MANITOBA – MINNESOTA TRANSMISSION PROJECT
Environmental Impact Statement

ASSESSMENT METHODS

CHAPTER 7
SEPTEMBER 2015

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ABBREVIATIONS AND ACRONYMS

ATK	Aboriginal traditional knowledge
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEnvPP	construction environmental protection plan
GHG	greenhouse gas
HVDC	high voltage direct current
LAA	local assessment area
MB	Manitoba
MCWS	Manitoba Conservation and Water Stewardship
MMF	Manitoba Metis Federation
NEB	National Energy Board
PDA	Project development area
PR	provincial road
PTH	provincial trunk highway
RAA	regional assessment area
RM	rural municipality
RPA	route planning area
TCPL	TransCanada Pipeline Ltd.
TDR	technical data report
VC	valued component

GLOSSARY OF TECHNICAL TERMS

Direct effect	An environmental effect that is: • A change that a project may cause in the environment; or • Change that the environment may cause to a project. It is a consequence of a cause-effect relationship between a project and a specific environmental component (Canadian Environmental Assessment Agency 2014).
Environmental effect	In respect of a project, any change that a project may cause to a biophysical element found in Table 7-1 and any effect of any such change on a socio-economic element (NEB 2015).
Indirect effect	A secondary environmental effect that occurs as a result of a change that a project may cause in the environment. An indirect effect is at least one step removed from a project activity in terms of cause-effect linkages (Canadian Environmental Assessment Agency 2014).
Map biographies	The map or set of maps resulting from a face to face interview during which the individual participant indicates the places he or she has used resources within living memory, and in some cases, places that have never been used or visited personally, but about which the participant has knowledge (Tobias 2000).
Measurable parameter	One or more variables that provide a means to determine the level or amount of change in a valued component for the purposes of quanitative or qualitative assessment of potential effects.
Mitigation	Measures for the elimination, reduction or control of the adverse environmental effects of a project, and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means (*Canadian Environmental Assessment Act, 2012*).
Pathway component	An intermediate component in a network of potential effects; used where the effects on the component are focused on potential effects to receptors.
Threshold	A limit of tolerance of a valued component to an effect, that if exceeded, results in a significant effect on that valued component.

Valued components	Biophysical and socioeconomic elements of particular value or interest to regulators or other parties.

7 Assessment Methods

7.1 Introduction

This chapter describes the methods used for assessing the Project's potential environmental effects. These methods were informed by past Manitoba Hydro assessments and initiatives, and have guided the preparation of this assessment with the intent to meet *The Environment Act,* C.C.S.M. c. E125 requirements, as well as the guidelines and requirements set out in the National Energy Board (NEB) Filing Manual (2015a), NEB Electricity Filing Manual (2015b), and the *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19, s. 52 *(CEAA 2012)*.

7.2 Approach Overview

The environmental assessment's overarching set of objectives is the:

- identification of potential positive and adverse Project effects
- development of mitigation measures (including design changes) to avoid or reduce adverse effects or enhance positive effects
- characterization of any remaining (residual) adverse effects
- determination of whether these adverse residual effects are significant
- development of follow-up and monitoring programs to verify both the accuracy of the environmental assessment and the effectiveness of mitigation measures.

Integral to the assessment was providing opportunities for engagement with landowners, public, First Nations, Metis and stakeholders, for two ends: to gather and understand local interests and concerns, and to obtain feedback for use in the route selection and environmental assessment process. Aboriginal Traditional Knowledge (ATK) was an important input to the process, as was learnings from past environmental assessments.

An initial step in the assessment was the identification of valued components (VCs), which are biophysical and socio-economic elements that could be adversely affected by the Project and are of particular value or interest to regulators or other stakeholder groups. Potential interactions between the Project and VCs were then identified, as were resulting potential effects. The anticipated spatial and temporal extent of these effects were established, mitigation measures to avoid or reduce them developed, and the residual effects (those that persist after the application of mitigation measures) characterized using specific criteria (direction, magnitude, geographic extent, frequency, duration, reversibility, and biophysical or socio-economic context). The significance of each residual effect was then determined by evaluating it against established thresholds (Section 7.3.6). If a residual effect exceeds the threshold, it was determined to be a significant effect.

Two categories of effects are assessed: Project effects and cumulative effects. Project effects are those direct or indirect effects caused by the Project on various elements of the environment in combination with baseline conditions and existing trends. Cumulative effects are those resulting from the residual effects of past, present, and reasonably foreseeable future projects and activities combined with the contribution of the Project's residual effects. The effects of past and current projects contribute to the baseline conditions upon which Project effects were assessed. Consequently, cumulative effects are those resulting from the previously defined Project effects combined with the effects of "reasonably foreseeable" future projects and activities. The characterization criteria and significance thresholds are the same for both Project and cumulative effects. Follow-up and monitoring programs were developed to evaluate and adaptively manage the efficacy of the proposed mitigation measures and resulting residual effects.

The assessment uses the *CEAA 2012* (Subsection 2(1)) definition of "environment", which is, "…the components of the Earth, and includes:

a. land, water and air, including all layers of the atmosphere

b. all organic and inorganic matter and living organisms [including humans]

c. the interacting natural systems that include components referred to in (a) and (b)"

7.2.1 Approach to Traditional Knowledge

Aboriginal Traditional Knowledge (ATK) is knowledge that is held by and unique to Aboriginal people (CEAA 2015). It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs, and medicines. The purpose of ATK studies is to gather and summarize community knowledge about the environment, use and management of the environment, and values about the environment from community members who use the land and resources for traditional and/or cultural purposes in and around the Project assessment areas. ATK is generally collected through map biographies, one-on-one interviews and historical or other types of research. The information shared is then used to inform the route selection and environmental assessment processes.

Manitoba Hydro offered First Nations and the Manitoba Metis Federation (MMF) the opportunity to conduct traditional knowledge or land use and occupancy studies beginning in the summer of 2014 and onward until summer of 2015 (see Chapter 4 for details). Communities that indicated an interest in undertaking a study were invited to submit a proposal, including a scope and timeline for deliverables. An ATK proposal template was developed and shared with communities that requested assistance with the development of a proposal for a study. Manitoba Hydro staff also met with communities that required assistance to help with the development of the proposal.

The ATK reports provided by communities, prior to the filing of the EIS, were reviewed by Manitoba Hydro to inform the environmental assessment and contributed to the design of the Project. Information from the reports was shared with the environmental assessment discipline

regulatory review process for these projects. Each VC chapter will outline the relevant learnings from past projects and associated regulatory processes, as well as learnings on the assessment process itself, including adding more clarity in analysis processes, more inclusive cumulative effects assessment, better integration of ATK and a more concise, plain-language approach to writing.

Similarly, the professional staff consulted in the preparation of this assessment have experience on environmental assessments across the country and have incorporated their learnings from past assessments.

7.3 Assessment Steps

The assessment progressed through the following steps:

1. project description
2. scoping of the assessment
3. description of existing conditions
4. assessment of Project effects (including mitigation)
5. assessment of cumulative effects (including mitigation)
6. determinations of significance;
7. follow-up and monitoring

Figure 7-1 summarizes these steps, which are described in the following sections.

7.3.1 Step 1: Project Description

The Project Description (see Chapter 2) defines the Project components and activities required to construct and operate the Project's permanent facilities and to decommission temporary infrastructure not required for operations. Alternative means to achieve the Project purpose are presented in Chapter 2: Project Description - Section 2.5, including design measures to mitigate potential adverse effects.

7.3.2 Step 2: Scoping of the Assessment

Scoping identifies the valued components that will be considered in the environmental assessment, the geographic areas and timescales over which potential effects will be studied, and the thresholds of change for determining if predicted Project effects would be significant. Scoping is an iterative process that is adjusted throughout the environmental assessment process as new information becomes available.

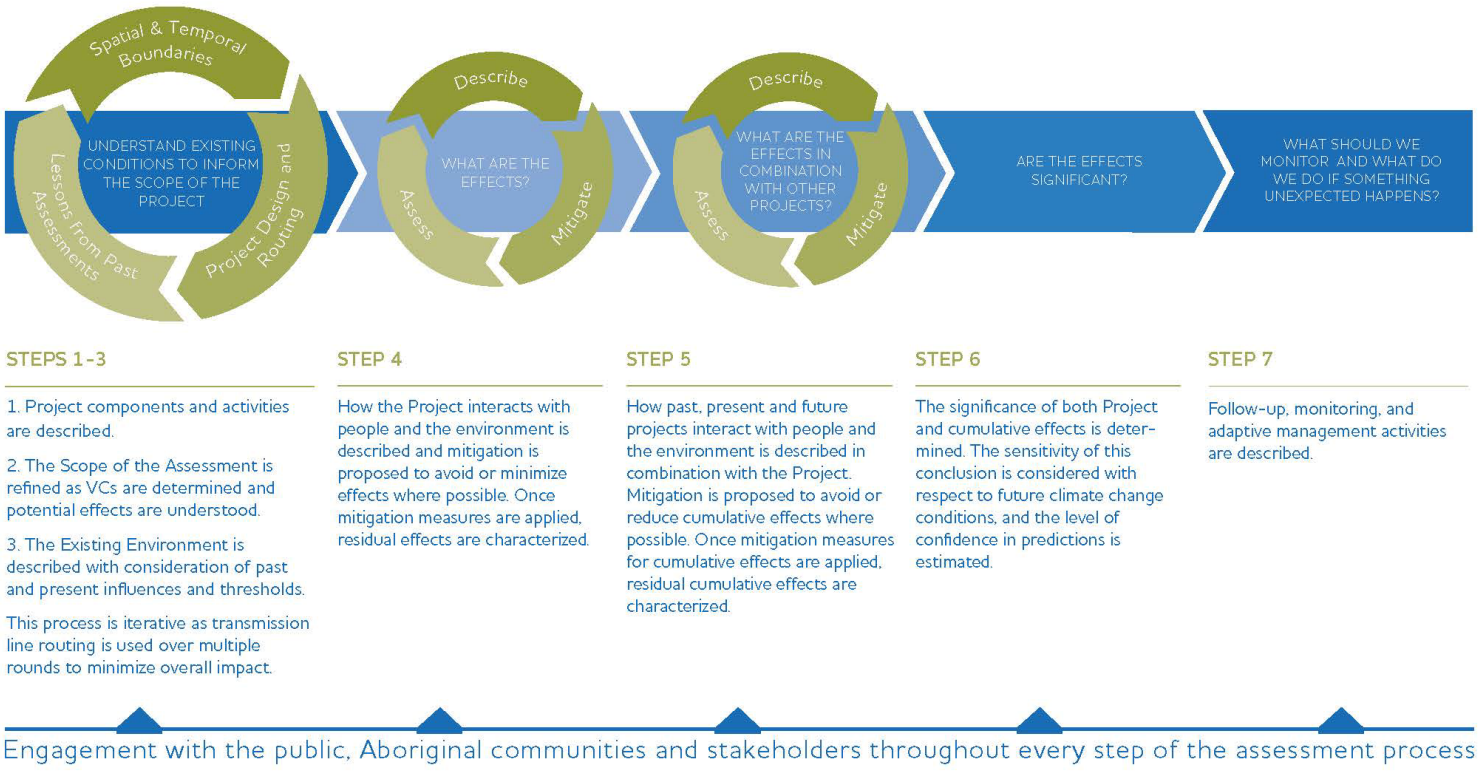

Figure 7-1 Assessment Process Overview

7.3.2.1 Selection of Valued Components

The selection of VCs is based on several factors, including consideration of input from regulators, the public, First Nations Metis and stakeholders; as well as the professional judgment of Manitoba Hydro and the environmental assessment team.

Table 6-1 in the NEB Electricity Filing Manual (2015b) (*Circumstances Triggering the Need for Detailed Biophysical and Socio-Economic Information*) and the Manitoba Conservation and Water Stewardship Environment Act Proposal Report Guidelines (MCWS 2015) were used as a guide in determining if there was likely an interaction between the Project and biophysical or socio-economic elements of the environment. Table 7-1 provides a summary of potential interactions between project activities (occurring during construction and operation and maintenance) and biophysical and socio-economic elements to be considered for inclusion in the assessment. Elements with the potential to interact with the Project are designated as:

- a valued component (VC)
- a pathway component (PC)

VCs are elements that have the potential to interact with the Project and that met one or more of the following criteria:

- represent a broad environmental, ecological or human environment component that might be affected by the Project
- are a part of the heritage of First Nations and Metis or a part of their current use of lands for traditional purposes
- are of scientific, historical, archaeological importance
- have been identified as important issues or concerns by stakeholders or by other effects assessments in the region

If change to an environmental element is ultimately captured by an assessment of an existing VC, the element is considered a pathway component. For example, a change in noise is assessed in the human health risk VC because noise is one of many pathways to effect that VC. In this assessment, physical environment elements such as soils, water quality, groundwater and air are described with respect to their potential pathway to effect a VC.

There are often many factors that contribute to a VC's condition, particularly in developed areas. To better understand the linkage between the sources of environmental change and the effects to valued components, 'pathways' of effect are described throughout. In each VC chapter a figure is provided that illustrates the relationship between the Project, the pathway of effect, and how effects are measured.

Table 7-1 lists the NEB and MCWS elements to be considered, identifies whether they interact with the Project and rationale, designates the elements as a VC or PC and includes the primary sections where the elements are discussed.

Table 7-1 Environmental Elements Included in the Environmental Impact Statement

Agency	Environmental Elements	Primary Section(s) Where Addressed in EIS	Rationale for Inclusion in the EIS
NEB	Physical and Meteorological Environment	Addressed as a pathway component and discussed in: • Physical Environment: Historic and Future Climate Study (Biophysical TDR) • Environmental Setting (Chapter 6) • Land and Resource Use VC (Chapter 16) • Effects of the Environment on the Project (Chapter 20) • Physical Environment: Terrain and Soils (Biophysical TDR) • Fish and Fish Habitat (Biophysical TDR)	• The physical environment,including terrain and meteorological conditions play a role in project routing and design • Prevailing climate and meteorological events (*e.g.*, ice storms) may affect the Project • The physical environment, including terrain and meterological conditions is a pathway to other environmental components in the EIS
MCWS	Description of the local area and regional setting including important terrain features such as hills, valleys, lakes, rivers, shorelines, etc. Description of the prevailing climate and meteorological conditions, and identification of any nearby climate monitoring stations		
NEB	Soil and Soil Productivity	Addressed as a pathway component and discussed in: • Environmental Setting (Chapter 6) • Agriculture VC (Chapter 15) • Physical Environment: Terrain and Soils (Biophysical TDR)	• The physical properties of soils (geotechnical parameter) play a role in project design • Soil productivity is a component of the Agriculture VC
NEB	Vegetation	Addressed as a valued component and discussed in: • Vegetation and Wetlands VC (Chapter 10) • Vegetation and Wetlands (Biophysical TDR)	• The Project has the potential to result in the damage or destruction of vegetation • The Project may result in the proliferation of invasive species • The Project will require ongoing vegetation control
MCWS	Description of the terrestrial environment including vegetation that could be affected by the proposed development.		
NEB	Water Quality and Quantity	Addressed as a pathway component and discussed in: • Environmental Setting (Chapter 6) • Fish and Fish Habitat VC (Chapter 8), • Land and Resource Use VC (Chapter 16) • Fish and Fish Habitat (Biophysical TDR)	• The Project has components located within 30 m of a waterbody • Potential changes to water and water quality affect fish and fish habitat • Water quality and quantity, including surface water and groundwater, are a pathway component in the EIS
MCWS	Identification and description of local and regional surface waterbodies (lakes, rivers, etc.) and description of the regional groundwater conditions including aquifers, recharge areas, quality, wells, etc.		
NEB	Fish and Fish Habitat	Addressed as a valued component in: • Fish and Fish Habitat VC (Chapter 8) • Fish and Fish Habitat (Biophysical TDR)	• The Project has components that located within 30 m of fish bearing waterbodies • The Project may result in an effect to fish or fish habitat
MCWS	Description of the aquatic environment including fish resources, fish habitat, benthic invertebrates, aquatic macrophytes, etc. for each waterbody that could be affected by the proposed development.		
NEB	Wetlands	Addressed as a valued component in: • Vegetation and Wetlands VC (Chapter 10) • Vegetation and Wetlands (Biophysical TDR)	• The Project has components that are within 30 m of a wetland • Wetlands are partially defined by vegetation, and their assessment is combined with the vegetation VC
MCWS	Identifcation and description of wetlands		
NEB	Wildlife and Wildlife Habitat	Addressed as a valued component in: • Wildlife and Wildlife Habitat VC (Chapter 9) • Wildlife and Wildlife Habitat (Biophysical TDR)	• The Project will be located near, through and on lands that are sensitive for wildlife • The Project will affect wildlife habitat and may result in an increase in wildlife mortality
MCWS	Description of the terrestrial environment, including wildlife (mammals, birds, amphibians, reptiles, etc.) , wildlife habitat, etc. that could be affected by the proposed development.		

Agency	Environmental Elements	Primary Section(s) Where Addressed in EIS	Rationale for Inclusion in the EIS
NEB MCWS	Species at Risk, or Species of Special Status and Related Habitat Identification and description of any rare, threatened or endangered species or any important or sensitive species and/or habitats, particularly if federally and/or provincially protected	Addressed as a valued component in: • Fish and Fish Habitat VC (Chapter 8) • Wildlife and Wildlife Habitat VC (Chapter 9) • Vegetation and Wetlands VC (Chapter 10)	• The assessment area includes lands within identified range of a species at risk or a species of special status and includes habitat that could support these species • These species are discussed under the Fish and Fish Habitat, Wildlife and Wildlife Habitat, and Vegetation and Wetlands VCs
NEB MCWS	Air Emissions Type, quantity and concentration of pollutants (emissions, effluents and solid wastes) to be relased and the technologies proposed to contain or treat the waste streams. Information on the storage, transportation or disposal of any hazardous wastes that may be produced.	Addressed as a pathway component and discussed in: • Human Health Risk VC (Chapter 18) • Project Description (Chapter 2) • Accidents,Malfunctions and Unplanned Events (Chapter 21)	• There will be increased air emissions from the construction and operation of the Project • Air emissions, effluents and solid wastes are a pathway to other environmental components in the EIS.
MCWS	Identification of any storage of gasoline or associated products (*e.g.*, diesel fuel, used oil, heating oil, aviation gas, solvents, isopropanol, methanol, acetone, etc.)	• Project Description (Chapter 2) • Accidents,Malfunctions and Unplanned Events (Chapter 21)	• The Project will require the storage of gasoline and associated products
NEB MCWS	Greenhouse Gas (GHG) Emissions Climate change implications including greenhouse gas inventory.	Addressed as a pathway component and discussed in: • Sustainable Development (Chapter 23) • Physical Environment: Greenhouse Gas Lifecycle Assessment (Biophysical TDR)	• The Project may result in an increase in greenhouse gas emissions during the construction, operations and maintenance phases
NEB	Acoustic Environment	Addressed as a pathway component and discussed in: • Human Health Risk VC (Chapter 18) • Physical Environment: Noise (Biophysical TDR)	• The Project may result in increased noise levels during construction, operations and maintenance
NEB	Electromagnetism and Corona Discharge	Addressed as a pathway component and discussed in: • Electric Field, Magnetic Field, Audible Noise, and Radio Noise Calculations (Socio-Economic TDR) • Human Health Risk VC (Chapter 18)	• The Project may change the existing environmental setting related to electromagnetic fields. • The Project will have the potential to result in radio and television interference
NEB MCWS	Human Occupancy and Resource Use Identification and description of the existing land and resource uses in the region; iIdentification and description of protected areas (*e.g.*, national and provincial parks).	Addressed as a valued component in: • Land and Resource VC (Chapter 16) • Agriculture VC (Chapter 15) • Socio-Economic and Land Use (Socio-Economic TDR)	• The Project will be partially located on land not in an existing transmission right of way
NEB MCWS	Heritage Resources Archaeological and historical sites, etc.	Addressed as a valued component in: • Heritage Resources VC (Chapter 12) • Heritage Resources (Socio-Economic TDR)	• The Project will include clearing of vegetation, excavating and drilling offering the potential for disturbance of heritage resources
NEB	Navigation and Navigation Safety	Addressed as a valued component in: • Land and Resource Use VC (Chapter 16) • Socio-Economic and Land Use (Socio-Economic TDR)	• The Project includes components that will be located across a waterway

Agency	Environmental Elements	Primary Section(s) Where Addressed in EIS	Rationale for Inclusion in the EIS
NEB	Traditional Land and Resource Use	Potential impacts of the development on Aboriginal and Treaty rights are the responsibility of the Crown. Traditional land and resource use is addressed as a valued component in: • Traditional Land and Resource Use VC (Chapter 11) • Also addressed in: • ATK Community Report (Black River, Long Plain and Swan River First Nation 2015) • ATK Report (Roseau River 2015) • Peguis First Nation Land Use and Occupancy Interview Project For the Manitoba – Minnesota Transmission Project – Draft Report (Peguis First Nation 2015) • ATK Report (Sagkeeng First Nation 2015)	• The Project will traverse the traditional territory of an Aboriginal group
MCWS	Identification of First Nation communities in the vicinity of the proposed development. Identification of potential impacts of the development on Aboriginal and treaty rights, including, but not necessarily limited to direct impacts on communities in the project area; resource use, including hunting, fishing, trapping, gathering, etc., cultural or traditional activities in the project area.		
NEB	Social and Cultural Well-Being	Addressed as a valued component in: • Community Health and Well-being VC (Chapter 19) • Socio-Economic and Land Use (Socio-Economic TDR)	• The Project may affect the social and cultural well-being of First Nations, Metis, local residents or communities
NEB	Human Health and Aesthetics	Addressed as a valued component in: • Human Health Risk VC (Chapter 18) • Socio-Economic and Land Use (Socio-Economic TDR) • Community Health and Well-Being VC (Chapter 19) • Visual Quality VC (Chapter 17)	• The Project may affect local or regional water quality and quantity, or air quality • The Project may change the existing environmental setting related to odours, visual aesthetics or other sensory conditions
MCWS	Identification of any existing public safety and human health risks in the development area. Potential impact on human health and safety resulting from any release of pollutants, including a human health risk assessment.		
NEB	Infrastructure and Services	Addressed as a valued component in: • Infrastructure and Services VC (Chapter 13) • Socio-Economic and Land Use (Socio-Economic TDR)	• The Project may result in increased demands on local and regional services • The Project may affect the usage of roadways during construction and operation
MCWS	Description of the socio-economic environmentand potential socio-economic implications resulting from environmental impact.		
NEB	Employment and Economy	Addressed as a valued component in: • Employment and Economy VC (Chapter 14) • Socio-Economic and Land Use (Socio-Economic TDR)	• The Project may affect local and regional employment
MCWS	Description of the socio-economic environment and potential socio-economic implications resulting from environmental impact.		

NEB – National Energy Board
MCWS – Manitoba Conservation and Water Stewardship

A complete discussion of interactions is provided in each VC chapter. For complete concordance with the NEB Filing Manuals (2015 a, b) and MCWS guidelines (2015), see Concordance Table - Tables C1-C3.

Based on Table 7-1, the VCs selected for the assessment are:

- Fish and Fish Habitat
- Wildlife and Wildlife Habitat
- Vegetation and Wetlands
- Traditional Land and Resource Use
- Heritage Resources
- Infrastructure and Services
- Employment and Economy
- Agriculture
- Land and Resource Use
- Visual Quality
- Human Health Risk
- Community Health and Well-being

More detail on the justification for VC selection is presented in the individual VC chapters.

7.3.2.2 Project Interactions with Valued Components

The assessment of potential Project effects on the biophysical and socio-economic environment is based on the identification of what Project activities and physical works will interact with the VCs and are likely to have effects. Table 7-2 identifies which Project components and physical activities interact with which VCs. The Project components and physical activities are described in Chapter 2. The potential effects of the identified interactions are described and assessed in the individual VC chapters.

Table 7-2 Project-Valued Component Interactions

Project Components and Physical Activities	Valued Component											
	Fish and Fish Habitat	Wildlife and Wildlife Habitat	Vegetation and Wetlands	Traditional Land and Resource Use	Heritage Resources	Infrastructure and Services	Employment and Economy	Agriculture	Land and Resource Use	Visual Quality	Human Health Risk	Community Health and Well-being
Transmission Line Construction Activities												
Mobilizing (staff and equipment)	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Access Route and Bypass Trail development	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Right-of-way Clearing/Geotechnical Investigations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Marshalling Yards, Borrow Sites, Temporary Camp Setup	-	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Transmission Tower Construction and Conductor Stringing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demobilization	-	✓	-	✓	-	✓	✓	✓	✓	-	✓	✓
Transmission Line Operations/Maintenance												
Transmission Line Operation/Presence	-	✓	-	✓	-	✓	✓	✓	✓	✓	✓	✓
Inspection Patrols	-	✓	✓	✓	-	-	✓	✓	-	-	✓	✓
Vegetation Management (tree control)	✓	✓	✓	✓	✓	-	✓	-	✓	-	✓	✓
Station Construction												
Station Site Preparation	-	✓	✓	-	-	✓	✓	✓	✓	-	✓	✓
Electrical Equipment installation	-	✓	-	-	-	✓	✓	-	✓	-	✓	✓

Project Components and Physical Activities	Valued Component											
	Fish and Fish Habitat	Wildlife and Wildlife Habitat	Vegetation and Wetlands	Traditional Land and Resource Use	Heritage Resources	Infrastructure and Services	Employment and Economy	Agriculture	Land and Resource Use	Visual Quality	Human Health Risk	Community Health and Well-being
Station Operations/Maintenance												
Station Operation/Presence	-	-	-	-	-	-	✓	-	✓	-	✓	-
Vegetation Management (weed control)	-	-	-	-	-	-	✓	-	✓	-	✓	-

NOTES:
"✓" = An interaction occurs between the Project and the VC.
"-" = Interactions between the project and the VC are not expected.

7.3.2.3 Potential Environmental Effects, Effects Pathways and Selection of Measurable Parameters

Once interactions likely to have effects are determined, the potential resulting effects for each VC are identified. This is done based on available scientific information, the assessment team's professional judgement and understanding of the interactions, previous experience from similar types of projects and recent environmental assessments, and input from engagement with the public, First Nations, Metis and regulators. The pathways by which these effects may occur are identified, and one or more measurable parameter(s) are selected for the quantitative (where possible) or qualitative measurement of potential Project and cumulative effects. Examples of measurable parameters include the area of wildlife habitat that may be affected or the expected number of workers that will move into the area for Project construction. The amount of change in these measureable parameters is used to help characterize the environmental effects and to assist in evaluating their significance (see Section 7.3.6 - Determinations of Significance).

7.3.2.4 Assessment Boundaries

Spatial and temporal boundaries are identified for the assessment and assist in quantifying effects. Spatial boundaries set the geographic areas over which the assessment will be conducted, and temporal boundaries set the time frame to be considered.

7.3.2.4.1 Spatial Boundaries

Spatial boundaries for the assessment are selected principally in consideration of the geographic extent over which Project activities and their effects on the VCs are likely to occur, as well as other ecological, technical and social considerations. Four types of areas are defined, one for Project planning and design purposes, and three for VC assessment purposes. They are defined as follows:

- Project planning/design area:
    - The route planning area (RPA) encompasses the larger planning area in which alternative routing options were considered (see Map 7-1 - Route Planning Area). This area was used for the alternative route evaluation and preferred route selection process only, and is the same for all VCs.
- Project assessment areas:
    - The Project development area (PDA) consists of the area physically disturbed by the Project and includes an 80 to 100 m wide right-of-way along the New Right-of-Way for the Final Preferred Route, and a 177 to 245 m wide corridor along the Existing Transmission Corridor. In addition, the PDA includes the three station modification footprints at Dorsey Converter Station, Riel Converter Station and Glenboro South Station, and also the associated access roads and marshalling yards. The PDA is to the same for all VCs (see Map Series 7-100 – Project Development Area).

- The local assessment area (LAA) encompasses the area in which both: a) Project-related environmental effects (direct or indirect) can be predicted or measured with a level of confidence that allows for assessment; and b) there is a reasonable expectation that those potential effects in the LAA will be a concern. The LAA encompasses the PDA and is selected principally in consideration of the geographic extent of effects. Consequently it is VC-specific.
- The regional assessment area (RAA) is the area that establishes the context for determining significance of project-specific effects. It is also the area within which potential cumulative effects—the residual effects from the Project in combination with those of past, present and reasonably foreseeable projects—are assessed. The RAA encompasses the PDA and the LAA, and is VC-specific.

The term, 'Project region' is used in the assessment referring to southern Manitoba in general.

The LAA and RAA used for each VC is identified in the assessment chapters. Maps showing the LAA and RAA, and justification for the areas selected are provided in each VC chapter.

7.3.2.4.2 Temporal Boundaries

The assessment addresses the interactions of potential effects during the Project's construction, and operation and maintenance phases with timescales that capture relevant variability and trends. For example, current and present use of lands for traditional land and resource use has been defined for this assessment as within the last 25 years (or one generation). Discussion on trends and variability can be found in the existing conditions descriptions for VCs to illustrate how past events have contributed to the current status of the VC and how long a VC may take to recover from effects. The Project schedule is presented in Chapter 2: Project Description - Section 2.12.

The effects of decommissioning are not assessed. Transmission lines are expected to be operational for more than 100 years. When decommissioning is scheduled, Manitoba Hydro will adhere to the environmental policies and regulatory framework in place at that time.

7.3.3 Step 3: Description of Existing Conditions

The existing conditions for each VC are established based on data collected during desktop analysis, field programs, public engagement, and from ATK and traditional use reports. Desktop analysis includes literature reviews, personal communications, and key person interviews. Influences of past and present projects and physical activities on the VC condition leading to the present time is presented along with a discussion of the current condition of the VC, including the current status of the VC with respect to significance thresholds. Additional supporting baseline material for the VCs is provided as warranted in technical data reports.

7.3.4 Step 4: Assessment of Project Effects

The Project's potential effects are assessed in the context of each VC's existing condition. As described below, effects pathways and standard and Project-specific mitigation are presented, and the residual effects described for each Project phase (construction, operation and maintenance). The determination of the significance of the residual effects is presented in Section 7.3.6.

7.3.4.1 Project – Effect Interactions and Pathways

Table 7-2 identifies which Project activities and components interact with which VCs. In the VC assessment chapters the effects that could result from these interactions are identified and assessed. For each VC, components and activities that do not interact with the VC are identified and the reason for the lack of interaction explained.

For each effect, the pathway or how the effect may occur as a result of Project interactions with the environment is described.

7.3.4.2 Mitigation of Potential Project Effects

The flexible nature of transmission line routing allows for the Project team to route the line to reduce effects to people and the environment. Adjusting the location of the transmission line route was a fundamental tool used to reduce effects of MMTP wherever possible. A multiple-criteria routing tool, discussed in Chapter 5, was employed to quantitatively assess where to place the line to balance effects to the built, natural and engineered environment.

Beyond routing, additional mitigative measures are included in both the design, construction and operation of the Project. Some mitigation measures are broad measures that deal with a host of potential adverse effects for a number of VCs. For example, by conducting clearing activities in wetlands under frozen or dry conditons, potential disturbance to underlyng vegetation is reduced because the ground is frozen and potential disturbance to waterfowl is reduced because they are not present or are in non-critical life stages. In some cases additional VC-specific measures are also required to deal with VC-specific issues not otherwise addressed. In some instances the Project provides an opportunity to create a net positive effect for the current state of a VC.

The challenge is that it is not always possible to mitigate all possible adverse effects and there are typically compromises that are beneficial to some aspects but detrimental to others, for any given location. For example, routing the transmission line to avoid critical habitat for one wildlife species, may result in the loss of habitat for another species. Once the physical locations of the structures are established, efforts are made to further mitigate adverse effects that may remain.

Mitigation measures work to eliminate, reduce, or control adverse effects so that they are not significant, and therefore address most of the criteria used to characterize significance. This includes reducing the size or magnitude of the Project activity and its associated effect, reducing its geographic extent, reducing the frequency or duration that a particular project activity occurs (*e.g.*, number of times a day, number of hours a day), and undertaking an activity in a less

sensitive ecological or social location or time period, or where recovery from the effect is feasible. Where residual adverse effects still occur, efforts are then made to try to address them through mitigation, restitution measures (*e.g.*, replacement, restoration or compensation), by either allowing natural recovery, actively facilitating recovery, or constructing something to replace what is being lost.

Recommended mitigation measures are identified in the VC-specific effects assessment chapters and the draft Construction Environmental Protection Plan (CEnvPP), see Chapter 22: Environmental Protection, Follow-up and Monitoring .

7.3.4.3 Characterization of Residual Project Effects

The Federal Environmental Assessment Review Office (FEARO) developed a reference guide for CEAA in determining whether a project is likely to cause significance adverse environmental effects (FEARO 1994). The guide includes several criteria to be considered when determining whether an effect was significant. These included magnitude, geographic extent, duration, frequency, reversibility and ecological context. These criteria, with some variations, have been used to describe environmental residual environmental effects for EIAs across Canada for the past 20 plus years.

Following an analysis of the effects pathways and mitigation measures, the residual environmental effects (*i.e.,* the environmental effects that remain after mitigation has been applied) are described using the following characterizations:

- Direction: the ultimate trend of the environmental effect (*i.e.*, positive, neutral, or adverse)
- Magnitude: the amount of change in a measurable parameter relative to existing conditions (*i.e.*, negligible, low, moderate or high)
- Geographical Extent: the geographic area within which an environmental effect of a defined magnitude occurs (*i.e.*, PDA, LAA, RAA)
- Frequency: the number of times during the Project or a specific project phase that an environmental effect may occur (*i.e.*, once, sporadically, regular or continuous)
- Duration: the period of time that is required until the VC returns to its existing condition or the environmental effect can no longer be measured or otherwise perceived (*i.e.*, short term, medium term or permanent)
- Reversibility: the likelihood that a measurable parameter will recover from an environmental effect (*i.e.*, reversible or irreversible).
- Ecological or Socio-Economic Context: the general characteristics of the area in which the project is located or resilience of the area to change (*i.e.*, undisturbed or disturbed; low, medium or high resilience).

Where possible, these characteristics are described quantitatively. Where they cannot be expressed quantitatively, at minimum, they are described using qualitative terms that are defined specifically for the VC or environmental effect.

The definitions for the magnitude of the residual effects are specific to each VC and are provided in the VC assessment chapter. The term 'negligible', as used in this assessment, means that an effect cannot be discerned and characterized by any means and therefore no assessable effect exists.

7.3.5 Step 5: Assessment of Cumulative Effects

7.3.5.1 Overview

Project residual effects that have the potential to interact cumulatively with residual environmental effects of other projects and physical activities (past, present and reasonably foreseeable) are identified and the resulting cumulative environmental effects assessed. This is followed by an analysis of the Project contribution to the cumulative effect.

As mentioned previously, Project effects are those direct or indirect effects caused by the Project on various components of the environment in combination with baseline conditions and existing trends due to natural causes. Cumulative effects are those resulting from the residual effects of past, present, and reasonably foreseeable future projects and activities combined with the contribution of the Project's residual effects. The effects of past and current projects contribute to the baseline conditions upon which Project effects are assessed. Consequently, cumulative effects are described as those resulting from the previously defined Project effects combined with the effects of "reasonably foreseeable" future projects and activities.

As defined in CEAA's Operational Policy Statement for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 (CEAA 2015) reasonably foreseeable future projects are those that are:

- Certain: the physical activity will proceed or there is a high probability that the physical activity will proceed, e.g., the proponent has received the necessary authorizations or is in the process of obtaining those authorizations.
- Reasonably Foreseeable: the physical activity is expected to proceed, e.g., the proponent has publicly disclosed its intention to seek the necessary EA or other authorizations to proceed.

Each VC chapter discusses how current environmental conditions were created by past and present physical activities and resource uses. How the Project and other existing and reasonably foreseeable known future projects and activities affect the environment cumulatively is then discussed. For each potential cumulative effect, the interactions by which it may occur and changes in the state of the VC relative to existing conditions are characterized.

To better characterize the combined various effects of individual projects and activities over time, each VC chapter includes a description of how conditions have changed over time. The cumulative effects assessment for each VC considers the spatial and temporal overlap of effects for each VC. The environmental setting of the Project is a region of southern Manitoba in which the original native ecology has been substantially affected by over one hundred years of human development. As such, many natural values on this landscape have been diminished and, in some cases in some areas, lost. The cumulative effects of this past development has been recognized to the extent possible and meaningful in this assessment.

The cumulative environmental effects are assessed following the same iterative process and format used for Project effects; namely, description and analysis of cumulative effects, mitigation of cumulative effects, and characterization of residual cumulative effects. As with the assessment of Project effects, information from engagement activities, and regulators was used to inform the cumulative effects assessment.

7.3.5.2 Project and Activity Inclusion List

The Project and activity inclusion list identifies known past, present and reasonably foreseeable future projects and physical activities with residual environmental effects that could overlap spatially and temporally with the Project's residual environmental effects. Table 7-3 presents the names, a description and the duration of these projects and activities and identifies where there is a potential interaction with a VC. Map Series 7-200 – Past and Present Physical Activities and Resource Use, Map 7-2 – Glenboro Past and Present Physical Activities and Resource Use, Map Series 7-300 – Reasonably Foreseeable Future Physical Activities, and Map 7-3 – Glenboro Reasonably Foreseeable Future Physical Activities presents the locations of these existing and known future physical activities. Figure 7-2 shows how the timelines of these projects overlaps with those of MMTP.

The specific projects and physical activities considered for each environmental effect and their interaction are described in the VC assessment chapters.

7.3.5.3 Pathways for Cumulative Effects

The assessment of each cumulative environmental effect begins with a description of the Project environmental effects and an analysis of the pathways whereby they might interact with the effects from other projects and activities.

7.3.5.4 Mitigation of Cumulative Effects

Mitigation measures that can reduce the project cumulative environmental effects are described, with an emphasis on those measures that would help to reduce the interaction of the Project effect with the effects from other projects and physical activities. These additional mitigation measures that would assist in reducing potential cumulative environmental effects are described in the various VC assessment sections.

Manitoba Hydro is committed to mitigation of potential cumulative effects through monitoring of its projects for potential effects, implementing adaptive management for unanticipated effects, and the sharing of information and knowledge with other proponents through its environmental assessments and monitoring reports to the regulatory agencies such as Manitoba Conservation and Water Stewardship (MCWS).

One of the challenges in developing mitigation measures for adverse cumulative environmental effects is that it is typically not feasible (or appropriate) for one proponent to manage effects in an area created by several proponents. The primary responsibility of any given proponent is to deal with their own projects.

The three types of mitigation measures that can be implemented are those:

- implemented solely by the Project proponent
- implemented by the Project proponent in cooperation with other project proponents, government, First Nation, Metis or public stakeholders
- implemented independently by other project proponents, government, First Nation, Metis or public stakeholders

For the latter two, the degree to which the proponent can influence the implementation of these measures is noted, where known.

7.3.5.5 Characterization of Residual Cumulative Effects

As with residual Project effects, residual cumulative effects are described using the same characterizations: direction, magnitude, geographic extent, frequency, duration, reversibility, and ecological or socio-economic context, using the same qualitative or quantitative measures used for Project residual effects.

Two aspects of cumulative environmental effects to a VC are described:

- Cumulative environmental effect (*i.e.,* the environmental effect of all past, present and reasonably foreseeable projects and physical activities in combination with the environmental effect of the Project).
- After characterizing the residual cumulative effects, the contribution of the Project to the cumulative effects is discussed.

Table 7-3 Project and Activity Inclusion List and VC Interaction

	Project	Description	Duration of Project (construction and operation)	VCs											
				Fish and Fish Habitat	Wildlife and Wildlife Habitat	Vegetation and Wetlands	Heritage Resources	Traditional Land and Resource Use	Infrastructure and Services	Employment and Economy	Agriculture	Land and Resource Use	Visual Quality	Human Health Risk	Community Health and Well-being
Past	Agriculture	Agricultural activities, such as cropping, livestock operations and aerial spraying have been occuring in southern Manitoba for over a century, and will continue into the future.	ongoing	-	✓	✓	✓	✓	-	✓	-	✓	✓	✓	-
	Residential Developments	Residential subdivisions have and continue to be developed near Winnipeg's City Limits and in neighbouring communities.	ongoing	-	✓	✓		✓	-	✓	✓	✓	✓	✓	-
	Existing Linear Developments	Roads, railways, the Red River Floodway and existing transmission and pipelines have been developed across the MMTP project area for over a century and will continue into the future.	ongoing	-	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-
	Commercial Resource Use Activities	Quarries, aggregate mines, peat mines and forestry activities have been developed and are operating in southern Manitoba.	ongoing	-	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓
	Domestic Resource Use Activities	Hunting, fishing, trapping and other domestic resource use activities have been undertaken in southern Manitoba and will continue.	ongoing	-	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓
	Recreational Activities	All-terrain vehicle (ATV) use, snowmobile use, multi-trail use and boating are recreational activities that have and continue to occur in Southern Manitoba.	ongoing	-	✓	✓	✓	✓	-	-	✓	✓	-	✓	-
Future	**Linear Developments**														
	St. Vital Transmission Complex	Two 230 kV transmission lines both originating at St. Vital Station in southeast Winnipeg, terminating at Letellier Station in Letellier, MB and La Verendrye (via the Southern Loop Transmission Corridor) in Oak Bluff, MB. St. Vital is located in the MMTP project region.	2016-2017 2017-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bipole III Transmission Project	A 500 kV high voltage direct current (HVDC) transmission line linking the northern power generating complex with the southern Manitoba conversion and delivery system. Includes two new converter stations and associated ground electrodes and additional 230 kV transmission line interconnections in the north. Projected in-service date is 2018.	2014-2018 2018-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dorsey to Portage South Transmission Project	A 230 kV alternating current (AC) transmission line from Manitoba Hydro's existing Dorsey Converter Station to the existing Portage South Station.	2018 2018-	-	-	✓	-	✓	✓	✓	✓	✓	✓	✓	✓
	Richer South Station to Spruce Station Transmission	A 230 kV transmission line from Manitoba Hydro's existing Richer South Station to TransCanada Pipeline Ltd.'s (TCPL's) proposed Spruce Station.	TBD-2018 2018-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Northwest Winnipeg Natural Gas Project	New 12" and 6" natural gas pipeline extension. The pipeline will be 6" diameter from Provincial Road (PR) 321 to Stonewall and the remainder of the project will be 12" pipeline.	2015-2017 2017-	-	✓	✓	-	✓	-	✓	-	✓	-	✓	✓
	Gas Upgrade Projects (Various)	2.2 to 9 km installations of new gas pipelines of various diameters in Waverley West Subdivision, Steinbach area and St. Pierre and Grunthal areas.	2016-2019 2019-	-	✓	-	-	✓	-	✓	-	✓	-	✓	-

Project	Description	Duration of Project (construction and operation)	VCs											
			Fish and Fish Habitat	Wildlife and Wildlife Habitat	Vegetation and Wetlands	Heritage Resources	Traditional Land and Resource Use	Infrastructure and Services	Employment and Economy	Agriculture	Land and Resource Use	Visual Quality	Human Health Risk	Community Health and Well-being
Energy East Pipeline Project	4,500 km crude oil pipeline system, including conversion of existing natural gas facilities to oil service. Includes expansion of existing Ile des Chenes, Spruce and Falcon Lake pump stations.	2016-2018 2018-	-	✓	-	-	✓	✓	✓	✓	-	-	✓	-
MIT Capital Projects	Surface rehabilitation/repaving, intersection improvements and structure improvements or replacements included in capital planning for next 5 years.	2015-2020 2020-	-	-	-	-	✓	-	✓	-	✓	-	✓	-
Oakbank Corridor	A new highway connecting Provincial Trunk Highway (PTH) 101 to PR 206. A new bridge across the Red River Floodway would be required.	Within 30 years 2045-	-	-	✓	-	✓	-	✓	✓	-	✓	-	-
St. Norbert Bypass	New highway bypass on a 135 to 165 m right-of-way from PTH 100 to PTH 75 south of Winnipeg.	Within next 5 years 2020-	-	✓	✓	✓	✓	-	✓	✓	✓	✓	-	-
Headingley Bypass	New 14 km highway bypass from CentrePort Canada Way to PTH 1W.	Within next 30 years 2045-	-	✓	✓	-	✓	-	✓	✓	✓	✓	-	-
Other Projects and Activities														
Southend Water Pollution Control Centre Upgrade	Upgrades to improve nitrogen and phosphorus removal. Physical activities located within existing fenced compound.	2015-2018 2018-	-	✓	-	-	-	-	✓	-	-	✓	-	-
Piney-Pinecreek Border Airport Expansion	Extension of an existing runway at the international airport. Timing and location unknown.	TBD TBD	-	✓	✓	-	✓	-	✓	-	-	-	-	-

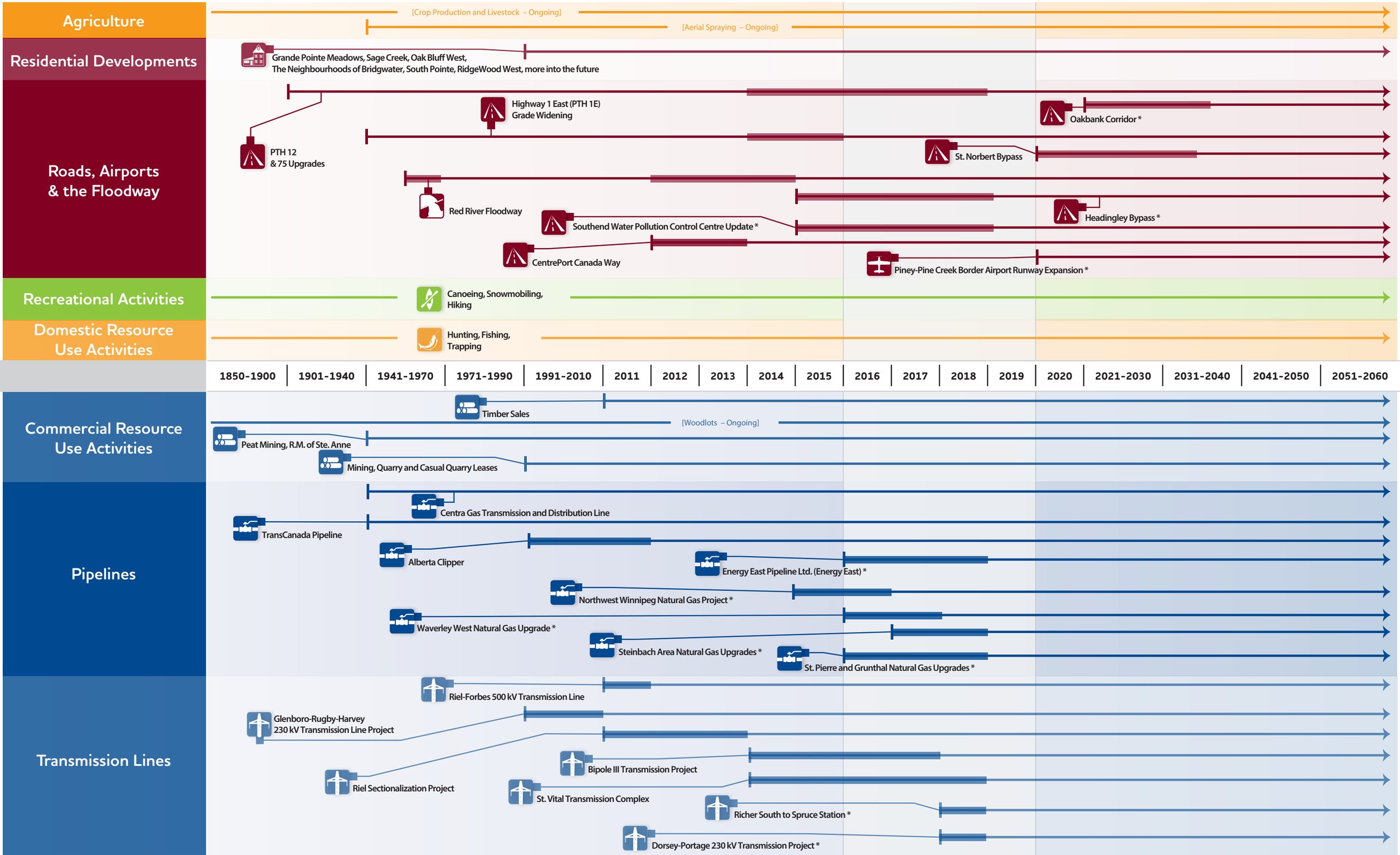

Figure 7-2. Past, Present and Future Projects in the MMTP Regional Assessment Areas

7.3.6 Step 6: Determinations of Significance

The EIS includes a determination of the significance of residual effects. In general, significant effects are those likely to be of sufficient magnitude, duration, frequency, geographic extent or irreversibility to cause a change in the VC that will alter its status or integrity beyond an acceptable level.

Significance thresholds were selected by the VC discipline specialists with consideration of provincial and federal regulatory requirements, standards, objectives, guidelines, and other relevant planning objectives applicable to each VC. Thresholds are developed in consideration of guidance, past practice, and the specific conditions of the receiving environment. There are few listed or legal standards or thresholds for defining significance of effects or activities for the VCs identified. In lieu of regulatory standards or thresholds, detailed definitions of the significance criteria for each environmental effect are provided in the VC assessment chapters. A threshold approach for the determination of significant effects is supported by the Clean Environment Commission (Manitoba Clean Environment Commission 2013).

7.3.6.1 Significance of Project Environmental Effects

The significance of Project environmental effects is determined using the list of significance criteria presented earlier and standards or thresholds that are specific to each VC or the measurable parameters used to assess the environmental effect.

In cases where significant environmental effects are identified, the likelihood of their occurrence is evaluated.

7.3.6.2 Significance of Cumulative Environmental Effects

For cumulative environmental effects, the determination of significance is made using the same VC thresholds as for Project environmental effects. Much of the prairie region of southern Manitoba has changed from a grassland environment to an agricultural environment since settlement over the last century. The cumulative effects of some environmental components in the region would likely be characterized, from a pre-development perspective, as having experienced “significant” change (for example, those tied to natural environment and aesthetics). This is qualitatively acknowledged throughout the EIS. The assessment of significance of cumulative environmental effects is based on comparison to current conditions and includes an analysis of the Project’s contribution to these cumulative environmental effects.

The likelihood of significant environmental effects occurring is evaluated.

7.3.6.3 Sensitivity of Significance Predictions to Future Climate Change

Sensitivity of Project and cumulative effects predictions to potential climate change scenarios are analyzed. The CEAA document, "General Guidance for Practitioners: Incorporating Climate Change Considerations in Environmental Assessments" (2003), proposes that the future climate conditions be reviewed to determine if there is a risk to the public or the environment in situations where the Project is the major factor related to the risk. Manitoba Hydro undertook a Historic and Future Climate Study for the Project (see Biophysical TDR), which identifies the range of possible changes to climatic parameters. A summary of future climate scenarios is presented with the study.

The significance prediction for each VC is reviewed to evaluate if these predictions would change as a result of climate change. If there is no likely change, then no further analysis is undertaken. If there is a change, the Project sensitivity will be analyzed and the range and extent of possible impacts on the Project and VCs and resultant potential risks to the public or the environment assessed. Where a risk to the public and/or the environment is identified, an impact management plan will be defined, as required, to manage or avoid the risk. This plan will be subject to the same Follow-up and Monitoring Programs described in Section 7.3.6.

7.3.7 Prediction Confidence

Confidence in the prediction of significance for both Project and cumulative effects is discussed. Confidence is based on scientific certainty relative to:

- the quality and quantity of data and the understanding of the effect pathways
- the known or estimated effectiveness of the proposed mitigation measures

7.3.8 Step 7: Follow-up and Monitoring

Manitoba Hydro's Environmental Protection Program provides the framework for implementation, management, monitoring and follow-up of environmental protection activities in keeping with environmental effects identified in the environmental assessment as well as in regulatory requirements. The Program outlines how Manitoba Hydro is organized and functions to deliver timely, effective, and comprehensive solutions and mitigations to predicted environmental issues and effects. The Program, fully described in Chapter 22, consists of the following:

- an implementation framework outlining how environmental protection is delivered and managed;
- the Construction Environmental Protection Plan (CEnvPP);
- contractor Environmental Management Plans;

- Culture and Heritage Resources Protection Plan;
- Biophysical and Socio-economic Monitoring Plans.

Follow-up and monitoring is carried out to verify the accuracy of the environmental assessment of a project, assess the effectiveness of measures taken to mitigate adverse effects through the continuous observation, measurement or assessment of environmental conditions at and surrounding the Project and determine compliance with regulatory requirements.

Adaptive management will be a core approach in implementation of the EPP. Adaptive management is a planned process for responding to uncertainty or to an unanticipated or underestimated Project effect. It applies information learned from monitoring actual Project effects and comparing them with predicted effects. If there is a variance between the actual and the predicted effects, a determination will be made as to whether modifications are required in existing mitigation measures or other actions are necessary to address the variance, or in cases where there may be no mitigating options available, the appropriate information is disseminated in a timely manner.

Plans for reporting and disseminating information regarding follow-up and monitoring activities, including any public reporting, are included in the EPP.

7.4 Effects of the Environment on the Project

The NEB Filing Manuals (2015a, b) and Section 19.1(h) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) require consideration of changes to the Project that may be caused by the environment. Environmental effects that may occur as a result of the environment acting on the Project will be assessed. Potential environmental changes and hazards may include wind, severe precipitation, ice storms, flooding, grass and forest fire, earthquakes and/or tornado. The influence that these environmental changes and hazards may have on the Project will be predicted and described as well as the measures taken to avoid potential adverse effects. The effects of the environment on the Project are presented in Chapter 20.

7.5 Accidents, Malfunctions and Unplanned Events

Section 16.1(a) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) requires that every assessment consider the effects of accidents, malfunctions or unplanned events that might occur in connection with a project. The potential for and consequence of accidents, malfunctions and unplanned events are assessed. The assessment provides a range of potential accident, malfunction and unplanned events scenarios from the construction and operation of the Project and evaluates their environmental effects. It provides an initial basis for the development of emergency response planning and what eventual will be incorporation into the Project's emergency response plan.

Accidents, malfunctions, and unplanned events scenarios were developed using historical risk assessment information where available for similar projects at a provincial, national or international scale, as appropriate. For each event considered, a possible scenario relating how the event might occur during the life of the Project was developed. Details on the types of accidents, malfunctions and unplanned events considered in this environmental assessment and the scenarios developed for this assessment, are discussed in Chapter 21: Accidents, Malfunctions and Unplanned Events.

Potential environmental effects on the VC due to accidents, malfunctions and unplanned events are assessed in a similar fashion to Project environmental effects (see Section 7.3.4). Environmental effects are characterized using the same terms used for routine project environmental effects, and mitigation measures are prescribed. The significance of the environmental effect is then determined using the same thresholds used for routine project environmental effects.

7.6 References

Canadian Environmental Assessment Agency (CEAA). 2003. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners [online]. Available from: https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=A41F45C5-1. Accessed on June 11, 2015.

Canadian Environmental Assessment Agency. 2014. Glossary [online]. Available from http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=B7CA7139-1&offset=3#d [accessed June 10, 2015].

Canadian Environmental Assessment Agency. 2015. Operational Policy Statement Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012. Updated March 2015.

FEARO (Federal Environmental Assessment Review Office). 1994. A reference guide for the Canadian Environmental Assessment Act. – Determining whether a project is likely to cause significant adverse environmental effects. Available from https://www.ceaa-acee.gc.ca/D213D286-2512-47F4-B9C3-08B5C01E5005/Determining_Whether_a_Project_is_Likely_to_Cause_Significant_Adverse_Environmental_Effects.pdf (accessed on 16 July 2015).

Manitoba Clean Environment Commission. 2013. Bipole III Transmission Project Report on Public Hearing. June 2013 [online]. Available from: http://www.cecmanitoba.ca/resource/hearings/36/FINAL%20WEB%20Bipole%20III%20Transmission%20Project_WEB3.pdf. Accessed October 15, 2013.

Manitoba Conservation and Water Stewardship. 2015. Environment Act Proposal Report Guidelines – Information Bulletin, July 2015 [online]. Available from: http://www.gov.mb.ca/conservation/eal/publs/info_eap.pdf. Accessed July 16, 2015.

National Energy Board. 2015a. Filing Manual, January 2015 [online]. Available from: https://www.neb-one.gc.ca/bts/ctrg/gnnb/flngmnl/flngmnl-eng.pdf. Accessed July 16, 2015.

National Energy Board. 2015b. Electricity Filing Manual, May 2015 [online]. Available from https://www.neb-one.gc.ca/bts/ctrg/gnnb/lctrct/lctrctflngmnl/lctrctyflngmnl-eng.pdf. Accessed June 10, 2015.

Tobias, T.N. 2000. Chief Kerry's Moose: a guidebook to land use and occupancy mapping, research design and data collection. Vancouver, BC. 64 pp.