Resource Management Board (Government of Manitoba 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Fox Lake Cree Nation. Further engagement may provide information on interactions between Fox lake Cree Nation's TLRU and the Project, if any.

Norway House Northern Affairs Community

Overview

Norway House Northern Affairs Community is located on the east channel of the Nelson River, approximately 30 km north of Lake Winnipeg, and approximately 218 km from the PDA. Recognized under the *Northern Affairs Act* in 1970, it is serviced by PR 373 and PTH 6 (Government of Manitoba 2016j). As of 2011, the population was 461 persons with 203 housing units (Government of Manitoba 2016j). Governance is provided by a Mayor and 6 Councilors and the community employs several permanent and seasonal personnel (Government of Manitoba 2016j). Norway House Northern Affairs Community has its own fire hall and police detachment, with medical services available on the adjacent Norway House Cree Nation Reserve (Government of Manitoba 2016j). Economic drivers are primarily commercial fishing and trapping, along with wild rice planting and transportation services (Government of Manitoba 2016j). Norway House Northern Affairs Community is also home to a local radio station, an annual fishing derby, and the annual York Boat Days (Norway House 2010). Norway House Northern Affairs Community has a number of services, including an airstrip, ferry services, and recreation facilities. Educational services are provided by Frontier School Division, which operates two schools in Norway House Northern Affairs Community: N-6 Jack River School and N-12 Helen Betty Osborne Ininiw Education Resource Centre (Government of Manitoba 2016j). Local businesses include restaurants, equipment rentals, a gas bar, and a pharmacy (Government of Manitoba 2016j).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Norway House Northern Affairs Community. Further engagement may provide

information on interactions between Norway House Northern Affairs Community's TLRU and the Project, if any.

Keeseekoowenin Ojibway Nation

Overview

Keeseekoowenin Ojibway Nation No. 286 (CIRNAC 2019a) is a Treaty 2 Ojibway (Anishinabe) Nation located near Elphinstone, Manitoba, approximately 119 km from the PDA. Keeseekoowenin Ojibway Nation has three reserves. Keeseekoowenin 61, the largest of these, is 2121.8 ha in size, while Clear Lake 61A is 428.5 ha in size, and Bottle Lake 61B is 40.5 ha in size, respectively (CIRNAC 2019a). As of June 2019, Keeseekoowenin Ojibway Nation had a registered population of 1,297 (CIRNAC 2019a). Keeseekoowenin Ojibway Nation is a member of the West Region Tribal Council, an advisory council representing eight First Nations that focuses on governance, education, social development, fire safety, and housing (211 Manitoba n.d.). Governance for Keeseekoowenin Ojibway Nation is provided by a Chief and four Councillors (Keeseekoowenin 2017). Keeseekoowenin Ojibway Nation is a member of the Coalition of First Nations with Interests in Riding Mountain National Park (Treaty Relations Commission of Manitoba 2019a), and assists Parks Canada with wildlife surveys, bison culls, and grasslands restoration (Parks Canada 2019). Keeseekoowenin Ojibway Nation maintains a collaborative relationship with Parks Canada regarding authority and jurisdiction over IR 61A fishing station on Clear Lake (Parks Canada 2018; Treaty Relations Commission of Manitoba 2019). Education services are provided by the Keeseekoowenin Education Authority, with a K-8 school located in Elphinstone (Manitoba First Nations Education Resource Centre 2019). The Keeseekoowenin Health and Wellness Centre is also located in Elphinstone (411 Directory Assistance 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Keeseekoowenin Ojibway Nation. Further engagement may provide information on interactions between Keeseekoowenin Ojibway Nation's TLRU and the Project, if any.

Pimicikamak Okimawin (Cross Lake Band of Indians)

Overview

Pimicikamak Okimawin is a self-governed traditional council which asserts its distinction from the Cross-Lake Band. Comprised of four councils – the Women's, Elders, Youth, and Executive councils, Pimicikamak Okimawin governs by consensus (Pimicikamak n.d.). Pimicikamak Okimawin has a custom electoral system (CIRNAC 2019a), and follows a "grassroots" government, being governed by a Chief, Vice Chief, and 7 Council members (Pimicikamak n.d.). The Treaty 5 community of Pimicikamak Okimawin is located approximately 190 km south of Thompson and Nelson River, where it enters Cross Lake (Cross Lake Band 2019) and is approximately 286 km from the PDA. Pimicikamak Okimawin is accessible by PR 373. Several reserves have been set aside with Cross Lake Reserve 19D being its

most populous, comprising 5760.3 ha (CIRNAC 2019a). Four other reserves are larger than 100 ha in size, including Cross Lake 19 comprising 2375 ha, Cross Lake 19E comprising 760 ha, Cross Lake 19B comprising 741 ha, and Cross Lake 19A comprising 598.6 ha (CIRNAC 2019a). As of June 2019, Pimicikamak Okimawin had a registered population of 8,869 (CIRNAC 2019a). The Mikisew School located on Reserve 19A provides services for Grade 8-12 students, acting under the Cross Like Education Authority (Manitoba First Nations Education Resource Centre 2019). Plans to build a hospital on Pimicikamak Okimawin traditional territory are under way, and Pimicikamak Okimawin retains a nursing station facility on Reserve (Cross Lake Band Health Services 2016). Facilities include a fire department, police station, water supply and trucks, septic tanks and sewage disposal systems, daily bus transportation, radio station, and an airstrip. Pimicikamak Okimawin co-manages natural resources in its traditional territory through membership in a Resource Management Board (Government of Manitoba 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Pimicikamak Okimawin. Further engagement may provide information on interactions between Pimicikamak Okimawin's TLRU and the Project, if any.

Tataskweyak Cree Nation

Overview

Tataskweyak Cree Nation No. 306 (CIRNAC 2019a) is a Treaty 5 Nation located 479 km from the PDA. Tataskweyak Cree Nation is accessible year-round by PR 280. Tataskweyak Cree Nation has three reserves, Split Lake 171, 171A, and 171B, which comprise approximately 19,000 ha (CIRNAC 2019a). Tataskweyak Cree Nation is a member of the Keewatin Tribal Council and is governed through the *Indian Act* Election System employing a Chief and six Council members (CIRNAC 2019a). As of June 2019, Tataskweyak Cree Nation had a registered population of 3,992, of which 2,474 reside on-reserve (CIRNAC 2019a). Tataskweyak Cree Nation is remote but receives daily freight deliveries from companies such as Arctic Beverages and Old Dutch. Grey Goose Bus Lines is an important transportation provider for Tataskweyak Cree Nation (KTC 2019). Tataskweyak Cree Nation retains its own education authority, and operates the Chief Sam Cook Mahmuwee Education Centre, an N-12 school (Manitoba First Nations Education Resource Centre 2019). Facilities include gas bars, schools, a store, nursing stations, band office, hotels, food services, and hydroelectric services (Tataskweyak Cree Nation 2019). Tataskweyak Cree Nation co-manages natural resources in its traditional territory through membership in a Resource Management Board (Government of Manitoba 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for Tataskweyak Cree Nation. Further engagement may provide information on interactions between Tataskweyak Cree Nation's TLRU and the Project, if any.

Treaty 2 Organization (Anishinaabe)

Overview

Treaty 2 Organization (Anishinabe) was founded on June 12, 2018, a result of a 1998 meeting of Treaty 2 Nations. This meeting led to the birth of Anishinaabe Agowidiiwinan, the Ojibway or Chippewa communities who were present at the signing of Treaty 2 in Manitoba House in 1871 (Treaty 2 Territory 2018a). Organization members include Dauphin River First Nation, Ebb and Flow First Nation, Keeseekoowenin Ojibway First Nation, Lake Manitoba First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, O-Chi-Chak-Ko-Sipi First Nation, Pinaymootang First Nation, Skownan First Nation and Tootinaowaziibeeng First Nation (Treaty 2 Territory 2018b). The purpose of the Treaty 2 Organization is to preserve and promote the collective rights of Treaty 2 members with respect to culture, lands, language and history. All Treaty 2 Organization members hold reserves in Treaty 2 Territory, and the collective encompasses First Nation members of Treaties 1, 4, and 5, including Dakotas, Cree, and Nakota-speaking peoples, among others (Treaty 2 Territory 2018b). The Organization provides services to organizations such as the Interlake Reserves Tribal Council, West Region Tribal Council, Dakota Ojibway Tribal Council, and West Region Tribal Health (Treaty 2 Territory 2018b). Governed by a Grand Chief, the Treaty 2 Organization holds many Councils and participates in coalitions. Councils include the Grand and Governing Councils, the Elders and Ikwewak (Women) Councils, the Land, Water and Resource Council, and the Anishnaabek and Youth Councils. The Treaty 2 Organization Grand Council is comprised of all Anishinaabek from Treaty 2 Nations and meets annually. With the exception of Tootinaowaziibeeng First Nation, all the member Nations of Treaty 2 Organization are engaged on the Project.

York Factory First Nation

Overview

York Factory First Nation No. 304 (CIRNAC 2019a) is Treaty 5 Cree Nation located 477 km from the PDA. As of June 2019, York Factory First Nation had a registered population of 1,454 (CIRNAC 2019a). York Factory First Nation is a member of the Keewatin Tribal Council (KTC 2019). The reserve size is 967.4 ha, with an on-reserve population of 406 (CIRNAC 2019a). When the Hudson Bay Company closed its post at York Factory in 1957, York Factory First Nation was relocated to the southeast shore of Split Lake, to an area known as York Landing or Kawechiwasik (KHLP 2019). However, York Factory First Nation did not receive reserve status until 1989 (KTC 2019b). The reserve has no year-round road access (CIRNAC 2019a). York Factory First Nation is governed by a Custom Electoral System (CIRNAC 2019a) with a Chief and four Councillors (KTC 2019b). Under the 1997 Manitoba TLE Framework Agreement, York Factory First Nation has an active Treaty Land Entitlement, with 29,173 acres to be acquired (CIRNAC 2019a). York Factory First Nation co-manages natural resources in its traditional territory through membership in a Resource Management Board (Government of Manitoba 2019).

TLRU Information

The Indigenous engagement program to date and publicly available literature have not revealed information on TLRU for York Factory First Nation. Further engagement may provide information on interactions between York Factory First Nation's TLRU and the Project, if any.

10.2.3 Project Interactions with TLRU

Table 10.2-4 identifies, for each potential effect, the Project components and physical activities that might interact with TLRU during construction and dry operations and result in the identified environmental effect. These interactions are identified by check marks and are discussed in detail in Section 10.2.4 in the context of effects pathways, standard and Project-specific mitigation and residual effects. A justification for no effect is provided following the table.

Table 10.2-4 Project-Environment Interactions with TLRU During Construction and Operations and Maintenance

Project Components and Physical Activities	Environmental Effects			
	Change in availability of traditional resources for current use	Change in access to traditional resources and areas for current use	Change to cultural and spiritual sites or areas	Change to the cultural value or importance associated with current use of lands and resources
Construction				
Site preparation of Project components[1] (development of the PDA prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])	✓	✓	✓	✓
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	✓	✓	✓
Construction of Project components[1] (physical construction of utilities, infrastructure, and other facilities)	✓	✓	✓	✓
Quarry development (blasting and aggregate extraction used for the construction of Project components[1])	✓	✓	✓	✓

Table 10.2-4 Project-Environment Interactions with TLRU During Construction and Operations and Maintenance

Project Components and Physical Activities	Environmental Effects			
	Change in availability of traditional resources for current use	Change in access to traditional resources and areas for current use	Change to cultural and spiritual sites or areas	Change to the cultural value or importance associated with current use of lands and resources
Water development and control (dewatering and realignment of existing water works)	✓	✓	✓	✓
Reclamation	✓	✓	✓	✓
Operation and Maintenance				
Operation and maintenance of the outlet channels (normal operational conditions when the outlet channels and associated infrastructure [e.g., water control structures] are either actively conveying water or are non-operational)	✓	✓	✓	✓
Operation and maintenance of other Project components[1] (normal operations conditions associated with PR 239 and municipal road realignments, distribution line and bridges and culverts)	✓	✓	✓	✓
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	✓	✓	✓
Operation, maintenance, and reclamation of quarries	✓	✓	✓	✓

NOTES:
✓ indicates a potential interaction.
– indicates no potential interactions are expected.
[1] Components include: outlet channels, water control structures, distribution line, bridges and culverts, PR 239 and municipal road realignments, temporary construction camps and staging areas, and quarries.

A conservative approach was used to identify potential interactions between the Project and TLRU. Where there is an absence of Project-specific information, this assessment assumes that TLRU activities have the potential to occur within the RAA, even if Indigenous groups did not specifically identify these areas or uses. As such, activities with a degree of uncertainty are assumed to contribute to the environmental effect.

The data used to inform residual effects of the Project relies on information available from TK assessments (completed by Manitoba Métis Federation, Interlake Reserves Tribal Association, Fisher River Cree Nation, and Dauphin River First Nation), the literature review, Indigenous groups' comments and responses during the Indigenous engagement program throughout the assessment process (see Chapter 5), the results of other VC assessments, past project experience, and professional judgment.

Relying on the results of other VC assessments to understand effects on TLRU has limitations. First, there is often a lack of clear or complete concordance between other VCs and TLRU. For example, there may be incompatibilities in using the wildlife assessment to understand effects on hunting if the species used for the wildlife assessment do not adequately reflect traditionally harvested species. In many cases, species assessed by the vegetation, wildlife, and fish and fish Habitat VCs were selected based on their status as species of management concern, rather than their traditional use potential. Further, the assessment of effects on plant, animal, or fish species does not capture the conditions that influence the act of harvesting. As stated in the Agency guidelines (CEA Agency 2018a), the results of the biophysical and socio-economic assessments may contribute to assessment and conclusion of effects of changes to the environment on Indigenous peoples, but it remains important to note that these assessments are not undertaken from the standpoint of understanding changes to an Indigenous group's experience of being on the land. Because of this potential disconnect, Indigenous groups may identify different project interactions not considered in this assessment, and other Project interactions with TLRU may arise later. Additionally, some of the conditions that influence TLRU, such as perceived effects, are not considered in the assessment of other biophysical or socio-economic VCs.

The extrapolation of the biophysical VC assessments to the harvesting assessment may also be constrained due to differing temporal and spatial parameters. Despite a determination of no significant effect for vegetation or wildlife, harvesting could still be affected because animals have moved away from a traditional hunting area or plants have been cleared from a gathering area for a period of time that is important in relation to TLRU. Regardless of whether a plant species can be reclaimed and eventually returned to baseline condition, or whether an ungulate population will remain viable in the region, individuals may not engage in traditional harvesting or gathering practices if the Project effects on a species continue. There may be areas outside the RAA that will support continued TLRU activities; however, it is acknowledged that TLRU cannot always be readily transferred to other locations within an Indigenous group's traditional territory or occupancy area, even if harvested resources can be found elsewhere within the territory. TLRU practices and related knowledge are often rooted in specific places that have important cultural and spiritual associations, and these areas may already be subject to TLRU and harvesting pressure from other Indigenous groups.

10.2.4 Assessment of Residual Environmental Effects on TLRU

10.2.4.3 Analytical Assessment Techniques

The assessment of residual environmental effects on TLRU presents Project interactions and pathways, mitigation measures and residual effects for each potential Project effect on TLRU.

Several recommendations and mitigation measures were identified during the Indigenous engagement program with the Indigenous groups as well as requested by the Indigenous groups through TK and community reports. The mitigation measures sections list those measures proposed by Indigenous groups and present mitigation measures that would be implemented for the Project.

The analysis of residual effects on TLRU is based on information from Project-specific TK and community reports, the results of the Indigenous engagement program for the Project, the results of the literature review, the conclusions of relevant biophysical and socioeconomic assessments, and feedback on the assessment from participating Indigenous groups. Although residual effects are considered separately for each Indigenous group, Project residual effects on TLRU are summarized and presented in a single table. If residual effects are anticipated to be unique for one or more Indigenous groups those distinctions are addressed.

Current use depends on the conditions for TLRU being present, that is, that traditional resources are available to be harvested and lands are accessible including sites, such as trails, sacred areas, campsites, and harvesting areas. The assessment of residual effects considers change in the distribution, diversity and abundance of traditionally used resources, access to those resources and areas, and changes to the sites and areas themselves. Project effects on current use include the conclusions of related project assessments, the specific environmental effects related to each current use activity and potential effects identified by Indigenous groups. Indigenous groups may choose not to practice traditional activities or use traditional sites and areas near the Project, and this is also taken into account.

10.2.4.4 Change in Availability of Traditional Resources for Current Use

Project Pathways

The Project has the potential to affect the availability of resources used for traditional purposes during construction, and operation and maintenance. Construction activities include vegetation clearing, removal of existing infrastructure, channel excavation, water diversion and realignment, utility construction, road construction, bridge construction, and quarry development. Operation and maintenance activities include conveyance of water and maintenance activities. The following describes potential pathways that could affect the availability of traditional resources. The specific information presented in this section is in response to potential interactions and pathways identified by Indigenous groups during the Indigenous engagement program. Additional details regarding the nature of residual effects and their anticipated magnitude for these VCs can be found in the following sections:

- Fish: 7.2.4.2 , 7.2.4.3 , and 7.2.4.4
- Vegetation: 8.2.4.2, 8.2.4.3 , 8.2.4.4, 8.2.4.5
- Wildlife: 8.3.6.2 , 8.3.6.3 , 8.3.6.4

Change in Habitat (Wildlife, Fish)

The Project could lead to changes in habitat for traditionally used resources which support hunting, trapping, fishing, or plant gathering activities. Changes are anticipated due to direct effects such as habitat loss or alteration during construction (e.g., vegetation clearing and ground disturbance from Project construction; increased access by predators; habitat fragmentation, such as that resulting from the installation of a planned power distribution line; and introduction of invasive species) and indirect effects from sensory disturbance (e.g., noise and artificial light; or potential effects on wildlife health), during construction, and to a lesser extent during operations, which can reduce habitat quality for wildlife and fish. These potential pathways have also been identified by Indigenous groups in relation to the Project. Through the engagement program for the Project, Manitoba Métis Federation indicated that continued development could result in changes to the availability of species that harvesters could access. According to one Manitoba Métis Federation citizen, “it’s going to affect the plant life. It’s going to affect the animal life and habitat. It’s going to affect the water” (MNP LLP 2017).

Change in habitat quality for wildlife, through fragmentation, has been identified as a potential pathway by Indigenous groups on other development projects. As part of another linear Project, the Bipole III Transmission Project, Fox Lake Cree Nation was concerned that habitat fragmentation would lead to decreased availability of hunting resources (Manitoba Hydro 2011c). This effect pathway may occur within the LAA as the channel creates clearings and gaps in undisturbed habitat. However, this effect pathway is not anticipated to occur beyond the PDA within the RAA.

Pinaymootang First Nation indicated that there had been a general decline in their ability to hunt, fish, trap, and gather plants. Pinaymootang First Nation attributed these changes to past floods, water control measures, and changes in the environment (Golder Associates 2018).

During engagement activities with MI, Kinonjeoshtegon First Nation identified concerns about potential loss of wildlife due to flooding and the construction and operation of the channels (Manitoba Infrastructure 2018b).

Fisher River Cree Nation identified several potential effects of the proposed Project, including impacts to hunting and wildlife, and particularly moose populations (Fisher River Cree Nation 2018a).

Peguis First Nation indicated that the proposed permanent channels are in Peguis First Nation hunting areas and expressed concerns regarding potential impacts to wildlife as a result of channel construction and operation. These areas were affected during the 2011 flood (for additional information on Indigenous groups see Chapter 5). Through the Indigenous engagement program, concerns about wildlife and wildlife habitat were raised by several Indigenous groups, including Dauphin River Northern Affairs Community, Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Norway House Cree Nation, Kinonjeoshtegon First Nation, and Lake Manitoba First Nation (Manitoba Infrastructure 2018b). These Indigenous Groups identified a potential for loss of terrestrial and aquatic wildlife due to flooding and operation of the channels. As many of the Indigenous groups in the RAA rely on fishing for sustenance and income, the effects of the Project on fish and fish habitat were indicated to be of particular importance to many of the Indigenous groups.

Indigenous groups indicated that there have already been, and would continue to be, effects to important spawning habitat such as Bear Creek, Dauphin River, Johnson Beach and Buffalo Creek (Golder Associates 2018). These changes would, in turn affect the fishing resource, with reduction in preferred species such as walleye (pickerel), carp, and whitefish. Indigenous groups also made note of potential effects to fish spawning areas at the mouth of the Dauphin River and on Lake St. Martin (Manitoba Infrastructure 2018b). Other fish-related concerns included impacts to preferred fish stocks and species (decline in walleye, increase in carp; effects to whitefish) as a result of channel presence in Lake St. Martin and fish stranding in Reach 1 of the EOC and the potential for this to occur in the permanent outlet channels (Manitoba Infrastructure 2018b).

Change in Wildlife Movement (Wildlife, Fish)

The Project could change movement patterns of wildlife, which support fishing, hunting and trapping activities. These pathways are further described in Chapter 7 (Aquatic Environment) and Chapter 8 (Terrestrial Environment). Specifically, wildlife movement can be directly affected by Project infrastructure, through access roads and road realignments that create physical barriers or fragment migration corridors, or indirectly affected by sensory disturbance hindering terrestrial and aquatic wildlife's ability to move throughout the landscape during Project construction and operations (see Chapter 8, Section 8.3 for a more detailed discussion on wildlife movement). For example, Fisher River Cree Nation identified potential Project effects to moose and elk migration routes which would in turn affect traditional resource use (MINR 2017).

The Project could also lead to changes in the distribution and abundance of fish in Lake St. Martin and Dauphin River, which support fishing activities, through changes in fish access during construction, such as dewatering or water diversion. Fish movement and passage can also change due to modifications to the local road network such as the realignment of PR 239; and juvenile fish entrainment or attracting adult fish to move downstream from Lake Manitoba and Lake St. Martin to Lake Winnipeg. These pathways are further described in Chapter 7 (Aquatic Environment).

Change in wildlife movement through fragmentation has been identified as a potential pathway by Indigenous groups on other development projects. As part of the Bipole III Transmission Project, which involved linear corridors, Fox Lake Cree Nation was concerned that habitat fragmentation may occur (Manitoba Hydro 2011c). These concerns may be transferrable to the proposed Project as the addition of the channel may alter wildlife movement through the LAA and therefore affect Indigenous use of traditional hunting resources.

During the Indigenous engagement program there were general concerns by several Indigenous groups, including Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Kinonjeoshtegon First Nation, and Lake Manitoba First Nation, regarding the movement of fish between Lake Manitoba and the Dauphin River, which is an important migratory route used by whitefish moving to upstream spawning areas (Manitoba Infrastructure 2018b).

Change in Wildlife Health or Mortality (Wildlife, Fish)

The Project could change terrestrial and aquatic wildlife health and mortality risk due to physical changes to habitat, such as water quality changes due to sedimentation, vegetation clearing during construction and as a result of animal-vehicle collisions during construction and operation, the operation of the planned power distribution line which could results in bird strikes and electrocutions, and fish stranding due to water diversion during construction and operation. The operation of the permanent channels may also allow the introduction of invasive species into new areas. The planned power distribution line could also contribute to an increase in wildlife mortality risk due to expanded access of predators and people. These pathways are further described in Chapter 7 (Aquatic Environment) and Chapter 8 (Terrestrial Environment). Wildlife mortality and ill-health can affect the availability of wildlife, which support fishing, hunting, and trapping activities.

Aquatic wildlife mortality due to the operation of the permanent channels has been identified as a potential pathway by Indigenous groups in relation to the Project. For example, during the Indigenous engagement program, concerns about fish stranding were raised by Dauphin River Northern Affairs Community, Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Norway House Cree Nation, Kinonjeoshtegon First Nation, and Lake Manitoba First Nation (Manitoba Infrastructure 2018b).

These Indigenous groups indicated that the operation of the EOC resulted in fish stranding and fish kill, which impacted the availability of fish for sustenance fishing. There was a consensus among these Indigenous groups that fish that travel down Buffalo Creek will be constrained by construction of the permanent outlet channel, which would lead fish to becoming stranded in the channel and Big Buffalo Lake and Marsh (Manitoba Infrastructure 2018b).

Changes in water quality and invasive species have also been identified as a potential pathway to aquatic wildlife mortality by Indigenous groups during the Indigenous engagement program, including Dauphin River Northern Affairs Community, Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Norway House Cree Nation, Kinonjeoshtegon First Nation, and Lake Manitoba First Nation. There are concerns that water quality of Lake Winnipeg has already changed over time with more sediments, increased turbidity, blue green algae, and invasive species (Manitoba Infrastructure 2018b). The Indigenous engagement program identified that discharge of Lake Winnipeg flood waters through Big Buffalo Marsh and down Buffalo Creek into Dauphin River would affect water quality in Dauphin River by increasing shoreline erosion, and transportation of sediments and invasive species (Manitoba Infrastructure 2018b) and increase sediments and silt entering into Lake St. Martin and Lake Winnipeg. Kinonjeoshtegon First Nation observed the erosion of the shores of Lake Winnipeg after the 2011 flood and have noted the presence of zebra mussels (Golder Associates 2018). There was further concern from Dauphin River Northern Affairs Community, Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Norway House Cree Nation, Kinonjeoshtegon First Nation, and Lake

Manitoba First Nation that the quality of the fish that are consumed will be affected by all the material being added into the lakes and creeks (Manitoba Infrastructure 2018b).

Terrestrial wildlife mortality through increased access and fragmentation has been identified as a potential pathway by Indigenous groups. Kinonjeoshtegon First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Peguis First Nation, Pinaymootang First Nation, and Dauphin River First Nation expressed concerns that increased uncontrolled access during construction would increase hunting and predator pressure in the RAA. Increased wildlife mortality will have negative impacts on their hunting activities and success (Manitoba Infrastructure 2018b). Lake St. Martin First Nation and Peguis First Nation expressed concerns regarding hunting access issues arising from road construction.

Due to ongoing concerns about moose populations in the Project area, aerial surveys are periodically conducted in the Project area, both on behalf of Manitoba Infrastructure (January/February 2016) and MSD (annually). These aerial surveys show that moose populations in the Project area fluctuate, contributing to Ebb and Flow First Nation concerns that there are substantial pre-existing impacts to hunting in the area (Desjarlais and Malcom 2017, pers. comm.).

Change in Plant Communities and Diversity

The Project could lead to a change in landscape and species diversity. Vegetation removal and grading during channel construction and operation can change plants in the PDA permanently. Land clearing for other Project features such as construction staging areas will be temporary because these areas will be reclaimed. The installation of a power distribution line will result in modification and loss of native vegetation. Reclamation may reclaim vegetation to a different state than prior to construction. This may have effects on habitat connectivity, shade, erosion, and fragmentation for plants and lower overall community and species diversity. These pathways are further described in Chapter 8 (Terrestrial Environment).

Indigenous groups (Dauphin River First Nation and Ebb and Flow First Nation) have indicated their concern for the historical loss of traditional use plant species, including berries and other edible plant species due to flooding or other unidentified factors. Lake St. Martin First Nation indicated that the flooding of Lake St. Martin has resulted in adverse effects to the harvesting of medicinal plants and herbs (Manitoba Infrastructure 2018b). Several Indigenous groups also expressed concerns about the use of chemicals for vegetation control and the potential effects that would have on medicinal and edible plant harvesting (Manitoba Hydro 2015b).

Change in Wetland Functions (Vegetation)

The Project has the potential to alter wetland function via changes in wetland abundance, vegetation cover and structure, siltation. These effects are expected to occur during construction, starting with vegetation clearing, and extend through operations with on-going shallow ground water drainage management and water diversion. The placement of a planned power distribution line may result in wetland area losses. These changes have the potential to alter nutrient cycles, decomposition and carbon

accumulation rates, water filtration and storage, habitat, and related traditional land and resource use activities, such as fishing, hunting and trapping.

During the Indigenous engagement program for the Project, potential effects on wetland function were identified by Dauphin River Northern Affairs Community, Dauphin River First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Norway House Cree Nation, and Kinonjeoshtegon First Nation, and Lake Manitoba First Nation (Manitoba Infrastructure 2018b). These Indigenous groups identified a concern that the channel will cut off creeks and therefore affect the natural processes within Buffalo Lake Marsh (Manitoba Infrastructure 2018b).

Fisher River Cree Nation identified potential Project effects on wetlands and peatlands, including the development of roads through such lands (Fisher River Cree Nation 2018).

Mitigation

Widespread flooding across much of southern Manitoba in 2011 overwhelmed the capacity of existing waterways in the region and resulted in overland flooding that affected Indigenous groups. Effects included damaged property, and in some cases, displacement and evacuation for several years. The purpose of the Project is to develop a permanent flood control management system for Lake Manitoba and Lake St. Martin to ease these pre-existing effects while minimizing effects from the Project.

This section identifies those mitigation measures proposed by Manitoba Infrastructure to avoid or reduce potential adverse effects on the availability of resources for traditional purposes (inclusive of current use), including those proposed for potential effects on Aquatic Environment resources (Chapter 7), and Terrestrial Environment (Chapter 8). As described in Section 4.5.1.2, a critical component of the assessment is to clearly characterize the pathways of effect, so that the linkages and dependencies that contribute to the selection of VCs can be used to measure predicted changes. When this is done, there is confidence that applying mitigation to “predecessor VCs” can manage potential effects to VCs that are dependent on them. In terms of traditional use activities and Indigenous health and socioeconomic conditions, this applies to VCs such as fish and fish habitat, wildlife, vegetation, and heritage resources. Mitigation measures to avoid or reduce effects on current use take into account recommendations made by Indigenous groups, as well as mitigation measures identified by related VCs that are specific, achievable, measurable, verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation.

Key mitigation measures proposed to avoid or reduce potential adverse effects on the availability of resources for Indigenous groups include the following:

- The current Project design and routing of the channels was influenced by the Indigenous engagement process (as described in Chapter 5) to limit effects and concerns that were expressed. For example, a route was chosen to utilize the Willow Point alignment to avoid impacts to the Johnson Beach area. Similarly, a route was chosen for the LSMOC that avoided Buffalo Lake.

- Project-specific environmental management plans and monitoring programs will be developed and implemented to mitigate potential Project-related effects to wildlife.
- A schedule of construction and Project activities will be made available to all Indigenous groups and Northern Affairs Communities engaged on the Project, so that areas and time periods of activity can be avoided.
- Opportunities will be provided for interested Indigenous groups to harvest traditionally used plants prior to construction of the outlet channels.
- Vegetation control will occur through mechanical methods where feasible, and hand clearing will occur along shorelines to mitigate effects to plant harvesting. Chemical vegetation control will only be used when mechanical methods are not feasible. Where chemical control is used, the least toxic, least persistent and most target-specific pesticides pre-approved for use by Provincial legislation are preferred. The applications are targeted to the season where the pest is most susceptible to treatment, applied by trained personnel who meet provincial licensing requirements, and applied using methods and equipment designed to minimize potential for drift and overspray (Manitoba Infrastructure 2016).
- Channel inlet/outlet excavation areas associated with Project construction will be limited to their minimum areas, but changes to fish habitat will occur. The channel route was selected to minimize environmental effects, and to avoid habitat change due to realignment or dewatering of drains and headwater streams, the selected route comparatively reduces the amount of change that will occur within watershed areas.
- To address the potential for stranding and fish kill, Chapter 7 indicates that baseflow in the LSMOC will be provided year-round to allow downstream fish passage and maintain water temperatures and dissolved oxygen concentrations to sustain fish that may occupy the channel. Because the water levels will be maintained, fish will have unrestricted access to Lake Manitoba or Lake St. Martin year-round. No stranding is predicted.
- Aquatic invasive species (AIS) such as zebra mussels, the spiny water flea and rainbow smelt are of concern to resource harvesters as they can affect the availability of resources. These species are known to be present only in Lake Winnipeg and the first two listed disperse only in downstream directions (i.e., not upstream through the channel network), as they are weak swimmers and drift with the current. Other vectors of spread such as such as boats, construction equipment, and the construction workforce will increase the risk of AIS transfers to Lake St. Martin or Lake Manitoba. Although risk is never completely eliminated, provincial AIS protocols in accordance with regulations.
- Mitigation for new water crossing infrastructure on drainage networks includes the use of bridges and properly installed culverts to minimize damage to fish populations and installation during periods of lower sensitivity (e.g., fish spawning).

- Entrainment of larval fish and attraction of adult fish downstream through the LMOC and LSMOC may be reduced by a gradual ramping up the opening of the control structures to allow fish time to move away from the structures.

- Changes to flows in the Dauphin and Fairford rivers are not a component of the Project and, therefore, conditions in the rivers should not change (except for a reduction in peak flows with the Project in operation) for fish ascending the rivers to spawn further upstream. Measures are in place to reduce the risk of attracting fish to the channels so that preferred habitat can be used for spawning. Maintenance and repair of vehicles, equipment, and machinery will be carried out in designated areas located at least 100 m from the ordinary high-water mark of a waterbody, riparian area, or wetland.

- Natural revegetation will be encouraged. Disturbed lands such as in areas vulnerable to erosion and sedimentation and will be seeded and/or planted in accordance to the Revegetation Plan. The Revegetation Plan will be completed as part of the Construction Environmental Management Program (CEMP) by MI. The Revegetation Plan will identify locations and methods for restoration of vegetation cover in disturbed areas.

- Project-related traffic will be restricted to the Project ROW and associated access routes required during Project construction and operation and maintenance. Where access routes are accessible by the public, signage will be erected limiting access to authorized personnel.

- The EMP will be developed that include objectives for restoration of natural conditions, erosion protection, sediment control, non-native and invasive plant species management, and wildlife habitat restoration. To reduce the potential for wildlife to become habituated to human presence, construction and operation and maintenance personnel will not be permitted to harass or feed wildlife. Nuisance wildlife will be reported to the appropriate authorities (e.g., MSD conservation officer).

- Exclusionary flagging or fencing will be clearly identified and installed, as appropriate, around environmentally sensitive sites (e.g., dens, roosts, stick nests, hibernacula) or sensitive habitats prior to clearing and construction, and evaluate features for additional mitigation measures (e.g., setbacks). Vegetation clearing and construction activities will be limited to the ROW and not extend beyond the PDA (Chapter 8, Section 8.2).

- Maintenance and repair of vehicles, equipment, and machinery will be carried out in designated areas located at least 100 m from the ordinary high-water mark of a waterbody, riparian area, or wetland. All machinery working near waterbodies will be kept clean, free of leaks, and inspected regularly.

Recommendations Proposed by Indigenous Groups

Indigenous groups also recommended measures to reduce effects on the availability of resources for traditional purposes, through a Project-specific Indigenous engagement program and TK studies as well as for other developments in the region that are also applicable to the Project. Manitoba Infrastructure will continue to engage with Indigenous groups regarding the recommendations identified.

Black River First Nation noted that medical properties of the plants originate in the roots, and if the roots are removed by construction, plants will not regrow, or take a long time to regenerate (Manitoba Hydro 2015a), therefore the vegetation should be mown rather than dug up. While plants in the PDA will need to be removed, in sensitive areas such as shorelines and river crossings, the roots of plants will be retained, and hand clearing will be used as described in the PERs.

Manitoba Métis Federation recommended avoiding or mitigating negative effects to current use of lands and resources used for traditional purposes (Shared Value Solutions 2018). Manitoba Métis Federation also recommended on-going monitoring of natural revegetation in the Buffalo Creek area (Shared Value Solutions 2018).

Fisher River Cree Nation made several recommendations regarding wildlife, including providing an assessment of potential Project impacts to moose populations and other wildlife; undertaking the development and implementation of mitigations as needed; addressing the effects on moose migration due to Project impacts; and protecting wetlands from drainage and construction-related impacts (Fisher River Cree Nation 2018a).

Project Residual Effects

The purpose of the Project is to reduce existing effects created by periodic flooding; however, the Project will also create effects. Following the implementation of mitigation measures, residual effects on availability of lands and resources currently used for traditional purposes are likely to occur during construction and operation of the Project.

An indirect loss or alteration of wildlife habitat is expected through sensory disturbance and fragmentation which can result in changes to hunting and trapping in within the LAA. As noted by Fisher River Cree Nation, Dauphin River First Nation, and the Misipawistik Cree Nation, moose, deer and elk are hunted in the LAA and may be subject to disturbances (e.g., noise, dust) from Project construction. In turn, these animals may move away from such disturbances, increasing the effort required to achieve a successful hunt. Sensory disturbance emitted during construction is expected to cease immediately following the conclusion of construction and reclamation activities.

Fragmentation effects potentially resulting in reduced habitat effectiveness are expected to persist beyond construction but be minimal along the LMOC, as it is situated in a fragmented landscape subject to a relatively high degree of existing anthropogenic disturbance (e.g., residences, agricultural activity, roads). Project residual effects on traditionally harvested wildlife species can be calculated using PDA calculations of the amount of permanent and temporary losses to wildlife habitats. With mitigation, hard or abrupt edges formed during clearing of the PDA will eventually be ‘softened’ as transitional vegetation (e.g., forbs, shrubs, young trees) re-establishes along the ROW edges. Although the LSMOC traverses relatively contiguous habitat, similar edge effects are expected along the ROW due to the existing mosaic of natural edge habitat (i.e., open fen adjacent to deciduous and mixed wood swamps).

Following mitigation, the LAA has the potential to be residually affected by altered water regimes (Chapter 6). These changes in water regime could affect availability of fishing resources (Section 7) as well as hunting resources due to potential residual adverse effects on nesting waterfowl (Chapter 8,

Section 8.3). While there may be some localized effects during certain times of year, the Project is expected to reduce the current effects to these resources that occur during flooding events.

Potential changes to fish habitat were identified in Chapter 7 through three Project pathways: excavations in Watchorn Bay, Birch Bay, Lake St. Martin and Sturgeon Bay to construct channel inlets/ outlets; realignment, isolation or dewatering drains and headwater streams; and the movement and deposition of sediment in Birch Bay within Lake St. Martin and Sturgeon Bay within Lake Winnipeg. As noted in Chapter 7, after mitigation, there is no expectation of noticeable residual effects on fish abundance and therefore there should be no effects on traditionally harvested fish species.

One-way movement of fish out of Lake Manitoba to Lake St. Martin and out of Lake St. Martin to Lake Winnipeg through the outlet channels is unavoidable. Resultantly, there are both positive and negative effects. Fish will have one-way access to the lakes, and there will be a sizable length of marginal fish habitat in the channels. The degree to which mitigation can reduce the entrainment of juvenile fish and attraction of adult fish to move downstream via the LMOC channel is uncertain; however, certainty that only one-way travel is possible is high though its occurrence is sporadic (every 3-5 years based on operational frequency of the channels).

Project residual effects on important traditional use plant species collection sites can be calculated using PDA calculations of the amount of permanent and temporary losses to plants habitats. Out of the 120 listed traditional use plant species, half are ranked by the Manitoba Conservation Data Centre (MBCDC) as provincially common including many berry species. Based on the data collected in 2016, it is not known if the traditionally used plant species are locally or regionally abundant. However, the habitat for these species exists within the LAA and RAA.

Residual effects on water, wildlife, fish, and vegetation have the potential to affect the activities that are supported by these resources, including hunting, fishing, trapping, plant harvesting, and camping. However, appropriate conditions for current use entail more than the availability of traditional resources and this assessment acknowledges that Indigenous groups may choose not to pursue TLRU activities near the Project for biological resources or physical sites, including lack of existing access. Various biophysical and socio-economic environmental conditions may also affect harvesting. For example, a change in air or water quality, noise, or altered visual aesthetics may deter individuals from harvesting traditional resources close to the PDA. The acoustic environment assessment (Chapter 6, Section 6.2.4.4.), air quality assessment (Chapter 6, Section 6.2.4.2), and human health assessment (Chapter 9, Section 9.5) provide further details on effects of noise, light, and air emissions on land users in the assessment areas.

Residual effects of the Project on the availability of traditional resources for current use will occur during both construction and operation and maintenance. Overall, effects are predicted to be adverse due to a loss in habitat for harvested resources, but low in magnitude as it is anticipated that current land and resource use practices will be able to continue with minor alteration of behaviour by Indigenous peoples. The Project will remove traditionally harvested plant species from the PDA and affect the distribution and abundance of wildlife and fish species in the LAA. However, the direct and indirect loss of habitat for harvested species is relatively small compared to the remaining habitat available in the RAA, and the habitat reclaimed (for example due to fewer riparian plants being inundated) by reversing the effects of

flooding. Residual effects on wildlife and fish will not pose a threat to the long-term persistence and viability of species in the RAA. Similarly, residual effects on vegetation will not result in the loss of vegetation communities in the LAA. The residual adverse effects of the Project on the availability of traditional resources for current use will occur infrequently and be limited to the LAA. Effects will be long-term in duration, regular and continuous in frequency, and irreversible as changes to availability of wildlife, vegetation and fish will extend into the operations and maintenance phase of the Project and the Project is not expected to be decommissioned. The timing of effects is characterized as highly sensitive based on the seasonality of wildlife and fish movement and habitat availability, as well as the seasonality of current land and resource use practices.

10.2.4.5 Change in Access to Traditional Resources and Areas for Current Use

Project Pathways

The Project has potential to impact access to areas of traditional use and traditional resources during construction and operation. Construction components include vegetation clearing, channel excavation, water diversion construction, road construction, bridge construction lay down areas, borrow extraction, reclamation, and utility alignments. Once complete, the Project will consist of two water-filled artificial channels crossing the landscape.

Access to traditional resources or areas for current use can be affected through the direct loss or alteration of trails or travelways, restrictions on the ability to navigate to and through current use areas, or limitations on the ability to undertake current use activities in proximity to the Project. Other potential effects on navigation are the potential for silt increases in the Dauphin River, which could influence ice jamming and the effects of frazil ice, and the potential for the disruption of wildlife crossings and corridors, displacement of animals and birds, and permanent bisection of wetlands areas (with no provisions for crossing of the outlet channel from either side of the proposed channel).

Loss and alteration can result from direct physical disturbance or destruction (e.g., destruction of a traditional trail), physical deterrents or obstructions (e.g., the outlet channels themselves) that prevent access or increase effort required either spatially or temporally, changes in the landscape (e.g., vegetation clearing) that make an aspect of a trail or travelway unrecognizable either partially or completely, or changes in the conditions (e.g., construction traffic) required for current use of trails and travelways.

Residual effects resulting from a change in access to lands and resources used for traditional purposes are expected. Indigenous groups have identified a number of potential ways in which the Project could affect access to traditional resources or sites. Kinonjeoshtegon First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Peguis First Nation, Pinaymootang First Nation, and Dauphin River First Nation expressed concerns that increased uncontrolled access during construction will have negative impacts on their hunting activities and success (Manitoba Infrastructure 2018b). Lake St. Martin First Nation and Peguis First Nation expressed concerns regarding hunting access issues arising from road construction.

Manitoba Métis Federation citizens noted that they are restricted to practicing traditional activities on unoccupied Crown land, and so projects that result in any change of access for Métis people are concerning (Caillou Group 2016).

Concerns regarding impacts to hunting areas and practices as a result of development were also noted. Black River First Nation indicated that previous projects have led to concerns regarding increased access to traditional hunting areas for non-Indigenous hunters (MMTP 2015). Black River First Nation also expressed concerns regarding the potential creation of new roads and access points, such that non-Indigenous access to Black River traditional hunting territory could increase (MMTP 2015). Fisher River Cree Nation also indicated concerns regarding reduction in access to hunting areas (Fisher River Cree Nation 2018). Fox Lake Cree Nation expressed concern regarding changes in access due to development, including positive (increased ease of access) and negative effects (increased hunting pressure) of increased access to traditional hunting lands (Manitoba Hydro 2015).

Effects on trails and resource access routes were also of concern. Dauphin River First Nation, Peguis First Nation, Kinonjeoshtegon First Nation, and Pinaymootang First Nation reported the use of important trails and access routes, including snowmobile routes, to access fishing, hunting, and gathering areas (Golder Associates 2018). A Dauphin River First Nation snowmobile trail, which borders wetlands southwest of Lake Winnipeg is intersected by the south end of the LSMOC as well as a planned power distribution line (mapped in Golder Associates 2018). Peguis First Nation utilizes a snowmobile trail that is intersected by the north end of the LSMOC. It is unknown whether the trail reported by Pinaymootang First Nation (Golder Associates 2018) represents a third trail or if it is the same trail used by Dauphin River First Nation and Peguis First Nation members, as the trail was not mapped. The Project will bisect these trails and the planned power distribution line will intersect it, preventing or altering access to hunting, trapping and plant harvesting areas immediately southwest of Lake Winnipeg and fishing areas in Sturgeon bay when accessed by land. The trail identified by Kinonjeoshtegon First Nation crosses the north end of Sturgeon Bay and is outside of the LAA. Lake St. Martin First Nation also reported concerns regarding how access will be controlled to the proposed access road, as members hunt in the region (Manitoba Infrastructure 2019). Manitoba Métis Federation identified the general location of historic fur trade posts, Métis cart trails, and York boat routes as the area between Lake Winnipegosis and Lake Manitoba (Manitoba Hydro 2011a).

Mitigation

This section identifies mitigation measures proposed by Manitoba Infrastructure and the measures recommended by Indigenous groups specifically for this Project or identified for other projects with similar effect pathways (Construction Environmental Management Program (CEMP) and Project Environmental Requirements (PER) are detailed in Chapter 3, Section 3.7). Key mitigation measures proposed to avoid or reduce potential adverse effects on access to lands and resources for traditional purposes includes the following:

- The current Project design and routing of the channels was influenced by the Indigenous engagement process (as described in Chapter 5) to limit effects and concerns that were expressed. For example,

a route was chosen to utilize Willow Point alignment to avoid impacts to the Johnson Beach area. Similarly, a route was chosen for the channel that avoided Buffalo Lake.

- Manitoba Infrastructure will engage with Dauphin River First Nation, Peguis First Nation, Pinaymootang First Nation and other Indigenous groups in order to better understand the use and importance of the snowmobile trails which are intersected by the Lake St. Martin Outlet Channel and to develop suitable means of crossing the Lake St. Martin Outlet Channel following construction.
- A schedule of construction and Project activities will be made available to all Indigenous groups and Northern Affairs Communities engaged on the Project, so that areas and time periods of activity can be avoided.
- An Access Management Plan, which will address access related issues expressed by directly affected landowners, Indigenous groups and the public, will be prepared to outline specific measures to ensure proper access during the construction of the Project.
- A Traffic Management Plan will be prepared for the Project, which will include a traffic control plan to describe anticipated detours and schedules specific to the Project design to mitigate travel delays.
- Project-related traffic will be restricted to the Project ROW and associated access routes required during Project construction and maintenance. Where access routes are accessible by the public, signage restricting access to authorized personnel will be erected.
- Restricted access for operation and maintenance to the LSMOC will be via the Lake St. Martin access road extending from the forestry road to the EOC inlet and Reach 1, currently being completed by Manitoba Infrastructure as a separate project. Permanent access along the channel alignment will be on top of the containment dikes on either side of the excavated channel.
- Regarding potential for silt increases in the Dauphin River, Manitoba Infrastructure is developing a comprehensive Environmental Management Program (EMP) that encompasses several mitigation methods and measures to reduce or prevent potential effects to surface water during Project construction and operation (Section 3.7). The EMP includes a Sediment Management Program and a Debris Management Program that include Best Management Practices (BMPs), mitigation measures, and monitoring plans to address potential effects of the Project due to changes in sediment erosion or debris transport (additional information is provided in Section 3.7).
- Manitoba Infrastructure will restrict unauthorized access to the outlet channels during operation
- The amount of Project-related vehicle traffic will be reduced by encouraging use of multi-passenger vehicles where feasible.
- Regarding potential effects on wildlife and wetlands, mitigation measures for disruption of wildlife crossings and corridors include (from Section 8.3.6.4) design for minimizing the use of rip rap and minimizing the side slopes, to the extent feasible, to facilitate wildlife movement; development and implementation of Project-specific environmental management plans and monitoring programs, to

mitigate potential Project-related effects to wildlife; and monitoring of wildlife movement using the ongoing remote camera survey into post-construction.

- Mitigation measures for the displacement of animals and birds include (from Section 8.3.6.2) that wildlife habitat will not be destroyed or damaged, except pursuant to a licence, permit or other authorization issued for the Project; no blasting will be permitted close (within approximately 1 km) to known sensitive wildlife habitat during critical lifecycle periods; trees containing large nests of sticks and areas where active dens or burrows occur will be identified, left undisturbed, and reported to the Natural Resources Officer; terrestrial buffers, as identified by the Manitoba Conservation Data Centre's Recommended Development Setback Distances from Birds (MB CDC 2014) and/or Manitoba Sustainable Development's Forest Management Guidelines for Terrestrial Buffers (MSD 2017) will be adhered to for all applicable sites; and all equipment supplied for use on the Project will be effectively "sound-reduced" by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.

- Mitigation measures for the bisection of wetlands include (see Sections 8.3.6.2 and 8.3.6.3) identification and reporting to the Natural Resources Officer of trees containing large nests of sticks and areas where active dens or burrows occur to be left undisturbed; clearing within 30 m of a waterbody will be performed by hand; development of rehabilitation plans that include objectives for restoration of natural conditions, erosion protection, sediment control, non-native and invasive plant species management, and wildlife habitat (particularly Species at Risk habitat) restoration; design for restriction of unauthorized access to the outlet channels during operation; installation of exclusionary fencing around open excavations near wetlands or excavations with the potential to entrap amphibians or other wildlife species; and installation of gates or other barriers to limit public from accessing outlet channel ROWs.

Project Residual Effects

The purpose of the Project is to reduce existing effects created by periodic flooding; however, the Project will also create effects. Residual effects as a result of changes in access to land and resources have been characterized based on information provided by participating Indigenous groups through TLU studies, literature reviews, engagement and consultation activities, as well as the relevant VC residual effects assessments. Access and trail routes identified by Indigenous groups for TLRU purposes should not be considered exhaustive. Other trails, travelways, and routes may exist or occur near the Project, even though they have not been explicitly identified.

Residual effects are anticipated for changes in access to lands and resources in the PDA. Travel along the snowmobile trails intersected by the Lake St. Martin Outlet Channel will be altered. For the purposes of this assessment, it has been assumed that Indigenous groups who hunt in the southern portion of the Project area may have entered into agreements with private landowners for hunting access. This access could be affected by the 172.5 ha of private land being taken up by the PDA. Roads and access routes that result from the Project may affect access to resources by causing Indigenous groups to seek alternate routes to areas and sites. Increased access by non-Indigenous land users may also occur, which will have a negative effect on access to resources and areas for Indigenous groups.

Barriers to use have effects beyond hunting and trapping, as Indigenous groups can also utilize traditional territory for plant gathering, visiting habitations, following trails, making camp, carrying out ceremonies, passing on traditional knowledge, and communing with ancestors. Little Saskatchewan First Nation reported picking berries throughout the southern section of the PDA. The installation of a permanent outlet channel may be a barrier to access to berry picking areas or initiate a change in access, such that Indigenous gatherers have to access favoured sites or areas through different routes or means or find new sites.

Changes to access and navigation routes as a result of the Project may affect Indigenous groups' ability to harvest, use trails, and access wildlife in the northern portion of the PDA, south of Lake Winnipeg. The potential for silt increases in Dauphin River as a result of the Project could influence ice jamming and effects of frazil ice. Such changes to water bodies such as Dauphin River would affect Indigenous groups' ability to traverse them, thereby restricting access.

The construction of a new temporary access roads for the Project is likely to increase vehicular traffic and access, thereby impacting Indigenous groups' access to traditional resources and potentially increasing competition for consumptive values such as fish, plants, and wildlife.

Installation of the LSMOC will occur in ecologically sensitive wetlands and bog lands. Long-term effects acting upon land and resource access could include the disruption of wildlife crossings and corridors, displacement of animals and birds, and permanent bisection of wetlands areas (with no provisions for crossing of the outlet channel from either side of the proposed channel).

Construction activities will affect Indigenous groups' abilities to access spiritual areas and locations within portions of the LAA. For example, the Project will result in changes to the southwest shoreline of Lake Winnipeg, impacting access to Dauphin River First Nation gravesites.

Irreversible Project effects include permanent changes to landscape resulting from installation of the channels including changes to terrain, vegetation, and physical access; and barriers to area access in the form of outlet channels that can only be crossed at certain locations.

Appropriate conditions for current use entail more than access to traditional resources, sites and locations, and that Indigenous groups may choose not to pursue TLRU activities near the Project for a variety of personal, practical, aesthetic, and spiritual reasons.

The PDA encompasses private and Crown land, and the degree to which private land is accessed for traditional use is unknown. Given that, the overall residual effects of the Project on the change in access to traditional resources and current use are anticipated to be moderate in magnitude, due to the construction, installation, and maintenance of permanent outlet channels. The Lake St. Martin outlet channel will bisect wetlands and snowmobile trails, and act as an east-to-west barrier, running from the northern shores of Lake St. Martin to the southern shores of Lake Winnipeg which can only be crossed at specific locations facilitated by the inclusion of bridges or mitigation designed to facilitate safe passage. East and west access to these wetlands by snowmobile or on foot will be restricted as a result of the installation of the northern outlet channel. The residual adverse effects of the Project on the change in access to traditional resources and current use will be long-term in duration, extend to the LAA, be continuous and irreversible. Timing is not applicable, as the loss of access to traditional resources and current use sites would occur irrespective of day or season.

10.2.4.6 Change to Cultural and Spiritual Sites or Areas

Project Pathways

Cultural and spiritual sites, sacred areas, communal gathering spaces, camps, cabins, and other habitation areas, apart from having a physical presence on the landscape, represent an integrated network of beliefs, values, and knowledge that delineate Indigenous groups' important cultural heritage. Current use sites and areas, including, but not limited to sites and areas for cultural or spiritual practices, or archaeological and palaeontological sites and areas, have the potential to be affected by direct physical disturbance associated with Project construction and maintenance, as well as the planned power distribution line. Construction includes vegetation clearing, channel excavation, water diversion construction, road construction, bridge construction, lay down areas, reclamation, and utility alignments. Maintenance includes inspection activities and repairs. The following describes potential pathways that could affect current use sites or areas.

Indigenous groups engaged on development projects often report concerns regarding effects to cultural areas and places, including burial areas and resting places, as well as archaeological features and sites. The literature review identified a number of concerns related to these kinds of sites and features as reported by Indigenous groups engaged in other projects. As an example, Tataskweyak Cree Nation voiced concerns with ongoing development and potential damage to sacred and burial sites (Tataskweyak Cree Nation 2011). Fox Lake Cree Nation reported concerns over development impeding the ability to engage in traditional culture, practices, and beliefs, as well as permanently altering the landscape (Manitoba Hydro 2014). Tataskweyak Cree Nation indicated their concerns regarding impacts to the cultural landscape and heritage resources, and the relationships that Tataskweyak Cree Nation have with them (Northern Lights Heritage Services 2012).

Regarding the proposed Project, residual effects as a result of changes to cultural and spiritual sites or areas are anticipated. Indigenous groups have indicated that the Project has potential to affect cultural and spiritual use sites or areas, including physical and cultural heritage resources. Kinonjeoshtegon First Nation, Little Saskatchewan First Nation, Dauphin River First Nation, Lake Manitoba First Nation, Pinaymootang First Nation, and Peguis First Nation identified site-specific TLRU within the RAA, including gravesites, spiritual areas and features (Golder Associates 2018). Kinonjeoshtegon First Nation indicated that gravesites are located along the shore of Lake Winnipeg and on both sides of the Jackhead River (Golder Associates 2018). Little Saskatchewan First Nation reported the presence of an important cemetery on Reserve 48 (Golder Associates 2018). Peguis First Nation expressed concern regarding management of heritage and burial sites during construction (Manitoba Hydro 2015b). Pinaymootang First Nation indicated the existence of grave sites and ceremonial or spiritual sites in the Project area; however, the specific location however was not disclosed (Golder Associates 2018). The Provincial Archaeological Site Inventory identified six registered archaeological sites in the Interlake Region, with one of the sites located on Dauphin River First Nation lands and the remaining five sites located within or adjacent to Pinaymootang First Nation traditional lands (Manitoba Infrastructure 2019b).

Some Indigenous groups were reluctant to disclose the precise locations of cultural areas or sites of traditional practice, while others were more specific. Sagkeeng First Nation indicated that they engage in

ceremonial and traditional use of lands but declined to disclose details regarding sites or practices (MMTP 2015). Manitoba Métis Federation identified the general locations of a number of culturally important sites or areas including ceremonial, burial, and other sacred or spiritual places, and an intergenerational family camp within an area between Lake Winnipegosis and Lake Manitoba (Manitoba Hydro 2011a). Graves are located at one of these settlements and Dauphin River First Nation indicated there are two historic settlements on the west shore of Lake Winnipeg, north of the Lake St. Martin Outlet Channel. Black River First Nation expressed concerns related to effects on cultural heritage resources, including potential discovery of unknown cultural, heritage, and burial sites within development areas (MMTP 2015). Fisher River Cree Nation expressed concern regarding the potential for loss, damage, and disturbance to culturally and historically significant sites and areas, and the resulting reduction in ability to transmit culture and knowledge to community members (Fisher River Cree Nation 2018b).

Mitigation

This section identifies mitigation measures proposed by Manitoba Infrastructure and the measures recommended by Indigenous groups specifically for this Project or identified for other projects with similar effect pathways. Key mitigation measures proposed to avoid or reduce potential adverse effects on cultural and spiritual sites or areas are as follows:

- The current Project design and routing of the channels was influenced by the Indigenous engagement process (as described in Chapter 5) to limit effects and concerns that were expressed.
- Project-specific environmental management plans and monitoring programs will be developed and implemented to mitigate potential Project-related effects to wildlife.
- Detailed recording and mapping of spiritual or cultural sites will be developed in partnership with Indigenous groups, leading to a decision made about the relative importance of the site and potential mitigations strategies.
- An appropriate ceremony will be held prior to commencement of construction under the direction of local Indigenous groups.

Project Residual Effects

The purpose of the Project is to reduce existing effects created by periodic flooding; however, the Project will also create effects. There will be Project residual effects to cultural and spiritual sites or areas.

Cultural and spiritual sites or areas identified by participating Indigenous groups within the RAA include potential burial sites and archaeological features. This list not considered an exhaustive list and given historical occupation of the PDA by Indigenous groups, other sites and areas may exist, despite not having been explicitly identified. Further, preservation of cultural and spiritual areas and sites does not guarantee that Indigenous groups will continue to utilize or find value in an area. Indigenous groups may choose to discontinue or to not pursue activities in an area for a variety of personal, practical, aesthetic, and spiritual reasons.

The removal of cultural or spiritual sites or areas within the PDA would constitute an irreversible, adverse effect, as these sites are not capable of being renewed once removed. Effects on cultural and spiritual sites are site-specific (as opposed to effects on wildlife that can be assumed to occur throughout the PDA and LAA) and limited to the PDA. Patterns of access to cultural or spiritual sites, or areas in the LAA may be altered by access restrictions to the PDA (such as the installation of LSMOC resulting in the bisecting of snowmobile trails, as discussed above in Section 10.2.4.5).

The assessments for heritage resources (Chapter 9, Section 9.6) and land and resource use (Chapter 9, Section 9.2) were reviewed for the TLRU assessment. Chapter 9, Section 9.6 indicates that there are 15 registered archaeological sites in the RAA, one in the LAA, and none in the PDA. As an example, six registered archaeological sites have been recorded in the Interlake Region. One of these sites lies within Dauphin River First Nation lands, and the other five are located on or adjacent to Pinaymootang traditional territory (Manitoba Infrastructure 2019b), which falls inside the PDA. Protocols for chance encounters of archaeological resources during site preparation and construction, described in Chapter 9, Section 9.6, addresses potential effects on these resources.

The land and resource use assessment identified residual effects related to changes in access conditions, which will in turn affect cultural sites and practices in the PDA. The land and resource use assessment (Chapter 9, Section 9.2) indicates that areas and access routes will be changed in the PDA. Access to cultural or spiritual, sites, or areas in the LAA will be affected due to changes in patterns of access because of the permanent realignment of PR 239.

Within the RAA, residual environmental effects to cultural or spiritual sites or areas are considered adverse and are expected through construction and operation and maintenance phases of the Project. Assuming a conservative approach, the likelihood of disturbance, alteration, or removal of cultural and spiritual sites in the LAA is moderate, based on TK information provided by participating Indigenous groups, desktop review of available TLRU information, and professional judgement. Within the PDA, residual effects to cultural or spiritual sites and areas are considered adverse and are expected during construction of the Project, due to removal of cultural and spiritual sites. The clearing of the PDA will result in permanent impacts to two snowmobile trails, affecting Dauphin River First Nation and Peguis First Nation, and possibly Pinaymootang First Nation. Once removed, cultural and spiritual sites cannot be renewed or returned to baseline conditions. Therefore, effects on cultural or spiritual sites within the PDA are predicted to be long-term in duration, high in magnitude, continuous, irreversible, and disturbed. Timing is not applicable, as changes to cultural and spiritual sites or areas would occur irrespective of day or season.

10.2.4.7 Changes to the Cultural Value or Importance Associated with Current Use

Project Pathways

The Project has the potential to affect the cultural value or the importance associated with current use. As noted in the Agency guidelines (CEA Agency 2018a), this could include changes that affect the spiritual and cultural experiences of the activity or practice, as well as a sense of place and well-being, and the applicability and transmission of Indigenous knowledge, laws, customs, and traditions. As noted in Section 10.2.1.5, the value or importance of these components are subjective and conditional, and are

contingent on beliefs, perceptions, values, and qualitative experience of Indigenous land users. Effects to TLRU are not reducible to effects on biological resources or physical sites and Indigenous groups may choose not to conduct TLRU activities even where availability and access to TLRU resources are not affected.

As stated in Section 10.2.1.5, changes to cultural value or importance associated with current use will be considered when an Indigenous group identifies potential effects to experiential values, including spiritual and cultural experiences of activities or practices, sense of place and well-being, transmission of Indigenous knowledge, laws, customs and traditions. Effects on the cultural value or importance associated with current use will consider issues such as values or attributes of the area that make it important as a place for inter-generational teaching of language or traditional practices, communal gatherings, or integrity of preferred traditional practice areas. Assessment of cultural value or importance associated with these will be considered narratively and in the larger context of the Project, with reference to potential effects to experiential values or sensorial experience identified by Indigenous groups.

Indigenous groups have identified potential effects on cultural value or importance associated with cultural use. Indigenous groups engaged on the Project, commenting on a previous project, noted that any disturbance to land or cultural sites is potentially impactful, and can change the value of that area or feature (MNP LLP 2017). To offer a Project-related example, the installation of a power distribution line may cause sensorial disturbances, including increased noise, increased dust, odours, emissions, and light pollution, thereby reducing cultural value or importance.

For Sagkeeng First Nation, ways of life, land, water, and animals are tied into their culture, making it impossible to sub-divide each of these into discrete categories. The teachings of Elders inform the understandings and activities of the community, even touching on everyday items such as beadwork on clothing, which can be imbued with stories and knowledge about community life and nature (MMTP 2015). For these reasons, development is impactful to Sagkeeng First Nation, and community members ask that proponents and developers keep these things in mind at all levels of a proposed project, from planning, to engagement, through construction, and to end-of-project-lifecycle. Other Indigenous groups participating in the Project offered views on the value and importance associated with current use. Fisher River Cree Nation expressed concerns related to the potential effects of the Project on cultural experience including increased noise, dust, and light pollution (Fisher River Cree Nation 2018). Manitoba Métis Federation indicated that community harvesters are likely to avoid areas where industrial development is obvious, as animals and plants in these areas are thought to have been disturbed (Calliou Group 2016). Changes in the physical attributes of the land, such that the experience of Métis culture could be affected, are of concern (Calliou Group 2016).

Manitoba Métis Federation also indicated that odours associated with industrial development would cause them to avoid harvesting in areas where such odours could be detected (MNP LLP 2017). Impacts to air quality, such as from the exhaust of construction and support vehicles, could deter Manitoba Métis Federation citizens from harvesting in areas where development is undertaken (MNP LLP 2017). Construction noise is also a factor, and Manitoba Métis Federation members indicated that they would avoid harvesting in areas where industrial development was in view (MNP LLP 2017). Manitoba Métis

Federation indicated that any reduction of unoccupied Crown land resulting from development is of concern, and that LAA and RAA lands cannot be expected to replace access to land lost for harvesting purposes in the PDA (Calliou Group 2016).

For Fox Lake Cree Nation, cultural identity is connected to 'Aski' – the land, water, resources, animals, and their interrelationships – and these things are integral to cultural identity (Manitoba Hydro 2011). Similarly, Tataskweyak Cree Nation noted, "Our culture, built around hunting, fishing and gathering, possesses knowledge accumulated over generations about how the non-human beings of Mother Earth interrelate with each other" (Tataskweyak Cree Nation 2011). This connection to traditional practices and experiences informs the core of members' collective identity.

Project Residual Effects and Mitigation

The purpose of the Project is to reduce existing effects created by periodic flooding; however, the Project will also create effects to the cultural value or importance associated with current use of traditional lands and resources.

Manitoba Infrastructure proposes Project mitigations intended to both meet regulatory requirements and reduce concerns of stakeholders, including participating Indigenous groups. It is important to note that Indigenous groups reported a broad range of concerns, including adequate engagement and inclusion in the development process. Sagkeeng First Nation shared a number of their concerns and recommendations, including suggesting appropriate and adequate engagement with First Nations, such that they are an integral part of the decision-making process, rather than simply impacted by it (Sagkeeng O-Pimatiziiwin 2015). Sagkeeng First Nation indicated that it takes a holistic view of the lands, waterways, animals, and people impacted, and so any consideration of projects, planning, and construction should reflect such views. The interconnectedness of each component is important to Sagkeeng First Nation, and proponents should understand this (Sagkeeng O-Pimatiziiwin 2015).

Sagkeeng First Nation also indicated that it expects all developers to recognize and respect Sagkeeng's traditional knowledge of its territory, and, with Sagkeeng's consent, consider this knowledge in Project assessment and planning (Sagkeeng O-Pimatiziiwin 2015). Additionally, Sagkeeng First Nation would like to see a Monitoring Committee set up with representation from Treaty 1 First Nations. Members have also asked whether lands could be designated as "protected areas" so that development cannot further impact certain plants and First Nations can have the opportunity to nurture the plants (Sagkeeng O-Pimatiziiwin 2015).

Manitoba Métis Federation recommended establishing of a forum whereby Manitoba Métis Federation citizens can interact with the Proponent regarding Project issues throughout the life of the Project (Shared Value Solutions 2018). Manitoba Métis Federation also recommended participation in environmental and cultural monitoring for the duration of the Project, including training and employment opportunities (Shared Value Solutions 2018).

Fisher River Cree Nation and Manitoba Métis Federation indicated concerns regarding increased noise as a result of the Project. Overall noise emissions are expected to be reduced during the construction of

the outlet channels as excavation proceeds and occurs below the existing ground level. The spoil sites located along the channel are expected to act as noise barriers. Potential acoustic mitigation measures comprise reducing or restricting equipment activities in specific areas or during specific time periods. Best management practices that would be implemented to help mitigate noise effects include notifying residents near construction noise-generating activities and installing temporary construction noise abatement barriers, if appropriate. Manitoba Infrastructure would also ensure that all machinery and factory supplied noise-abatement equipment (e.g., mufflers) would be maintained and kept in good working order. Any complaints arising from a perceived noise issue would be addressed through a complaint response procedure.

Fisher River Cree Nation and Manitoba Métis Federation indicated concerns regarding increased dust and construction-related odours. Manitoba Infrastructure notes that air quality effects arising from Project activities would be addressed by implementation of best management practices and as indicated in the PERs. To manage emissions from Project equipment, all engines and exhaust systems would be properly maintained. Equipment that shows excessive emissions of exhaust gases, including construction equipment, would not be operated until corrective repairs or adjustments are made. As much as possible, the idling of construction vehicles would be reduced, and use of work camps (as necessary) would reduce emissions associated with the transportation of staff to and from site during construction.

Any dust emissions arising from all Project phases would be mitigated by requiring all vehicles used to haul fine materials to or from the work site to have the load covered with a tarpaulin cover during transport. All material stockpiles or spoil piles prone to wind erosion would be maintained so as to reduce release of particulate matter or dust. This may include, but is not limited to, covering or stabilization of material stockpiled at the work site as required. Dust suppression options would include the application of dust suppressants (limited to the roadway, driveway, or designated area). The application rate of all dust suppressants would be monitored to ensure adequate coverage without pooling or runoff, as well as to ensure that dust suppressants do not enter and contaminate waterbodies, including surface and groundwater. Areas of roads that are subject to flooding would not receive dust suppressants.

As noted by Fisher River Cree Nation, construction-related lighting has potential impacts. To mitigate these potential impacts, measures employed could include the use of full cut-off luminaires wherever possible to reduce glare, light trespass, and sky glow from Project lighting. As much as is practical, lighting would be located such that unavoidable light spill off the working area is not directed toward receptors outside of the PDA. Lighting would not be directed toward oncoming traffic on nearby roads or off-site so as to avoid safety and nuisance hazards. Lighting design would be intended to avoid the excessive use of mobile flood lighting units and to turn lighting off when not required.

In order to mitigate potential Project effects on vegetation or plant species that are valued to Indigenous groups, a number of measures would be taken. These could include limiting vegetation removal and restricting construction access to existing roads and trails when possible. New access would be constructed through previously disturbed areas when possible and grading and compacting would be limited to access needed for heavy equipment. Vegetation removal would be limited and construction access to existing roads and trails would be restricted when possible. Again, new access would be

constructed through previously disturbed areas when possible and grading and compacting will be limited to access needed for heavy equipment. Disturbed areas would be revegetated following construction in accordance with developed revegetation plans. Wherever possible, temporary camp sites and staging areas would be located in currently disturbed areas and existing facilities.

Impacts to wildlife are a concern for Manitoba Métis Federation. Manitoba Infrastructure proposes wildlife and animal mitigation measures based on industry best practices, including not destroying or damaging wildlife habitat, except pursuant to a licence, permit, or other authorization issued for the Project. Wherever possible, existing trails, roads, or cut lines would be used for access.

10.2.4.8 Summary of Project Residual Effects

Table 10.2-5 summarizes the residual environmental effects on traditional land and resource use during construction and operations.

Table 10.2-5 Summary of Project Residual Effects on TLRU

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Ecological and Socio-economic Context
Change in availability of traditional resources for current use	C/O	A	LT	N-L	HS	LAA	RC	I	U/D
Change in access to traditional resources for current use	C/O	A	LT	M	NS	LAA	RC	I	D
Changes to cultural and spiritual sites or areas	C/O	A	LT	M-H	NS	PDA-LAA	RC	I	D
Changes to the cultural value or importance associated with current use	As noted in Section 10.3.1.3, residual effects are characterized narratively, and as such, are not included in this table.								

Table 10.2-5 Summary of Project Residual Effects on TLRU

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Ecological and Socio-economic Context
KEY See Table 10-2 for detailed definitions. ***Project Phase*** *C: Construction* *O: Operation* ***Direction:*** *P: Positive* *A: Adverse* *N: Neutral* ***Duration:*** *ST: Short-term* *MT: Medium-term* *LT: Long-term*			***Magnitude:*** *NL: Negligible or Low* *M: Moderate* *H: High* ***Timing*** *NS: No sensitivity* *MS: Moderate sensitivity* *HS: High sensitivity* ***Geographic Extent:*** *PDA: Project development area* *LAA: local assessment area* *RAA: regional assessment area* *N/A: Not applicable*				***Frequency:*** *IF: Infrequent* *SI: Sporadic/Intermittent* *RC: Regular/ Continuous* ***Reversibility:*** *RS: Reversible (short-term)* *RL: Reversible (long-term)* *I: Irreversible* ***Ecological/Socio-Economic Context:*** *U: Undisturbed* *D: Disturbed* *R: Resilient* *NR: Not resilient*		

10.2.5 Determination of Significance

A definition for significant adverse effects on TLRU is provided in Section 10.2.1.8. The determination of significance for assessment of residual environmental effects on TLRU provided here considers information on current use of lands and resources for traditional purposes obtained from Project-specific studies conducted by Indigenous groups, the Indigenous engagement program for the Project, a review of relevant publicly available literature, consideration of significance determinations for related biophysical and socio-economic VC assessments, the ecological and socio-economic context of the Project area, past-project experience, and professional judgment.

Taking a conservative approach, this assessment assumes that Indigenous groups engaged on the Project may have access agreements with landowners in the PDA.

The effects of the Project on TLRU will result in the long-term loss of availability of traditional use resources or access to lands currently used for traditional practices, the permanent loss of traditional use sites and areas, and diminished value or importance of cultural sites and areas in the PDA and LAA. However, these effects are not anticipated to critically reduce or eliminate availability and access to lands, resources, and cultural sites and areas. The purpose of the Project is to reduce existing effects created by periodic flooding, and overall disruption to access of traditional lands and resources is anticipated to

be moderate, as are effects to cultural sites and areas located within the PDA and LAA. Discussion of a change in value or importance of culture and spiritual sites and areas does not lend itself well to relying on a residual effects categorization. Recognizing this, Manitoba Infrastructure has proposed mitigation measures intended to reduce effects on what could be understood as intangible values. As a result, overall effects on TLRU are considered not significant.

Regarding alternative views on the basis of significance, the assessment on current use of lands for traditional purposes does not discuss the severity of effects, as severity is not included in this Project's Terms of Reference, nor has it been a requirement in other CEAA 2012 assessments. Manitoba Infrastructure is committed to ongoing engagement with Indigenous groups as outlined in Appendix 5C "Indigenous Consultation Approach and Current Status". Further information obtained regarding residual effects on availability of traditional resources and significance of effects will be considered against the results of the EIS and incorporated into Project planning and regulatory reporting as appropriate.

10.2.6 Prediction Confidence

Prediction confidence in the assessment of effects on TLRU is low-to-moderate. This reflects available Project-specific TLRU and traditional ecological knowledge information provided through the Indigenous engagement program, including TK reports, technical reviews, community reports, and consultation reports, as well as an understanding of applicable mitigation measures, and reliance on assessments of other VCs of relevance to TLRU. TK and community reports are the best sources of information on which to base an assessment of Project effects on TLRU. As of July 2019, one TK report, one technical report, one consultation report, and one community report comprising the traditional knowledge of twelve potentially-affected Indigenous groups had been incorporated into the assessment of residual effects on TLRU. Given the qualitative and subjective nature of assessing TLRU, the views of Indigenous groups may differ from the findings of this assessment.

Manitoba Infrastructure's engagement process is ongoing and will continue throughout the Project phases with interested parties to consider TLRU information, concerns, and recommendations provided by Indigenous groups. Prediction confidence is anticipated to increase with time as further TLRU information from engaged Indigenous groups, outcomes from Manitoba Infrastructure's ongoing Indigenous engagement activities, and confirmation of site-specific mitigations (e.g., snowmobile/ATV crossings) are developed and implemented. Manitoba Infrastructure will notify MSD and CEA Agency upon receipt of any new TK reports submitted by Indigenous groups during the regulatory process and of any considerations made in response to these reports.

10.2.7 Follow-Up and Monitoring

Follow-up and monitoring programs for TLRU have not been identified at this point. However, anticipated effects of the Project and efficacy of proposed mitigation will be discussed with Indigenous groups as part of Manitoba Infrastructure's ongoing engagement.

10.2.8 Conclusions

10.2.8.3 Change in Availability of Traditional Resources for Current Use

Availability of traditional resources for current use will change as a result of the Project. Residual Project effects on availability of traditional resources for current use will be limited to the LAA and occur infrequently. The Project is expected to remove traditionally harvested plant species from the PDA and to cause changes to the abundance and distribution of wildlife and fish species in the LAA. However, the residual effects are not anticipated to alter the long-term persistence and viability of species within the RAA. Residual effects to habitat for harvested species will be limited considering the remaining habitat suitable for traditional resources available within the LAA. The purpose of the Project is to reduce existing effects created by periodic flooding and to lessen the existing effects of flooding on the availability of traditional resources for current use.

10.2.8.4 Change in Access to Traditional Resources and Areas for Current Use

Access to traditional resources and areas for current use will change change as a result of the Project. Outlet channels will intersect traditional use trails and travelways and act as barriers to accessing traditional resources, which can only be crossed as specific locations. Resource users will be able to continue to travel in the area but crossing the outlet channels will only be possible at specific crossing locations which will be identified as site-specific mitigations are developed. Travel routes and patterns of access that are not intersected by the PDA will not be altered.

10.2.8.5 Change to Cultural and Spiritual Sites or Areas

Changes to cultural and spiritual sites or areas, in the form of disturbance and removal of cultural sites or areas within the PDA during Project construction and operation and maintenance, are expected. Effects to cultural and spiritual sites or areas located within the PDA are permanent and irreversible, as the sites cannot recover or be returned to baseline. As a result, effects to cultural and spiritual sites are expected to result in changes to current practices and restrictions on the ability to continue current practices in preferred ways or at preferred use locations.

10.2.8.6 Changes to the Cultural Value or Importance Associated with Current Use

Changes to the cultural value or importance associated with current use are expected as a result of the Project. Effects to cultural value or importance associated with current use are difficult to capture quantitatively. For Indigenous groups engaged on the Project, changes in value can be reflected in the qualities of enjoyment or satisfaction associated with traditional resources, sites, areas, and places. Effects to overall enjoyment can extend to air, water, land, sites, animals, vegetation, and culture. The values associated with enjoyment and use can be intangible, but they are important to Indigenous groups, and use or enjoyment of traditional resources could be discontinued as a result of Project-related effects. Manitoba Infrastructure appreciates that intangible values are important and will continue to engage with

Indigenous groups regarding mitigations to changes to cultural value or importance associated with current use, and concerning the recommendations identified by Indigenous groups.

10.3 INDIGENOUS HEALTH AND SOCIO-ECONOMIC CONDITIONS

10.3.1 Scope of the Assessment

This environmental assessment for the Indigenous health and socio-economic conditions VC is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 7.1.10 of Part 2 of the Canadian Environmental Assessment Agency (CEA Agency) EIS Guidelines for the Project (CEA Agency 2018a) describes the requirements to address health and social conditions. Section 3.4.1 of the Environmental Assessment Scoping Document for the Project that Manitoba Infrastructure (MI) submitted to Manitoba Sustainable Development (Manitoba Infrastructure 2018a) indicates that the EIS will contain information on Indigenous groups, including community information such as population and services, resource use including hunting, fishing, trapping and gathering; and other economic activities.

Chapter 4, Section 4.4.1 of the EIS describes VCs as features that may be affected by the Project as related to the role of the VC in the ecosystem and the value people place on it. Indigenous health and socio-economic conditions is a VC because of the potential for the Project to affect Indigenous groups. This assessment assumes that the exercise of traditional activities depends on the health and abundance of traditionally harvested species and the continued availability of and access to traditional use sites and areas. A review of information gathered during the Indigenous engagement program for the Project (see Chapter 5, Section 5.3), reports from traditional knowledge (TK) studies conducted for the Project, and publicly available literature, as well as the analysis of relevant biophysical and socio-economic assessments in the EIS, concludes that the Project has the potential to affect health and socio-economic conditions of Indigenous groups.

The assessment of Indigenous health and socio-economic conditions considers the outputs of the assessments of other VCs. Therefore, the assessment scoping process required additional steps to determine appropriate indicators of change and complete the assessment. This scoping process is summarized in Section 10.3.1.3.

In addition to describing the scope of the assessment, this section includes a description of existing Indigenous health and socio-economic conditions, Project interactions, assessment of residual environmental effects, determination of significance, effects to federal lands, and any follow up and monitoring requirements.

10.3.1.1 Regulatory and Policy Setting

Federal Regulations and Policy

The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) discusses Indigenous peoples in section 5(1), regarding "the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project." As set out in section 5(1)(c) these are to be addressed "with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on: health and socio-economic conditions.

Provincial Regulations and Policies

In Manitoba, public health is the responsibility of the Manitoba Ministry of Health, Seniors and Active Living in accordance with *The Public Health Act*. Health Canada's mandate include the protection of human health from exposures to chemicals in the environment. The scope of the human health assessment VC satisfies the requirements for the EA under the *Manitoba Environment Act* and the *Canadian Environmental Assessment Act*, which consider potential project effects to human health. The assessment of potential human health effects follows the guidance framework published by Health Canada and is outlined in Chapter 9, Section 9.5.1.1.

10.3.1.2 Indigenous Engagement and Consultation Process

A discussion of the Indigenous and public engagement process (IPEP) is provided in Chapter 5 (Indigenous and public engagement). Manitoba Infrastructure has undertaken engagement prior to and throughout preparation of the EIS and will make Project information available on a public website. The full list of Indigenous groups engaged on the Project is included in Section 10.2.1.4.

Engagement feedback from Indigenous groups has been an important consideration in identifying issues of concern, framing the scope of the EIS baseline and effects assessment, and in identification of specific mitigation measures, where provided. Indigenous input and community concerns contributed to selecting the channel routes for the Project. Key issues regarding Indigenous health and socio-economic conditions identified through the engagement process. The sections of the EIS where they are addressed are summarized in the following sub-sections.

Table 10.3-1 summarizes issues and concerns relevant to Indigenous health and socio-economic conditions which have been raised during the engagement process since 2011.

Table 10.3-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous group
Effects to domestic drinking water supply	Lake St. Martin First Nation; Norway House Cree Nation; Pinaymootang First Nation; Keewahtinook Fishers of Lake Winnipeg; Interlake Reserves Tribal Council and Fisher River Cree Nation.

Table 10.3-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous group
Health of fish for consumption	Dauphin River First Nation; Keewahtinook Fishers of Lake Winnipeg
Altered cultural experience due to noise effects	Fisher River Cree Nation
Effects on fishing grounds (e.g., depleting fish stocks, Project debris, contamination of fish)	Black River First Nation; Interlake Reserves Tribal Council; Hollow Water First Nation; Fisher River Cree Nation; Ebb and Flow First Nation; Peguis First Nation; Dauphin River First Nation; Manitoba Metis Federation; Lake St. Martin First Nation, Norway House First Nation, Pinaymootang First Nation, Seymourville Northern Affairs Community, O-Chi-Chak-Ko-Sipi First Nation, Lake Manitoba First Nation; Keewahtinook Fishers of Lake Winnipeg
Effects on hunting and trapping (e.g., reduction in vegetation; moose populations)	Dauphin River First Nation; Interlake Reserves Tribal Council; Lake St. Martin First Nation; Peguis First Nation; Manitoba Metis Federation; Fisher River Cree Nation; Pinaymootang First Nation; Lake Manitoba First Nation
Effects on gathering traditional plants for medicine	Dauphin River First Nation; Interlake Reserves Tribal Council; Lake St. Martin First Nation; Peguis First Nation; Fisher River Cree Nation; Pinaymootang First Nation
Effects on agriculture (e.g., loss for farmland)	Lake St. Martin First Nation; Little Saskatchewan River First Nation; Fisher River Cree Nation; Pinaymootang First Nation
Effects of the Project on commercial fisheries and compensation for adverse effects	Lake St. Martin First Nation; Dauphin River First Nation; Seymourville Northern Affairs Community; Ebb and Flow First Nation; Norway House Cree Nation; Black River First Nation; Pinaymootang First Nation; Keewahtinook Fishers of Lake Winnipeg; Interlake Reserves Tribal Council
Effects on recreation in the area (e.g., boating, recreation access, camping, recreation facilities, increased recreation)	Fisher River Cree Nation; Norway House Northern Affairs Community; Little Saskatchewan First Nation; Interlake Reserves Tribal Council; Dauphin River First Nation; Pinaymootang First Nation; Peguis First Nation
Effects on tourism	Fisher River Cree Nation
Number and control of access roads connected with the Project	Interlake Reserves Tribal Council; Dauphin River Nation; Black River First Nation; Fisher River Cree Nation; Lake St. Martin First Nation; Peguis First Nation; and Pinaymootang First Nation
Increase in vehicle traffic and potential for vehicle-wildlife collisions	Fisher River Cree Nation
Effects of road works	Lake St. Martin First Nation
Opportunities for economic participation	Hollow Water First Nation; Little Saskatchewan First Nation; Lake St. Martin First Nation; Pinaymootang First Nation; Peguis First Nation; Interlake Reserves Tribal Council; and the Manitoba Metis Federation
Training and mentoring opportunities	Fisher River Cree Nation

Table 10.3-1 Summary of Issues Identified Through Engagement

Issue/Concern	Indigenous group
Effects from previous floods in 2011	Peguis First Nation; Ebb and Flow First Nation; Dauphin River First Nation; O-Chi-Chak-Ko-Sipi First Nation; Pinaymootang First Nation; Interlake Reserves Tribal Council; Keewahtinook Fishers of Lake Winnipeg; Berens River First Nation; and Lake St. Martin First Nation

Potential changes to Indigenous health, including consumptive activities, are addressed in this section. Issues identified by Indigenous groups related to agriculture, commercial fisheries, as well as recreation and tourism are addressed in Chapter 9, Section 9.2. Potential changes to infrastructure and services and economy are addressed in Chapter 9, Section 9.3 and Section 9.4.

10.3.1.3 Identification of VCs and Effect Pathways Related to Indigenous health and socio-economic conditions

Overview

Due to differences in subject matter, the requirement to assess Project effects on Indigenous "health and socio-economic conditions" are met by dividing the discussion into two separate subsections: Indigenous health conditions and Indigenous socio-economic conditions". The assessment of Indigenous health and Indigenous socio-economic conditions requires additional considerations over other VCs as it relies on the outputs of their assessment. This section determines the VCs and associated residual effects that are relevant to the assessment. The determination of relevant VCs considers the effect pathways that could potentially affect Indigenous health and Indigenous socio-economic conditions.

Identification of Related Valued Components

The assessment of Indigenous health and Indigenous socio-economic conditions focuses on the interactions among changes to VCs and change in conditions, attributes, sites, lands, resources, or structures of relevance for Indigenous groups. The interrelationship between VCs plays an important role in how changes to the environment may affect conditions and material circumstances of Indigenous groups. For example, changes in surface water quality may influence fish health, which could, in turn, affect country foods and Indigenous health conditions.

Figure 10.3-1 illustrates relationships between biophysical and socio-economic VCs and Indigenous health and Indigenous socio-economic conditions and identifies the source EIS chapters where individual VCs are addressed. Consideration of effects on Indigenous health and Indigenous socio-economic conditions is carried out by focusing the discussion of effects on a single encompassing VC for each key topic, rather than having to source information from several VCs individually. The interrelationship between source VCs, and Indigenous health and Indigenous socio-economic conditions, addresses the requirement to assess changes to the environment on Indigenous groups as defined in Section 5(1)(c) of CEAA 2012.

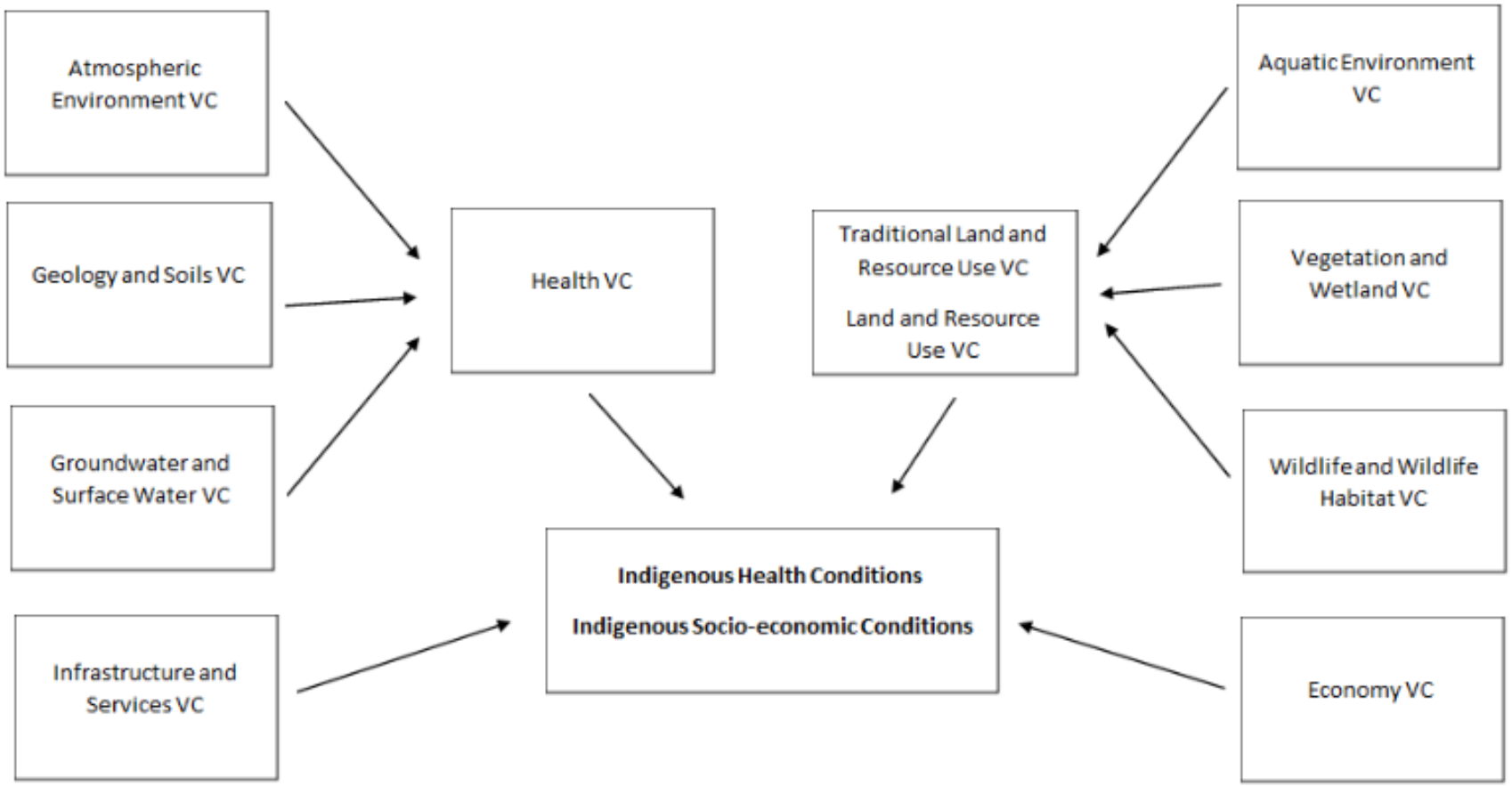

Figure 10.3-1 Valued Components Related to Indigenous Health and Indigenous Socio-economic Conditions

As indicated in the Indigenous Consultation Approach and Current Status document, Manitoba Infrastructure is committed to continued dialogue with Indigenous communities. Should new or additional information regarding potential effects to Indigenous peoples become available, this will be considered in ongoing project planning.

Pathways Carried Forward for Indigenous Health Conditions

Project effects pathways for the assessment of Indigenous health conditions are outlined in Table 10.3-2.

Table 10.3-2 VCs and Residual Effects Relevant for Indigenous Health Conditions

Valued Component	Effect pathway assessed in related VC	Effect pathways carried forward for Indigenous health conditions
Health	Change in Human Health	Construction of the Project may change Indigenous health conditions through changes in air quality, changes in noise, and changes in surface water quality and drinking water quality.
Traditional Land and Resources Use	Change in availability of lands and resources currently used for traditional purposes	Project construction and operations have the potential to affect Indigenous health conditions through a reduction in the quantity of country foods to harvest.
	Change in access to lands and resources currently used for traditional purposes	Project construction and operations have the potential to affect Indigenous health conditions through a reduction in access to country foods to harvest. Project construction and operations have the potential to affect Indigenous health conditions through effects to navigation, including by boat or trails.
	Changes to the cultural value or importance associated with current use	Construction activities have the potential to affect Indigenous health conditions through a reduction in the value and perceived quality of country foods.

Pathways Carried Forward for Indigenous Socio-economic Conditions

Project effects pathways for the assessment of Indigenous Socio-economic Conditions are outlined in Table 10.3-3.

Table 10.3-3 VCs and Residual Effects Relevant for Indigenous Socio-economic Conditions

Valued Component	Effect Pathway assessed in Related VC	Effect pathways carried forward for Indigenous Socio-economic conditions
	Change in resource use	Construction and operation of the Project may change Indigenous socio-economic conditions by affecting

Table 10.3-3 VCs and Residual Effects Relevant for Indigenous Socio-economic Conditions

Valued Component	Effect Pathway assessed in Related VC	Effect pathways carried forward for Indigenous Socio-economic conditions
Land and Resource Use		commercial activities that Indigenous people are engaged in such as fishing, hunting, trapping and gathering, and recreation and tourism.
	Change in agriculture	Construction and operation of the Project may change Indigenous socio-economic conditions by affecting farming and agricultural activities that Indigenous people are engaged in.
	Change in parks, recreation and tourism	Construction and operation of the Project may change Indigenous socio-economic conditions by affecting parks, recreation and tourism.
Infrastructure and Services	Change in temporary accommodations	The Project's construction workforce may increase demand for the temporary accommodations which may also be used by Indigenous people.
	Change in community infrastructure and services	The Project workforce and activities may increase demand for fire and police services, health services, potable water which may also be used by Indigenous people.
	Change in road traffic	Construction related traffic may cause congestion of roads (e.g., PTH 6) used by Indigenous people.
Economy	Change in regional labour force	Project employment, expenditures and population growth related to development can result in positive and adverse effects which will extend to Indigenous people because they account for a large proportion of the population near the Project area.
	Change in regional economy	Local, regional, and provincial businesses, including Indigenous-owned businesses, could benefit from Project and consumer-related spending. Adverse economic effects might occur when the labour, goods and services required for the Project exceed the existing capacity potentially leading to supply issues and cost increases and subsequently effect Indigenous people living in the immediate Project region.

Boat travel between Lake Manitoba, Lake St. Martin and Lake Winnipeg currently takes place via the Fairford River, a portage is required around the Fairford River Water Control Structure, and the Dauphin River. Project construction and operation and maintenance activities will not affect navigation through those waterways.

10.3.1.4 Boundaries

Spatial Boundaries

Spatial boundaries for Indigenous health and Indigenous socio-economic conditions were determined through a review of information from Indigenous groups, related VCs, and professional judgement. The

Project development area (PDA), local assessment area (LAA) and regional assessment area (RAA) for the assessment of effects on Indigenous health and Indigenous socio-economic conditions are shown in Appendix 10B, Figure 10.3B-1.

Project Development Area

The PDA encompasses the Project footprint and is the area of physical disturbance in which the Project components (main works) and associated works and activities are located. The PDA includes an area of 2,099 ha or 21.0 km^2. There are two primary PDA components: the Lake Manitoba Outlet Channel and PR 239 and municipal alignments (the LMOC PDA); and the Lake St. Martin Outlet Channel (the LSMOC PDA). The LMOC PDA is approximately 24.1 km in length while the LSMOC PDA is approximately 23.8 km in length.

Local Assessment Area

The LAA for Indigenous health and Indigenous socio-economic conditions includes the PDA and the largest extent established for relevant VCs; health, TLRU, land and resources use, infrastructure and services, and economy.

Regional Assessment Area

The RAA for the assessment of effects on Indigenous health and Indigenous socio-economic conditions includes the PDA and LAA and the largest extent of the RAA established for relevant VCs; health, TLRU, land and resources use, infrastructure and services, and economy.

Temporal Boundary

The temporal boundary for the assessment of effects on Indigenous health and socio-economic conditions covers the duration of the construction and operation phases of the Project. Construction is tentatively expected to occur over a period of approximately 2.5 to 3 years with approximately 1 to 2 years for post construction-related works, such as site clean-up, survey, and reclamation. It is currently estimated that construction would occur from fall 2020 to spring/summer 2023, with operation and maintenance starting in fall 2022. The overall schedule is contingent largely on receipt of the final regulatory approvals in 2020. Once construction is complete, the Project would be ready for operational usage on an as-required basis. The operation and maintenance phase of the Project is expected to be indefinite as there are no plans to terminate operations.

10.3.1.5 Residual Effects Characterization

Table 10.3-4 presents definitions for the characterization of residual environmental effects on Indigenous health and Indigenous socio-economic conditions. The criteria describe the potential residual effects that remain after mitigation measures have been implemented.

Table 10.3-4 Characterization of Residual Effects on Indigenous health and Indigenous Socio-economic Conditions

Characterization	Range of Criteria	Level of Effect and Definition
Direction of Change (type of effect)	Neutral	No measurable change on the VC.
	Adverse	Net loss (adverse or undesirable change) on the VC.
	Positive	Net benefit (or desirable change) on the VC.
Duration (period of time the effect occurs)	Short-Term	The potential effect results from short-term events or activities such as the time required to complete a discrete component during construction, maintenance, or rehabilitation activities (i.e., a timeframe of several months to three years).
	Medium-Term	The potential effect is likely to persist until the completion of construction and rehabilitation activities (i.e., > three years to 5 years).
	Long-Term	The potential effect is likely to persist beyond the completion of construction and rehabilitation activities into the operations and maintenance phase of the Project (i.e., a timeframe of greater than 10 years).
Magnitude – Health Conditions (degree or intensity of the change)	Negligible or Low	Negligible - no measurable change from existing conditions and no alteration of behavior is required to continue current traditional land and resource use practices. Low - a measurable change from existing conditions but is below environmental and/or regulatory criteria, does not represent an unacceptable change to public health and TLRU is able to continue at current levels. No alteration of behavior is required to continue current traditional land and resource use practices.
	Moderate	A measurable change from existing conditions that is above environmental and/or regulatory criteria but does not affect Indigenous health, TLRU is able to continue at a reduced level or with; • some restrictions on current practices; • some alteration of behavior is required to continue current practice in preferred ways or at preferred use locations.
	High	A measurable change from existing conditions that is above environmental and/or regulatory criteria and represents potentially unacceptable change to public health, and TLRU cannot continue or cannot continue without; • substantial changes to current practices; • substantial restrictions on the ability to continue current practices in preferred ways or at preferred use locations.
Magnitude – Socio-economic Conditions (degree or intensity of the change)	Negligible or Low	Negligible – no measurable change in; • land or resource use and capacity, • use or, access to, or interference with infrastructure and,

Table 10.3-4 Characterization of Residual Effects on Indigenous health and Indigenous Socio-economic Conditions

Characterization	Range of Criteria	Level of Effect and Definition
		• local employment, goods and service, economic activity from baseline conditions. Low - a small, measurable change in; • land and resource use and capacity but activities and production can take place at or near similar levels as under baseline conditions, • use of, access to, or interference with infrastructure and services but on a scale that is within the current available capacity and will not affect the quality of the service provided • local employment, goods and services, and economic activity.
	Moderate	Measurable change; • in land and resource use and capacity from baseline conditions, that is less than high, • in use of, access to or interference with infrastructure and services that nears the available capacity or may affect the quality of services provided, • which is unlikely to pose a substantial risk or benefit to the economy.
	High	Measurable change; • in land and resource use and capacity, such that activities and production cannot take place at similar levels as under baseline conditions, • in use of, access to or interference with infrastructure and services that meets or exceeds the available capacity or degrades the quality of service provided • on a scale that is substantial compared to current economic conditions and if negative, represents a management challenge.
Timing	No Sensitivity	Effect on Indigenous health and socio-economic conditions does not occur during a sensitive timing period as identified by related VCs and/or Indigenous groups.
	Moderate Sensitivity	Effect on Indigenous health and socio-economic conditions may occur during a lower sensitivity timing period, as identified by related VC's and/or Indigenous groups.
	High Sensitivity	Effect on Indigenous health and socio-economic conditions may occur during a higher sensitivity timing period, as identified by related VC's and/or Indigenous groups.
Extent (Spatial Boundary)	PDA	The physical space or directly affected area on which Project components or activities are located and/or immediately the adjacent area, including designated ROWs, and permanent and temporary facilities (e.g., borrow pits and quarries).

Table 10.3-4 Characterization of Residual Effects on Indigenous health and Indigenous Socio-economic Conditions

Characterization	Range of Criteria	Level of Effect and Definition
	LAA	Area within which potential Project effects are measurable and extending beyond the PDA but not beyond the LAA.
	RAA	The anticipated regional extent of potential direct, indirect and cumulative effects that may extend beyond the LAA.
Frequency (how often the effect occurs)	Infrequent	The potential effect occurs once or seldom during the life of the Project (e.g., initial clearing and grubbing).
	Sporadic/Intermittent	The potential effect occurs only occasionally and without any predictable pattern during the life of the Project (e.g., blasting at quarries; site-specific construction equipment noise; potential wildlife-vehicle collisions).
	Regular/Continuous	The potential effect occurs at regular and frequent intervals during the Project phase in which they occur or over the life of the Project (e.g., noise associated with vehicle traffic along the realigned portions of PR 239).
Reversibility (the degree of permanence)	Reversible (short-term)	Potential effect is readily reversible over a relatively short period (< than five years).
	Reversible (long-term)	Potential effect is potentially reversible but over a long period (> than five years).
	Irreversible	Project-specific potential effects are permanent and irreversible.
Social Context (resilience of a VC to adapt to changes as a result of the Project)	Below standard condition	Community condition, as measured by social determinants of health, economic health, and quality and availability of infrastructure and services is demonstrably lower than provincial average.
	Standard condition	Community condition, as measured by social determinants of health, economic health, and quality and availability of infrastructure and services is similar to the provincial average.
	Resilient	Indigenous groups are able to adapt and maintain pre-Project activities in the region.
	Not Resilient	Indigenous groups will not be able to adapt to changes or maintain pre-Project activities in the region.

10.3.1.6 Significance Definition

The determination of significance for Indigenous health and Indigenous socio-economic conditions relies on the characterizations and determinations presented in the assessment of related source VCs and their associated environmental effects and relates those determinations to Indigenous groups. If residual effects on a related VC (Chapter 9, Section 9.2 (land and resource use), Chapter 9, Section 9.3 (infrastructure and services), Chapter 9, Section 9.4 (economy), Chapter 9, Section 9.5 (health), and Section 10.2 (traditional land and resource use) were identified as significant and would have a substantial effect on Indigenous health and Indigenous socio-economic conditions, the resulting effects of

changes would also be considered as significant. The determination of significance is also guided by information provided by Indigenous groups and professional judgment applied to the Project context.

A significant effect on Indigenous health conditions is one that results in:

- a long-term loss of availability of traditional use resources or access to lands relied on for current use practices or current use sites and areas, such that current use is critically reduced or eliminated from the LAA, or
- chemical exposures that exceed objectives established by relevant regulatory organization(s) and are likely to result in a long-term change in the health of an identified receptor(s), or
- audible noise levels that exceed provincial guidelines, and where there is a reasonable expectation that the predicted changes in noise levels could result in an increase in public annoyance and could affect public health and welfare

A significant effect on Indigenous socio-economic conditions is one that results in:

- wide degradation, restriction or disruption of present land and resource uses to a point where these activities and production cannot continue at or near baseline levels or cannot be adequately compensated,
- an exceedance of available capacity or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies or mitigation measures. A significant adverse residual effect is also unlikely to recover to existing conditions, and/or
- economic effects which are distinguishable[2] from current conditions and trends and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation measures.

10.3.2 Existing Conditions for Indigenous health and Indigenous Socio-Economic Conditions

This describes existing conditions for Indigenous groups and potential effect pathways identified by Indigenous groups in order to identify interactions between the residual environmental effects predicted in the assessment of other VCs and the health and socio-economic conditions of Indigenous groups engaged regarding the Project.

[2] "Distinguishable" means that the adverse effect is measurable, predictable, and attributable to one or more project or cumulative interactions (i.e., it is not within the boundaries of normal variation of the measurable parameter under existing conditions).

10.3.2.1 Methods

Baseline Indigenous health and socio-economic conditions was obtained through review of TK studies and Indigenous engagement activities for the Project, and other primary and secondary data sources identified in Chapter 9, Section 9.2 (land and resource use), Chapter 9, Section 9.3 (infrastructure and services), Chapter 9, Section 9.4 (economy), Chapter 9, Section 9.5 (health), and Section 10.2 (traditional land and resource use). In addition, information was gathered through a review of publicly available literature containing information for Indigenous groups engaged on the Project to deepen the understanding of the current health and socio-economic conditions for these Indigenous groups. Confidential studies or those stipulating one-time use were excluded from the literature review. The following types of information sources were considered:

- TK studies conducted by Indigenous groups
- government reports and databases (i.e. Indigenous and Northern Affairs, Canadian Census)
- historical literature
- Internet sources (e.g., Indigenous group websites)
- geospatial analysis of land and resource use

The review considered the baseline information, issues and concerns, potential effects, and residual effects that are relevant to the potentially affected Indigenous groups' health and socio-economic conditions.

The results of the literature review is not a comprehensive representation of the Indigenous health and socio-economic conditions but rather an overview of information relevant to the understanding of potential Project effects on Indigenous groups. Manitoba Infrastructure will continue to engage with potentially affected Indigenous groups to hear issues or concerns, and to learn about Indigenous health and socio-economic conditions to be incorporated into Project planning, as appropriate.

Below is a summary of Indigenous health and socio-economic conditions from Indigenous groups engaged for the Project. Any concerns that have been shared with respect to the Project are also included. As indicated, engagement by Manitoba Infrastructure is ongoing and additional information may become available at a future date.

10.3.2.2 Overview

Indigenous Health Conditions

Health care for Indigenous groups in Manitoba is provided by the federal First Nations and Inuit Health Branch (FNIHB) and through Regional Health Authorities (RHAs). Indigenous groups in the RAA are in the Interlake-Eastern, Northern and Prairie Mountain RHAs. The FNIHB provides most services to residents living on reserve in First Nation communities in the RHA; however, First Nation residents living

on reserve do access regional hospitals and programs that are off reserve in the region. The RHAs have Indigenous health programs that provides Indigenous groups with access to health care in their own language. The program in the Eastern-Interlake RHA was designed in partnership with the IRTC (Interlake-Eastern Regional Health Authority 2018).

Health disparities exist between Manitoba's Indigenous and non-Indigenous populations. The Interlake-Eastern RHA Indigenous population is younger and has a higher birth rate than non-Indigenous people. Indigenous adults in the RHA are diagnosed with chronic diseases at higher rates and at younger ages compared to non-Indigenous Manitoban residents. The overall cancer incidence rate for First Nations in the RHA was 629.6 cases per 100,000 people compared to an overall Manitoba average of 471.2 (Interlake-Eastern Regional Health Authority 2018).

The First Nations Regional Health Survey (RHS) was initiated in 1997. Phase 3 of the survey was conducted between March 2015 and December 2016 (FNIGC 2018a, 2018b). The Phase 3, Volume 1 report indicated that almost two-thirds (59.8%) of FN adults, one third (33.2%) of FN youth, and over one-quarter (28.5%) of First Nation children had one or more chronic health conditions. Chronic health conditions such as diabetes, arthritis, hypertension, allergies and chronic back pain remain the most commonly reported conditions among First Nation adults.

A study by the Manitoba Centre for Health Policy (Martens et al. 2010) found that in 2006 in Manitoba, the Metis had a larger proportion of youth, a lower proportion of middle aged, and a lower proportion of older adults. Youth between 0 and 19 year of age comprised 33.9% of the Metis population compared with 26.4% of other Manitobans. People age 65+ comprised 9.1% of the Metis population compared to 13.9% of other Manitobans. The study also found that the Metis have higher mortality rates compared to other Manitobans and that chronic disease conditions is higher for the Metis with the exception of osteoporosis.

In terms of health facilities, the only hospital in the Interlake Region in the immediate vicinity of the Project is Lakeshore General Hospital, located in Ashern. It is a 14-bed acute care hospital with a 24-hour emergency room and offers ambulance services to Winnipeg and Dauphin. There are community health offices in Ashern and St. Laurent, the latter which is approximately 95 km from Ashern. Both communities also have emergency medical service stations. The E. M. Crowe Memorial Hospital, which is located in the community of Eriksdale, has 13-acute care beds. Community health offices and emergency medical service stations are located in Ashern and St. Laurent, approximately 95 km from Ashern. A mobile clinic visits Gypsumville weekly (Manitoba Infrastructure 2019b). The federal government provides most services to residents living on reserve in First Nation communities. First Nation members living on reserve do access regional hospitals and programs that are off reserve.

Shock Trauma Air Rescue Society (STARS) is contracted by the provincial government to provide rapid and emergency medical care and air transport for critically ill and injured patients within flying range of Winnipeg. The Winnipeg RHA oversees STARS.

The Northern RHA is the largest of the five RHAs in Manitoba. The First Nations in the Northern RAA, which include Fox Lake Cree Nation, Tataskweyak Cree Nation, York Factory First Nation and Pimicikamak Okimaun, Norway House Cree Nation, use hospitals located in Thompson (Thompson

General Hospital) which has 69 beds and Gillam Hospital which has 10 beds. The First Nations in the Northern RHA also have nursing stations located on-reserve which are funded by the federal government. Similarly, Indigenous communities on the east side of Lake Winnipeg are unlikely to use health facilities in the LAA (e.g., Berens River First Nation, Black River First Nation, Hollow Water First Nation). The communities of Ebb and Flow First Nation, Keeseekoowenin First Nation, O-Chi-Chak-Ko-Sipi First Nation and Skownan First Nation use health care facilities in the Prairies Mountain RHA.

In 2011 and 2014, flooding resulted in severe damage to housing and infrastructure in the First Nations communities, particularly those located on Lake St. Martin. Eighteen Indigenous communities were evacuated and over 1,300 residents have since returned to their communities. Some of these First Nations (e.g., Opaskwayak Cree Nation, Sioux Valley First Nation) are outside of the Indigenous health and socio-economic conditions RAA and weren't flooded. As of the end of March 2018, 1,717 people from the most affected First Nation communities remain evacuated. Over 1,600 of the 1,717 are from the four Lake St. Martin area First Nations: Lake St. Martin First Nation, Little Saskatchewan First Nation, Dauphin River First Nation and Pinaymootang First Nation (Government of Canada 2019a). The communities were evacuated from their Reserve Lands and in 2017 some community member begun to return home. Indigenous Services Canada (ISC) and the Province of Manitoba are rebuilding housing and infrastructure so that people displaced from their homes can return (Government of Canada 2019b). In January 2018, the Province of Manitoba signed a $90 million settlement agreement with the Lake St Martin First Nation, Dauphin River First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation as a result of the 2011 flood (CBC 2018). The lawsuit alleged that members of the four First Nations were forced to leave their homes in 2011 when the Government of Manitoba diverted water from the Assiniboine River to reduce the risk of flooding in Winnipeg. The long-term displacement due to the flooding has also been identified by Indigenous residents as a strain on livelihoods and well-being of community members (Einarsson 2017).

As identified in Section 10.2, the LAA is used by Indigenous groups for hunting, trapping, fishing, plant gathering. A list of 145 species used by Indigenous groups engaged on the Project for consumptive, ceremonial or utilitarian purposes is included in Appendix 10A, Table 10A.2-1. In addition to site specific hunting, trapping, fishing, plant gathering locations Indigenous groups also identified cultural sites, habitation areas, and trails and travelways within the LAA.

Indigenous Socio-economic Conditions

As noted above in 2011 and 2014, flooding resulted in severe damage to housing and infrastructure in the First Nations communities in the immediate Project area, particularly those located on Lake St. Martin and Lake Manitoba. Indigenous Services Canada (ISC) and the Province of Manitoba are rebuilding housing and infrastructure so that people displaced from their homes can return. It is estimated that all the Lake St. Martin area residents who were displaced by the 2011 flood will be able to return to their home communities by the end of 2019. The Government of Canada is also working to return evacuees from Ebb and Flow First Nation and Peguis First Nations to their communities (Government of Canada 2019b).

Indigenous groups in the RAA operate businesses that service community members, area residents and tourists. A non-comprehensive list of such businesses includes gas services stations (Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Fisher River Cree Nation, Lake Manitoba First Nation, and Peguis First Nation) (AHKI 2019; Rez Gas 2019); convenience stores/supermarkets (Pinaymootang First Nation, Peguis First Nation), and campgrounds (Pinaymootang First Nation). Indigenous-owned enterprises are also involved in various resource-based industries, including commercial fishing, trapping, and guide-outfitting (Section 10.1). Indigenous groups also have temporary accommodations in the RAA. These include the Pinaymootang Motel & Entertainment Centre, located in Fairford, which has 20 rooms, as well as hotels in Fisher River Cree Nation (Bay River Inns & Suites) and at Hodgson, but these are more distant from the RAA.

Peguis First Nation operates the Peguis Development Corporation (PDC), which has a mandate of facilitating economic development and employment within the Peguis community. Currently, the PDC owns businesses involved in construction, food retail, marketing communications, drill rig service, dry goods, and a gas service station. The PDC has also facilitated the development of businesses by community members (CBJ 2019; Peguis First Nation 2019).

In terms of economic activities, commercial fishing is an important income source for communities. Commercial fishing occurs on Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Engaging in commercial fishing provides income to Indigenous communities such as Dauphin River First Nation, Dauphin River Northern Affairs Community, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation, O-Chi-Chak-Ko-Sipi First Nation, Kinonjeoshtegon First Nation, and Lake Manitoba First Nation (Manitoba Infrastructure 2018b). Subsistence and recreational fishing is also carried out on Lake St. Martin, Dauphin River, Mantagao River, and Sturgeon Bay year-round (Manitoba Infrastructure 2019b). Lake St. Martin also supports a winter commercial fishery for walleye, lake whitefish, and sauger, and a year-round fishery for rough fish.

The Indigenous communities of Lake St. Martin, Little Saskatchewan River, and Pinaymootang engage in agricultural land use associated with hay lands. Fisher River Cree Nation has a forestry-based industry which includes timber harvest operations, sawmill, firewood production, tree nursery, tree plantations, biomass production, and forest regeneration contracts. Hunting and trapping for grouse, rabbits and furbearers (i.e., beaver and muskrat) are important resource use activities engaged in by Indigenous communities. Indigenous communities, such as Fisher River Cree Nation, also engage in resource-based tourism activities. Fisher River Cree Nation has identified expansion plans for resource tourism business with respect to remote outfitting camps and recreational development initiatives related to cottage lot and recreational vehicle (RV) campground development.

In 2016, the labour force of the LAA consisted of 3,725 persons over the age of 15 years and of these individuals, approximately 49.1% (participation rate) were employed or actively seeking work and 17.0% were unemployed. There are marked differences between the labour force living within First Nation Reserve lands (based on Census subdivisions) and the labour force living within the RMs of Grahamdale and West Interlake. The average participation rate of LAA/RAA residents living on a reserve is 43%, while

the unemployment rate is 34%. By contrast, within the RMs of Grahamdale and West Interlake the labour force participation rate is 61% while the unemployment rate is 8.0%. In 2016, there were approximately 635 unemployed workers in the LAA, of which 510 were living within an Indigenous community and the balance were living within the RM of Grahamdale and West Interlake (Chapter 9, Section 9.4).

10.3.3 Assessment of Residual Environmental Effects on Indigenous Health Conditions

The following 10 Indigenous groups have reserves or community locations within the LAA and RAA: Pinaymootang First Nation, Little Saskatchewan First Nation, Lake St. Martin First Nation, Dauphin River First Nation, Dauphin River NAC, Peguis First Nation, Fisher River Cree Nation, Fisher River NAC, Lake Manitoba First Nation and Kinonjeoshtegon First Nation. Members of the other 29 Indigenous groups engaged on the Project may choose to live and work within the LAA and RAA or travel to areas within the LAA or RAA to access services, temporary employment or to harvest country food. The assessment of residual effects included in this section will apply to all Indigenous people living, working or harvesting country foods within the LAA and RAA. However, this assessment focuses on the 10 Indigenous groups with reserves or community locations within the LAA and RAA, as the potential for adverse effects and benefits of the Project would primarily be experienced by Indigenous people who reside within the LAA and RAA.

10.3.3.1 Change in Indigenous Health Conditions

Project Pathways

As identified in Section 10.3.2, the effect pathways carried forward for Indigenous health conditions are also addressed as part of the health and TLRU assessments.

The health assessment (Chapter 9, Section 9.5) considered the effects of potential changes to air quality, water quality, soil quality and noise on human health. Indigenous receptors were included in the evaluation of the potential changes in human health risks. Indigenous receptors were assumed to live near the Project, have the opportunity to gather, harvest and consume both locally grown produce and country foods from the Interlake Region that lies within the LAA.

During construction, emissions such as combustion exhaust and fugitive dust are anticipated to have a residual effect on air quality. However, as identified in the Chapter 9, Section 9.5, the concentrations of contaminants of potential concern are predicted to remain below the applicable ambient air quality standards and a further assessment of effects on human health was not required.

Dust will be created during construction; however, the dust deposition is not expected to alter the concentrations of Project-related chemicals in surface water or ground water. The deposition of Project-related dusts on soils also is not expected to alter the concentrations of Project-related chemicals in surface soils or in terrestrial country foods consumed by Indigenous people (Chapter 6, Section 6.3).

Project activities related to construction and operation of the Project include increased sediment input to surface water (Chapter 6, Section 6.4.7.5, are also not anticipated to result in changes in surface water quality or groundwater quality (Chapter 6, Section 6.4). As a result, residual effects on Indigenous health conditions associated with the consumption of groundwater, surface water and/or aquatic country foods are not expected as a result of Project activities.

As identified in Chapter 6, Section 6.2.4.4 construction noise and noise from vehicles and machinery during operation and maintenance pose a potential annoyance risk for humans near the Project. Indigenous people harvesting country foods or practicing other traditional activities in the TLRU LAA may be exposed to construction noise. Construction related noise, in the absence of mitigation, is expected to result in noise levels above the upper noise threshold at a limited number of residential receptor locations. This effect on noise is anticipated to be temporary and is not expected to extend beyond the LAA. Blasting, if it is required, has the potential to affect health from the noise and vibrations.

In addition to the Project effect pathways identified in the health assessment (Chapter 9, Section 9.5), Indigenous health conditions may also be affected by changes in the availability of country foods and value or perceived quality of country foods which are assessed in TLRU (Section 10.2). The TLRU assessment considers changes to the availability of wildlife, fish and plants which are harvested for country foods. The Project is expected to remove plant species harvested as country foods from the PDA; however, the residual effects are not anticipated to alter the long-term persistence and viability of species including those harvested as country foods within the TLRU RAA. As identified in Section 10.2, the Project may create a barrier to accessing areas where country foods are harvested or initiate a change in access patterns or routes (by trails or boats) used to travel to harvesting locations. However, travel routes and patterns of access which are not intersected by the PDA will not be altered. Indigenous health conditions may also be affected if the Project alters the value or perceived quality of country foods.

The mental well-being of Indigenous residents in the local assessment areas has been affected by the 2011 flood and the associated displacement, causing a strain on the livelihoods and well-being of community members (Einarsson 2017). The goal of the Project, decreasing the extent of effects from flooding, is expected to have a positive effect on mental health of the area's inhabitants.

Mitigation

This section identifies mitigation measures proposed by Manitoba Infrastructure or identified for other projects with similar effect pathways (Construction Environmental Management Program (CEMP) and Project Environmental Requirements (PER) are detailed in Chapter 3, Section 3.7). Mitigation measures proposed to avoid or reduce potential adverse effects on Indigenous health conditions include those identified in the Health and TLRU assessments. A list of the key mitigation measures which will be implemented to reduce changes in Indigenous health conditions are presented below.

Mitigation measures include the following:

- Manitoba Infrastructure will continue to share Project information with Indigenous group and Indigenous business operators so that advanced planning can occur.

- A schedule of construction and Project activities will be made available to all Indigenous groups engaged on the Project, so that areas and time periods of activity can be avoided.
- Opportunities will be provided for interested Indigenous groups to harvest traditionally used plants prior to construction of the outlet channels.
- Vegetation control will occur through mechanical methods where feasible, and hand clearing will occur along shorelines to mitigate effects to plant harvesting. Chemical vegetation control will only be used when mechanical methods are not feasible.
- Manitoba Infrastructure is developing a surface water quality monitoring program for the Project. The monitoring program being developed for the Project area waterways will include the continued collection of surface water samples from regional and local waterways and analyses of a suite of parameters that will provide information on surface water quality in the Project area during Project construction, operation and maintenance activities.
- Temporary construction noise abatement barriers may be used to reduce noise levels. If noise abatement barriers are ineffective, a temporary reduction in the intensity of construction activities may be considered.
- Should blasting be required, the timing of blasting activities will consider area-specific environmental sensitivities, to the extent possible, with the intent of minimizing disturbance to stakeholders, avoiding disturbance to rare species and sensitive time periods, and to minimize potential effects on wildlife populations used by Indigenous groups for traditional purposes.
- Machinery and factory-supplied noise-abatement equipment (e.g., mufflers) will be maintained in good working order, and machinery idling will be minimized.
- A complaint response procedure will be implemented to address noise complaints, should they arise.
- An Access Management Plan, which will address access related issues expressed by directly affected landowners, Indigenous groups and the public, will be prepared to outline specific measures to ensure proper access during the construction of the Project.
- Manitoba Infrastructure will engage with Indigenous groups in order to better understand the use and importance of trails which are intersected by the Lake St. Martin Outlet Channel and to develop suitable means of crossing the Lake St. Martin Outlet Channel following construction.
- Manitoba Infrastructure will continue to engage with Indigenous groups regarding mitigations to changes to cultural value or importance associated with current use.

Project Residual Effects

No changes are expected to surface water quality, groundwater quality, soil quality or chemical quality of country food as a result of the Project (Chapter 9, Section 9.5). As a result, residual effects on Indigenous

health conditions are not anticipated from consumption of country foods, ingestion of drinking water or contact with surface or ground water.

Regarding increased sediment inputs to surface water, as indicated in Chapter 6, Section 6.4.7.5, sediment and vegetation may be flushed out when the water control structure gates are opened. While a temporary increase in sediment and debris transport may occur when the gates are opened, the overall changes in sediment erosion, transport and deposition due to the Project are expected to be localized in nature, minor and not measurable. The flood conditions, under which the Project gates would be opened, would be expected to include flows that carry elevated sediment loads irrespective of the Project. The overall amount of sediment and debris in the Lake Manitoba–Lake St. Martin–Lake Winnipeg system is not expected to be altered but could be distributed differently. As a result, changes to sediment and debris transport are anticipated to be negligible to low as are changes to water quality.

In Section 9.5.4.2, it was noted that Project construction activities related to excavation of the outlet channels may also result in changes in surface water and/or groundwater quality that may result in an increase in human health risk for people who use surface water or groundwater as a source of domestic water. The health assessment (Section 9.5) considered the effects of potential changes to water quality on human health. As stated in Section 9.5.4.2, the Project will have no residual effects on groundwater or surface water quality.

Changes to Indigenous health conditions as a result of Project effects on air quality will be negligible and emissions will remain below the applicable Ambient Air Quality Standards. Noise levels are expected to remain below noise thresholds for the majority of receptor locations. Where noise level exceedances are anticipated, the effect will be limited to construction and both Indigenous and non-Indigenous people are expected to be able to continue pre-Project activities in the area (Chapter 9, Section 9.5). The residential receptors at which noise level exceedances are anticipated are not located within an Indigenous group's reserve or community lands. While Project noise may result in temporary annoyance, residual effects on the health of Indigenous people are not anticipated.

Potential effects to travel and access, including by boat and by trail, were assessed in Section 10.2.4.5, and the results of that assessment were carried forward into the Indigenous health assessment. It is noted in Section 10.3.1.3 that boat travel takes place between Lake Manitoba, Lake St. Martin, Lake Winnipeg, the Fairford River, and the Dauphin River. Project construction and operation and maintenance activities will not affect navigation through those waterways (Section 10.3.1.3), and any potential effects to such travel will be limited to the construction phase of the Project. Sportfishing and recreational boating is likely to be affected during maintenance and operation of the outlet channels, due to the presence of the in-water components of the Project (10.3.3.2). Notices to boaters, involving the posting of signage (i.e., danger, do not trespass warnings) will be implemented to communicate with boaters that the channels are not to be used for navigation (Section 10.3.3.2).

The availability of and access to country foods within the LAA is currently limited by the effects of periodic flooding and the purpose of the Project is to lessen these effects. In doing so, the Project will remove plant species harvested for county foods from the PDA and affect the distribution and abundance of

wildlife and fish species in the TLRU LAA. However, the direct and indirect loss of habitat for harvested species is relatively small compared to the remaining habitat available in the RAA, and the habitat reclaimed by reversing the effects of flooding (Section 10.2). Travel routes intersected by the PDA and potentially used when harvesting country food are anticipated to change as a result of the Project. However, Indigenous people will be able to continue to travel in the area but crossing the outlet channels will only be possible at specific crossing locations which will be identified as site-specific mitigations are developed.

The social context in which residual effects on Indigenous health conditions will take place is characterized as below standard condition. The Indigenous groups who were evacuated in 2011 and 2014 and specifically Indigenous groups whose housing and infrastructure were severely damaged have social and economic determinants of health which are lower than the provincial average. Residual effects on Indigenous health conditions are characterized as adverse and low to moderate in magnitude as some alteration of behavior is required to continue harvesting country foods but changes do not represent an unacceptable change to public health. Effects will be long-term in duration, regular and continuous in frequency, and irreversible as changes to availability of country food will extend into the LAA though operations and maintenance phase of the Project, and the Project is not expected to be decommissioned. The timing of effects is characterized as highly sensitive based on the seasonality of harvested species and current land and resource use practices.

The Project may deter the harvest and consumption of country foods; Indigenous groups engaged on the Project identified this as an effect associated with all forms of development. The value or perceived quality of country foods is subjective, conditional and contingent on beliefs, perceptions, and qualitative experience of Indigenous land users. As such, Manitoba Infrastructure will continue to engage with Indigenous groups to better understand the extent to which this effect pathway may occur.

10.3.3.2 Assessment of Residual Environmental Effects on Indigenous Socio-Economic Conditions

Project Pathways

As identified in Section 10.3.2. the effect pathways carried forward for Indigenous socio-economic conditions are also addressed as part of the land and resource use, infrastructure and services, and economy assessments.

Land and Resource Use

Construction and operation of the Project may change Indigenous socio-economic conditions by affecting commercial activities that Indigenous people are engaged in, such as commercial fishing trapping and forestry. There are commercial fisheries active on Lake Manitoba, Lake St. Martin, and Lake Winnipeg and between these three waterbodies up to nine commercial fishery seasons will be affected by Project construction. Similar to residents of RMs of Grahamdale and West Interlake, commercial fishing on Lake Manitoba is a major source of income for members of some Indigenous groups. As identified in Chapter

9, Section 9.4, commercial fishing in Sturgeon Bay has been the most important source of income to the residents of Dauphin River, and also provides employment to residents of other nearby communities. Although the overall level of participation in commercial fisheries by Indigenous groups engaged on the Project is not known, potential effects on commercial fisheries were identified as a key concerns by three of the Indigenous groups whose reserves are located within the LAA, these being Lake St. Martin First Nation, Dauphin River First Nation, and Pinaymootang First Nation. Several other Indigenous groups engaged on the Project also identified this concern. Indigenous communities in the LAA also participate in other resource-based industries including trapping and forestry and the potential effects on trapping and forestry were identified as key concerns by Dauphin River First Nation and Lake St. Martin First Nation and Fisher River Cree Nation.

Construction and operation of the Project may change Indigenous socio-economic conditions by affecting farming and agricultural activities that Indigenous people are engaged in. As identified in Chapter 9, Section 9.4, hay land and pasture lands are located within the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation, and Pinaymootang First Nation. The reserve lands for these three Indigenous groups extends to the Lake St. Martin shoreline at several points around the lake. Reduction of lake levels in Lake St. Martin due to the operation of the LSMOC is a desired positive outcome and objective of the Project.

Changes in recreation and tourism were identified as potential issues by several Indigenous groups (see Table 10-3 and Section 5 for additional information). During construction access to Lake Manitoba, Lake St. Martin, and Lake Winnipeg for sportfishing and recreational boating in proximity to the Project would be affected by the in-water channel works. Channel excavation for the ROW may physically interfere with recreational activities and limit the ability of recreationalists from accessing recreation areas. Nuisance effects (e.g., Project-related noise, dust and reduced visual quality) may also affect the experience of recreationalists, if these changes deter visitors businesses reliant on visitor experience for their revenues, such as guide-outfitters, could also be affected. During operation and maintenance of the outlet channels, access to Lake Manitoba, Lake St. Martin, and Lake Winnipeg for sportfishing and recreational boating in proximity to the Project would be affected by the ongoing presence of the in-water components. Though the ROW is not meant to be accessible to public automobile traffic, it could be used as a recreational trail for snowmobiles and ATVs.

Changes in resource use were identified as potential issues by several Indigenous groups (see Table 10-3 and Section 5 for additional information). During construction, trapping of furbearers and access to resources could be affected by the channel works. Channel excavation for the ROW may physically interfere with trapping activities and limit the ability of resource users to access trapping areas. The construction of the channels and access to the channel ROW has the potential to affect productive forestland and high value forest sites (e.g., past personal permit areas). Nuisance effects (e.g., noise, dust, and reduced visual quality) may also affect the experience of resource users. During operation and maintenance of the channels, access to trapping areas could be affected by the ongoing presence of the channel works. Though the ROW is not meant to be accessible to resource users, it could be used as an access point for trappers.

Infrastructure and Services

It is expected that the majority of the Project's workforce will be from outside of the RAA and will require accommodations while on site. These workers will stay in construction camps established for the Project or at hotels and motels found in the communities located in the LAA (Chapter 9, Section 9.3). Indigenous groups engaged on the Project operate temporary accommodations within the LAA. These include the Pinaymootang Motel & Entertainment Centre, located in Fairford and the Fisher River Cree Nation's Bay River Inns & Suites in Hodgson (PMEC 2019; FRCN 2019). Because of the limited availability of such accommodations, it is anticipated that most workers will be housed at one or more temporary construction camps (Chapter 9, Section 9.3). Depending on the timing and the number of workers requiring temporary accommodations, there is a potential that there will be limited accommodations available for others (e.g., visitors or tourists both Indigenous and non-Indigenous) during construction.

As identified in Chapter 9, Section 9.3, the Project is anticipated to increase demands on community infrastructure and services during construction in the LAA. This could result in a reduction in available capacity and/or quality of services for Indigenous people living within LAA. For example, there could be injuries at construction sites, vehicle collisions because of increased traffic, and incidents requiring police response. This could reduce the capacity of existing service providers to respond to other emergencies in Indigenous and non-Indigenous communities within the LAA. Construction of the Project will also generate solid waste and the construction camps will require water, wastewater and solid waste services.

Project-generated construction phase road traffic will increase traffic volumes, potentially contributing to roadway congestion. This may affect Indigenous people living and working within the LAA. Access to resource use and recreational sites and to traditional use and cultural sites may be restricted during construction and operation of the Project.

Economy

Project employment can result in both positive and adverse effects which can extend to Indigenous groups. The unemployment rate of individuals living within or outside of First Nation Reserve lands located in the LAA is over four times higher than the unemployment rate within RMs of Grahamdale and West Interlake (i.e., 34% unemployment compared to 8%). During construction, Project contractors and sub-contractors will hire workers from within the LAA and will also bring in workers from outside the LAA to meet labour requirements. Local suppliers to the Project would create additional indirect jobs, and spending by the direct and indirect workforce would result in induced employment (Chapter 9, Section 9.4). While Project related employment is anticipated to be primarily beneficial, as it will result in an increase in household income, it is also recognized that a sudden change in discretionary income in some households may result in changes in spending decisions that may result in adverse social outcomes. There is also the possibility that some individuals will leave school early in order to take up employment with the Project.

Project spending can benefit and adversely affect regional businesses including Indigenous owned businesses. Benefits typically relate to increased revenues, which can increase the capacity of local

businesses by supporting capital investment and hiring. Adverse effects relate to increased demand for labour, and goods and services, which can increase operational costs (and therefore decrease revenues) through wage inflation and employee turnover. Increased competition for labour can also decrease the capacity of local businesses through labour shortages.

Mitigation

This section identifies mitigation measures proposed by Manitoba Infrastructure or identified for other projects with similar effect pathways (Construction Environmental Management Program (CEMP) and Project Environmental Requirements (PER) are detailed in Chapter 3, Section 3.7). Mitigation measures proposed to avoid or reduce potential adverse effects on Indigenous socio-economic conditions include those identified in the land and resource use, infrastructure and services, and economy assessments. As list of the key mitigation measures which will be implemented to reduce changes in Indigenous socio-economic conditions are presented below.

Mitigation measures include the following:

- Manitoba Infrastructure will continue to share Project information with Indigenous group and Indigenous business operators so that advanced planning can occur.
- A schedule of construction and Project activities will be made available to all Indigenous groups engaged on the Project, so that areas and time periods of activity can be avoided.

Land and Resource Use

- Manitoba Infrastructure will engage with commercial fish harvesters, anglers, local resource users, and MSD Regional Officials to address potential conflict, disturbance, or access restrictions to fishing/harvesting areas in the PDA and LAA, and availability of fish resources.
- Manitoba Infrastructure will contact recreational users/organizations to the extent feasible and practical prior to Project start-up to notify them of Project construction activities and schedule.
- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- Existing roads, road allowances, trails, portages and other travel ways shall not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users.
- Recreation will not be allowed along the outlet channels following construction and during operation and maintenance; Manitoba Infrastructure will install warning signs where required.
- Transport Canada (TC) Navigation Protection Approval(s) will be required for the construction of in-water structures such as groynes and levees.

- Notices to boaters, involving the posting of signage (as per Transport Canada requirements) will be implemented to communicate with boaters that the channels are not to be used for navigation.
- Employees, workers and other staff shall not hunt, trap or harass wildlife at the construction site or during working hours.
- No person shall remove, disturb, spring or in any way interfere with any trap set out lawfully by any other person for the purpose of taking furbearing animals.
- Signage will be erected for restriction of unauthorized access to the outlet channels during operation.
- Locations of past personal permit areas (timber) will be identified in the Environmental Protection Plan(s) (EPPs) to limit damage from construction activities (e.g., errant construction equipment).

Infrastructure and Services

- Temporary construction camps will be used to house the majority of the workforce.
- An Emergency Response Plan will be developed for the Project and shared with Project personnel. The plan will include measures to address the disposal of waste, emergency response communications, 24-hour emergency transport to hospital for occupational and non-occupational injuries and a plan for fire response and evacuation.
- An Access Management Plan, which will address access related issues expressed by directly affected landowners, Indigenous groups and the public, will be prepared to outline specific measures to ensure proper access during the construction of the Project.
- A Traffic Management Plan will be prepared for the Project, which will include a traffic control plan to describe anticipated detours and schedules specific to the Project design to mitigate travel delays.
- Manitoba Infrastructure will continue to engage with Indigenous groups in order to better understand the use and importance of trails which are intersected by the Lake St. Martin Outlet Channel and to develop suitable means of crossing the Lake St. Martin Outlet Channel following construction (Section 10.3.3.1).

Economy

- Manitoba Infrastructure will work with First Peoples Development Inc., a non-profit organization that connects First Nations Sub-Agreement Holders with employment and training initiatives, to identify and explore opportunities for working with Indigenous groups on Manitoba Infrastructure projects.

Project Residual Effects

Land and Resource Use

As identified in Chapter 9, Section 9.2, residual adverse effects on commercial fishing and trapping are anticipated as there will be a net loss in resource use. During construction, access to resources could be temporarily disrupted and affect the harvest of commercial fishers and trappers (Chapter 9, Section 9.2). These residual effects, while limited to construction, may affect income sources for Indigenous groups engaged on the Project. Particularly, Dauphin River First Nation, Dauphin River Northern Affairs Community, Kinonjeoshtegon First Nation, Lake Manitoba First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Peguis First Nation, Fisher River Cree Nation, Ebb and Flow First Nation and O-Chi-Chak-Ko-Sipi First Nation will be affected, as they identified the importance of commercial fishing and trapping for their residents (Manitoba Infrastructure 2018b).

The reductions in lake levels and flood levels in Lake St. Martin as a result of the Project will provide positive effects to agricultural land use along the Lake St. Martin shoreline that will persist through operation of the Project. It is anticipated that this will allow for the return of soil capability and productivity to the area of the shoreline affected by flooding in recent years. This is anticipated to manifest primarily in return of hay land and pasture productivity within reserve lands associated with the Indigenous communities of Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation along the western shoreline of Lake St. Martin.

During the construction phase, the presence of workers and equipment in the LAA will generate noise, dust and a visual presence. This may detract from the recreational experience causing tourists/ recreational users to reduce or stop their use of areas near Project work sites during periods of construction activity. Recreational activities such as fishing and hunting and indirectly business such as guide-outfitters may be affected but this disruption is expected to be limited to construction. During Project operation and maintenance, potential interactions with recreational use/activities will be limited, except from the presence and visibility of the outlet channels. Visual quality within the LAA is not expected to change overall with the Project. The outlet channels will create access restrictions which are potentially adverse for some recreational users such as snowmobilers. The Project's construction phase will span three trapping seasons in Open Trapping Area Zone 3 and the Gypsumville RTL for most furbearer species, excluding black bear in all zones and wolverine in Open Trapping Zone Area 3 (MSD 2018b). MSD has noted that marten along the LSMOC LAA may be particularly susceptible to an adverse interaction with the Project due to the construction of the outlet channels and development of barrier impeding dispersal. During construction, noise and activity is anticipated to deter furbearer movement across both channels (see Chapter 8, Section 8.3). During Project operation and maintenance, increased access for trapping is anticipated to result in an increased mortality risk to furbearers will persist. Chapter 8, Section 8.3 provides further discussion on wildlife mortality risk and access.

Access to the commercial fish lakes will not be permanently affected by the Project. The physical area removed (temporarily) from fish harvesting (i.e., the inlet and outlet areas) will be negligible in proportion within the LAA to overall sizes of Lake Manitoba (1.4%), Lake St. Martin (0.2%), and Lake Winnipeg

(0.1%). The presence of a construction workforce could lead to increased competition for fish resources that are of interest to commercial fishers in the LAA. Existing access is already available to commercial fishing lakes. Project operation and maintenance is anticipated to have no potential interaction with commercial fishing.

The Project's construction phase will remove commercial forest area (productive forestland) and a past personal permit area from the LAA. Project operation and maintenance activities are not expected to affect commercial forestry use as trees will have been already removed from the channel ROW.

Infrastructure and Services

Residual effects on accommodations are expected to be adverse during construction because of the limited availability of temporary accommodations within the LAA and the potential for displacement of other users, such as tourists. However, there could also be an economic benefit to the region because of spending on accommodations and related services.

Adverse residual effects on the availability of community infrastructure and services are also anticipated during construction due to the influx of workers. Potential effects from the Project on emergency and protection services will be reduced through the implementation of the Emergency Response Plan, which will include a plan for medical incidents that includes 24-hour emergency transport to hospital and a plan for fire response and evacuation.

Although a detailed estimate of wastewater generation has not been completed, the Project will not source potable water, or dump wastewater or solid waste generated through construction at an Indigenous community. If an Indigenous group expresses interest in providing these contracting services to the Project, Manitoba Infrastructure would collaborate with the Indigenous group/business and identify a work package which includes the appropriate water sourcing and disposal and treatment of waste.

During construction, local travel between Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Dauphin River First Nation, and Dauphin River Northern Affairs Community and the town of Hilbre, along PR 6 and 513, is unlikely to experience Project related traffic or worker presence. Construction traffic associated with the LMOC will be take place south of Hilbre on PR 6 and PR 239 and not extend into Indigenous group's reserve or community roads. As most of the LSMOC construction traffic will use the EOC access road, it is anticipated that Project-related traffic along PTH 6, north of Hilbre as well as on connecting roads, such as PR 513 will be minimal. Members of Lake St. Martin First Nation, Little Saskatchewan First Nation, Pinaymootang First Nation, Dauphin River First Nation and Dauphin River Northern Affairs Community may experience Project related traffic when traveling south of Hilbre along PTH 6 to access the City of Winnipeg.

During operation the LMOC and LSMOC will allow more water to be conveyed from Lake Manitoba to Lake Winnipeg more quickly and increase the percentage of time that Lake Manitoba and Lake St. Martin can be managed at desired levels. This will alleviate flooding in low-lying areas, which incudes but is not limited to the Pinaymootang First Nation, Little Saskatchewan First Nation, and Lake St. Martin First Nation reserve lands which border Lake St. Martin. Roadways that may otherwise be flooded, such as PR

513, the primary road access to Dauphin River First Nation and Dauphin River Northern Affairs Community, may remain operational, facilitating the connectivity of residents, businesses, and services that use these roads.

Economy

Approximately 13% of direct employment (90 persons, 268 PYs) would be satisfied by current LAA residents with the remaining hired from elsewhere in Manitoba. In consideration of the higher rate of unemployment in Indigenous groups compared to the larger labour force within the LAA, there may be more opportunities for employment and increased income. The likelihood of labour competition may also be lower than within the labour force living within the RM of Grahamdale and West Interlake.

Construction-related employment will end once the Project is completed. The Project-based, short-term nature of employment is common in the construction industry, and as Project related demand for construction workers winds down it is anticipated that many workers will find employment on other projects. Further, the skills, experience and labour income gained by construction workers during their employment with the Project could improve qualifications and reduce financial barriers to employment on future projects in the LAA and elsewhere.

Indigenous owned businesses located within the LAA could provide fuel, accommodation and potentially other services to support Project construction. Due to their proximity, these businesses are well-positioned to benefit from Project spending. Manitoba Infrastructure's purchasing and contracting policies would also determine the extent to which local businesses would benefit from construction-related spending.

The Project will lead to increased demand for and goods and services within the LAA, and while Indigenous workers hired directly or indirectly as a result of the Project will likely have higher incomes to support greater spending the Indigenous people not participating Project related work may see increased prices in consumer goods without increases in income. It is not likely that the Project will affect the cost and availability of consumer goods for Indigenous groups within the RAA because it is expected that the market will respond to increased supply of such items, which can easily be transported from major commercial centres, including Winnipeg.

Overall the social context in which residual effects on Indigenous socio-economic conditions will take place within is characterized as below standard condition. The Indigenous groups who were evacuated 2011 and 2014 and specifically Indigenous groups whose housing, and infrastructure was severely damaged have economic conditions including unemployment rates and household incomes which are below the provincial average. Residual effects on Indigenous socio-economic conditions will take place during construction and operation and extend to all of the Indigenous groups located within the LAA. The duration of residual effects on Indigenous socio-economic conditions are likely to take place at regular intervals during construction, operations, or maintenance activities and are characterized as regular/continuous in frequency and short-term duration.

Residual effects on commercial activities, including trapping and forestry, and recreation and tourism are anticipated to be adverse and moderate in magnitude, as commercial fishing, trapping and forestry activities and production and recreation and tourism activities will be affected but be able to continue at similar levels as under baseline conditions. Residual effects on agriculture will be positive and moderate in magnitude as the restored productivity of the hay land and pasture within Lake St. Martin First Nation, Little Saskatchewan First Nation, and Pinaymootang First Nation.

During construction, residual effects on infrastructure and services will be adverse with accommodation near or above the available capacity and the quality of services such as emergency response may be affected. During operations, positive effects which are moderate in magnitude are anticipated as the LMOC and LSMOC increase the percentage of time that Lake Manitoba and Lake St. Martin can be managed at desired levels and alleviate effects of flooding on infrastructure and services.

Changes in labour force and regional economy are moderate in magnitude and unlikely to pose a substantial risk or benefit to the economy. Project residual effects on the employment are expected to be positive in direction with the addition of direct, indirect, and induced employment income for Indigenous workers. The regional economy is predicted to experience both positive and adverse effects. Positive effects will result from Project-related direct and indirect spending within the LAA, as well as increased household spending from the local residents hired by the Project. The inclusion of household financial management training and prohibition of hiring individuals aged 18 or younger without high school certificates will reduce the potential for adverse social effects associated with increased household income. Local Indigenous businesses could also experience adverse effects related to potentially higher costs of labour and some services due to localized inflation associated with Project spending.

10.3.3.3 Effects on Sub-populations within Indigenous Groups

Manitoba Infrastructure acknowledges that potential Project effects could be experienced differently for particular sub-populations within an Indigenous group. However, little information regarding sub-populations such as women, youth, and Elders has been obtained to date. As described in Section 10.2.2.3, existing conditions for Traditional Land and Resource Use (TLRU) were derived from Project-specific Traditional Knowledge (TK) studies and the Indigenous engagement program for the Project and the Lake St. Martin Emergency Outlet Channel. In addition, information was gathered through a review of publicly available literature. Information obtained by Manitoba Infrastructure indicates that some Indigenous groups have governing structures that include women's, Elders' and youth councils. In Section 10.2.2, it was noted that Pimicikamak Okimawin governs by consensus, and that consensus is achieved through four councils – the Women's, Elders, Youth, and Executive councils (Pimicikamak n.d.). As well, the Treaty 2 Organization holds many councils, including the Grand and Governing Councils, the Elders and Ikwewak (Women) Councils, the Land, Water and Resource Council, and the Anishnaabek and Youth Councils. However, further information about the operations, proceedings and conclusions of these governing councils, including any information about how women, Elders, or youth might be differentially impacted by potential Project effects was not available.

In Section 10.3.2.2, the First Nations Regional Health Survey (FNIGC 2018a, 2018b) was referenced, which indicated almost two-thirds (59.8%) of First Nation adults, one third (33.2%) of First Nation youth, and over one-quarter (28.5%) of First Nation children had one or more chronic health conditions (FNIGC 2018a, 2018b). Also discussed in Section 10.3.2.2. was the Manitoba Centre for Health Policy study (Martens et al. 2010), which found that in terms of the 2006 Manitoba population, Métis had a larger proportion of youth, a lower proportion of middle-aged, and a lower proportion of older adults. Youth between 0 and 19 years of age comprised 33.9% of the Métis population compared with 26.4% of other Manitobans. As discussed in Section 10.3.3.1, residual effects on Indigenous health conditions associated with the consumption of groundwater, surface water, and/or aquatic country foods are not anticipated as a result of Project activities. Overall, project effects on Indigenous health through the ingestion of country foods and exposure to air quality and noise changes are expected to be low to moderate. Given this, Indigenous groups engaged on the Project are not expected to be differentially affected.

Manitoba Infrastructure is committed to ongoing engagement with Indigenous groups as outlined in the Indigenous Consultation Approach and Current Status document. Further information obtained regarding how particular sub-populations within an Indigenous group may be differentially impacted by Project effects will be considered against the results of the EIS and incorporated into Project planning and regulatory reporting as appropriate.

10.3.3.4 Summary of Project Residual Effects

Table 10.3-5 summarizes the residual environmental effects on Indigenous health and socio-economic conditions during construction and operations.

Table 10.3-5 Summary of Project Residual Effects on Indigenous health and Socio-economic Conditions

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-economic Context
Change in Indigenous Health Conditions	C/O	A	LT	L-M	HS	LAA	RC	IR	BS
Change in Indigenous Socio-economic Conditions	C/O	A-P	ST-LT	M	HS	LAA	R	R	BS

Table 10.3-5 Summary of Project Residual Effects on Indigenous health and Socio-economic Conditions

Residual Effect	Residual Effects Characterization								
	Project Phase	Direction	Duration	Magnitude	Timing	Geographic Extent	Frequency	Reversibility	Socio-economic Context

KEY See Table 10-4 for detailed definitions. ***Project Phase*** *C: Construction* *O: Operation* ***Direction:*** *P: Positive* *A: Adverse* *N: Neutral* ***Duration:*** *ST: Short-term* *MT: Medium-term* *LT: Long-term*	***Magnitude:*** *N: Negligible or Low* *L: Low* *M: Moderate* *H: High* ***Timing*** *NS: No sensitivity* *MS: Moderate sensitivity* *HS: High sensitivity* ***Geographic Extent:*** *PDA: Project development area* *LAA: local assessment area* *RAA: regional assessment area* *N/A: Not applicable*	***Frequency:*** *IF: Infrequent* *SR: Sporadic/Intermittent* *RC: Regular/Continuous* ***Reversibility:*** *RS: Reversible (short-term)* *RL: Reversible (long-term)* *I: Irreversible* ***Ecological/Socio-Economic Context:*** *BS: Below standard condition* *S: Standard condition* *R: Resilient* *NR: Not resilient*

As indicated in Section 10.3.3.1, residual effects on Indigenous health conditions associated with the consumption of groundwater, surface water, and/or aquatic country foods are not anticipated as a result of Project activities. Project activities related to construction and operation of the Project are also not anticipated to result in changes in surface water quality or groundwater quality (Section 10.3.3.1), and no changes are expected to surface water quality, groundwater quality, soil quality, or chemical quality of country food as a result of the Project (Section 10.3.3.1). While dust will be created during construction, deposition is not expected to alter the concentrations of Project-related chemicals in surface water or ground water (Section 10.3.3.1). As indicated in Section 10.3.4.1, since no changes are expected to surface water quality, groundwater quality, soil quality, or chemical quality of country food, chemical exposure levels are likely to remain below thresholds established by relevant regulatory organizations.

Potential effects to travel and access, including by boat and by trail, were assessed in Section 10.2.4.5, and the results of that assessment were carried forward into the Indigenous health assessment. It is noted in Section 10.3.1.3 that boat travel takes place between Lake Manitoba, Lake St. Martin, Lake Winnipeg, the Fairford River, and the Dauphin River. Project construction and operation and maintenance activities will not affect navigation through those waterways (Section 10.3.1.3), and any potential effects to such travel will be limited to the construction phase of the Project. Sportfishing and recreational boating is likely to be affected during maintenance and operation of the outlet channels, due to the presence of the in-water components of the Project (10.3.3.2). Notices to boaters, involving the posting of signage

(i.e., danger, do not trespass warnings) will be implemented to communicate with boaters that the channels are not to be used for navigation (Section 10.3.3.2).

As indicated in Section 10.3.1.3, water travel between Lake Manitoba, Lake St. Martin, Lake Winnipeg, Fairford River, and the Dauphin River will not be affected by Project operation and maintenance. As discussed in Section 10.3.3.2, Project operation and maintenance is anticipated to have no potential interaction with commercial fishing. Project operation and maintenance effects are not expected to affect commercial forestry use, as trees will have been already removed from the channel ROW (Section 10.3.3.2). Expected effects include increased access for trapping resulting in an increased mortality risk to furbearers (Section 10.3.3.2); discontinuation of recreation along the outlet channels during operation and maintenance (Section 10.3.3.2); and vehicle noise during operation and maintenance which could cause annoyance (Section 10.3.3.2). Overall, potential effects to Indigenous health resulting from Project operation and maintenance are expected to be negligible.

Existing roads, road allowances, trails, portages, and other travel ways will not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users (Section 10.3.3.2). In addition to site-specific hunting, trapping, fishing, and plant gathering locations, Indigenous groups also identified cultural sites, habitation areas, and trails and travelways within the LAA (Section 10.3.2.2). Manitoba Infrastructure will continue to engage with Indigenous groups in order to better understand the use and importance of trails which are intersected by the Lake St. Martin Outlet Channel and to develop suitable means of crossing the Lake St. Martin Outlet Channel following construction (Section 10.3.3.1).

10.3.4 Determination of Significance

10.3.4.1 Significance of Residual Environmental Effects from the Project

A significant effect on Indigenous health conditions is one that results in:

- a long-term loss of availability of traditional use resources or access to lands relied on for current use practices or current use sites and areas, such that current use is critically reduced or eliminated from the LAA, or
- chemical exposures that exceed objectives established by relevant regulatory organization(s) and are likely to result in a long-term change in the health of an identified receptor(s), or
- audible noise levels that exceed provincial guidelines, and where there is a reasonable expectation that the predicted changes in noise levels could result in an increase in public annoyance and could affect public health and welfare

Although some alteration of behavior will be required to continue harvesting country foods changes to current use practices will not be critically reduced. No changes are expected to surface water quality, groundwater quality, soil quality or chemical quality of country food and as a result chemical exposure levels are below objectives established by relevant regulatory organization. Noise levels are not

anticipated to affect public health and welfare. As a result, residual effects on Indigenous health conditions are anticipated to be not significant.

A significant effect on Indigenous socio-economic conditions is one that results in:

- wide degradation, restriction or disruption of present land and resource uses to a point where these activities and production cannot continue at or near baseline levels or cannot be adequately compensated or
- an exceedance of available capacity or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies or mitigation measures. A significant adverse residual effect is also unlikely to recover to existing conditions or
- economic effects which are distinguishable[3] from current conditions and trends and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation measures.

The reductions in lake levels and flood levels in Lake St. Martin as a result of the Project will provide positive effects to agricultural land use within Lake St. Martin First Nation, Little Saskatchewan First Nation and Pinaymootang First Nation. Residual effects on commercial fishing, trapping, forestry, and recreation and tourism are expected particularly during construction however it is anticipated that the activities will be able to continue at similar levels as under baseline conditions. Changes to accommodation will take place during Project construction but are not anticipated to persistent and ongoing. A Traffic Management Plan and Emergency Response Plan will be implemented to mitigate residual effects on community infrastructure and services. Positive effects on infrastructure and services are anticipated during operations when the Project will alleviate flooding in low-lying areas and roadways and other infrastructure that may otherwise be flooded may remain operational. Changes in labour force and regional economy are unlikely to pose a substantial risk or benefit to the economy. As a result, residual effects on Indigenous socio-economic conditions are anticipated to be not significant.

10.3.5 Potential Effects on Federal Lands

Federal Lands within the Indigenous health and socio-economic assessment consist of the reserve lands associated with the Indigenous communities of Pinaymootang First Nation, Little Saskatchewan First Nation, Lake St. Martin First Nation, Dauphin River First Nation, Peguis First Nation, Fisher River Cree Nation, Lake Manitoba First Nation, and Kinonjeoshtegon First Nation.

Effects on land and resource use during construction and operation and maintenance of the Project were evaluated in related VCs; Chapter 9, Section 9.2 (land and resource use), Chapter 9, Section 9.3

[3] "Distinguishable" means that the adverse effect is measurable, predictable, and attributable to one or more project or cumulative interactions (i.e., it is not within the boundaries of normal variation of the measurable parameter under existing conditions).

(infrastructure and services), Chapter 9, Section 9.4 (economy), Chapter 9, Section 9.5 (health), and Section 10.2 (traditional land and resource use).

During construction residual effects of the Project on land and resource use, infrastructure and services, economy, health and traditional land and resources use are not expected to be greater on federal lands. During operations positive effects on; agricultural land use along the shoreline of Lake St. Martin First Nation, Little Saskatchewan First Nation, and Pinaymootang First Nation lands as well as infrastructure and services within the low-lying Federal lands around Lake St. Martin.

No additional mitigation measures or follow-up and monitoring programs beyond those identified in Sections 9.2, 9.3, 9.4, 9.5, and 10.2 are required for federal lands.

10.3.6 Prediction Confidence

Prediction confidence in the assessment of effects on Indigenous health and socio-economic conditions is low-to-moderate. This reflects the level of information available for Indigenous groups engaged on the Project and the level of discussion which has taken place with Indigenous groups regarding the findings of this assessment. Given the qualitative and subjective nature of assessing Indigenous health and socio-economic conditions, the views of Indigenous groups may differ from the findings of this assessment.

Manitoba Infrastructure's engagement process with Indigenous groups is ongoing and will continue throughout the Project phases to consider information, concerns, and recommendations provided by Indigenous groups.

10.3.7 Follow-up and Monitoring

Follow-up and monitoring programs for Indigenous health and socio-economic conditions have not been identified at this point. However, anticipated effects of the Project and efficacy of proposed mitigation will be discussed with Indigenous groups as part of Manitoba Infrastructure's ongoing engagement.

10.3.8 Conclusions

10.3.8.1 Change in Indigenous health conditions

Project effects on Indigenous health conditions have been considered and avoided or reduced through the application of mitigation measures. Residual effects on Indigenous health conditions are not anticipated from consumption of country foods, ingestion of drinking water or contact with surface or ground water. Project effects on air quality will be negligible and noise levels associated with construction are not anticipated to effect health of Indigenous people. Residual effects on Indigenous health conditions are characterized as adverse and low to moderate in magnitude as some alteration of behavior is required to continue harvesting country foods but changes do not represent an unacceptable change to public health. The Project may deter the harvest and consumption of country foods; Indigenous groups engaged on the Project identified this as an effect associated with all forms of development. Manitoba Infrastructure will continue to engage with Indigenous groups to better understand the extent to which

changes to the perceived quality of country foods may occur as a result of the Project. Residual effects on Indigenous health conditions are not predicted to be significant.

10.3.8.2 Change in Indigenous Socio-economic Conditions

Project effects on Indigenous socio-economic conditions have been considered and avoided or reduced through the application of mitigation measures. Residual effects on commercial fishing, trapping, forestry, and recreation and tourism are expected particularly during construction however it is anticipated that the activities will be able to continue at similar levels as under baseline conditions. The reductions in lake levels and flood levels in Lake St. Martin as a result of the Project will provide positive effects to agricultural land use within Lake St. Martin First Nation, Little Saskatchewan First Nation, and Pinaymootang First Nation. Adverse residual effects on the availability of community infrastructure and services will be reduced through the implementation of the Emergency Response Plan. Local travel between Indigenous groups located on the west and north shore of Lake St. Martin and the town of Hilbre is unlikely to experience Project related traffic or worker presence. A Traffic Management Plan will be developed to address effects on use of the wider road network in the LAA. Project residual effects on the employment are expected to be positive with the addition of direct, indirect, and induced employment income for Indigenous workers. Residual effects on Indigenous socio-economic conditions are not predicted to be significant.

10.4 ABORIGINAL AND TREATY RIGHTS

10.4.1 Scope of the Assessment

This assessment for the Aboriginal and Treaty Rights VC is in accordance with the requirements described in both federal and provincial guidance documents for the Project. Concordance tables, demonstrating where EIS Guidelines are addressed, are provided at the beginning of the EIS.

Section 2.3 of Part 1 of the Agency EIS Guidelines for the Project (CEA Agency 2018) discusses the need to fulfil the statutory obligations of the *Canadian Environmental Assessment Act 2012* (CEAA 2012) to assess environmental effects of the proposed Project on Aboriginal peoples, and to assist the Agency fulfilling the Crown's constitutional obligations to consult with potentially impacted Indigenous groups on potential impacts to potential or established Aboriginal or Treaty rights. Section 3.4.1 of the Environmental Assessment Scoping Document for the Project (Manitoba Infrastructure 2018a) was submitted to Manitoba Sustainable Development indicates that the EIS will contain information on Indigenous peoples, in order to support this assessment. The EIS Guidelines require the EIS/EA to assess potential adverse impacts of the Project on potential or established Aboriginal or Treaty rights and where appropriate identify measures to mitigate or accommodate potential adverse impacts.

Chapter 4, Section 4.4.1 of the EIS describes VCs as features that may be affected by the Project as related to the role of the VC in the ecosystem and the value people place on it. Aboriginal and Treaty Rights is a valued component because of the constitutional requirement for government (federal, territorial and/or provincial) to fulfill the Duty to Consult with Indigenous groups. The Government of

Canada (2017) has recognized that, through consultation, the Crown seeks to strengthen relationships and partnerships with Aboriginal peoples and thereby achieve reconciliation objectives. Based on Government of Canada's (AANDC 2011) guiding principles and consultation directives, existing consultation mechanisms such as environmental assessment and regulatory approval processes in which Aboriginal consultation will be integrated will be used to coordinate decision making and determine if additional consultation is required. Manitoba's Department of Indigenous and Northern Relations also has an interim provincial policy (n.d.) for Crown consultations that identifies three key objectives:

- To ensure the Government of Manitoba informs itself and gains a proper understanding of the interests of First Nations, Métis communities and other aboriginal communities, with respect to a proposed government decision or action.
- Ways to address and/or accommodate those interests, where appropriate, will be identified through a process of consultation while continuing to work towards the best interests of the citizens of Manitoba.
- To advance the process of reconciliation between the Crown and First Nations, Métis communities and other aboriginal communities.

It should be noted that, while information on engagement conducted for the Project is provided in this section, Manitoba Infrastructure has undertaken engagement prior to and throughout preparation of the EIS, and will continue to engage with Indigenous groups, government agencies, and stakeholders throughout the life of the Project. This section also does not define or delimit existing or asserted, Aboriginal or Treaty rights within a given traditional territory or occupancy area, nor is it a complete depiction of the dynamic way of life and systems of knowledge maintained by Indigenous groups engaged on the Project. Rather, this section relies on information obtained through the Project's Indigenous engagement program and publicly available sources to document the assertion of potential or established Aboriginal and Treaty rights and rightsholder's perspectives on Project interactions with the ability to exercise Aboriginal or Treaty rights. The Crown has the ultimate responsibility to fulfill the Duty to Consult and provide, if warranted, accommodations. Manitoba Infrastructure acknowledges that Indigenous groups may provide additional information about the potential effects on Aboriginal and Treaty rights.

10.4.1.3 Regulatory and Policy Setting

Federal Regulations and Policy

The Agency Guidelines for the Project, citing the *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (AANDC 2011), offer definitions of Aboriginal and Treaty rights.

Aboriginal rights are defined as:

> *Practices, traditions and customs integral to the distinctive culture of the Aboriginal group claiming the right that exist[ed] prior to contact with the Europeans (Van de Peet). In the context of Métis groups, Aboriginal rights means practices, traditions, and customs integral to the distinctive culture of the Métis group that existed prior to effective European control, that is, prior*

> *to the time when Europeans effectively established political and legal control in the claimed area (Powley). Generally, these rights are fact and site specific. For greater certainty, the Guidelines also define Aboriginal title as an Aboriginal right, (AANDC 2011:61).*

Treaty rights are defined as:

> *Rights that are defined by the terms of a historic Treaty, rights set out in a modern land claims agreement or certain aspects of some self-government agreements. In general, Treaties (historic and modern) are characterized by the intention to create obligations, the presence of mutually binding obligations and a measure of solemnity (Simon, Sioui). A treaty right may be an expressed term in a Treaty, an implied term or reasonably incidental to the expressed Treaty right. The scope of Treaty rights will be determined by their wording, which must be interpreted in accordance with the principles enunciated by the Supreme Court of Canada (Badger 1996, Sundown 1999, Marshall 1999 (AANDC 2011:62).*

Aboriginal and Treaty Rights are recognized and affirmed in Section 35(1) of the *Constitution Act, 1982* which provides constitutional protection to these rights in Canada (CIRNAC 2019b). As established through Canadian legal cases, the honour of the Crown requires that the Crown act honourably in recognition of a special trust relationship with Indigenous peoples. Consequently, the Crown has a duty to consult and, where appropriate, accommodate when the Crown contemplates conduct that might adversely impact potential or established Aboriginal or Treaty rights (AANDC 2011).

Section 6 of Part 2 of the EIS Guidelines establishes requirements to address impacts to potential or established Aboriginal or Treaty rights.

Provincial Regulations and Policies

In Manitoba, historic Treaty rights are collective entitlements derived through six numbered treaties (1 through 6) plus a Treaty 5 adhesion area. These treaties, signed between 1871 and 1910, and each with similar but slightly different terms, collectively account for all the inhabited lands within the current provincial boundaries of Manitoba (Treaty Relations Commission of Manitoba 2019). In the Sparrow decision, the Supreme Court of Canada stated that Treaties and statutes relating to First Nations should be liberally construed and uncertainties resolved in favour of First Nations.

The numbered treaties often, but not always, included:

- land to be set aside for First Nation use only (known as reserves)
- money to be paid to a First Nation every year (known as annuities)
- hunting and fishing rights on unoccupied Crown land
- schools and teachers on reserves to be paid for by the government
- one-time benefits (such as farm equipment and animals, ammunition and clothing)

In 1930, the Manitoba Natural Resources Transfer Agreement (MNRTA) transferred control of Crown land and natural resources from Canada to Manitoba, In Section 13, the MNRTA guaranteed that "the said Indians shall have the right, which the Province hereby assures to them, of hunting, trapping and fishing game and fish for food at all seasons of the year on all unoccupied Crown lands and on any other lands to which the said Indians may have a right of access" (Manitoba 1930:7). These rights were recognized and affirmed by Section 35 of the *Constitution Act*, 1982. With few exceptions as required, such as limiting harvest for species conservation purposes, the MNRTA effectively expanded the area where Treaty rights could be practiced from beyond the Treaty boundary to the entire province. The MNRTA also provides clarity that harvests are intended for domestic consumption as food as opposed to commercial harvests.

Section 11 of the MNRTA also requires that Manitoba set aside sufficient unoccupied Crown land toward the settlement of Canada's outstanding Treaty obligations (Manitoba 1930). The quantity of Treaty Land Entitlement (TLE) lands promised to each Treaty signatory was based on the population of the First Nation and the per capita formula in the numbered treaties (Tough 1996).

The Manitoba Treaty Land Entitlement Framework Agreement (MFA) was concluded in 1997 between Canada, Manitoba, and the Treaty Land Entitlement Committee (representing Entitlement First Nations) to fulfill outstanding land obligations arising out of Treaty Land Entitlement (TLE) claims. To participate in the lands selection process, First Nations execute a Treaty Entitlement Agreement (TEA) with TLEC, Manitoba and Canada and then conduct a land selection study to select parcels of land to be selected or acquired (purchased in areas where unoccupied Crown lands supply is low). Once selections are made the MFA Additions to Reserve policy guides the process of transferring the lands from Manitoba to Canada. Four First Nations with outstanding TLE have expressed interest in engagement on this Project and two of them have signed TEAs. Nations with signed TEAs include Brokenhead Ojibway Nation and Norway House Cree Nation and those without TEA include Fox Lake Cree Nation and York Factory First Nation.

The *Northern Affairs Act*, established by the Manitoba Government in 1966 and most recently revised in 2006, provides the framework through which designated northern communities located within an unorganized territory of Manitoba with municipal services and to coordinate interprovincial and interjurisdictional initiatives, policies and strategies affecting northern Manitoba (MDINR n.d). Eleven of the Indigenous groups engaged on the Project are designated Northern Affairs Communities under this Act (see Section 10.4.3.4 Engagement and Key Issues for a list of Indigenous groups).

Additional agreements have been signed in Manitoba. These agreements have formalized participation in land use and management in specific areas (e.g., land use plans or land management plans within resource management areas). Agreements have also been established to provide wildlife harvesting rights such as one with the Manitoba Métis Federation discussed below.

One process that led to land use planning in traditional areas began in 2000. The East side of Lake Winnipeg Planning Initiative, and later named Wabanong Nakaygum Okimawin (WNO), operated on behalf of 16 eastside First Nations to provide support for broad area planning. Progress was slow and complicated by planning for the Bipole III transmission line (later changed to the west side), the east side all-weather road network and lastly, a 2004 proposal submission for a World Heritage Site, Pimachiowin Aki (Wellstead and Rayner 2009). By 2009, The East Side Traditional Lands Planning and Special Protected Areas Act enabled the Lands Branch of the Government of Manitoba to administer planning area designations and land management plans by First Nations.

Another process formalized engagement and participation requirements in specific areas. Adverse effects agreements (e.g., Northern Flood Implementation Agreements) associated with the effects of hydroelectric development established Resource Management Boards (RMBs) for nine Indigenous groups situated on northern affected waterways. The RMBs were established to co-manage the natural resources in defined areas through land use plans and resource management plans (Indigenous and Northern Relations 2019). The RMBs foster effective communication among community members, stakeholders and government agencies (Indigenous and Northern Relations 2019).

10.4.1.4 Indigenous Engagement and Consultation Process

A discussion of the Indigenous and public engagement process (IPEP) is provided in Chapter 5 (Indigenous and Public Engagement). Manitoba Infrastructure has undertaken engagement prior to and throughout preparation of the EIS, and will continue to engage with Indigenous groups, government agencies, and stakeholders throughout the life of the Project. The full list of Indigenous groups is included in Section 10.2.1.4 Engagement and Key Concerns.

In addition to concerns raised and discussed in Section 10.2.1.4, concerns raised by Indigenous groups associated with the exercise of Aboriginal and Treaty rights include:

- The reduction of unoccupied Crown Land availability on which to exercise Aboriginal and Treaty rights. For example, in association with the Manitoba-Minnesota Transmission Project, the Manitoba Métis Federation raised this concern (Calliou Group 2016). As part of Project engagement, Fisher River Cree Nation (2018) also indicated the removal of Crown Lands from their traditional territory for use in the Project was expected to affect their Aboriginal and Treaty rights.
- Changes to land designations have the potential to affect Treaty Land Entitlement selections or acquisitions. Peguis First Nation's Notice Area is located within the Project RAA and land dispositions contemplated by Manitoba require notification.
- Numerous Indigenoufigures groups engaged in the Project have Land Use Plans and resource management plans covering their traditional territories, including lands and waters in the RAA. Therefore, the potential for Project interactions with these lands will be examined to understand any concerns or issues that may arise from Project interactions with these areas.

10.4.1.5 Methods

The assessment of effects on Aboriginal and Treaty rights presents existing conditions, effect pathways, and mitigation measures, and provides a discussion of potential Project effects on Aboriginal and Treaty rights. The assessment considered information from Project-specific studies completed by Manitoba Métis Federation, Interlake Reserves Tribal Association, Fisher River Cree Nation, and Dauphin River First Nation, as well as perspectives on potential effects on Aboriginal and Treaty rights and recommendations for avoiding, mitigating or accommodating those effects identified through Indigenous engagement. A review of publicly available literature, including the following, was also conducted:

- regulatory and policy literature
- current and historic legislation
- analyses conducted by treaty scholars
- agreements in place with Indigenous groups

The assessment adopts the spatial boundaries established for the TLRU assessment (see Section 10.2.1.6), which are referred to hereafter as the Rights LAA and RAA. The spatial boundaries, treaties and management areas (including resource management, planning, harvesting and notification areas) are illustrated in Appendix 10B, Figure 10.4B-1. The full extent of Treaties 1, 2, 4 and 5 are not included in that figure; rather, the figure focuses on the Rights LAA, Rights RAA and the portions of Treaties 1, 2, 4 and 5 which overlap or are adjacent to the Rights LAA and RAA where potential effects are evaluated. Areas outside of the Rights RAA are displayed to provide context for the changes to Aboriginal and Treaty Rights which may occur within the assessment boundaries and in recognition that the boundaries of Treaties 1, 2, 4 and 5 extend to areas of Manitoba and Canada not included in the scope of this assessment.

Pathways though which the Project may affect Aboriginal and Treaty rights were identified by considering potential interactions between Project components and the ability of Indigenous groups to exercise Aboriginal and Treaty rights as informed through the sources noted above.

A conservative approach was used to identify potential interactions between the Project and Aboriginal and Treaty rights. Activities with a degree of uncertainty are assumed to contribute to the environmental effect. Residual effects identified in Section 10.2.4 are carried forward because the exercise of Aboriginal and Treaty rights depends on the health and abundance of traditionally harvested species and the continued availability of and access to traditional use sites and areas.

The approach of characterizing effects to Aboriginal and Treaty rights is in keeping with the methodology implemented by the Government of Canada in the Crown Consultation and Accommodation Report for the Trans Mountain Expansion Project (Canada 2019). That report reflects recent federal precedence on the subject matter (which is also evolving regarding information requirement and evidentiary standard) and also

offers an applicable means for the Project EIS to characterize such effects; specifically, through a ranking of "seriousness" as follows:

- Negligible refers to no detectable impact or any change from existing conditions.
- Minor refers to the ability to exercise the right is minimally disrupted.
- Moderate refers to the ability to exercise the right has been diminished or disrupted.
- Serious refers to the ability to exercise the right has been significantly diminished.

10.4.2 Existing Conditions for Aboriginal and Treaty Rights

10.4.2.3 Aboriginal Rights

All the First Nations engaged by the Project are signatory to Treaties 1, 2 or 5, which provided historically defined treaty rights. Indigenous groups without historic treaty consist of the Manitoba Métis Federation and the residents of the identified Northern Affairs Communities (NACs). With respect to Métis rights in Manitoba, the Manitoba Métis Federation is signatory to agreements detailed below. The Northern Affairs Act supports and facilitates the provision of municipal services and infrastructure. Citizens of these communities, which are often located adjacent to First Nation Reserve communities, include non-Indigenous, "non-status" Indigenous who are not registered to a First Nation but have Indigenous heritage and Métis people (Ultra Insights Planning and Research Services 2014). In Daniels *v.* Canada, the Supreme Court of Canada (SCC) determined that non-status Indians (and Métis) can be considered 'Indians' under the *Constitution Act, 1867*, and as such, the Crown has a fiduciary responsibility to Métis and non-status Indians (Daniels *v.* Canada 2016).

10.4.2.4 Treaty 1

The benefits of Treaty 1 included the provision of 160 acres (approximately 65 ha) for each family of five. Hunting and fishing rights were not explicitly mentioned in treaty texts but hunting rights were conferred orally (Tough 1996; Talbot 2009). Annuity granted was $3 per person (later raised to $5) after an initial $3 gift per person (Treaty Nos. 1 and 2, 1871; Tough 1996).

The only Treaty 1 signatory nation with an outstanding TLE that is being engaged on the Project is Brokenhead Ojibway Nation. Outstanding TLE lands (those not transferred to reserve) for Brokenhead Ojibway Nation amount to over 14,000 acres or over 5,500 ha in both Crown Land selections and land for purchase or acquisitions (Implementation Monitoring Committee 2018).

Under the terms of Peguis First Nation 2006 TEA, the Province of Manitoba is obligated to notify Peguis First Nation of any proposed disposition application on Crown Land within the Notice Area (Peguis First Nation, Canada and Manitoba 2006; Peguis First Nation 2012; Appendix 10B, Figure 10.4B-2). Peguis First Nation has received a land purchase amount, a total of nine years to complete making its selections, now completed, and up to 25 years to buy Acquisition lands. Land acquisitions are not restricted to the

Treaty 1 area and may occur in the Treaty 2 area as this is where the Peguis First Nation 1B reserve lands are located as well as the Notification Area (Peguis First Nation 2012).

Indigenous groups engaged with on this Project who are signatories of Treaty 1 include the Peguis First Nation, Sagkeeng First Nation, and Sandy Bay First Nation.

10.4.2.5 Treaty 2

Treaty 2 also included the provision of 160 acres (approximately 65 ha) for each family of five and did not explicitly mention hunting and fishing rights in the text but Treaty scholars support that these rights were conferred orally (Tough, 1996; Talbot 2009). In a ruling on the spirit of treaties, the Supreme Court of Canada has arrived at similar conclusions noting that “treaties and statuses relating to Indians should be liberally construed and uncertainties resolved in favour of the Indians” (SCC 1990a). Additionally, the government has a fiduciary responsibility in administering treaties, and as noted in *R v. Sparrow*, “the honour of the Crown is at stake in dealings with Aboriginal people” (SCC 1990b). There are no EFNs in the Treaty 2 area that are being engaged on the Project. Annuity granted was $3 per person (later raised to $5) after an initial $3 gift per person (Treaty Nos. 1 and 2, 1871; Tough 1996).

Indigenous groups engaged with on this Project who are signatories of Treaty 2 include the Dauphin River First Nation, Ebb and Flow First Nation, Keeseekoowenin Ojibway First Nation, Lake Manitoba First Nation, Lake St. Martin First Nation, Little Saskatchewan First Nation, O-Chi-Chak-Ko-Sipi First Nation, Pinaymootang First Nation, and Skownan First Nation.

10.4.2.6 Treaty 5

Treaty 5 was signed in different locations over a period of time from 1875-1876 and 1908-1910. The terms of Treaty 5 were similar to those of Treaty 1 and Treaty 2. Land allotments provided by Treaty 5 were also 160 acres (approximately 65 ha) per family of five. Explicit rights were defined for hunting and fishing such that “Indians, shall have right to pursue their avocations of hunting and fishing throughout the tract surrendered” subject to government regulations or land taken up for settlement. A five-dollar annuity was provided as well as one-time provision of farming tools and implements.

Treaty 5 First Nations with outstanding TLE who are engaged on the Project include Norway House Cree Nation, Fox Lake Cree Nation and York Factory First Nation. None have signed a TEA under the Manitoba Framework Agreement (Treaty Land Entitlement Committee of Manitoba Inc. 2018). Norway House Cree Nation, as of January 2018, had converted over 40,000 acres (approximately 16,000 ha) of their total allotment of just over 100,000 acres (Treaty Land Entitlement Committee of Manitoba Inc. 2018). Both the Tataskweyak Cree Nation and the Pimicikamak Okimawin have settled outstanding TLE.

Indigenous groups engaged with on this Project who are signatories of Treaty 5 include the Berens River First Nation, Black River First Nation, Bloodvein First Nation, Fish River Cree Nation, Fox Lake Cree Nation, Hollow Water First Nation, Kinonjeoshtegon First Nation, Misipawistik Cree Nation, Norway House

Cree Nation, Pimicikamak Okimawin, Poplar River First Nation, Tataskweyak Cree Nation, and York Factory First Nation.

10.4.2.7 Agreements

The 2012 Province of Manitoba / Manitoba Métis Federation Agreement on Métis Natural Resource Harvesting sets out recognized areas for Métis natural resource harvesting including portions within the Project's local and regional assessment areas (Manitoba 2012; Appendix 10B, Figure 10.4B-2). Also, the 2016 Manitoba Métis Federation-Canada Framework Agreement on Advancing Reconciliation sets out a process to further discussions on a constitutional grievance related to land grants under Section 31 of the *Manitoba Act, 1870* (CIRNAC 2016). Among other things, the Framework Agreement enabled a formal negotiation process to begin discussing terms of a self-government agreement between Canada and the Manitoba Métis Federation (MMF 2018).

The *East Side Traditional Lands Planning and Special Protected Areas Act* enables First Nations to engage in land and resource planning in designated areas of Crown land that they have traditionally used. Once a land use plan is approved, the allocation, disposition or use of Crown land in a planning area must be generally consistent with the approved plan for that area (Manitoba Sustainable Development 2019). Two First Nations engaged on this Project are parties to approved land use plans: Poplar River First Nation – Asatiwisipe Aki and Bloodvein First Nation – Pimitotah.

Poplar River First Nation and Bloodvein First Nation are also members of the Pimachiowin Aki Corporation, a non-profit in support of governance, operations and monitoring of the Pimachiowin Aki World Heritage Site. The lands included in both the land use plans and in the Pimachiowin Aki World Heritage Site border the northern basin of Lake Winnipeg within the Project's RAA (see Appendix 10B, Figure 10.4B-2).

First Nations with RMBs engaged in the Project include Fox Lake Cree Nation, Norway House Cree Nation, Tataskweyak Cree Nation and York Factory First Nation. These RMBs are situated on the upper and lower Nelson River reaches north of the outlet of Lake Manitoba. The Norway House RMB overlaps with the north basin of Lake Winnipeg.

10.4.3 Assessment of Effects on Aboriginal and Treaty Rights

Effects on Aboriginal and Treaty rights may occur where the Project has a residual effect on traditional harvesting (hunting, trapping, fishing, plant or material gathering) or on physical activities associated with traditional use (travel and navigation, use of habitation, cultural and spiritual areas). Section 10.2.3 assessed Project effects on TLRU, including change in availability of traditional lands and resources currently used for traditional purposes, current use, change in access to traditional resources or areas for current use, change to cultural and spiritual sites or areas, and change to the cultural value or importance associated with current use of lands and resource.

Mitigation measures discussed in the TLRU assessment and related VC sections such as Terrestrial Environment will reduce or eliminate effects on resources which are relied upon in order to exercise Aboriginal and Treaty rights for current use, and reduce or eliminate effects on conditions that may prohibit or deter exercise Aboriginal and Treaty rights. Residual effects are not anticipated to alter the long-term persistence and viability of species within the RAA which are relied upon to exercise Aboriginal and Treaty rights. Residual effects are anticipated to alter access to, and the use of, cultural and spiritual sites or areas, particularly for sites which are intersected by the PDA. However, it is anticipated that TLRU activities will be able to continue with some restrictions and alteration of behaviour by members of Indigenous groups. Changes in value or importance to current use may take place as a result of Project activities and Manitoba Infrastructure has proposed mitigation measures intended to reduce effects on these values (Section 10.2.4.7).

Potential effects on Aboriginal and Treaty rights may also occur if Project activities affect water levels and indirectly change an Indigenous group's ability to carry out land use planning objectives. As noted above, land use plans have been generated for Poplar River First Nation (2011) and Bloodvein River First Nation (2014) (see Appendix 10B, Figure 10.4B-2). Norway House Cree Nation, Norway House NAC, Fox Lake Cree Nation, Tataskweyak Cree Nation and York Factory First Nation have established Resource Management Areas (RMA) either individually or in partnership with other Indigenous groups. The Norway House RMA includes the north shore of Lake Winnipeg (see Appendix 10B, Figure 10.4B-2). The RMAs which Fox Lake Cree Nation, Tataskweyak Cree Nation and York Factory First Nation participate in are north of the RAA. Though not all Indigenous groups have participated yet in the engagement process, "water management" was one of the highest priorities for Indigenous groups with RMAs (Manitoba Indigenous and Northern Relations 2019). Norway House Cree Nation expressed concerns about the Project to worsen sediments, erosion, turbidity, water levels, and water supply due to its location downstream from the Project (Manitoba Infrastructure 2018b).

An analysis of changes in water levels on Lake Winnipeg and waterways downstream of Lake Winnipeg as a result of the Project altering water flows was conducted by Manitoba Hydro. The analysis concluded that any potential changes in water levels are not discernible in the context of existing water level variations within Lake Winnipeg (Manitoba Hydro 2019). As a result, changes to the north basin of Lake Winnipeg, Nelson River and area of land covered by the land use plans and resource management areas established by Poplar River First Nation, Bloodvein River First Nation, Norway House Cree Nation, Fox Lake Cree Nation, Tataskweyak Cree Nation and York Factory First Nation are also not anticipated. Effects on Aboriginal and Treaty rights are similarly not anticipated as no discernible changes in water levels on Lake Winnipeg and downstream waterways are expected.

Change in quantity of Crown Lands available to pursue traditional activities has the potential to affect the exercise of Aboriginal and Treaty rights. This effect may take place through changes in the disposition of Crown land, through sale or conversion from unoccupied to occupied and through alteration of land completed in anticipation of a change in disposition. Two Indigenous groups have expressed concerns with respect to the conversion of unoccupied Crown Lands. Fisher River Cree Nation (2018) indicated that Project components will remove lands from their traditional territory and increase access to it by other hunters. The Manitoba Métis, in relation to the Manitoba-Minnesota Transmission Project, have indicated

that unoccupied Crown land represents areas where the Métis of Manitoba can exercise their Aboriginal Rights without seeking permission (Calliou Group 2016). Loss of access to those lands may affect the exercise of those Aboriginal Rights (Calliou Group 2016).

Concerns with respect to Project-related alteration of Crown land were also brought forward by the Interlake Reserve Tribal Council, representing Dauphin River, Kinonjeoshtegon, Lake Manitoba, Little Saskatchewan, Peguis and Pinaymootang First Nations. The Interlake Reserve Tribal Council reported that a 23-kilometer route in the Interlake was cleared in preparation for the Project and that the Indigenous groups were not informed by the Government of Manitoba in advance (IRTC 2019). Manitoba Infrastructure has responded to these concerns directly, and a record of notification correspondence for field activities is provided in Chapter 5.

Indigenous groups recommended measures which may mitigate or accommodate for changes to the quantity of Crown Lands available to pursue traditional activities. The Manitoba Métis Federation (Shared Value Solutions 2018) recommended the establishment of an ongoing process for Project communications and concerns. Fisher River Cree Nation proposed the granting of Crown lands as fee simple lands for the Nation or rent-free Crown land leases, permits and licenses for a variety of potential community economic development land uses as an accommodation measure (Fisher River Cree Nation 2018). Another accommodation option brought forward by Fisher River Cree Nation (2018) was to provide the portions of the Project area with formal protections such as designating lands as a Provincial Park, Wildlife Management Area, Provincial Forest or a combination thereof. Manitoba Infrastructure will continue to engage with Indigenous groups regarding the recommendations identified.

The Project's conversion of unoccupied Crown land (land to which Indigenous groups have the right to hunt, trap, fish as afforded by the MNRTA) to occupied Crown Land will have adverse residual effects on exercise Aboriginal and Treaty rights. An area of 961.43 ha, which represents 0.92% of the unoccupied Crown land within the Rights LAA, will be converted and no longer available for the indigenous groups to pursue traditional land use activities. The purpose of the Project is to reduce existing effects created by periodic flooding, so while 0.92% of the unoccupied Crown land within the TLRU LAA will be converted, habitat for species harvested by Indigenous groups will also be retained by reversing the effects of flooding and improving the use of TLRU sites outside of the PDA.

The conversion of unoccupied Crown land to land set aside for Project infrastructure may affect the ability of Indigenous groups to make Treaty Land Entitlement selections or acquisitions. Indigenous groups with outstanding TLE include Fox Lake Cree Nation, York Factory First Nation, Brokenhead Ojibway Nation and Peguis First Nation. Brokenhead and Peguis are the only two with active TLE Agreements. As per the Manitoba Framework Agreement, the Entitled First Nation may select from its Treaty Area or provide a reasonable social or economic development objective for the Selection (Manitoba Framework Agreement 1997). Therefore, the only eligible Indigenous group to make selections is Peguis First Nation. As per the Treaty Entitlement Agreement, the Government of Manitoba is obligated to notify Peguis of any type of disposition within Peguis' Notice Area. The Peguis' Notice Area does not overlap the LAA where land dispositions are expected to occur though it does overlap the RAA and alteration of adjacent lands may also influence Treaty Land Entitlement selections or acquisitions. Manitoba Infrastructure will

continue to review land dispositions within the Notice Areas to uphold the Treaty Entitlement Agreement with Peguis First Nation.

Residual effects on Aboriginal and Treaty rights are anticipated as a result of the disposition or conversion of Crown Land and changes to TLRU (changes in the sites, resources, and access relied upon to practice activities such as hunting and fishing). Minimal disruption to the ability to exercise rights is anticipated and the seriousness of effects is categorized as minor. This categorization considers that; the persistence and viability of species relied upon to exercise Aboriginal and Treaty rights within the RAA are not anticipated to change as a result of the Project, it is anticipated that activities related to the exercise of Aboriginal and Treaty rights will be able to continue with some restrictions and alteration of behaviour by members of Indigenous groups, and 0.92% of the Crown land within the TLRU LAA will not remain available for the exercise of Aboriginal and Treaty rights. As identified throughout the Application, Manitoba Infrastructure's engagement is ongoing, and Indigenous groups may provide additional information about the potential effects of the Project on Aboriginal and Treaty rights.

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10.5.2 Personal Communications

Chief Wayne Desjarlais and Councillor Darcy Malcolm. Meeting with Manitoba Infrastructure in Winnipeg (500 Portage Avenue), August 30, 2017.

Appendix 10A TABLES

Appendix 10A TABLES

LIST OF TABLES

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
Sturgeon	*Acipenseridae spp.*			✓							
White Sucker	*Catostomus commersonii*				✓			✓			
White fish	*Coregonus clupeaformis*			✓	✓			✓			
Common Carp	*Cyprinus carpio*							✓			
Northern Pike	*Esox lucius*	✓		✓	✓		✓	✓			
Channel Catfish	*Ictalurus punctatus*	✓									
Burbot	*Lota lota*			✓	✓						
Trout	*Not identified*			✓							
Perch	*Perca flavescens*	✓			✓			✓			
Sauger	*Sander canadensis*	✓									✓
Walleye	*Sander vitreus*				✓		✓	✓	✓		
balsam fir	*Abies balsamea*		✓								
Manitoba maple	*Acer negundo*	✓									
yarrow	*Achillea millefolium*		✓								
weke	*Acorus americanus*		✓								
baneberry	*Actaea rubra*		✓								
giant hyssop	*Agastache foeniculum*		✓								
speckled alder	*Alnus incana*		✓								
Saskatoon berry	*Amelanchier alnifolia*	✓	✓		✓			✓			✓
sweet grass	*Anthoxanthum monticola* ssp.		✓								

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
	alpinum (Hierochloe odorata)										
dogbane	*Apocynum androsaemifolium*		✓								
columbine	*Aquilegia* sp.		✓								
balsam fir	*Abies balsamea*		✓								
Manitoba maple	*Acer negundo*	✓									
yarrow	*Achillea millefolium*		✓								
weke	*Acorus americanus*		✓								
baneberry	*Actaea rubra*		✓								
giant hyssop	*Agastache foeniculum*		✓								
speckled alder	*Alnus incana*		✓								
Saskatoon berry	*Amelanchier alnifolia*	✓	✓		✓			✓			✓
sweet grass	*Anthoxanthum monticola* ssp. *alpinum (Hierochloe odorata)*		✓								
dogbane	*Apocynum androsaemifolium*		✓								
columbine	*Aquilegia* sp.		✓								
balsam fir	*Abies balsamea*		✓								
golden chantrelle	*Cantharellus aurora*	✓									
fireweed	*Chamerion angustifolium*		✓								
bunchberry	*Cornus canadensis*		✓								✓

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
red osier dogwood	*Cornus sericea*		✓								
American hazelnut	*Corylus americana*		✓								
beaked hazelnut	*Corylus cornuta*	✓	✓								
golden chantrelle	*Cantharellus aurora*	✓									
hawthorn	*Crataegus* sp.		✓								✓
shrubby cinquefoil	*Dasiphora fruticosa*		✓								✓
tall cinquefoil	*Drymocallis arguta*		✓								
Canada fleabane	*Erigeron canadensis*		✓								
strawberry	*Fragaria vesca*	✓		✓							
wild strawberry	*Fragaria virginiana*		✓								✓
Bicknell's geranium	*Geranium bicknellii*		✓								
yellow avens	*Geum aleppicum*		✓								
alumroot	*Heuchera richardsonii*		✓								
St. John's wort	*Hypericum perforatum*		✓								
tamarack	*Larix laricina*	✓	✓								
wood lily	*Lilium philadelphicum*		✓								
northern bugle-weed	*Lycopus uniflorus*		✓								✓
hawthorn	*Crataegus* sp.		✓								✓

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
Canada mayflower	*Maianthemum canadense*		✓								
Not identified	Medicinal Plants in general		✓						✓	✓	
wild mint	*Mentha* sp.		✓								
Morel	*Morchella esculenta*	✓									
Not identified	Nuts							✓			
yellow evening primrose	*Oenothera flava*		✓								✓
jackpine	*Pinus banksiana*	✓									
seneca	*Polygala senega*		✓					✓			
balsam poplar	*Populus balsamifera*	✓	✓								
rattlesnake root	*Prenanthes* sp. *(Nabalus* sp.*)*		✓								
self-heal	*Prunella vulgaris*		✓								
pin cherry	*Prunus pensylvanica*		✓								
sand cherry	*Prunus pumila*		✓								
plum	*Prunus* sp.		✓								
choke cherry	*Prunus virginiana*	✓	✓								
bracken (fiddlehead)	*Pteridium aquilinum*	✓									
wintergreen	*Pyrola* sp.		✓								
bur oak	*Quercus macrocarpa*	✓	✓								

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
Labrador tea	*Rhododendron groenlandicum*		✓								
Labrador tea	*Rhododendron* spp.				✓						
marsh/bog Labrador tea	*Rhododendron tomentosum*										✓
wild black currant	*Ribes americanum*		✓								
Canadian gooseberry	*Ribes oxyacanthoides*		✓								✓
red currant	*Ribes triste*										
prairie rose	*Rosa arkansana*		✓								
wild rose	*Rosa* sp.		✓								✓
cloud berry	*Rubus chamaemorus*			✓							
raspberry	*Rubus idaeus*	✓	✓	✓	✓						
dewberry	*Rubus pubescens*		✓								
blackberry	*Rubus* sp.		✓								
three-toothed cinquefoil	*Sibbaldiopsis tridentata*		✓								
Canada goldenrod	*Solidago canadensis*		✓								
smooth goldenrod	*Solidago gigantea*		✓								
meadowsweet	*Spiraea alba*		✓								✓
marsh hedge-nettle	*Stachys pilosa var. pilosa*		✓								
snowberry	*Symphoricarpos albus*		✓								

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
dandelion	*Taraxacum officinale*	✓									
cedar	*Thuja occidentalis*		✓								
red clover	*Trifolium pratense*		✓								
blueberry	*Vaccinium angustifolium*	✓	✓	✓	✓						✓
dwarf blueberry	*Vaccinium caespitosum*										✓
cranberry	*Vaccinium macrocarpon*			✓	✓			✓			✓
dwarf blueberry	*Vaccinium myrtilloides*										✓
bog blueberry	*Vaccinium uliginosum*										✓
Logan berry (presumed to be lingonberry)	*Vaccinium vitis-idaea*			✓							
highbush cranberry	*Viburnum opulus*		✓								
downy arrow-wood	*Viburnum rafinesquianum*		✓								✓
wild grapes	*Vitis riparia*		✓								
wild rice	*Zizania palustris*		✓								
Moose	*Alces alces*	✓	✓	✓	✓		✓	✓	✓	✓	✓
Mallard	*Anas platyrhynchos*	✓									✓
Ruffed-grouse	*Bonasa umbellus*	✓									
Canada Goose	*Branta canadensis*	✓									
Coyote	*Canis latrans*	✓	✓		✓						✓

Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	Latin Name	Manitoba Métis Federation	Black River First Nation	Fox Lake Cree Nation	Kinonjeoshtegon First Nation	Lake Manitoba First Nation	Peguis First Nation	Pinaymootang First Nation	Dauphin River First Nation	Fisher River Cree Nation	Multiple Indigenous Groups[1]
Wolf	*Canis lupus*		✓	✓	✓						
Beaver	*Castor canadensis*		✓	✓	✓				✓		✓
Elk	*Cervus canadensis*		✓				✓	✓			✓
Wolverine	*Gulo gulo*				✓						✓
Bald Eagle	*Haliaeetus leucocephalus*			✓							
River Otter	*Lontra canadensis*		✓	✓	✓		✓				✓
Lynx	*Lynx canadensis*				✓		✓				
American Marten	*Martes americana*			✓	✓			✓	✓		
Short-tailed Weasel	*Mustela erminea*	✓		✓				✓			
Long-tailed Weasel	*Mustela frenata*	✓		✓				✓			
Mink	*Neovison vison*	✓	✓		✓		✓				
Grouse	*Not identified*				✓			✓			✓
Prairie Chicken	*Not identified*	✓									
Ducks	*Not identified*			✓	✓			✓			✓
Geese	*Not identified*			✓	✓			✓			
Rabbit	*Not identified*		✓	✓	✓			✓			✓
Mule Deer	*Odocoileus hemionus*							✓		✓	✓
White-tailed Deer	*Odocoileus virginianus*	✓	✓		✓		✓	✓	✓		✓
Muskrat	*Ondatra zibethicus*	✓		✓				✓			✓
Fisher	*Pekania pennanti*			✓	✓			✓	✓		✓
Partridge	*Perdix perdix*							✓			

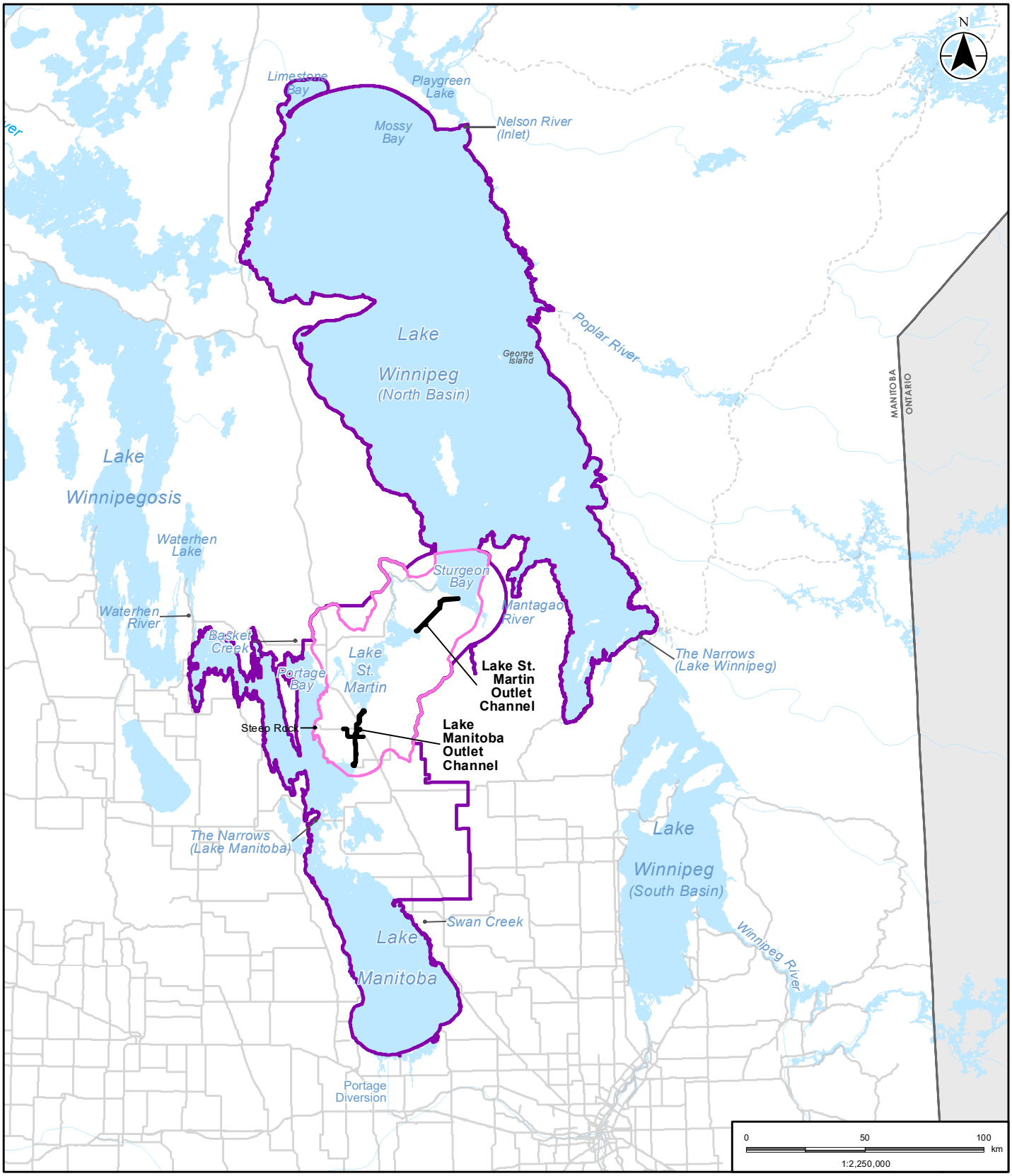
Table 10A.2-1 Species of Interest for Indigenous Groups Engaged on the Project

Common Name	*Latin Name*	*Manitoba Métis Federation*	*Black River First Nation*	*Fox Lake Cree Nation*	*Kinonjeoshtegon First Nation*	*Lake Manitoba First Nation*	*Peguis First Nation*	*Pinaymootang First Nation*	*Dauphin River First Nation*	*Fisher River Cree Nation*	*Multiple Indigenous Groups*[1]
Squirrel	*Tamiasciurus hudsonicus*				✓						
Sharp-tailed grouse	*Tympanuchus phasianellus*	✓									
Black Bear	*Ursus americanus*		✓								✓
Caribou	*various spp.*			✓							

[1] Source material identified through literature review (see Section 10.1.2.1) attributed species of interest to multiple Indigenous groups engaged on the Project.

Appendix 10B FIGURES

LIST OF FIGURES



Legend

- Project Development Area (PDA)
- Traditional Land & Resource Use Local Assessment Area (LAA)
- Traditional Land & Resource Use Regional Assessment Area (RAA)
- Waterbody
- Major Highway
- Winter Road

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:56:40 AM

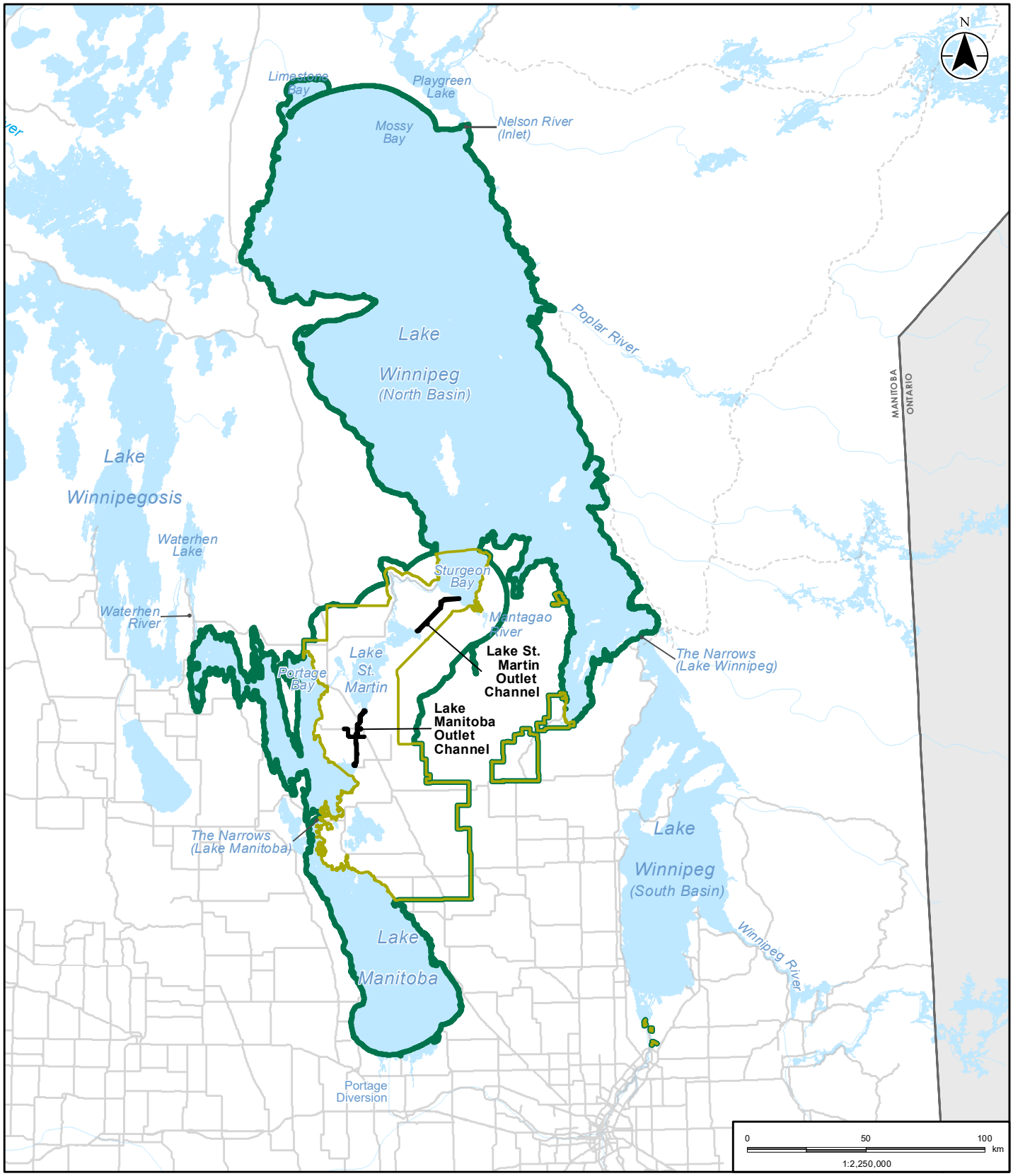
Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Traditional Land & Resource Use Spatial Boundaries

Figure 10.2B-1

G:\ GIS_Project_Folder\11475100\figures\Ch10_Indigenous_People\Final\Fig 10.2B-2 TLRU Spatial Boundaries.mxd



Legend

- Project Development Area (PDA)

Assessment Area

- Indigenous Health & Socio-Economic Local Assessment Area (LAA)
- Indigenous Health & Socio-Economic Regional Assessment Area (RAA)
- Waterbody
- Major Highway
- Winter Road

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 1:30:42 PM

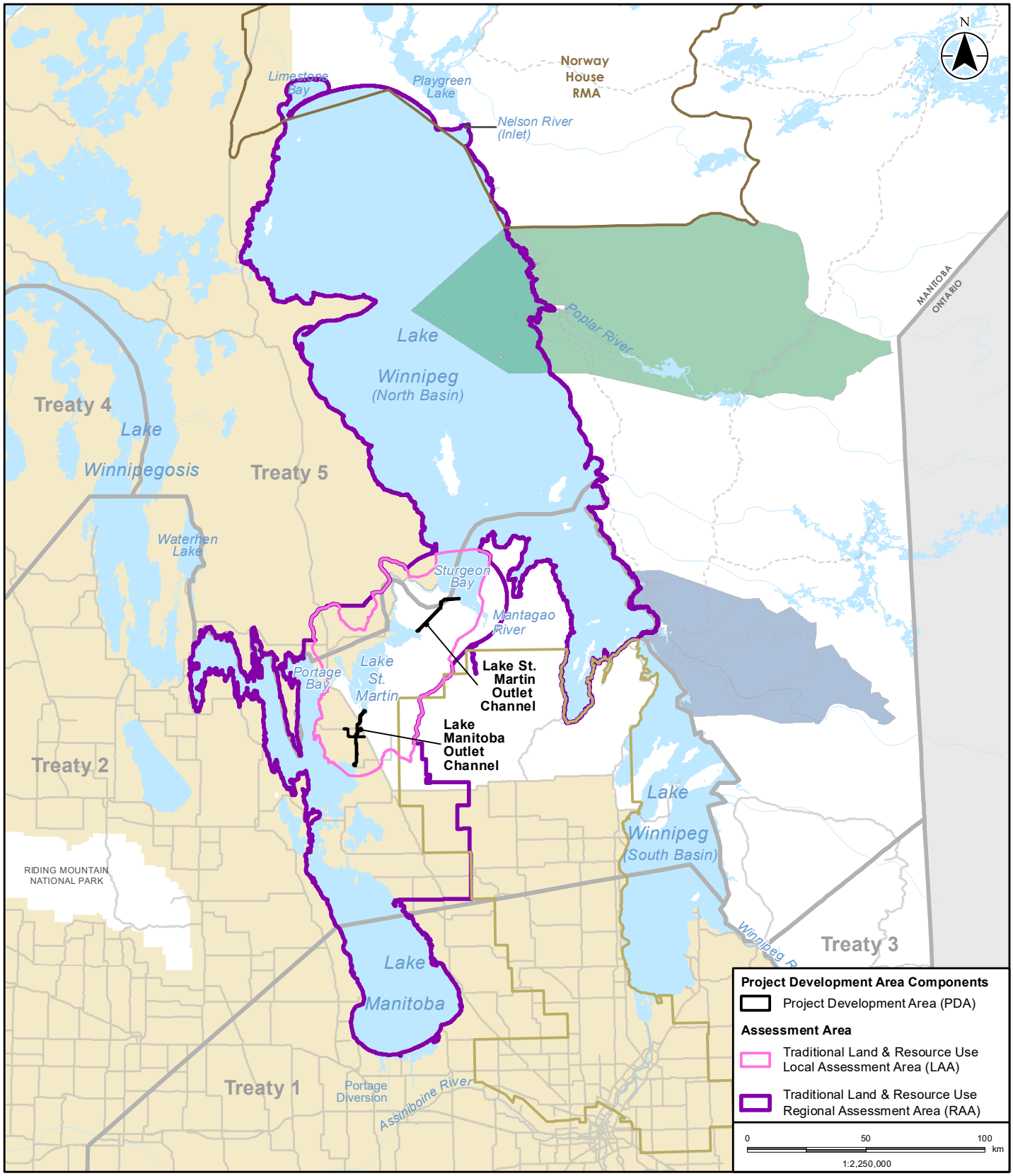
Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Indigenous Health and Socio-Economic Assessment Areas

Figure 10.3B-1

G:\ GIS Project Folder\11473120\figures\Ch10 Indigenous Health & SocioEC Spatial Boundaries.mxd



Legend

Traditional Use Planning Areas
- Asatiwisipe Aki (Poplar River First Nation)
- Pimitotah (Bloodvein River First Nation)
- Resource Management Area
- Peguis First Nation TLE Notice Area
- Métis Natural Resource Harvesting
- Treaty Boundry
- Waterbody
- Major Highway
- Winter Road

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 1:32:13 PM

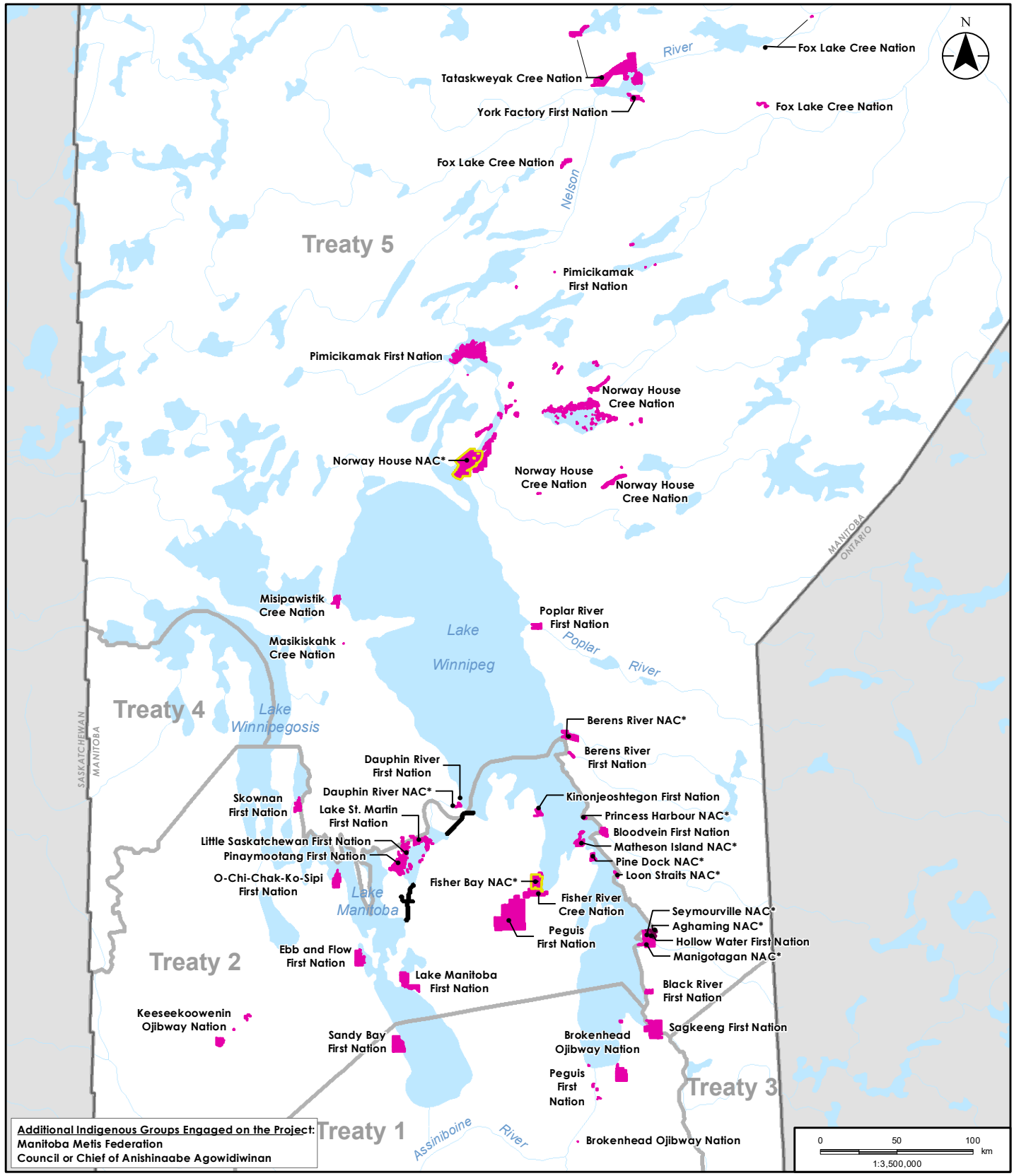
Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Treaty Management Areas

Figure 10.4B-1

G:\ GIS Project Folder\11475\20\figures\Ch10 Indigenous People\Final\Fig 10.4B-1 Aboriginal and Treaty Rights - Treaty Mgmt Areas.mxd



Legend

- Project Development Area (PDA)
- Indigenous Group Reserve and Community Locations
- Northern Affairs Communities with an Adjacent First Nations Community of the Same Name
- Treaty Boundry
- Provincial Boundary

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/21/2019 10:52:07 AM

Manitoba

MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Indigenous Group Reserve and Community Locations

Figure 10.4B-2

G:_GIS_Project_Folder\11475120\figures\Ch10_Indigenous_People\Final\Fig 10.2B-1_TLRU Indigenous Group Reserves and Community Locations.mxd