6.0 PUBLIC ENGAGEMENTPROGRAM

6.1 PURPOSE AND OBJECTIVES

Public and stakeholder engagement is an integral part of Manitoba Hydro's SSEA process. Manitoba Hydro developed a two-round Public Engagement Program (PEP) to guide consultation for the Project. The approach reflects the experience of Manitoba Hydro's current practices and principles for engagement in a SSEA context.

The overall purpose of the PEP was to provide the public, in particular those who may be directly or indirectly affected by the Project, with meaningful opportunities to receive information on, and provide their input into, the SSEA for the Project. The PEP aimed to achieve the following with respect to such interested parties:

- Opportunities for early involvement – this includes providing early notice and information about the Project and the PEP so that parties can assess their interests and provide early comment, as well as become involved in ongoing planning and environmental review activities.
- Opportunities for ongoing involvement – this includes providing ongoing opportunities to learn about the Project and key planning activities, to provide input with respect to any concerns or opinions, to resolve issues raised, to have views and inputs recorded, and to learn about actions that occur as a result of studies and planning activities.
- Opportunities at various stages – this includes opportunities to provide inputs: a) when issues are being initially identified; b) when alternative routes/sites are being considered; c) when initial effects are described and ways to mitigate or enhance identified effects are considered; d) when the EA Report has been filed with regulators for review and comment.
- Variety of mechanisms – this includes a variety of tools to communicate, to receive feedback and to engage in ongoing meaningful dialogue.
- Adaptive approach – this includes adjusting the PEP, as required and feasible, throughout the course of the environmental review and planning process, in response to issues, concerns and challenges.

A preliminary list of stakeholders was developed prior to Round One engagement activities. Additional stakeholders were identified throughout the environmental assessment process. Stakeholders were classified into three groups that determined the nature of engagement activities. The groups are described below. For further detail on specific stakeholders, refer to the Appendix 11.5.

6.1.1 Community Leadership and Key Landowners

This group included Rural Municipality (RM) and Aboriginal leadership as well as landowners that hold property in the areas of the proposed alternative routes, through which the Project would be built. The RM's of Portage la Prairie, Cartier, St. Francois Xavier and Rosser were engaged as were Dakota Tipi First Nation, Dakota Plains First Nation, Long Plain First Nation and the Manitoba Metis Federation. Peguis First Nation was also notified of the Project since a portion of each of the alternative routes (and the preferred route during Round 2) would run through their Community Interest Zone.

6.1.2 Other Landowners, Agricultural Interests and Regulatory Authorities

This group included stakeholders that may have an interest in the Project but were geographically removed from the location of the alternative routes (or from the preferred route during Round 2). Other landowners and agricultural interests (within a mile of the proposed transmission line but not with ownership of land where the Project would be built) were also included in this group.

6.1.3 Other Stakeholders

This group included the remaining categories of stakeholders (ENGOs and NGOs), including agricultural organizations (complete list in Appendix 11.5).

The specific goals for the PEP for this Project were to:

- Share project information as it became available;
- Obtain local knowledge which might assist in Project planning;
- Obtain input from stakeholders in the Study Area on the best way to involve the public and get their feedback into the decision-making process;
- Understand local issues pertinent to the Project;
- Integrate issues and concerns identified by interested parties in the decision-making process; and
- Discuss appropriate mitigation and monitoring measures.

6.2 METHODS

Two rounds of public engagement were held for this Project. Round One was held from December 2011 through January 2012. The purpose of this round was to:

- Introduce the Project;
- Describe the Project and the SSEA process;
- Identify potential routing issues, constraints and opportunities;

- Present alternative routes and identify issues and concerns; and
- Receive feedback on the alternative routes.

From November through December 2011, Manitoba Hydro attended Council meetings in the RMs of Portage la Prairie, Cartier, St. Francois Xavier and Rosser. Open Houses were held in Oakville and St. Francois Xavier. Meetings and discussions also took place with specific landowners in the area that had particular concerns and with Manitoba Infrastructure and Transportation.

Round Two activities were undertaken from March through April of 2012. The purpose of this round was to:

- Present the preferred route;
- Present outcomes from Round One engagement;
- Identify and discuss any outstanding potential routing issues; and
- Obtain input on mitigation measures to minimize potential adverse effects and enhance positive effects.

Manitoba Hydro attended Council meetings in the RMs of Portage la Prairie, Cartier, St. Francois Xavier and Rosser. Open Houses were once again held in Oakville and St. Francois Xavier. Manitoba Hydro also initiated dialogue and held meetings with other specific stakeholders including landowners adjacent to the preferred route at the Assiniboine River crossing and representatives from Sunnyside Colony. A meeting also took place with representatives of the Manitoba Metis Federation and from Peguis First Nation. Manitoba Hydro will with Peguis on all projects in the area.

Several different tools were used throughout the engagement process, including:

- Meetings with RMs, landowners, government, local First Nations, and the MMF;
- Open houses;
- Comment forms at Open Houses to be filled out and returned;
- Project Manager's email and phone number;
- Project newsletters (specific to each round of engagement) circulated within the postal code areas that correspond to the Study Area and provided in bulk to RM offices;
- Information packages circulated to potentially affected landowners, which included a Project newsletter and mapping specific to their landholdings; and
- Newspaper advertisements in the Central Plains Herald-Leader and Daily Graphic.

Further detail and samples of materials can be found in the Appendix 11.5.

6.3 ENGAGEMENT ACTIVITIES

6.3.1 Open Houses

A total of four Open Houses were held - two in each of the communities of Oakville and St. Francois Xavier. Notification of each Open House was a key component to ensure the best possible attendance. This engagement process was facilitated by Project newsletters that were circulated by mail to landowners in the vicinity of the Project and newspaper ads placed in the Central Plains Herald-Leader and the Daily Graphic, both of which are circulated in the area. In some cases, this approach was supplemented with telephone calls. Long Plain First Nation, Dakota Plains First Nation, Dakota Tipi First Nation and the Manitoba Metis Federation received telephone calls, as did agricultural organizations and the appropriate RMs.

The format of the Open Houses was as follows:

- Attendees were typically greeted by a Project team member at the entrance. They were asked to sign-in and were given a brief orientation to the layout of the room, the process and the attending Project team personnel.
- The venues were organized with storyboards in one area and tables with maps and related materials in another. The latter proved a useful opportunity for Project personnel to sit down with attendees in front of maps and other materials to discuss specific issues and concerns.

At the Community Open Houses, storyboards were shown and Manitoba Hydro representatives were available to answer questions and explain the information presented on the storyboards. During Round One, the storyboards welcomed the participants; outlined the purpose and goals of the Project; described the project and SSEA approach; and presented several alternative routes on a map. In Round Two, storyboards also communicated concerns voiced in Round One, described how public input changed the design of the Project; explained why the preferred route was selected (and displayed the route on a map); showed the anticipated design of the towers; addressed potential effects; provided and overview of the content of the environmental protection plan; and outlined the Project schedule.

Project team representatives responded to the questions raised by attendees, sought to understand the community or individual interest related to the Project planning, and offered perspectives on the issues that were raised. In some instances where a representative could not respond specifically to a particular question or concern, the issue was forwarded to the appropriate department within the Corporation and a response provided as required.

Selected Open House materials are provided in the Appendix 11.5.

6.3.2 Comment Forms

Comment forms were created for each round and were handed out at each Open House. This allowed input from the general public to be properly documented. Information from the comment forms included a variety of topics of interest and direct questions on the participant's views on the Project and its potential effects. The comment forms were designed to understand whether the Open House materials gave individuals the information they required to understand the Project. The forms also documented specific concerns of individuals. A copy of the comment forms used for Round One and Round Two are available in the Appendix 11.5.

6.3.3 Meetings

A variety of meetings took place during both rounds of engagement, including with:

- RM Councils – Meetings were held with the RMs of Portage la Prairie, Cartier, St. Francois Xavier and Rosser. With the exception of the RM of Cartier, these engagements took place during regularly scheduled Council meetings. Discussions with the RM of Cartier took place in meetings with the public works subcommittee. Representatives from the Project team were provided with an opportunity to speak about the Project and environmental assessment activities underway. Attendees were offered a chance to ask questions and voice their concerns. Notes were compiled following these meetings. See Appendix 11.5 for more detail.
- Landowners – Direct discussions with landowners took place during both rounds of engagement. One area of focus for these discussions was the Assiniboine River crossing where the Project would pass relatively close to residential properties. Discussions also took place regarding the proximity of the Project to infrastructure on the Sunnyside Hutterite Colony. As a result of this engagement it was confirmed that the structure in relatively close proximity to the Project would be grounded. Further engagement will be undertaken closer to the beginning of Project construction.
- Manitoba Infrastructure and Transportation (MIT) – Ongoing discussions took place between Manitoba Hydro and MIT. Topics included the crossing of Highway #1 and the road allowance along the section of the line in between the existing transmission line (D12P) and Highway #1.
- Manitoba Metis Federation (MMF) – Manitoba Hydro met with representatives from the MMF to provide a description of the Project and its proposed alternative routes. The primary topic of interest was potential effects on resource users. A follow up meeting took place to facilitate the distribution of information letters to Metis resource users in the area of the Project.
- Peguis First Nation – Manitoba Hydro also had discussions with Peguis First Nation since a portion of each of the alternative routes (and the preferred route during Round 2) would run through their Community Interest Zone.

Additional detail on outcomes of these engagements can be found in Section 6.4.

6.3.4 Project Newsletters

Newsletters were created for each round of engagement. These included summaries of available Project information, responses to frequently raised questions and identified the next steps in the SSEA process. The newsletters were entitled:

- Newsletter #1 – Dorsey to Portage South – Overview and Alternative Routes; and
- Newsletter #2 – Project Update and Open House Notification – Round Two: Preferred Route.

In Round One, a map with alternative routes was included in the newsletter. In Round Two, a map insert was provided in order to show the preferred route. Each newsletter was provided to stakeholders and the public either at RM or stakeholder meetings (Section 6.4.1), Community Open Houses (Section 6.4.2) or delivered via mail. The newsletters were also available to members of the general public from RM offices and upon request. Newsletters were also sent to potentially interested organizations and associations.

Newsletters were sent to approximately 2000 rural addresses throughout Cartier, St. Eustache, Newton Siding, Rosser, St. Francois Xavier, Elie, Marquette, Southport and Oakville, Manitoba in both Round One and Round Two. A complete list of the postal codes used can be found in the Appendix 11.5. For additional information please refer to the Preliminary List of Stakeholders for Engagement in Appendix 11.5. A copy of each newsletter and map insert is also available in Appendix 11.5.

6.3.5 Information Packages

Round Two engagement included the circulation of information packages to approximately 280 landowners within 0.5 miles (0.85 km) of the preferred route. These packages were customized to specific landowners and included the following:

- A letter advising the landowner that the preferred route for the Project had been selected; notification that the route was in proximity to the land they own or manage; and an invitation to attend an upcoming Open House;
- Round Two newsletter;
- Map of the Study Area with a grid to facilitate location of the land parcel of interest to them; and
- Applicable orthographic grid maps showing the land(s) owned by the landowner in relation to the preferred route.

Copies of all maps and other materials are provided in the Appendix 11.5.

6.3.6 Newspaper Advertisements

Community newspaper advertisements were printed approximately two weeks prior to each open house and included a project description summary and the dates and times of each Open House. See the Appendix 11.5 for more detail.

6.3.7 First Nations and Aboriginal Engagement

Three First Nations, Dakota Plains First Nation, Dakota Tipi First Nation, and Long Plain First Nation, are located within the vicinity of the proposed Project. In addition, there is a substantial Metis population in the Study Area. Invitation letters with newsletters attached were sent to each of the First Nations and the MMF. Telephone calls were placed in advance of the Open Houses to follow up on these invitations.

A representative from the MMF attended the Round One Open House and requested an independent meeting to discuss the Project. Following this request, Manitoba Hydro met with the MMF to discuss options for further engagement. The primary topic of interest was potential effects on resource users. A follow up meeting took place to facilitate the distribution of information letters to Metis resource users in the area of the Project.

A portion of the Study Area is located within Peguis First Nation's Community Interest Zone. An engagement invitation letter was sent and a follow-up meeting with Manitoba Hydro took place. Additional information was provided as requested by Peguis First Nation. Manitoba Hydro will with Peguis on all projects in the area.

Additional detail regarding Project-related First Nations and Aboriginal Engagement can be found in Appendix 11.5.

6.4 PUBLIC ENGAGEMENT PROGRAM FEEDBACK

Feedback was acquired throughout the engagement process for the Project. This section provides feedback summaries for Round One and Two. The nature of the Project feedback evolved during the two rounds, moving from general to more specific in nature. Since the Project information provided in Round 1 of the PEP was general in nature (need for the Project, goals of the Project, Study Area, Alternative Route suggestions, etc.), the nature of the feedback was typically of a very high level. The presentation of a preferred route in Round Two elicited more specific feedback about route selection, potential effects, compensation and other concerns.

- 32 comment forms were completed;
- 11 meetings in-person meetings were held (with RM's, landowners and MMF) along with several calls to landowners, MMF and MIT); and
- 280 information packages were sent out to stakeholders within 0.5 miles of the preferred route.

6.4.1 Round One – General Feedback Summary

The purpose of Round One was to introduce the Project and to address any initial questions or concerns regarding the alternative routes being presented.

Thirty-two comment forms were submitted in total at the Oakville and St. Francois Xavier Round One Open Houses. From those comment forms, seven key issues were identified. The greatest concern identified was property values followed by impacts to farming practices. Those who submitted comment forms indicated concern for compensation and health risks. Concerns regarding wildlife and tower design were also noted.

Route A was preferred by 65% of respondents while Route C was indicated as the secondary route preference.

Additional comments and concerns brought forward for Round One included:

- Design
  - Transmission lines are proposed to run too close to landowner homes. Lines should be kept as far as possible from homes.
  - Will the height of the new tower be a hazard to aircraft?
  - Twinning of the existing line seems to be the most practical.
  - Lamp pole structure should be used in areas where spacing is tight.
  - Would it be possible to run the line underground?
- Compensation
  - Consider discount on hydro bills for landowners affected by the additional transmission line.
  - The suggested compensation is not nearly enough to cover loss of property value and inconvenience of towers on land.
  - To alleviate farming difficulties, consider obtaining more easement for wider spacing between lines so farm equipment could pass through more easily.
- Impacts to farming practices
  - Additional towers will increase farming difficulty.
  - Towers placed side by side on agricultural land creates added difficulty for operating machinery.
  - The extra cost to farm land as a result of the towers should not be incurred by the farmers.
  - Who is liable if farmers damage their equipment or a tower as a result of an accident?
  - Weed infestation under the towers is a nuisance to farming.
  - Aerial sprayers will not spray fields with two transmission lines.

- Property values
  - River lots will lose property value with the brush cleared and a second transmission line.
  - The suggested routes are not practical as they are all located in future planning residential zones.
- Health risks
  - There are health risks associated with living under two hydro transmission lines.
  - Electrical and magnetic fields (EMF) pose a risk to nearby residents.
- Others
  - Underground transmission lines should be considered where the transmission line nears private homes as well as at the Assiniboine River crossing.
  - Wildlife may be displaced due to disturbance (brush clearing) in habitat along the river crossing.

This feedback was used to generate a list of stakeholder interests in order to ensure that information and discussions in Round Two of the PEP would be appropriately targeted to match stakeholder interests or concerns. The feedback was also used to assist in issue identification.

6.4.2 Round Two – General Feedback Summary

The purpose of Round Two was to respond to issues, ideas and concerns raised during Round One, to present the preferred route, to gain feedback on the route and to obtain input on possible mitigation measures to minimize possible negative effects and enhance positive effects. Manitoba Hydro used Round Two as an opportunity to respond to the major concerns raised by attendees; these responses are provided below.

General Information

Participants inquired about how the preferred route was selected and what took place during Round One. Positive feedback was also received on the engagement process and notification materials.

Health Risks and Other EMF Concerns

Numerous participants had questions concerning the potential health effects (i.e., EMF) on humans and animals (livestock) as a result of proximity to the Project as well as possible effects on cellular phone, satellite and internet reception. Scientific studies and associated literature have shown no direct link between human health and exposure to EMF. Concerned participants were referred to the Manitoba Hydro website for further information: (http://www.hydro.mb.ca/safety_and_education/emf).

Design

Some participants shared concern regarding placement of the proposed route. The focus of their comments was typically focused on three specific areas of the proposed transmission line: where it crosses the Assiniboine River, the segment near the Sunnyside Hutterite Colony, and the portion that parallels Highway 1.

Through research and consultation, alternative design options have been identified and are being considered by the Project team at certain points along the preferred route. As a result of feedback from local residents, Manitoba Hydro has explored options for crossing the Assiniboine River. In order to accommodate concerns about the proximity of residences, driveway displacement and woodlot clearing, Manitoba Hydro will utilize double-circuit towers along this portion of the route. Use of double-circuit towers would allow the existing transmission lines and those of the new Project to be strung on a single tower structure on each side of the river.

Participants also commented that the towers are aesthetically unappealing. Placement of the Project parallel to the existing line is expected to mitigate against added visual impacts.

Agriculture

Participants mentioned that the Project would adversely affect agriculture operations. Primary among these concerns was the impact the additional towers would have on navigating farm equipment around transmission towers. Participants noted a general concern over the loss of agricultural lands due to tower placement as well as the general nuisance they felt would be caused by the transmission line.

Manitoba Hydro recognized that the placement of their infrastructure projects can create challenges for farmers relating to spraying and seeding in addition to the removal of land from agricultural uses. Manitoba Hydro discussed these issues with potentially affected landowners and provided these concerns to the design engineers in order to optimize tower placement and minimize farming impacts. Farming will still be feasible underneath the transmission line.

Participants were advised that the additional ROW required by this Project would typically only be an additional 15 m as Manitoba Hydro currently owns the existing right-of-way running along the D12P transmission line. Landowners will have the choice to lease the land from Manitoba Hydro for farming purposes.

Property Values

Several landowners expressed concern about the possibility of property values declining due to the existence of another transmission line in the area of D12P. Participants were informed that Manitoba Hydro monitors property values near their

infrastructure projects. According to past monitoring, a decline in property values is not expected as a result of the construction of this transmission line.

Compensation

A number of participants wanted to know how the easement process worked and how the market value of the land to be eased would be assessed. Questions arose around compensation for interruption of agricultural activities on the land and what compensation would cover in terms of construction damage on crops.

Manitoba Hydro will seek to acquire easement agreements with all affected landowners. The right-of-way will be expanded as required from the existing D12P right-of-way as an easement agreement and affected landowners will be compensated accordingly. Towers will be placed on property currently owned by Manitoba Hydro.

Additional comments and concerns from Round 2 included:

- General
  - How was the preferred route selected?
  - What were the outcomes from Round 1?
  - Why is another transmission line needed going out of the Portage South station if there aren't going to be any new lines away from the station?
  - Positive feedback was given about the engagement process to date.
  - Does this affect the potential wind farm construction down the road?
- Design
  - Concerns regarding proximity of line to Sunnyside Colony farm structures.
  - Is there not some method for transmitting hydro power wirelessly yet?
  - Inquiries were made about the general tower appearance, design, span distance and estimated frequency per kilometre.
  - How will the Assiniboine River crossing work? How will it be assembled?
  - How much room will there be between the highway and the existing D12P?
- Health risks - EMF related
  - What are the links between EMF and health?
  - How does EMF affect animals, specifically livestock?
  - Questions arose around the 'sparking' or 'small lightening' coming off D12P near their property.
  - How will this affect cell/satellite/internet reception? Will it be worse with the double-circuit tower?
  - It was mentioned that MTS could not provide service to one property due to the presence of the D12P transmission line. Would Hydro be willing to offer free internet?

- Compensation
  - How does the easement process work?
  - Will compensation be paid for 'inconvenience'? This would include interruption of normal daily activities on the farm during construction.
  - What does the compensation cover for construction damage to crops?
  - What is the market value of the land that would be eased?
  - Specifically for Sunnyside colony, can Manitoba Hydro help move some infrastructure around the colony property to decrease the impact the second transmission line will create?
- Agriculture
  - It was mentioned that it is difficult to navigate farm equipment around the transmission towers.

Interest was mentioned on placing the new tower line south of D12P, on the other side of the road.

7.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVE ROUTES

This chapter outlines in detail the approach that was used to identify and evaluate alternative routes and to select a preferred route for the proposed D83P 230-kV transmission line. The purpose of this approach is to select a transmission line route that, while recognizing cost and technical considerations, will have the greatest positive and least negative effects on people and the environment.

The process by which a single, preferred route is selected is a multi-phased process within the overall SSEA approach employed by Manitoba Hydro. The identification and evaluation of alternative routes continues the process that began with definition of the Study Area (Chapter 4). The route selection process uses regional and site-specific biophysical and socio-economic information to systematically reduce the potential number of alternatives. The most viable alternative routes are then compared and evaluated with the intended result being the selection of a preferred route. Throughout the process information from environmental studies, government officials, and the public (local government councils, interest groups, landowners and other members of the public) was used to aid in route selection.

This chapter summarizes the selection process, describes the comparison and evaluation of the viable alternative routes, and describes the preferred route. Sections 8.11 to 8.14 describe the assessment of the potential effects of the preferred route, including mitigation measures to address any potential residual effects.

7.1 ROUTING CONSTRAINTS AND OPPORTUNITIES

The objectives of the Project route selection process were to minimize adverse socio-economic and biophysical effects while satisfying the technical and capital cost feasibility requirements.

7.1.1 Biophysical and Socio-economic Constraints

The first step was to prepare a preliminary list of biophysical and socio-economic components which could potentially interact with the Project (Table 7-1). The list is based on previous experience on similar transmission line projects, input from technical specialist, and the presence of these components within the Study Area. At this stage, the components were not given any priority ranking. The intent of the list was to identify sensitive components for the purpose of route identification and comparison. Potential effects and mitigation opportunities were identified during the alternative route comparison and preferred route selection process.

Table 7-1 Biophysical and Socioeconomic Components Considered During Preferred Route Selection

Category	Component
Biophysical	Rare and Endangered Species and Habitats
	Wetlands
	Sensitive Species and Habitats
	Watercourse Crossings
	Riverbottom and Other Riparian Forest
	Plantations/Shelterbelts/Private Woodlots/Natural Forest Cover
	Special Lands (e.g., Wildlife Management Areas, Ducks Unlimited, Manitoba Habitat Heritage Corporation)
Socioeconomic	Existing Settlements/Colonies
	Rural Dwellings/Farmsteads
	Areas Designated for Future Urban or Rural Residential Development
	Licensed and Private Airstrips
	Cemeteries/Churches/Schools
	Provincial Trunk Highway and Provincial Road Rights-of-Way
	Communications Facilities
	Designated and Valued Recreation and Resource Use Areas
	Active or Dormant Surface and Aggregate Deposits
	Waste Disposal Sites
	Utility ROWs (other than Manitoba Hydro)
	Areas of Intensive Development and Use
	Existing Active and Potential Irrigation Areas
	Designated Heritage and Archaeological Sites/Areas
	Known Heritage and Archaeological Sites/Areas

Farming activity in general was not considered an appropriate socio-economic avoidance component as almost the entire Study Area is comprised of agricultural lands. Farming activities that were identified as avoidance components were intensive agricultural operations such as farmsteads, irrigation structures, and intensive livestock operations. Other information considered was soil agricultural capability, existing agricultural practices, and the pattern of land ownership. The alternative route identification process minimized potential effects to agriculture in general by making use of road allowances, half-mile lines, and existing transmission/distribution line ROWs. Effects on land ownership and tillage patterns were considered during the comparison and evaluation of the alternatives.

7.1.2 Engineering and Economic Constraints

Capital costs for structures and materials as well as construction costs were a consideration in the alternative route selection process. In general, capital costs increase with line length and routing complexities. Capital costs are proportional to line length while heavy angle structures, special structures used to redirect the transmission line, are a substantial cost premium over suspension structures on straight line segments. The consideration in identifying alternative routes was therefore to limit transmission line length and minimize route complexities. Line length and the number of heavy angle structures were used as a factor for the comparison of alternative routes.

7.1.3 Routing Opportunities

There are a number of features within the Study Area that offered potential routing opportunities for the transmission line. These features include existing and developed severances (e.g., municipal road allowances, half-mile lines, drainage ditches), Crown Land, and existing transmission/distribution line ROW.

Existing and Developed Severances

The Study Area contains a number of existing and developed severances which can be used to minimize the effects of the Project on property and land use. Property ownership in the area is based on the section-township-range survey system as well as the water frontage system along the Assiniboine River. These property severances may also contain municipal road allowances. In addition, a network of agricultural drains has been constructed throughout the Study Area. These features provide routing opportunities which minimize effects to property and land use by confining the ROW to the edges of the properties or farm fields while providing routing alternatives to avoid residences, farmsteads, and other infrastructure.

Crown Land

Crown Land may provide a routing opportunity for a transmission line however each parcel has to be considered within the context of other routing considerations as well as the potential environmental sensitivities of each Crown Land parcel.

Existing Transmission/Distribution Line ROW

Existing transmission/distribution lines provided potential routing opportunities to minimize transmission line effects on property and land use. The incremental effects of paralleling an existing line could potentially be less than a pioneered route. As well, any unused portions of existing ROWs reduce the property acquisition requirements for the project. For example, the existing D12P 230-kV transmission line connects the Dorsey and Portage South stations and is offset to the south within the existing ROW. This provided the opportunity to consider an alignment for the Project which could make use of the vacant portion of the existing ROW which in turn would minimize the new ROW requirements.

7.2 ROUTE SELECTION PROCESS

The selection of a preferred route involved a two-phase process. The first phase identified three preliminary alternative routes within the Study Area using predefined opportunities and constraints. The second phase defined the alternative route and segment alignments in greater detail, comparing and evaluating the alternatives, followed by the selection of a preferred route. The following sections describe how this process was conducted within the biophysical, socio-economic, and stakeholder setting of the Study Area.

7.3 PRELIMINARY ALTERNATIVE ROUTE IDENTIFICATION

The Study Area was outlined earlier (Chapter 4) based on high-level engineering and economic constraints. Routes outside of the study were considered not feasible due to engineering and economic considerations as well as the greater environmental and socio-economic footprints associated with the longer routes.

The identification of preliminary alternative routes proceeded with the following steps:

1. An alignment (Alternative A) was drafted that paralleled the D12P transmission line along the north side so as to make use of the vacant portion of the existing ROW. This alignment also included alternative segments along the south side of D12P where potential critical constraints along the north side had been identified. This alignment would include transmission tower matching to reduce potential effects on agricultural activities;
2. An alignment (Alternative B) was drafted paralleling the D12P transmission line along the north side portions of the route but following new and separate alternative segments to avoid potential critical constraints along the D12P alignment; and
3. An alignment (Alternative C) was drafted that followed a largely new and separate alignment from that of D12P. The intent of the alignment was to avoid potential critical constraints along D12P that could arise during more detailed development and evaluation.

The preliminary alternative routes were initially approximated on available orthophoto imagery. The required ROW was estimated to be 56 m therefore ROW boundaries of27 m were added on both sides and parallel to the unencumbered ROW centrelines. A 75-m buffer zone was then added to the outside edge of the ROW to define an area of potential direct effects from each alternative route alignment. A second 75-m buffer zone was added to the outer edge of the first buffer zone to define an area of potential indirect effects.

Three preliminary alternative routes, including secondary route segments, were outlined within the Study Area. The preliminary alternative route options were identified based on the opportunity to parallel the existing D12P transmission line between the Dorsey and Portage South station. The considerations for making use of this alignment were:

- an alignment to the north of D12P would minimize the requirement for new ROW by making use of the existing vacant D12P ROW;
- any potential effects would be incremental and would avoid creating new potential effects in another portion of the Study Area;
- disturbance to the land use and property fabric could be minimized by following existing linear features; and
- the alignment would avoid, minimize or mitigate potential effects to the environment and socio-economic components such as infrastructure, residences, and commercial operations.

The preliminary alternative routes were then reviewed by the technical specialists to ensure all publically available information was verified to the extent possible and that information generated by each discipline had been fully integrated into the route identification process. The review also allowed the technical specialists to further refine the scope of their field studies and to ensure consistency between the technical studies and the route evaluation process.

The preliminary alternative routes identified during this phase utilized the routing opportunities identified in Section 7.1.3 and could not reasonably be discounted based on any known biophysical, socio-economic, engineering or economic constraints.

7.4 ALTERNATIVE ROUTE COMPARISON AND EVALUATION

The purpose of the second phase was to compare and evaluate the alternative routes through increasing alignment definition while incorporating biophysical, socio-economic, and stakeholder information. At the same time a more detailed examination of mitigation methods was conducted so as to minimize potential Project effects. The second phase consisted of the following steps:

1. Identification of preliminary alternative route nodes;
2. Identification and confirmation of preliminary alternative route segment evaluation criteria;
3. Preliminary alternative route segment filtering process;
4. Evaluation of refined alternative routes and integration of input from affected stakeholders;

5. Identification of the preliminary preferred route;
6. Identification of any outstanding potential issues and mitigation options and additional engagement with directly affected stakeholders; and
7. Identification of the final preferred route.

At each step, updated and more detailed biophysical, socio-economic, and stakeholder information was incorporated into the route selection process.

7.4.1 Preliminary Alternative Route Nodes

Route nodes were identified for each segment of each preliminary alternative route. The purpose for using node identification was to identify discrete route segments which could be compared and evaluated against other alternative route segments. The nodes were identified by using an alpha coding system (e.g., A, B, C.) on 1:20,000 scale orthophoto base mapping with each letter code representing an intersection of alternative route segments. Descriptions were also used to further distinguish alternative route segments that were either similar in geographic location or similar in orientation to other features (e.g., segments north and south of D12P).

7.4.2 Alternative Route Segment Evaluation Criteria

The evaluation criteria were developed by the Project team to enable the comparison and evaluation of preliminary alternative route segments (Table 7-2). The criteria included Valued Ecosystem Components (VECs). The VECs were identified by technical leads based on existing biophysical and socio-economic information for the Study Area. The VEC definition used was: "…those aspects of the natural and socio-economic environment that are particularly notable or valued because of their ecological, scientific, resource, socio-economic, cultural, health, aesthetic, or spiritual importance, and which have a potential to be adversely affected by project development or have the potential to have an effect on the project..." The process used to identify potential effects to VECs is presented in Chapter 8.

Additional evaluation criteria addressed technical and cost considerations as well as other environmental or socio-economic components which could be used to minimize potential residual Project effects on the environmental or socio-economic nature of the Study Area. Values used in the evaluation criteria matrix are approximate and are described in more detail in the subsequent evaluation criteria matrices.

Table 7-2 Alternative Route Segment Evaluation Criteria

Component	Evaluation Factor	Evaluation Criteria
Technical	Line and Structures	Line Length
		# of Heavy Angle Structures
	Existing Severances Followed	Line Length along the Half Mile Line
		Line Length along Road Allowances
		Line Length along D12P requiring additional 15 m of ROW
		Line Length along D12P requiring additional 39 m of ROW
		Line Length along Sub-Transmission Lines
		New Diagonal Severances / Mid-field Alignments
	Linear Features Crossed Crossing of Major Waterbodies (Assiniboine, LaSalle)	Crossing of Major Waterbodies
		Crossings of Major Roads and Rail Lines
Biophysical	Species At Risk	Biophysical Species At Risk Short eared Owl Special Habitat (VEC) in the ROW
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW
		Aquatic/Riparian Habitat in the ROW
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement
		New Agricultural Property Splits
		New Agricultural Management Unit Splits
	Special Investment for Crop Production	Irrigation Systems in the ROW
		Row or Speciality Crops in the ROW
Land Use	Commercial Business Residential	Non-Residential Farm or Commercial Buildings in the ROW
		Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge
		Non-Residential Farm or Commercial Buildings/Yards between 75 and 150 m from the ROW Edge
		Residences in the ROW
		Residences within 75 m of the ROW Edge
		Residences between 75 and 150 m of the ROW Edge

Component	Evaluation Factor	Evaluation Criteria
		Residential Shelterbelts Removed
		Airstrips (< 800 m from the ROW)
		Underground Water Pipelines or gas lines in/affected by the ROW
		Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW
		Wind Farms Affected by the ROW
	Community	Community Interest Zones or Impacts on Future Reserve Lands
		Recreation areas affected by the ROW
		Other Community Infrastructure Affected by the ROW
	EMF	Radio/TV/GPS interference
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW

7.4.3 Alternative Route Segments Filtering Process

Four sets of alternative route segments were identified for comparative evaluation. The alternative route segments within each set had common nodes. The segments were defined using the nodes system and compared using the evaluation criteria (Table 7-2).

The following alternative route segment sets were evaluated:

1. B-O vs B-C-O (Map 7-1);
2. P-E (north side of the Trans-Canada Highway) versus P-E (North side of D12P) versus P-E (South side of D12P; Map 7-2);
3. O-I-J-E-F-M-N versus O-I-J-K-F-M-N versus O-I-J-K-L-M-N versus O-I-J-K-L-N (Map 7-3); and
4. E-F-M-N-G-H (North side of D12P) versus E-F-M-N-G-H (South side of D12P; Map 7-4).

7.4.3.1 B-O versus B-C-O

Alternative route segment B-C-O was preferred based on the following considerations (Map 7-1; Table 7-3):

- B-C-O requires less land transferred from private property to the new ROW easement.
- Greater use of the existing D12P transmission ROW width can be accommodated with the B-C-O route segment over the B-O route segment.
- B-C-O has slightly less distance of disturbance by diagonal severances.

7.4.3.2 P-E (north side of the Trans-Canada Highway) versus P-E (north side of D12P) versus P-E (south side of D12P)

Alternative route segment P-E (north side of D12P) was preferred based on the following considerations (Map 7-2; Table 7-4):

- P-E (north side of D12P) requires minimal land transferred from private property to the new ROW easement.
- P-E (north side of D12P) uses the vacant portion of the existing D12P ROW while the other segments require new ROW
- Joint use of a narrow portion of the TransCanada Highway allowance might be accommodated.

Discussions are on-going with Manitoba Infrastructure and Transportation (MIT) regarding the proximity of the conductors blowing onto the TransCanada Highway allowance and of foundation encroachment on the MIT ROW setback. These issues have been resolved with the slight relocation of a single tower.

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Table 7-3 Alternative Route Segment Evaluation Criteria: B-O versus B-C-O. Preferred segment shaded.

Component	Evaluation Factor	Evaluation Criteria	Route Segments B-O	Route Segments B-C-O
Technical	Line and Structures	Line Length (km)	6.6	6.7
		# of Heavy Angle Structures	1	1
	Existing Severances Followed	Line Length (km) along the Half Mile Line	0	0
		Line Length (km) along road allowances (km)	5.9	0
		Line Length (km) along D12P requiring additional 15 m of ROW	0	6.4
		Line Length (km) along D12P requiring additional 39 m of ROW	0	0
		Line Length along Sub-Transmission Lines	0	0
		New Diagonal Severances / Mid-field Alignments	0.8	0.4
	Linear Features Crossed Crossing of Major Waterbodies (Assiniboine, LaSalle)	Crossing of Major Waterbodies	0	0
		Crossings of Major Roads and Rail Lines	Major Roads (1)	Major Roads (1)
Biophysical	Species At Risk	Short eared Owl (VEC) Habitat in the ROW	0	0
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW	0	0
		Aquatic/Riparian Habitat in the ROW	0	0
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement	~ 3	~ 1
		New Agricultural Property Splits	~ 2	~ 1
		New Agricultural Management Unit Splits	~ 2	~ 1
	Special Investment for Crop Production	Irrigation Systems in the ROW	0	0
		Row or Speciality Crops in the ROW		
Land Use	Commercial Business Residential	Non-Residential Farm or Commercial Buildings in the ROW	0	0
		Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge	1 (Commercial/municipal building separated from the alignment by a municipal road allowance)	0
		Non-Residential Farm or Commercial Buildings/Yards between 75 and 150 m from the ROW Edge	0	0
		Residences in the ROW	0	0
		Residences within 75 m of the ROW Edge	0	0
		Residences between 75 and 150 m of the ROW Edge	0	1 (Shed, separated from the alignment by D12P)
		Residential Shelterbelts Removed	0	0
		Airstrips (< 800 m from the ROW)	0	0
		Underground Water Pipelines or gas lines in/affected by the ROW	0	0
		Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW	0	0
		Wind Farms Affected by the ROW	0	0

Component	Evaluation Factor	Evaluation Criteria	Route Segments B-O	Route Segments B-C-O
	Community	Community Interest Zones or Impacts on Future Reserve Lands	0	0
		Recreation areas affected by the ROW	0	0
		Other Community Infrastructure Affected by the ROW	0	0
	EMF	Radio/TV/GPS interference	0	0
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW	0	0

Table 7-4 Alternative Route Segment Evaluation Criteria: Segment P-E alternatives. Preferred segment shaded.

Component	Evaluation Factor	Evaluation Criteria	Route Segments P-E (North of TransCanada)	Route Segments P-E (North Side of D12P)	Route Segments P-E (South Side of D12P)
Technical	Line and Structures	Line Length (km)	4.3	4.3	4.3
		# of Heavy Angle Structures	2	1	1
	Existing Severances Followed	Line Length (km) along the Half Mile Line	0	0	0
		Line Length (km) along Road Allowances	4.3	4.3 (might conflict with TransCanada Highway Restrictions)	4.3
		Line Length (km) along D12P requiring additional 15 m of ROW	0	4.3	0
		Line Length (km) along D12P requiring additional 39 m of ROW	0	0	4.3
		Line Length along Sub-Transmission Lines	0	0	0
		New Diagonal Severances / Mid-field Alignments	0	0	0
	Linear Features Crossed Crossing of Major Waterbodies (Assiniboine,	Crossings of Major Waterbodies	0	0	0
		Crossings of Major Roads and Rail Lines	Major Roads (1)	Major Roads (1)	Major Roads (1)

Component	Evaluation Factor	Evaluation Criteria	Route Segments P-E (North of TransCanada)	Route Segments P-E (North Side of D12P)	Route Segments P-E (South Side of D12P)
	LaSalle)				
Biophysical	Species At Risk	Short eared Owl (VEC) Habitat in the ROW	0	0	~ 200 m
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW	0	0	~ 200 m grass/pasture
		Aquatic/Riparian Habitat in the ROW	0	0	~ 50 m
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement	~ 7	0	0
		New Agricultural Property Splits	0	0	0
		New Agricultural Management Unit Splits	0	0	0
	Special Investment for Crop Production	Irrigation Systems in the ROW	0	0	0
		Row or Speciality Crops in the ROW			
Land Use	Commercial Business Residential	Non-Residential Farm or Commercial Buildings in the ROW	0	0	0
		Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge	0	0	0
		Non-Residential Farm or Commercial	0	0	0

Component	Evaluation Factor	Evaluation Criteria	Route Segments P-E (North of TransCanada)	Route Segments P-E (North Side of D12P)	Route Segments P-E (South Side of D12P)
		Buildings/Yards between 75 and 150 m from the ROW Edge			
		Residences in the ROW	0	0	0
		Residences within 75 m of the ROW Edge	0	0	0
		Residences between 75 and 150 m of the ROW Edge	0	0	0
		Residential Shelterbelts Removed	0	0	0
		Airstrips (< 800 m from the ROW)	0	0	0
		Underground Water Pipelines or gas lines in/affected by the ROW	0	0	0
		Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW	0	0	0
		Wind Farms Affected by the ROW	0	0	0
	Community	Community Interest Zones or Impacts on Future Reserve Lands	0	0	0

Component	Evaluation Factor	Evaluation Criteria	Route Segments P-E (North of TransCanada)	Route Segments P-E (North Side of D12P)	Route Segments P-E (South Side of D12P)
		Recreation areas affected by the ROW	Alignment is Adjacent to the TransCanada Trail	0	0
		Other Community Infrastructure Affected by the ROW	1 (Aggregate Storage Area)	1 (Aggregate Storage Area)	1(Aggregate Storage Area)
	EMF	Radio/TV/GPS interference	0	0	0
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW	0	0	0

7.4.3.3 O-I-J-E-F-M-N versus O-I-J-K-F-M-N versus O-I-J-K-L-M-N versus O-I-J-K-L-N

Alternative Routes segment O-I-J-E-F-M-N was preferred based on the following considerations (Map 7-3; Table 7-5):

- O-I-J-E-F-M-N makes the greatest use of the vacant portion of the D12P ROW and therefore requires the fewest land transfers from private property to the ROW easement.
- O-I-J-E-F-M-N results in the lowest number of diagonal severances, least amount of mid-field severances, and fewest agricultural management unit splits.
- O-I-J-E-F-M-N and O-I-J-K-F-M-N have the greatest separation from residences.
- O-I-J-E-F-M-N is the least likely to impinge on the permitted yet undeveloped proposed wind farm development near Dacotah.

Alternative route segment O-I-J-E-F-M-N, however, has a potential to affect a municipal aggregate storage site. Although transmission lines and aggregate storage areas are generally compatible and is not expected to be of significant concern, advance discussion with the owner is warranted. Manitoba Hydro will work with the landowner to resolve potential issues.

7.4.3.4 E-F-M-N-G-H (North side of D12P) versus E-F-M-N-G-H (South side of D12P)

Alternative Route segment E-F-M-N-G-H (north side of D12P) was preferred based on the following considerations (Map 7-4; Table 7-6):

- The north side of D12P makes use of the vacant portion of the D12P ROW. The north side of D12P would require an additional 15 m of ROW width while the south side of D12P would require an additional 39 m of ROW width. The north side of D12P would therefore require the least amount of private property transferred to the ROW easement.
- The north side of D12P avoids two water pumping stations are located immediately adjacent to the south side of the D12P ROW. The south side of the D12P ROW would require relocation of the pumping stations as well as any associated underground infrastructure.
- The north side of D12P avoids a recently constructed television tower immediately south of the D12P ROW near Dacotah. The south side of D12P would require mitigation or relocation of the television tower.
- The north side of D12P would intersect 120 m (total width) of unmodified riparian habitat whereas the south side of D12P would intersect 150 m (total width) of unmodified riparian habitat.

- The north side of D12P does not intersect potential Short-eared Owl habitat whereas the south side of D12P may affect approximately 300 m of Short-eared Owl habitat.

A large equipment shed impinges on the north side of the D12P ROW and adjacent granaries at the Sunnyside Hutterite Colony may potentially be affected by this alignment. Manitoba Hydro will work with the colony to provide grounding of the buildings. The north side of D12P would also require a cross-under at the Portage South Station in close proximity to a fibre optics cable located immediately south of D12P.Alternative Route C was not included in the filtering process. The majority of the alternative route (segment B-G) is an alternative alignment to the routes considered for alignments A and B. Alternative route C was therefore compared and evaluated against the refined route A and B alignments resulting from the filtering process.

Table 7-5 Alternative Route Segment Evaluation Criteria: Segment O-N alternatives. Preferred segment shaded.

Component	Evaluation Factor	Evaluation Criteria	Route Segments O-I-J-E-F-M-N	Route Segments O-I-J-K-F-M-N	Route Segments O-I-J-K-L-M-N	Route Segments O-I-J-K-L-N
Technical	Line and Structures	Line Length (km)	32.4	31.7	31.7	31.7
		# of Heavy Angle Structures	5	4	4	6
	Existing Severances Followed	Line Length (km) along the Half Mile Line	0	0	1.6	1.6
		Line Length (km) Along Road Allowances	4.6	6.5	6.5	26.0
		Line Length (km) along D12P requiring additional 15 m of ROW	22.8	20.7	18.2	0
		Line Length (km) along D12P requiring additional 39 m of ROW	0	0	0	0
		Line Length (km) along Sub-Transmission Lines	3.6	5.1	7.4	7.4
		New Diagonal Severances / Mid-field Alignments	3.5	4.6	4.6	4.6
	Linear Features Crossed Crossing of Major Waterbodies (Assiniboine, LaSalle)	Crossing of Major Waterbodies	2	2	2	3
		Crossings of Major Roads and Rail Lines	Major Roads (3); RR (2)	Major Roads (3); RR (2)	Major Roads (3); RR (2)	Major Roads (3); RR (2)
Biophysical	Species At Risk	Short eared Owl (VEC) Habitat in the ROW	0	0	0	0
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW	0	0	0	0
		Aquatic/Riparian Habitat in the ROW	~ 50 m riparian	~ 50 m riparian	~ 50 m riparian	~ 50 m riparian
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement	~ 11	~ 14	~ 17	~ 35
		New Agricultural Property Splits	~ 4	~ 6	~ 7	~ 5
		New Agricultural Management Unit Splits	~ 3	~ 7	~ 8	~ 6
	Special Investment for Crop Production	Irrigation Systems in the ROW	0	0	0	0
		Row or Speciality Crops in the ROW				
Land Use	Commercial Business Residential	Non-Residential Farm or Commercial Buildings in the ROW	0	0	0	0
		Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge	0	0	0	0
		Non-Residential Farm or Commercial Buildings/Yards between 75 and 150 m from the ROW Edge	0	0	0	0
		Residences in the ROW	0	0	0	0
		Residences within 75 m of the ROW Edge	0	0	1 (Residence is separated from ROW by municipal road allowance and sub-transmission line)	1 (Residence is separated from ROW by municipal road allowance and sub-transmission line)
		Residences between 75 and 150 m of the ROW Edge	0	0	0	0
		Residential Shelterbelts Removed	0	0	0	0
		Airstrips (< 800 m from the ROW)	0	0	0	0
		Underground Water Pipelines or gas lines in/affected by the ROW	1 (Gas line crossing)	1 (Gas line crossing)	1 (Gas line crossing)	1 (Gas line crossing)
		Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW	0	0	0	0

Component	Evaluation Factor	Evaluation Criteria	Route Segments O-I-J-E-F-M-N	Route Segments O-I-J-K-F-M-N	Route Segments O-I-J-K-L-M-N	Route Segments O-I-J-K-L-N
		Wind Farms Affected by the ROW	0	0	0	0
	Community	Community Interest Zones or Impacts on Future Reserve Lands	0	0	0	0
		Recreation areas affected by the ROW	0	0	0	0
		Other Community Infrastructure Affected by the ROW	1 (Aggregate storage area)	0	0	0
	EMF	Radio/TV/GPS interference	0	0	0	0
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW	0	0	0	0

Table 7-6 Alternative Route Segment Evaluation Criteria: Segment E-H alternatives. Preferred segment shaded.

Component	Evaluation Factor	Evaluation Criteria	Route Segments E-F-M-N-G-H (North Side of D12P)	Route Segments E-F-M-N-G-H (South Side of D12P)
Technical	Line and Structures	Line Length (km)	40.8	40.8
		# of Heavy Angle Structures	3	3
	Existing Severances Followed	Line Length (km) along the Half Mile Line	0	0
		Line Length (km) along Road Allowances	0	7.7
		Line Length (km) along D12P requiring additional 15 m of ROW	40.8	0
		Line Length (km) along D12P requiring additional 39 m of ROW	0	40.8
		Line Length (km) along Sub-Transmission Lines	0	0
		New Diagonal Severances / Mid-field Alignments	0	0
	Linear Features Crossed Crossing of Major Waterbodies (Assiniboine, LaSalle)	Crossing of Major Waterbodies	2	2
		Crossings of Major Roads and Rail Lines	Major Roads (1); RR (1)	Major Roads (1); RR (1)
Biophysical	Species At Risk	Short eared Owl (VEC) Habitat in the ROW	0	~ 300 m immediately adjacent to ROW
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW	Small patches of forest	Small patches of forest
		Aquatic/Riparian Habitat in the ROW	~ 120 m total in three locations	~ 150 m total in four locations
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement	0	0
		New Agricultural Property Splits	0	0
		New Agricultural Management Unit Splits	0	0
	Special Investment for Crop Production	Irrigation Systems in the ROW	0	0
		Row or Speciality Crops in the ROW		
Land Use	Commercial Business Residential	Non-Residential Farm or Commercial Buildings in the ROW	1 (Large equipment building on inside edge of ROW)	0
		Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge	0	1 (Large equipment shed separated by D12P)
		Non-Residential Farm or Commercial Buildings/Yards between 75 and 150 m from the ROW Edge	0	1 (Separated from ROW by D12P)
		Residences in the ROW	0	0
		Residences within 75 m of the ROW Edge	0	1
		Residences between 75 and 150 m of the ROW Edge	4 (2 of which are separated by D12P)	1
		Residential Shelterbelts Removed	0	0
		Airstrips (< 800 m from the ROW)	0	0
		Underground Water Pipelines or gas lines in/affected by the ROW	2 (Gas line crossings)	4 (2 Gas line crossings; 2 Pumping station buildings)

Component	Evaluation Factor	Evaluation Criteria	Route Segments E-F-M-N-G-H (North Side of D12P)	Route Segments E-F-M-N-G-H (South Side of D12P)
		Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW	0	1 (recently constructed TV tower immediately adjacent to the ROW)
		Wind Farms Affected by the ROW	0	0
	Community	Community Interest Zones or Impacts on Future Reserve Lands	0	0
		Recreation areas affected by the ROW	0	0
		Other Community Infrastructure Affected by the ROW	0	1 (Lagoon)
	EMF	Radio/TV/GPS interference	0	0
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW	0	0

7.4.4 Evaluation of Refined Alternative Routes

The alternative route filtering process was used to select route segments that had the least potential environmental and socio-economic footprints while remaining technically and economically feasible. The three refined alternative route alignments (A-north, A–north/south, and A/B hybrid) as well as alternative route C were then compared and evaluated.

7.4.4.1 Description of Refined Alternative Routes

Alternative Route A (North)

Alternative Route A (north) would originate at the Dorsey Station 230 kV switchyard at Node A and follow an independent alignment south for 0.7 km to the north side of the D12P transmission line (Map 7-5). The alignment would then parallel D12P along the north side, cross the Assiniboine River on independent structures, and continue south to the Trans-Canada Highway. The entire segment would make use of the vacant portion of the D12P ROW and would require an additional 15 m of new ROW width. After crossing the Trans-Canada Highway, the alignment would continue to parallel D12P, between the north side of D12P and the Trans-Canada Highway. At Dakotah the alignment would turn southwest and then continue west to the Portage South Station. At node H, immediately east of Portage South Station, the alignment would cross under D12P to the south side in order to terminate in a vacant bay at the Portage South Station. Two tie-down structures will be required for the cross-under. An underground fibre optic cable is also located on the south side of the D12P ROW.

Alternative Route A (North/South)

Alternative Route A (north/south) would originate at the Dorsey Station 230 kV switchyard at Node A and follow an independent alignment south for 0.7 km to the D12P transmission line where the alignment would cross under to the south side of D12P (Map 7-5). The alignment would then parallel D12P along the south side, cross the Assiniboine River on independent structures, and continue south to the Trans-Canada Highway. The entire segment would make use of a portion of the existing D12P ROW and would also require an additional 39 m of new ROW width. After crossing the Trans-Canada Highway, the alignment would cross under D12P and continue to parallel D12P, between the north side of D12P and the Trans-Canada Highway. At Dakotah the alignment would turn southwest and then continue west to the Portage south Station. The alignment segment between the Trans-Canada Highway crossing and the Portage South Station would make use of the vacant portion of the D12P ROW and would require additional 15 m of new ROW width. At node H, immediately east of Portage South Station, the alignment would cross under D12P to the south side in order to terminate in a vacant bay at the Portage South Station. Two tie-down structures will be required for the cross-under. An underground fibre optic cable is also located on the south side of the D12P ROW.

Alternative Route A/B Hybrid

Alternative Route A/B hybrid would originate at the Dorsey Station 230-kV switchyard at Node A and follow an independent alignment south for 0.7 km to the north side of the D12P transmission line (Map 7-5). The alignment would then parallel D12P along the north side and continue a short distance past node B on an independent alignment before turning south southwest to the Assiniboine River along an alignment parallel to a municipal road allowance for much of the distance. The alignment would cross the Assiniboine River upstream of the D12P crossing and on a perpendicular alignment. The alignment would then turn south to Road 61N before turning west and parallel to the municipal road allowance and a 66-kV sub-transmission line. Due north of Dakotah the alignment would turn south, cross over the Trans-Canada Highway, and converge with the D12P alignment. Where the alignment would parallel the D12P ROW, the segment would make use of the vacant portion of the D12P ROW and would require additional 15 m of new ROW width. From the divergence from and convergence with D12P at Dakotah the alignment would require a new ROW width of 54 m. At Dakotah the alignment would parallel D12P along the north side and west to the Portage South Station. The alignment segment between the convergence with D12P and the Portage South Station would make use of the vacant portion of the D12P ROW and would require additional 15 m of new ROW width. At node H, immediately east of Portage South Station, the alignment would cross under D12P to the south side in order to terminate in a vacant bay at the Portage South Station. Two tie-down structures will be required for the cross-under. An underground fibre optic cable is also located on the south side of the D12P ROW.

Alternative Route C

Alternative Route C would originate at the Dorsey Station 230 kV switchyard at Node A and follow an independent alignment south for 0.7 km to the north side of the D12P transmission line (Map 7-5). The alignment would then parallel D12P along the north side and continue past node B on an independent alignment before turning south southwest to the Assiniboine River. The alignment would cross the Assiniboine River on a perpendicular alignment and upstream of the D12P and potential alternative route A/B hybrid crossings. The alignment would for the most part follow the quarter section line and municipal road allowances. North northwest of Benard the alignment would turn south, cross the Trans-Canada Highway, pass west of Benard, and then continue west. Southwest of Newton the alignment would turn south and converge with D12P immediately west of the Sunnyside Hutterite colony. Where the alignment would parallel the D12P ROW, the segment would make use of the vacant portion of the D12P ROW and would require additional 15 m of new ROW width. The route segment between the divergence from and then convergence with the D12P ROW will require a new ROW width of 54 m. The alignment would then parallel D12P along the north side and west to the Portage South Station. The alignment segment between the convergence with D12P and the Portage South Station would make use of the vacant portion of the D12P ROW and would require additional 15 m

of new ROW width. At node H, immediately east of Portage South Station, the alignment would cross under D12P to the south side in order to terminate in a vacant bay at the Portage South Station. Two tie-down structures will be required for the cross-under. An underground fibre optic cable is also located on the south side of the D12P ROW.

7.4.4.2 Evaluation of Alternative and Selection of Preferred Route

Potential constraints for the four refined alternative routes were tabulated into a route evaluation matrix (Table 7-7). Based on the route comparisons within the evaluation matrix the alternative routes were ranked as follows:

1. Route A (north);
2. Route A (north/south);
3. Route A/B hybrid; and
4. Route C.

Alternative Route A (north) provided the most balanced alternative when considering the potential environmental and socio-economic effects and technical and cost considerations. The Alternative Route A (North) was selected as the preferred route for the following reasons:

- The route takes advantage of the greatest portion of vacant D12P ROW and requires the least amount of new ROW width;
- No residences will be displaced;
- Requires the least number of agricultural land transfers, property splits, and management unit splits;
- The Assiniboine River crossing would be a 15 m incremental addition to the D12P ROW width, avoiding the larger footprint of a 54 m wide independent crossing and the fragmentation of riverbottom forest habitat and riparian zone;
- The La Salle River crossings will be 15 m incremental additions to the D12P ROW width and not new, 54 m wide independent crossings;
- No permanent irrigation systems will be affected;
- Paralleling D12P allows for structure matching thereby minimizing the effects to existing agricultural operations and avoiding potential new effects along independent routes;
- Paralleling D12P will have the least affect aerial crop spraying practices;
- There are no known heritage resources directly on Route A (north);
- The alignment does not intersect Species at Risk (Short-eared Owl) habitat;
- Mitigation options are available for minimizing potential indirect effects to the nearby residence at the Assiniboine River crossing; and
- Mitigation options (e.g., grounding) are available for infringing on a large equipment shed located at the Sunnyside Hutterite colony.

Table 7-7 Alternative Routes Evaluation Criteria: Full route comparison. Preferred route shaded.

Component	Evaluation Factor	Evaluation Criteria	Alternative Route A (North)	Alternative Route A (North/South)	Alternative Route A/B Hybrid	Alternative Route C
Technical	Line and Structures	Line Length (km)	66.14	66.14	66.14	65.2
		# of Heavy Angle Structures	10	10	12	8
	Existing Severances Followed	Line Length (km) along the Half Mile Line	0	0	0	30.4
		Line Length (km) along Road Allowances	4.0	4.0	4.8	5.6
		Line Length (km) along D12P requiring additional 15 m of ROW	66.14	44.0	54.7	13.7
		Line Length (km) along D12P requiring additional 39 m of ROW	0	18.8	0	0
		Line Length (km) along Sub-Transmission Lines	0	0	3.5	0
		New Diagonal Severances / Mid-field Alignments	0	0	3.6	14.4
	Linear Features Crossed	Crossing of Major Waterbodies	3	3	3	3
	Crossing of Major Waterbodies (Assiniboine, LaSalle)	Crossings of Major Roads and Rail Lines	Major Roads (7); RR (3)	Major Roads (7); RR (3)	Major Roads (7); RR (3)	Major Roads (7); RR (3)
Biophysical	Species At Risk	Short-eared Owl (VEC) Habitat in the ROW	0	0	0	0
	Wildlife Habitat	Grasslands/Forest Habitat in the ROW	smaller patches of forest	smaller patches of forest	smaller patches of forest	~ 300 m of forest in total
		Aquatic/Riparian Habitat in the ROW	120 m in total in three locations	120 m in total in three locations	120 m in total in three locations	120 m in total in three locations; other smaller riparian habitats along minor streams
Agricultural	Effects on Private Land Entitlements	Agricultural Land Transfer to New Easement	0	0	~ 15	~ 71
		New Agricultural Property Splits	0	0	~ 6	~ 35
		New Agricultural Management Unit Splits	0	0	~ 4	~ 35
	Special Investment for Crop Production	Irrigation Systems in the ROW	0	0	0	0
		Row or Speciality Crops in the ROW	0	0	0	1 (Sod farm)
Land Use	Commercial Business	Non-Residential Farm or Commercial Buildings in the ROW	1 (Large equipment shed)	1 (Large equipment shed)	1 (Large equipment shed)	0
	Residential	Non-Residential Farm or Commercial Buildings within 75 m from the ROW Edge	0	2 (1 of which is separated by D12P)	0	0
		Non-Residential Farm or Commercial Buildings/Yards between 75 and 150 m from the ROW Edge	0	2 (1 of which is separated by D12P)	0	0
		Residences in the ROW	0	0	0	0
		Residences within 75 m of the ROW Edge	2	0	0	0
		Residences between 75 and 150 m of the ROW Edge	6 (2 of which are separated by D12P)	8 (4 of which are separated by D12P)	6 (2 of which are separated by D12P)	4 (1 of which is separated by a road allowance)
		Residential Shelterbelts Removed	1	1	0	0
		Airstrips (< 800 m from the ROW)	0	0	0	0
		Underground Water Pipelines or gas lines in/affected by the ROW	2	2	2	1

Component	Evaluation Factor	Evaluation Criteria	Alternative Route A (North)	Alternative Route A (North/South)	Alternative Route A/B Hybrid	Alternative Route C
	Community	Microwave/TV/ Cell Phone Towers or other communications in/Affected by the ROW	0	0	0	0
		Wind Farms Affected by the ROW	0	0	0	0
		Community Interest Zones or Impacts on Future Reserve Lands	0	0	0	0
		Recreation areas affected by the ROW	0	0	0	1 (Local recreation area)
		Other Community Infrastructure Affected by the ROW	1 (Aggregate storage area)	1 (Aggregate storage area)	1 (Aggregate storage area)	0
	EMF	Radio/TV/GPS interference	0	0	0	0
Heritage		Historic, Archaeological and Traditional Use Sites in the ROW	0	0	0	0

Potential issues related to the Preferred Route are considered to be manageable. Mitigation options are provided for known potential issues, notably the following: Proximity to a residence which is located immediately south of the Assiniboine River; following between the north side of D12P and on the south side of the TransCanada Highway; encroachment on large equipment shed at the Sunnyside Colony.

The general practices pertinent to preferred route include:

- Attain or exceed all CSA Standards for overhead systems (CAN/CSA-C22.3 NO. 1-10);
- Obtain all permits and authorizations prior to construction;
- Use of self-supporting lattice steel structures;
- Match structures with those of D12P transmission line, where possible;
- Maximize the use of vacant ROW width along the north side of 12P;
- Maintain a constant distance between D83P and D12P;
- Obtain a consistent additional ROW width of no more than 15 m, where possible; and
- Avoid the use of guyed anchors.

7.4.5 Potential Issues and Mitigation Options

Three potential issues were identified for the Preferred Route. These issues were not considered to be potentially critical constraints as several mitigation options were identified for each issue.

7.4.5.1 Assiniboine River Crossing

A residence is located on the south side of the Assiniboine River immediately west of the existing D12P transmission line ROW. The estimated distance from the edge of the existing D12P ROW is 35 m. A parallel alignment for the Preferred Route would place the new D83P ROW edge at approximately 20 m from the residence.

The potential mitigation options are:

1. Acquire the necessary 15 m of ROW width from the property owner in order to achieve the required D83P ROW width. Related mitigation measures would include selective removal of hazard trees and potential danger trees as well as the provision of vegetative screening between the ROW and the residence.
2. Converge the D83P and D12P transmission lines north of the Assiniboine River crossing onto a new set of double circuit structures and diverge the lines on the south side. A double circuit design for the crossing and approaches would reduce the ROW width requirements and permit both transmission lines to be contained within the existing ROW width.
3. Acquire the residence and property.

The mitigation option selected was to replace the existing D12P approach and crossing structures with double circuit structures. Although an outage will be required on D12P, this can be accommodated within the 230-kV transmission grid. In addition to avoiding potential effects to the residence and property, this option has further benefit in that it avoids even an incremental extension of the ROW within the riparian zone and the requirement to clear river bottom forest habitat.

7.4.5.2 TransCanada Highway

The D12P transmission line follows parallel to the south side of the TransCanada Highway for about 4.3 km. There is insufficient distance between the existing D12P ROW north boundary and the south boundary of the TransCanada Highway allowance to accommodate the additional 15 m ROW required for the Preferred Route. ROW width requirements for transmission lines are designed to include conductor blow-out.

The potential mitigation options are:

1. Secure authorization from Manitoba Infrastructure and Transportation for joint use of a portion of the TransCanada Highway allowance for the D83P ROW. This would accommodate possible conductor blow-out.
2. Realign the D83P transmission line ROW along the south side of D12P.
3. Relocate the D83P transmission line ROW on the north side of the TransCanada Highway. This would be subject to federal approval for following adjacent to the TransCanada Trail.

The mitigation option selected was to secure authorization from Manitoba Infrastructure and Transportation for joint use of a portion of the Trans-Canada Highway allowance for the Preferred Route ROW. Conductor blow-out, even under extreme wind events, would not cross-over the TransCanada Highway therefore risks to traffic were considered minimal.

7.4.5.3 Sunnyside Colony

The Preferred Route ROW encroaches on a large equipment shed and possibly other small granaries/infrastructure at the Sunnyside Colony. The edge of the equipment shed is within the proposed new ROW boundary required for the Preferred Route. Although the shed and other infrastructure would not directly affect the transmission line, the proximity of the shed to the conductor causes a potential hazard due to possible induction effects. Manitoba Hydro will ground the shed to ensure it does not maintain a charge, thereby eliminating risk to shed users.

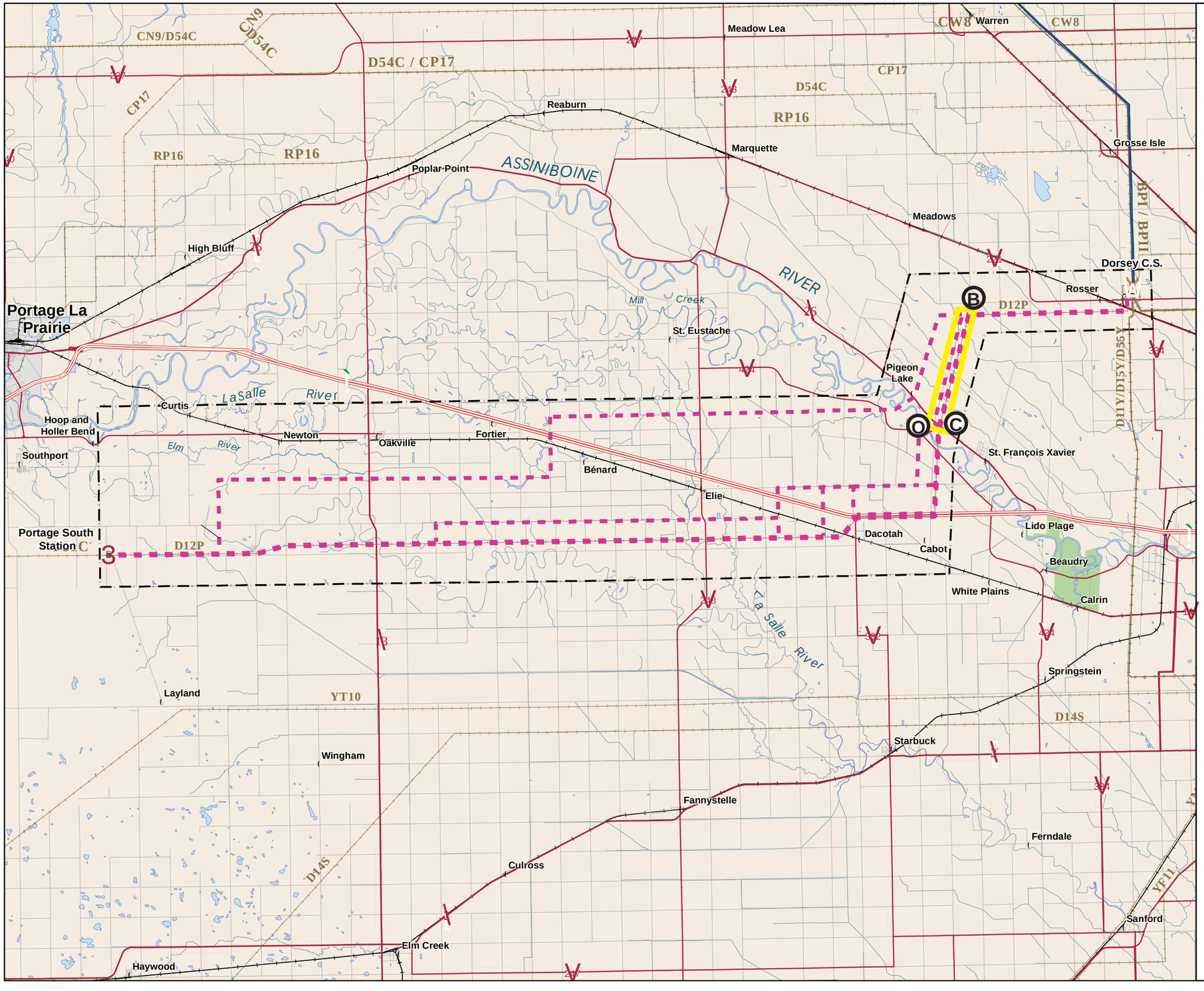
7.4.6 Public Engagement Program

Manitoba Hydro developed a two-round PEP to guide the public engagement process for the Project (Chapter 6).

7.4.7 Final Preferred Route

The Project Preferred Route will originate at the south side of the Dorsey Converter Station 230-kV switchyard and then follow an independent alignment for 0.7 km before connecting to the north side of the D12P ROW (Map 7-6). Within this segment, the Project will cross Provincial Highway 236, turn west in parallel to the highway, and then south to parallel a rail spur servicing the Dorsey Converter Station. The Project will then cross the rail spur, the main rail line, and Provincial Highway 221 (Rosser Road) to connect to the D12P ROW.

The Project will then turn west and parallel D12P along the north side for approximately 8.8 km to the north edge of the Assiniboine River lot land survey pattern. While continuing to parallel the north side of the D12P ROW, the route will turn southwest into the river lot land survey pattern for approximately 7.4 km, cross Provincial Highway 26 and then the Assiniboine River. Between the highway crossing and the river crossing the Project and D12P will converge into a double-circuit transmission line (see Section 3.2.1.1). Once across the Assiniboine River, the Project and D12P will diverge into separate single-circuit transmission lines with the Project continuing to parallel D12P to the north.



D83P Transmission Project

Project Infrastructure

- Alternative Routes
- Study Area

Infrastructure

- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase

- Community
- Provincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
- National/Provincial Park

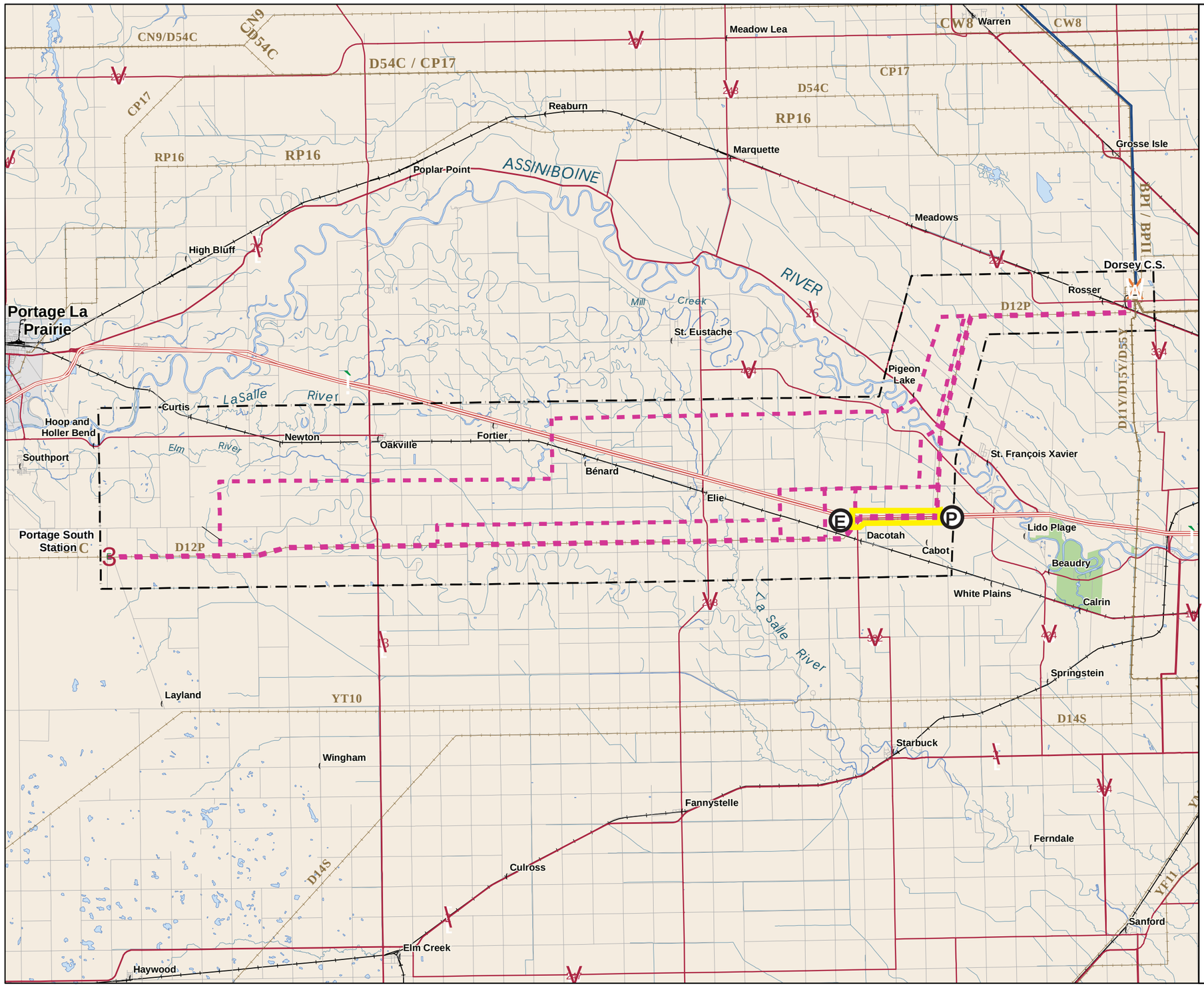
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Phase 2
General Location of Alternative Route Segments to be Compared

Map 7-1



Manitoba Hydro

D83P Transmission Project

Project Infrastructure

- Alternative Routes
- Study Area

Infrastructure

- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase

- Community
- Provincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
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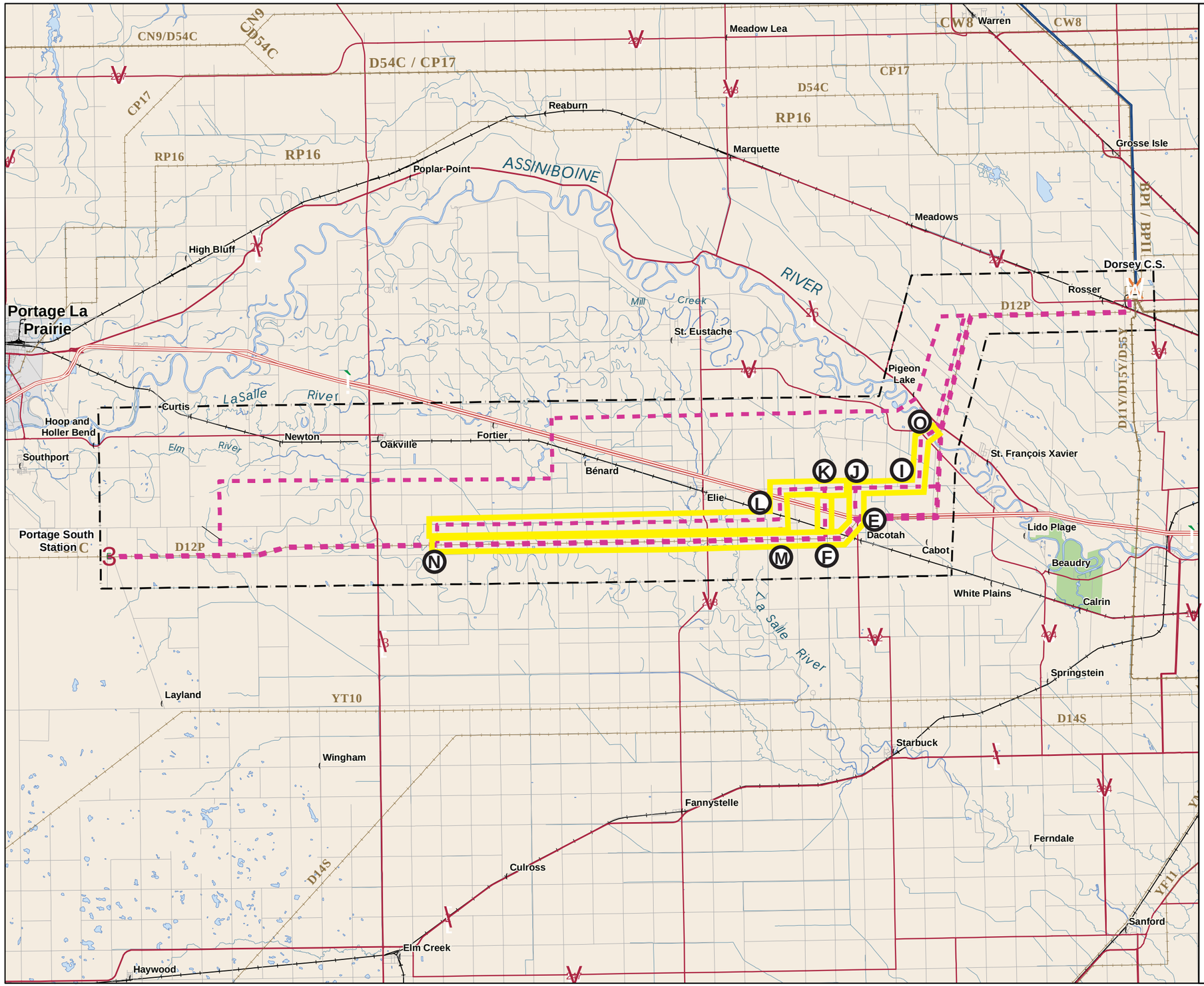
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Phase 2
General Location of Alternative Route Segments to be Compared

Map 7-2



Manitoba Hydro

D83P Transmission Project

Project Infrastructure

- Alternative Routes
- Study Area

Infrastructure

- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase

- Community
- Provincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
- National/Provincial Park

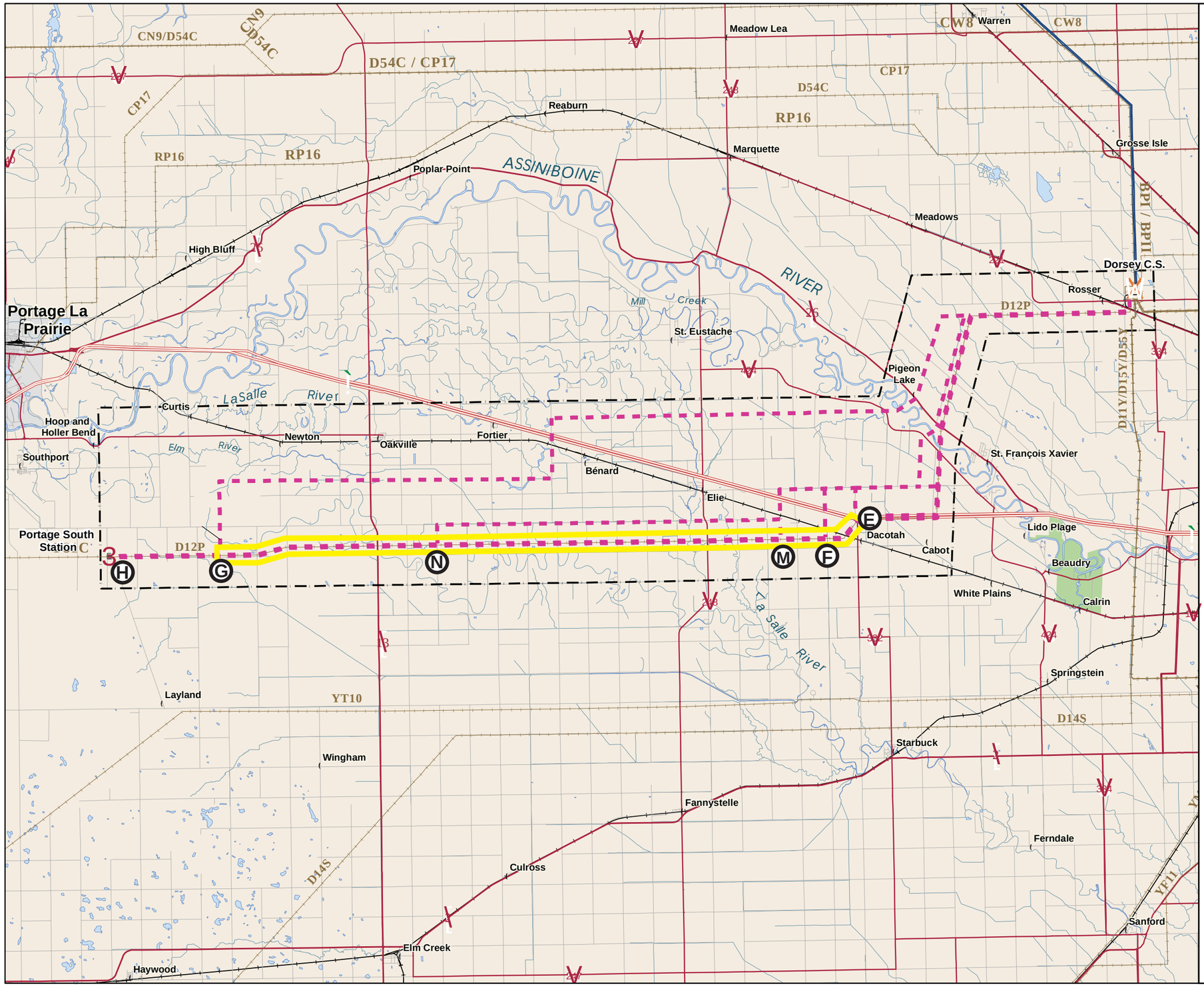
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Phase 2
General Location of Alternative Route Segments to be Compared

Map 7-3



Manitoba Hydro

D83P Transmission Project

Project Infrastructure
- Alternative Routes
- Study Area

Infrastructure
- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase
- Community
- Provincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
- National/Provincial Park

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Phase 2
General Location of Alternative Route Segments to be Compared

Map 7-4

Manitoba Hydro

D83P Transmission Project

Project Infrastructure

- Alternative Route A (North)
- Alternative Route A (South)
- Alternative Route B
- Alternative Route C
- Study Area

Infrastructure

- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase

- Community
- Pronvincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
- National/Provincial Park

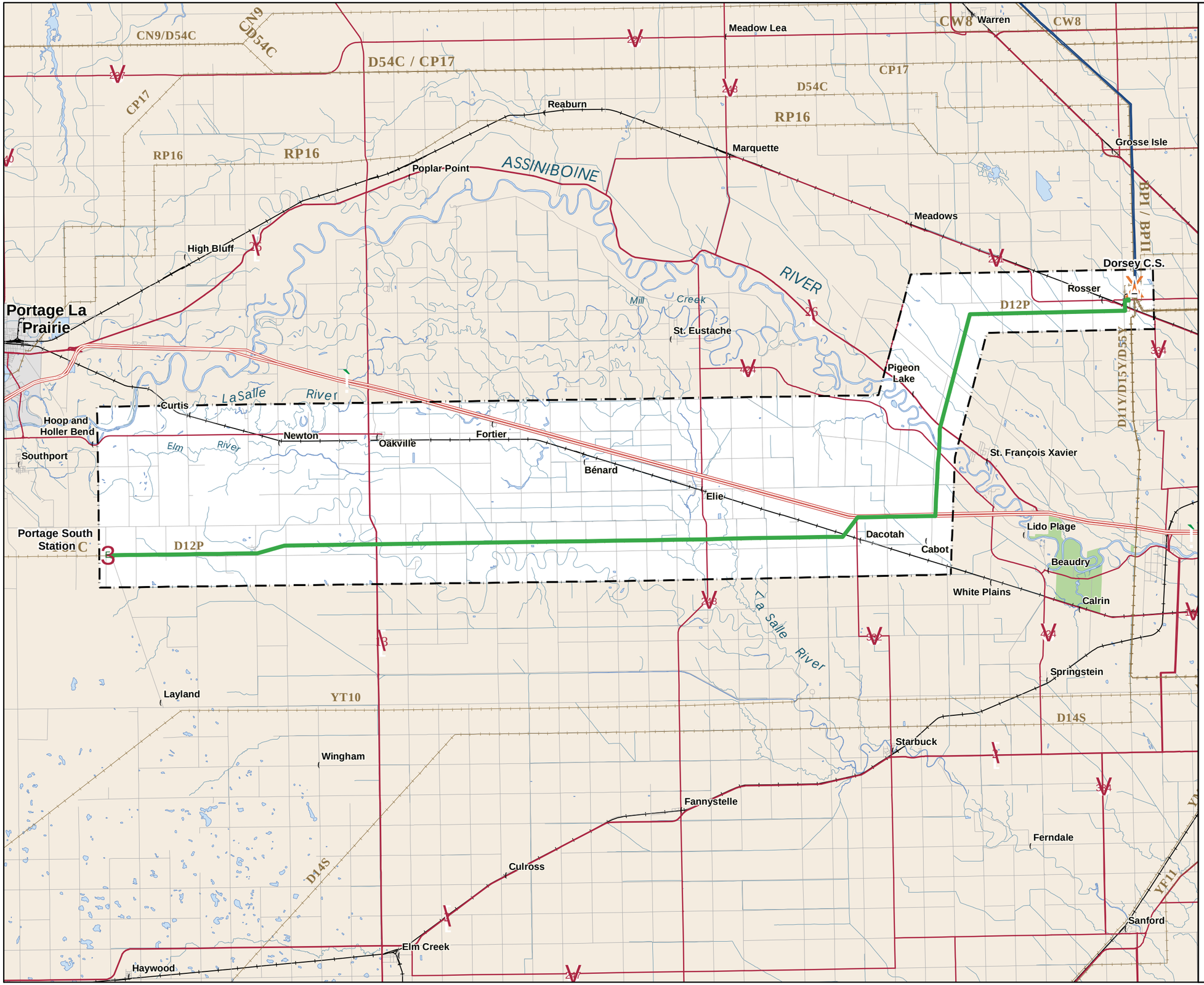
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Phase 2 Refined Alternative Routes

Map 7-5



Manitoba Hydro

D83P Transmission Project

Project Infrastructure

- Preferred Route
- Study Area

Infrastructure

- Converter Station
- Portage South Transformer Station
- Bipole I and II
- Transmission Line

Landbase

- Community
- Pronvincial HWY / Road
- Railway
- Watercourse
- Waterbody
- City / Town
- First Nation
- National/Provincial Park

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 24, 2012

0 2.5 5 Kilometres
0 2.5 5 Miles

1:200,000

Preferred Route

Map 7-6

8.0 EFFECTS ASSESSMENT AND MITIGATION

8.1 OVERVIEW

As part of the Environmental Assessment process, environmental effects of the Project are to be outlined and assessed. Mitigation measures are proposed to avoid or remedy adverse effects. In accordance with these expectations, this chapter addresses the following:

- Biophysical Effects of the Project;
- Socio-economic Effects of the Project;
- Accidents and Malfunctions;
- Effects of the Environment on the Project;
- Cumulative Effects; and
- Sustainable Development.

Environment effects and mitigation measures are identified and assessed for the Project components (transmission line, Dorsey Station 230-kV Switchyard, and Portage South Station) as described in Chapter 3. The assessment approach and sources of information include those described in Chapter 4 as well as the public, local First Nations and the MMF, and stakeholder engagement activities carried out in accordance with the Project PEP described in Chapter 6. Avoidance of adverse environmental and socio-economic effects was important in determining the preferred sites and routing; therefore, reducing potential residual effects of the Project.

Development of avoidance mitigation was important during the design of the Project and included attention to scheduling construction activities to avoid sensitive and important time periods for some species (e.g., bird nesting and impacts to aquatic habitats). Project design also balanced technical feasibility and associated cost.

As identified in Chapter 4 and detailed further here, the environmental effects assessment for the Project is comprised of biophysical and socio-economic environmental components. Specific components that could potentially be affected by the Project are identified as VECs to facilitate assessment of the interactions between the Project components and specific valued components of the environment.

Potential positive and negative residual effects of the Project (i.e., effects on VECs remaining after implementation of mitigation plans) were identified in terms of the assessment and the regulatory significance of these residual effects was evaluated. Predicted positive and negative residual environmental effects were evaluated using the framework and approach described in Chapter 4.

Assessment of cumulative effects is a critical component of sound environmental assessment practice. All mitigation measures will be consolidated and organized into an EnvPP, developed under the EPP described in Chapter 9.

8.2 TRANSMISSION LINE

The Project includes a new 230-kV AC transmission line and station modifications at the Dorsey Converter Station and the Portage South Station. The 66 km transmission line will originate from the 230-kV switchyard of the Dorsey Converter Station, located approximately 8 km northwest of Provincial Trunk Highway No.101, at the northwest side of Winnipeg. The line will terminate at the Portage South Station, located about 12.5 km southeast of Portage La Prairie. The Project will run parallel to the existing D12P 230-kV transmission line and will be located in part on the unused portion of the existing D12P ROW. As this Project is located in an agricultural setting, the extension of the existing ROW will be primarily located on private property.

8.2.1 Potential Effects

8.2.1.1 Biophysical Effects

Terrain and Soils

Potential biophysical effects to terrain and soil may come as a result of construction and operation (e.g., route, tower, or line maintenance) of the transmission line:

- Soil contamination is a potential effect during construction and operation maintenance activities due to spills from construction and maintenance vehicles (e.g., fuel, oil, or hydraulic fluid). Soil contamination can also result from the persistence of herbicide residues, subsequent to the application of vegetation management strategies. The primary effect of both forms of contamination is a reduction in soil productivity. Adherence to Manitoba Water Quality Standards Objectives and Guidelines (MWQSOG 2011) and CCME Soil Quality Guidelines (CCME 2011) and standard best practices, when coupled with Manitoba Hydro's current herbicide application policies, will result in minimal soil contamination.
- Soil compaction in locations of vehicle traffic, material handling and storage, and construction can result in increased run-off, decreased vegetative growth and reduced crop yields. Soil compaction will be minimized by first minimizing the spatial area of the activity. Where activity is required, additional mitigation strategies include reduction in traffic flow, targeting frozen or dry ground conditions, the use of temporary ground cover or matting, and tillage of affected agricultural land.
- Soil erosion and mass wasting can occur in situations where soil is exposed to water or wind for extended periods of time or where steep and unstable slopes have been created or traversed. Erosion and mass wasting can lead to sedimentation of waterbodies, a reduction in soil productivity and vegetative growth, and (in extreme

cases) a potential risk of human injury. The risk of soil erosion will be reduced by reducing water-soil contact and period of bare soil exposure. The risk of mass wasting will be reduced by limiting the amount of construction on or the creation of steep slopes, and by the avoidance of concentration water in areas of high relief.

Air Quality

Potential effects to air quality have been identified during the construction phase and operation/maintenance phases of the Project:

- Fugitive dust generated by movement of vehicles during the construction and maintenance activities (e.g., access construction, materials and equipment hauling) can affect local air quality. Fugitive dust is anticipated as the result of increased vehicle traffic over dirt roads and yards during dry conditions. Using effective dust suppression programs and appropriate construction windows (e.g., winter construction) will reduce the effect of fugitive dust emissions.
- Higher vehicle emissions (e.g., engine exhaust) during the construction and maintenance activities (e.g., access construction, materials and equipment hauling) can affect local air quality. Emissions from internal combustion engines will be minimized by ensuring proper vehicle maintenance, restricting unnecessary idling and using low-sulphur fuels.

Climate

Potential effects to climate have been identified during the construction phase and operation/maintenance phases of the Project:

- Greenhouse gas (GHG) emissions from vehicles during the construction and maintenance activities (e.g., access construction, materials and equipment hauling) can affect local air quality. Emissions from internal combustion engines can be minimized by ensuring proper vehicle maintenance, restricting unnecessary idling and using low-sulphur fuels. An additional source of GHG is sulphur hexafluoride, a compound frequently used as an insulating medium in high voltage electrical equipment (e.g., switch gears, circuit breakers). To reduce the potential for accidental release during station upgrades, Manitoba Hydro will employ proper handling and recycling procedures.
- The removal of vegetation biomass within the ROW will reduce regional carbon stocks and buffering capacity. Mitigation measures to limit this potential effect will include retention of buffers of low growth vegetation in riparian areas, and the salvage and reuse of any cleared merchantable timber.

Water Quality and Quantity

Surface Water

Potential effects to water during construction and operations have been identified.

- Soil erosion near or along watercourses can lead to sedimentation. Increased water sedimentation can have cascading effects on primary producers, invertebrates, and fish. The potential for sedimentation can be reduced by designing and installing all watercourse crossings in accordance with "Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat" (DFO and MNR 1996) and minimizing disturbance to riparian vegetation in accordance with Operational Statements (e.g., DFO 2007).
- Surface water contamination can arise from several sources including deleterious substance spills, herbicides used for vegetation control during operation, and accidental release of concrete or concrete wash water during foundation installation. Adherence to Manitoba Water Quality Standards Objectives and Guidelines (MWQSOG 2011), CCME Quality Guidelines (CCME 2011) and standard best practices (e.g., not releasing concrete wash water until it has reached a neutral pH), when coupled with Manitoba Hydro's current herbicide application policies, should result in minimal surface water contamination.

Groundwater

Potential effects to groundwater can be broken down into two key areas: aquifer productivity and groundwater quality. Aquifer productivity refers to an aquifer's ability to yield water. Normal operation of the Project (including the transmission line and two stations) should not result in effects to aquifer productivity due to a lack of effect pathways and interactions (e.g., water supply at stations connected to civic systems).

In contrast, there are several potential project effects on groundwater quality:

- Groundwater contamination could result from deleterious substance spills, and herbicides used for vegetation control during operation. Adherence to CCME Quality Guidelines (CCME 2011) and standard best practices, when coupled with Manitoba Hydro's current herbicide application policies, will result in minimal groundwater contamination.
- In areas with artesian wells or springs, geotechnical drilling and foundation installation can result in a direct groundwater discharge to the surface and can create the potential for surface and ground water interconnection. The following strategies will minimize the potential for unintended groundwater effects:
  - Monitoring of water levels during drilling and foundation installation;
  - Employment of qualified drillers with experience in artesian aquifers;

- Development of emergency response plans for sealing auger holes; and
- Follow-up inspections of installed foundations to assess moisture levels.

Wildlife Species at Risk

Four species at risk potentially occur within the Study Area (Section 5.3.2): Short-eared Owl (COSEWIC-Special Concern: not detected but range overlaps with Study Area), Northern Leopard Frog (SARA-Special concern: positively identified in the Study Area, limited habitat along final preferred route), Northern Myotis (COSEWIC – Recommended Endangered: range overlaps with Study Area), and Little Brown Myotis (COSEWIC – Recommended Endangered: range overlaps with Study Area).

Potential effects of the Project on the Short-eared Owl include:

- Mortality or injury resulting from bird-wire collisions and electrocutions. Wire strikes are one of the most common, non-hunting, sources of bird mortality and are a known source of mortality for short-eared owls (COSEWIC 2008). Electrocutions are more common on smaller distribution lines than they are at large transmission facilities. Minimizing the ROW footprint within Short-eared Owl habitat through route selection will minimize the potential for bird-wire collisions.
- Mortality or injury resulting from collisions with construction and maintenance vehicles will be reduced by minimizing the ROW footprint within Short-eared Owl habitat, by posting adequate speed limits, and by ensuring that all Project vehicles stay on established roads and ROWs.
- Many bird species, including owls, can be sensitive to sensory disturbance associated with human activity (e.g., construction activity, traffic). Responses to sensory disturbance range from behaviour alteration to habitat abandonment. The potential effects of sensory disturbance on Short-eared Owls will be reduced by minimizing the ROW routing within potential habitat and, where practical, conducting construction activities in or near potential habitat during the non-breeding season.

Potential effects of the Project on the Northern Leopard Frog include:

- Increased human activity and vehicular traffic within the ROW (during construction and operations) increases the probability of direct Northern Leopard Frog mortality and injury in areas close to potential habitat. The potential for direct mortality will be reduced by minimizing the extent to which wetlands are disturbed by construction activity (e.g., ROW route selection), limiting construction activity in the vicinity of frog habitat to winter months, and ensuring all Project vehicles stay on established roads and ROWs.
- Direct habitat loss can result if wetland habitats are altered by construction activities (e.g., filling wetlands to facilitate road construction). The limited amount of wetland

habitat along the final preferred route, coupled with the ability to span most wetland areas without altering Project design will minimize the potential direct loss of Northern Leopard Frog habitat.
- All amphibians can be negatively affected by alteration of water quality resulting from, for example, contamination and erosion. Any mitigation measure implemented to maintain water quality (see above) will benefit amphibian populations.

Potential effects of the Project on bats include:

- Direct mortality resulting from tree clearing during seasons when bats are active in the Study Area. Restriction of all tree clearing activities to the winter will minimize the potential for direct mortality of tree-roosting bats.
- Direct habitat loss resulting from forest clearing will be minimized by routing the ROW through already disturbed landscapes.
- All bats can be negatively affected by alteration of water quality and cascading effects on insect (i.e., prey) populations. Any mitigation measure implemented to maintain water quality (see above) will benefit insect and, therefore, bat populations.

Wildlife Habitat

Potential effects to wildlife habitats have been identified for three habitat types within the Study Area: native prairie/tame grassland, wetlands and forests. Potential effects to all three habitat types include:

- Direct habitat loss for habitat specialists (grassland: Bobolink, Sprague's Pipit; wetlands: Yellow Rail; forest: Red-headed Woodpecker, Little Brown Myotis and Northern Myotis) will be minimized by routing the ROW through already disturbed landscapes. In addition, restriction of clearing activities to the winter (where practical) will minimize the potential for direct mortality of wildlife (e.g., tree-roosting bats).
- Functional habitat loss for species resulting from avoidance of anthropogenic structures and activity (i.e., sensory disturbance) may result in wildlife avoidance of the immediate vicinity of the disturbance. The degree of avoidance will depend on the species and the frequency/intensity of disturbance. Routing the ROW through already disturbed landscapes and ensuring all Project vehicles stay on established roads and ROWs will minimize the potential effects of sensory disturbance.
- The clearing of vegetation for construction purposes and vehicle traffic associated with construction and maintenance can facilitate the introduction of non-native and invasive species into forested and grassland ecosystems. Mitigation to prevent the introduction of invasive species will include reduction of vehicles allowed access to construction area, cleaning of vehicles prior to entry into these areas, and the

acquisition of construction and ground cover materials (e.g., gravel) from clean, weed-free sources.
- Increased edge effects (e.g., edge predators, avian brood parasites) for currently unaffected habitat patches will be minimized by routing the ROW through already disturbed landscapes.

In addition, forested habitats can be affected by alterations of microclimate at ROW edges. The two main microclimate alterations will be an increase in solar radiation and a decrease in moisture; both of these changes result in the alteration of the floristic community (and the faunal community that depends on it), can have direct impacts on microclimate-sensitive wildlife (e.g., salamanders, snakes) and facilitate the establishment of non-native and invasive species. General mitigation measures to limit these effects include:

- Reducing the amount of forest habitat to be cleared; and
- Minimizing the extent to which grubbing is used within the ROW to minimize effects on roots of trees in adjacent forest patches.

Fish Species at Risk

Four species at risk have been identified within the Study Area (Section 5.2.3.4): Chestnut Lamprey, Lake Sturgeon, Bigmouth Buffalo, and Silver Chub. Potential effects of the Project on these species include:

- Direct disturbance of habitat in the Assiniboine and La Salle Rivers during construction and operations; and
- Alteration of water quality resulting from soil erosion, mass wasting and contamination.

The potential for both effects will be reduced by designing and installing all watercourse crossings in accordance with "Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat" (DFO and MNR 1996) and adherence to CCME Quality Guidelines (CCME 2011).

Fish Habitat

Both potential direct and indirect effects to fish habitat have been identified. Direct effects to fish and fish habitat in waterbodies and watercourses (e.g., river, creek, wetlands, and drainage ditch) include:

- disruption of spawning, rearing, feeding, overwintering, and fish passage;
- temporary or permanent habitat loss at crossings installed for construction and operation; and
- reduction in water quality due to erosion and sedimentation at watercourse crossings.

Indirect effects to fish habitat include:

- disruption or destruction of riparian zones along LaSalle and Assiniboine rivers; and
- disruption of riparian habitat along watercourses and in wetlands that feed the two major rivers.

Adherence to Manitoba Water Quality Standards Objectives and Guidelines (MWQSOG 2011), CCME Quality Guidelines (CCME 2011) and standard best practices (e.g., not releasing concrete wash water until it has reached a neutral pH), when coupled with Manitoba Hydro's current herbicide application policies, will result in minimal effects to water quality The potential for sedimentation will be reduced by minimizing disturbance to riparian vegetation in accordance with Operational Statements (e.g., DFO 2007). If required, ice crossings will be designed and installed in accordance with Operational Statements (e.g., DFO 2007).

Vegetation

Most of the Project is located in cultivated areas; therefore, potential effects to natural vegetation are limited. However, Project construction and operational activities may have several potential effects on vegetation:

- The clearing of vegetation for construction purposes and vehicle traffic associated with construction and maintenance can facilitate the introduction of non-native and invasive species into forested and grassland ecosystems. Mitigation to prevent the introduction of invasive species will include reduction of vehicles allowed access to construction area, cleaning of vehicles prior to working on the Project, and the acquisition of construction and ground cover materials (e.g., gravel) from clean, weed-free sources.
- The construction of linear features on the landscape can result in the fragmentation of habitat patches into smaller patches. The Project will follow an existing ROW, thereby minimizing the potential for fragmentation effects.
- In addition to reducing the vigour and occurrence of weed species, herbicides can have effects on non-target plant species. General mitigation measures to limit non-target effects of herbicides include:
  - Incorporation of non-herbicide based control measures (e.g., hand cutting) into the vegetation management plan; and
  - Monitoring for species of concern and limiting herbicide use in their vicinity.
- The creation of new habitat edges during vegetation clearing will alter the microclimate of both the ROW and the neighbouring vegetation types and can increase the potential for windfall events. The two main microclimate alterations will be an increase in solar radiation and a decrease in moisture; both of these changes result in the alteration of the floristic community and facilitate the establishment of

non-native and invasive species. General mitigation measures to limit these effects include:

- Reducing the amount of forest habitat to be cleared; and
- Minimizing the extent to which grubbing is used within the ROW to minimize effects on roots of trees in adjacent forest patches.

8.2.1.2 Socio-economic Effects

The assessment of socio-economic effects covers a range of potential effects including those related to land use, agriculture, resource use, economy, services, personal, family and community life and heritage resources.

Land Use

Issues and concerns related to land use vary depending on the segment of the Project under consideration (e.g., land used for agricultural purposes; land developed for rural residential purposes). Based on prior experience with other transmission project environmental assessments and what was heard during the Project PEP, the following issues and concerns were considered under the land use component of this assessment:

- Construction and operation of the Project can potentially affect property and residential development. Specific concerns may relate to the proximity of the Project to residences and/or shelterbelts, damage to property, decrease in property values and a desire to be compensated for same. To offset these concerns, the Project will be located as far from residences as feasible and will follow the existing ROW. In the event that property damage occurs (e.g., from heavy equipment), the landowner will be compensated;
- Construction can potentially affect private forestlands in the Project footprint. Specifically, there could be displacement of shelterbelts; property damage; and resulting decrease in property values. The Project will be placed along the existing ROW, thereby reducing the need for removal of forestlands;
- Construction and operations could potentially affect Aboriginal lands, specifically intrusion into Community Interest Zones. This could, in turn, affect a First Nation's ability to obtain new Reserve lands; and
- The Project could potentially affect Designated Protected Areas, including intrusion into these areas; associated loss of lands that could be potentially be protected in the future; and disturbance to, or loss of ecological integrity and enduring features. Project routing avoided concerns related to Protected Areas in the Study Area.

Of these issues and concerns, some create tangible Project effects while others are more perceptual in nature. Through the site selection process, certain highly sensitive land uses and associated effects on these lands are avoided, notably First Nation Reserve lands, communities and rural residences.

Agriculture

Concerns with respect to potential impacts of the Project on agricultural practices were raised during the PEP. These included:

- Removing agricultural land from production; potential effects will be offset by Project routing;
- Increased costs and/or inconvenience related to farming activities; potential effects will be offset during tower spotting (e.g., by placing towers parallel to those of the existing transmission line);
- Proximity of project to farm structures or shelterbelts; potential effects will be offset by Project routing, placing the line as far away from these features as feasible. If the line is still in relatively close proximity to a farm structure than it may be grounded for safety purposes;
- Damage to property – Manitoba Hydro will minimize the chances of property damage by carrying out the work during winter months (when the ground is frozen). If damage to property occurs landowners will be compensated;
- Control of weeds – Manitoba Hydro has standard policies in place related to ROW maintenance that will be adhered to;
- Disruption of pivot or other irrigation systems; potential effects will be offset through the routing process;
- Health and safety of livestock; there are no known adverse effects on the health and safety of livestock.
- Complications related to aerial spraying; potential effects can be offset through the routing process. By placing the line next to an existing transmission line and having the towers run parallel, potential effects on aerial spraying are minimized; and
- Desire to be compensated for direct damage and loss of productivity. Landowners will be compensated for direct damage resulting from project construction and operations and for loss of productivity for portions of cultivated land in the ROW that are not currently owned by Manitoba Hydro.

Infrastructure

The range of issues and concerns related to infrastructure would depend largely on the type of infrastructure over which the Project would cross (e.g., railways, roads, pipelines). Based on previous experience with environmental assessments for similar projects and what was heard during the Project PEP, issues and concerns may include:

- Increased traffic on roads. Mitigation will include traffic signage, prior notification to the RMs when large pieces of equipment will be moved and the use of safe travel routes whenever possible;

- Disruption or damage to culverts and drains. Potential damage to culverts and drains will be minimized by undertaking the work during the winter when the ground is frozen. Compensation will be provided if damage occurs;
- Disruption or damage to communications infrastructure, railway lines and pipelines. Potential effects will be mitigated through communication and coordination with appropriate parties regarding timing of construction activities as well as operations maintenance activities;
- Induction effects on communications facilities, railway lines and pipelines; potential effects can be offset by Project routing, placing the line as far away from these features as feasible; and
- Disruption of wind turbines; potential effects can be offset by Project routing.

Economy

Based on previous experience with similar projects and what was heard during the Project PEP, issues and concerns related to resource use may include:

- Availability of, and access to, jobs and business opportunities; these opportunities might be enhanced through communication with relevant employment agencies and preference policies (e.g., hiring and contracting).
- Development of employment and business preferences for First Nations and Aboriginal people;
- Development of employment and business preferences for local communities; and
- Long-term benefits such as associated long-term community income stream.

Resource Use

Based on previous experience with similar projects and what was heard during the Project PEP, issues and concerns related to resource use may include:

- Forestry – including mechanical damage to trees and forest adjacent to the ROW; invasive species introduction; and forest resource utilization (e.g., availability of merchantable timber). Potential effects will be offset through the routing process.
- Recreation and tourism – including disruption of recreation and tourism activities, sites and facilities. Potential effects will be offset through the routing process.
- Domestic and commercial resource use by Aboriginal and non-Aboriginal people – including disruption to hunting, fishing, gathering of medicinal and other plants, berries and fuel wood; outfitting, mining and forestry.

Services

Based on previous experience with similar projects and what was heard during the Project PEP, issues and concerns related to services may include the following:

- Increased demands for community-based services such as emergency, health and social services – potential mitigation measures related to these services would be coordinated with appropriate service providers.
- Increased access to areas such as Designated Protected Areas, Areas of Aboriginal interest and Heritage Resources – measures to offset concerns related to these areas could be outlined in an access management plan or heritage resource management plan.

Personal, Family, and Community Life

Potential issues and concerns related to personal, family and community life can be wide-ranging. Based on previous experience with similar projects and what was heard during the Project PEP, these issues may include:

- Human health – including noise and vibration; effects of EMF on health (especially on pregnant women and child, newborns and young children); induction effects (e.g., metallic fencing located in close proximity to the Project). Potential health effects related to noise and vibration will be minimized by ensuring construction activities are undertaken during appropriate hours (i.e., not in the evening when nearby residents might be sleeping). There are no known effects of EMF on human health.
- Public safety – including increased traffic accidents due to Project-related traffic; and herbicide use related to maintenance of the ROW. Potential adverse effects related to health will be minimized through proper training of project workers, signage and designating safe travel routes. Potential adverse effects related to herbicide use will be mitigated by proper safety and training protocols.
- Aesthetics – within the context of property and residential development, Aboriginal lands, Designated Protected Areas, recreation, tourism and culture. Adverse effects on aesthetics will be offset through appropriate routing.

Heritage Resources

Potential effects to heritage resources such as archaeological sites have been identified as a result of the Project. The Study Area contains eight previously recorded archaeological site areas and 11 identified during 2011 surveys (Section 5.4.5). In addition, most of the water crossings have the potential to contain heritage sites. Of these 19 locations, only five (four previously known and one new) are in the vicinity of the final preferred route. However, none are located within the ROW of the final preferred route. Manitoba Hydro will employ standard stop-work mitigation strategies should a previously unknown site be discovered during construction.

Navigable Waters

Potential effects to navigation have been identified for the construction phase and operation/maintenance phases of the Project. In order to mitigate potential effects to navigation on the Assiniboine River, the stringing of the conductors will be conducted during the winter, outside of the navigation season. Once lifted to the towers and tensioned, the conductors will comply with the specifications outlined in CSA 22.3 *Overhead Systems* (2010) thereby ensuring no impingement on the navigation channel.

A watercourse assessment report will be submitted to Transport Canada – Navigable Waters Protection Program under a separate cover. The watercourse assessment was completed using the self-assessment guidance provided under the *Navigable Waters Protection Act* (NWPA) *Minor Works and Waters (NWPA) Order* and the draft *Minor Works and Waters (NWPA) Regulations*. The report will also include a completed NWPA Request for Work Approval form and all mandatory documentation.

8.2.2 Valued Environmental Components

Following the processed outlined in Section 4.2.2.2, numerous biophysical and socioeconomic components were evaluated as potential VECs (Section 8.2.1; Table 8-1). The final VEC list was defined by the multi-disciplinary project team undertaking the assessment based on:

- Identified regulatory requirements;
- Consultation with regulatory authorities;
- Information derived from published and unpublished date sources;
- Comments and issues identified by stakeholders during the PEP;
- Field surveys;
- Prior experience with other similar projects; and
- Professional judgment of Manitoba Hydro and other EA team members.

8.2.2.1 Biophysical

One potential VEC was identified for the biophysical component: short-eared owl (Table 8-2). Like all species of raptors, this species has the potential to interact with the Project through collisions with and, less frequently electrocution by transmission lines and conductors (COSEWIC 2008). Transmission line strikes typically occur while the owl is hunting and looking down at the ground; in addition, owls are also susceptible to line collisions during the breeding season when males conduct elaborate courtship flights while focused on females watching from the ground. Short-eared owls are a migratory species (northern Manitoba) and year-long resident (southern Manitoba) often found hunting in agricultural fields. The species was not detected in the study area during wildlife survey efforts but has the potential to occur during the breeding season (and possibly year-round during milder winters). The possible interaction between this species and the Project, combined with its conservation status (COSEWIC – Special Concern), warrants the species' designation as a VEC.

Table 8-1 Summary of potential effects of the Project on the biophysical and socioeconomic environment.

Component	Factor	Specific Factor	Potential Effect
Physical Environment	Terrain and Soils	Soils	Soil contamination due to spills of fuel, oil, or hydraulic fluid from construction vehicles
			Soil productivity - loss of agricultural capability in ROW, herbicide residue from vegetation control measures
			Soil erosion and mass wasting
	Air Quality	Air Quality	Fugitive dust generated by construction and maintenance activities
			Higher vehicle emissions
	Climate	Greenhouse gas emissions	Greenhouse gas emissions from construction and maintenance vehicles and equipment
			Loss of carbon sinks as a result of ROW clearing
	Water Quality and Quantity	Surface Water	Reduced surface water quality as a result of erosion and sedimentation from watercourse crossings and associated work areas
			Reduced surface water quality as result of deleterious substance spill and herbicide use for vegetation control
		Groundwater	Reduced groundwater quality as result of deleterious substance spill and herbicide use for vegetation control
			Potential for groundwater discharge during drilling and foundation installation
Biological Environment	Wildlife species at risk	Short-eared Owl	Collision with and electrocution by Project structures
			Collision with Project vehicles
			Disturbance by construction activities
			Direct habitat loss
		Northern Leopard Frog	Mortality during construction and operations
			Direct habitat loss
			Decreased water quality
		Northern Myotis, Little Brown Myotis	Mortality during construction
			Direct habitat loss
			Decreased water quality affecting insect prey base
	Wildlife habitat	Native prairie/tame grassland	Direct habitat loss for grassland species (e.g., Bobolink, Sprague's pipit)
			Functional habitat loss for grassland species resulting from avoidance of anthropogenic structures and activity.
			Introduction of invasive species through construction and maintenance activities
			Edge effects (e.g., edge predators, brood parasites)
		Wetlands	Direct habitat loss for wetland species (e.g., Yellow Rail)
			Functional habitat loss for wetland species resulting from avoidance of anthropogenic structures and activity
			Introduction of invasive species
			Edge effects (e.g., edge predators, brood parasites)
			Disruption of riparian habitat (and attendant loss of functionality) along water courses and in wetlands
		Forests	Direct habitat loss for forest-breeding species (e.g., Red-headed Woodpecker)

Component	Factor	Specific Factor	Potential Effect
			Functional habitat loss for forest-breeding species resulting from avoidance of anthropogenic structures and activity
			Introduction of invasive species through construction and maintenance activities
			Edge effects (e.g., edge predators, brood parasites)
			Alteration of microclimate along ROW edges
	Fish species at risk	Chestnut lamprey	Disturbance of habitat (Assiniboine River)
			Decreased water quality
		Lake sturgeon	Disturbance of habitat (stocked in Assiniboine River)
			Decreased water quality
		Bigmouth buffalo	Disturbance of habitat (Assiniboine and LaSalle Rivers)
			Decreased water quality
		Silver chub	Disturbance of habitat (Assiniboine and LaSalle Rivers)
			Decreased water quality
	Fish habitat	Direct habitat effects	Temporary or permanent habitat loss at crossings installed for construction and operation
			Reduction in water quality due to erosion and sedimentation at watercourse crossings
			Blockage or reduction in fish passage at watercourse crossings.
		Indirect habitat effects	Disruption or destruction of riparian habitat along watercourses and in wetlands
	Vegetation	Riparian forest (limited to LaSalle and Assiniboine Rivers)	Soil compaction, soil erosion, and horizon mixing through construction and maintenance activities
			Introduction of invasive species
			Fragmentation of forest patches
			Herbicide effects on non-target species
			Alteration of microclimate along ROW edges
		Grassland-hayfield	Soil compaction, soil erosion, and horizon mixing through construction and maintenance activities
			Introduction of invasive species
			Fragmentation of grassland-hayfield patches
			Herbicide effects on non-target species
			Alteration of microclimate along ROW edges
Socio-economic	Land Use	Property and residential development	Proximity of residences and/or shelterbelts
			Property damage
			Decrease in property values
			Desire to be compensated for property damage and decrease in property value
		Private forestlands	Displacement of shelterbelts
			Property damage
			Decrease in property values
		Aboriginal Lands	Intrusion into Community Interested Zones and associated effects on ability to obtain new Reserve lands

Component	Factor	Specific Factor	Potential Effect
			Interest in securing job/business opportunities and income steam in exchange for traversing traditional lands
		Designated Protected Areas (DPA)	Intrusion into DPAs
			Loss of lands that could potentially be protected in the future
			Disturbance/loss of ecological integrity and enduring features.
			Disturbance/loss of lands to be possibly protected in the future
	Agriculture	Agricultural practices	Removal of agricultural lands from production
			Inconvenience and increased costs of farming
			Proximity of farm buildings and/or farm shelterbelts
			Property damage (e.g., farm machinery, fences)
			Weed control around and under towers resulting in herbicide drift to nearby fields
			Health and safety concerns regarding livestock
			Restricted aerial spraying
			Interference with irrigation systems
			Desire to be compensated for direct damage and loss of productivity
	Infrastructure	Traffic and transportation	Increased traffic on roads.
		Culverts and drains	Disruption or damage to culverts and drains during construction.
		Induction effects	Disruption or damage to communication facilities, railway lines and pipelines.
		Underground communication facilities and pipelines	Disruption of services
		Wind energy facilities	Location of line will potentially limit the areas suitable for wind energy development
	Economy	Economic Opportunities (jobs, business, training, enduring benefits)	Availability of and access to job and business opportunities
			Preference for Aboriginal peoples for jobs and business opportunities
			Local community preference for job and business opportunities
			Creation of long-term enduring benefits (e.g., income stream)
	Resource Use	Forestry	Mechanical damage to trees and forest stands adjacent to ROW
			Invasive species introduction
		Recreation and Tourism	Disruption of recreational and tourism activities
			Intrusion into recreational and tourism sites
		Domestic Resource Use	Disruption to hunting activities
			Disruption to fishing activities
			Disruption to gathering of medicinal and other plants (e.g., berries)
			Disruption of fuel wood gathering
			Disruption to outfitting, mining and forestry activities
	Services	Community Services	Increased demands on community services (emergency, health, social)
		Increased access	Increased access to protected areas, Aboriginal interests and Heritage Resources
	Personal, Family and	Human Health	Increases in audible noise and vibration

Component	Factor	Specific Factor	Potential Effect
	Community Life		Potential effects of EMF on health (especially pregnant women and child, newborns and young children.
			Induction effects – metallic fencing located in close proximity to the Project
			Increased herbicide use
		Public Safety	Increased traffic creates potential for increased accidents
			Increased herbicide use
		Aesthetics	Aesthetic changes – an issue with Property & Residential Development, Aboriginal Lands, Designated Protected Areas; PAIs, Recreation & Tourism and Culture
	Heritage Resources	Heritage Resources	Damage/disturbance to known/unknown heritage and cultural resources
	Navigable Waters	Navigation along Assiniboine River	Impingement on navigation channel

Table 8-2 Biophysical Valued Environmental Components.

Component	Specific Factor
Biological	Short-eared Owl's potential to interact with the Project through collisions with construction vehicles, collisions with transmission lines and, less likely, electrocution by conductors.

8.2.2.2 Socio-Economic

Several socio-economic VECs emerged from this screening process (Table 8-3) and will be examined in detail in the effects assessment (Section 8.2.3). No heritage VECs have been identified within the ROW of the final preferred route.

Table 8-3 Socio-economic Valued Environmental Components

Component	Specific Factor
Land Use	Property and residential development Aboriginal lands
Agriculture	Agricultural productivity
Economy	Employment and business opportunities
Infrastructure	Infrastructure Recreation
Personal, Family and Community Life	Human health Public safety Aesthetics

8.2.3 Potential Environmental Effects to VECs and Mitigation

This section provides an assessment of Project effects of the preferred route on the biophysical and socio-economic VECs as listed in Section 8.2.2. A description of these effects is provided, followed by detailed tables outlining proposed mitigation, monitoring and follow-up measures. Residual effects following mitigation are noted where appropriate and significance criteria are presented. A description of these criteria is provided in Sections 4.2.2.3 (Tables 4-1 to 4-2) and 8.2.2. Briefly, significance assessment involves the evaluation of each effect attribute against a three-level significance ranking scale:

- Level I - a negligible or limited potential to contribute to an overall significant environmental effect;
- Level II – a moderate potential to contribute to an overall significant environmental effect; and

- Level III - a high potential to contribute to an overall significant environmental effect.

An effect is defined as significant for a given VEC if it meets both of the following criteria:

- A Level II or III rating for ecological and/or socio-economic context; and
- A Level II or III rating for all of the attributes involving magnitude/extent, duration and frequency.

8.2.3.1 Construction

Biophysical

The biophysical concerns regarding Project construction include both direct and indirect effects to the VEC, Short-eared Owl. Direct effects include collisions with construction vehicles and indirect effects include habitat loss and disturbance from construction activity (Table 8-4). No residual effects were determined to be significant.

Land Use

This section applies to property and residential development as well as Aboriginal lands. Agricultural land use is addressed separately.

The final preferred route will run parallel to and along the north side of the existing D12P transmission line. Much of the ROW required for the Project is owned by Manitoba Hydro although an additional 15 m easement will be required in most cases. Land use in the vicinity of the Project is primarily agricultural, with a few exceptions (e.g., the south side of the Assiniboine River crossing). The final preferred route and design for the Project was adapted to avoid passing within close proximity to rural residences.

With the final preferred route, two residences, both on the south side of the Assiniboine River crossing, will be located within approximately 75 m of the proposed ROW edge. Manitoba Hydro engaged each of these landowners as part of Round 1 activities to discuss routing options, specific concerns and potential mitigation options. Concerns raised during these discussions included:

- Removal of shelterbelt at boundary of property with existing ROW;
- Displacement of resident's driveway;
- Reduction of opportunities for future development on residential property (covered under Section 8.2.3.2 Operations); and
- Effects of EMF on human health (covered in Section 8.2.3.2).

Table 8-4 Biophysical – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Direct effect -Mortality/injury of Short-eared Owl due to bird-wire collisions or electrocution	• Minimize ROW routing through grassland habitat	Negligible	Context – I Magnitude/geographic extent – I Duration – I Frequency – I Reversibility – I Likelihood of occurrence - I
Direct effect -Mortality/injury of Short-eared Owl due to collisions with construction vehicles	• Posted speed limits will be followed • All construction vehicles will stay within established roads and rights of way • Minimize ROW routing through grassland habitat	Negligible	Context – I Magnitude/geographic extent – I Duration – I Frequency – I Reversibility – I Likelihood of occurrence - I
Indirect effect- Disturbance by construction activities in or near Short-eared Owl habitat	• All construction vehicles will stay within established roads and rights of way • Minimize disturbance to grassland habitat	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

In order to address the concerns of these residents, Manitoba Hydro opted for a double-circuit tower option that will allow the existing D12P and the Project to be strung on the same structures. This approach avoids having to build a new line adjacent to the existing D12P. This approach:

- Results in no displacement of existing driveways or other infrastructure on either property
- Eliminates the need to acquire additional ROW and enter into easements with the owners of the two adjacent properties.
- Reduces residents' concerns related to EMF by not having a new line located closer to their residences than the existing line, and
- Eliminates issues related to shelterbelt removal, and future development opportunities.

During the PEP, concerns were also raised regarding the potential for damage to property during Project construction. Any such potential or actual damage will be addressed through the combination of winter construction and Manitoba Hydro's compensation policies. Table 8-5 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Agriculture

Agricultural concerns regarding Project construction raised through the PEP were primarily related to inconvenience and increased farming costs associated with the Project. Winter construction should minimize inconvenience associated with construction activity.

Concerns were also raised about the proximity of the Project to farm buildings and/or shelterbelts and property damage during construction. These effects are minimized by route selection, by the timing of construction (winter) and Manitoba Hydro's existing construction procedures. The preferred route runs in close proximity to Sunnyside Colony in the western portion of the Study Area, where there is an equipment shed and various other structures including granary structures. During PEP Open Houses, Manitoba Hydro and Sunnyside Colony discussed issues and concerns, routing options and potential mitigation measures. Manitoba Hydro will ground the structures to eliminate the risks associated with induction. Some shelterbelts in the area of Sunnyside Colony will be removed to accommodate the additional ROW requirements.

Concerns were also raised regarding the potential for property damage. As noted under land use, Manitoba Hydro will develop an EnvPP for addressing these occurrences. Table 8-6 provides a summary of potential effects and mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Table 8-5 Land Use – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Proximity to homes, residential shelterbelts or similar.	• At the Assiniboine River crossing, a double circuit tower structure will be utilized, eliminating the need for additional ROW to accommodate a new line. Therefore, effects on nearby residences will be confined to what is already occurring with the existing D12P transmission line. • No mitigation required. Project design eliminates need for additional mitigation at Assiniboine River crossing.	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential for damage to property (e.g., land, drainage, structures) during construction.	• Construction will take place during winter months to minimize the potential for damage to soil (e.g., through compaction). • Careful attention on the part of construction crews will minimize the likelihood of activities resulting in property damage. • Compensation policy will be in place for landowners with properties that will be directly affected by construction.	Minor Property damage	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Economy

Project construction activities will result in some benefits for communities in the Study Area, through employment and business opportunities (Table 8-7). These will be short term in duration as Project construction is expected to take place beginning October 2014 with an in-service date during the spring of 2015.

Potential direct benefits from the Project would be associated with construction employment as well as contracting and other business opportunities. Indirect benefits could be associated with the provision of goods and services to the construction workforce (e.g., fuel, food). Actual Project workforce requirements remain to be determined but will be decided through negotiations with the contractors doing the work. Considerations in this process would include clearing and construction methods and sequencing of activities. Previous experience suggests that a workforce of approximately 60 people will be required.

Potential project effects on the economy are beneficial rather than potentially adverse. Significance criteria have been established to address adverse effects only.

Infrastructure

The line would cross existing roads, railway lines, telecommunication and water infrastructure. It would also cross one notable natural gas pipeline and several snowmobile trails. Appropriate affected parties, including Manitoba Infrastructure and Transportation (MIT); the Rural Municipalities of Portage la Prairie, Cartier, St. Francois Xavier and Rosser; the Canadian Pacific Railway (CPR); the Canadian National Railway (CNR); and Manitoba Telecomm Services (MTS) have been engaged by Manitoba Hydro to identify and address their concerns.

Roads and highways in the area could also be affected by Project construction-related traffic, primarily through heavy truck traffic on quarter mile grid roads. The nature and magnitude of these effects will depend to a large extent on the tower construction process (i.e., whether or not towers are built on site or transported from other locations). There are currently no official weight restrictions on the quarter-mile roads. Scheduling of the work during the winter months is expected to minimize potential damage to roads. Consultation with the RM of Cartier indicates that potential effects would be heavily dependent on weather conditions leading up to and during Project construction.

Table 8-6 Agriculture – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Proximity of Project to farm buildings and/or farm shelterbelts.	• No farm buildings will be displaced. Some shelterbelts will be cleared near Sunnyside Colony. Manitoba Hydro will clear only what is necessary. • Farm structures situated within the ROW will be grounded. • Compensation will be provided for additional ROW requirements.	Limited shelterbelt removal	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - III Likelihood of occurrence - III
Potential for damage to property (e.g., crops, land, drainage, equipment, structures) during construction.	• Construction will take place during winter months to minimize the potential for damage to soil (e.g., through compaction). • Compensation policy will be in place for landowners with properties that will be directly affected by the ROW and for any physical damages resulting from construction.	Minor property damage	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Table 8-7 Economy – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details).

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Increased employment opportunities	• None required.	Increased employment opportunities.	None, as significance criteria are designed for adverse effects
Increased business opportunities	• None required.	Increased business opportunities	None, as significance criteria are designed for adverse effects

Concerns were raised in discussions with MIT regarding the amount of clearance required between the Project ROW and the PTH #1 control zone (north and east of Dakotah in the RM of Cartier). Similar concerns were raised regarding the intersection of PTH #1 and PR #332. Manitoba Hydro consulted MIT on both of these issues and it was confirmed that Project design would allow for placement of the Project along this corridor, eliminating issues associated with highway control zone infringement.

Disruption or damage to other infrastructure, including drains and culverts and water infrastructure could occur during construction. As in the case of effects on local roads, the nature and magnitude of these effects will depend on Project-related traffic.

Based on previous experience with similar projects, there could be potential effects on water infrastructure and other pipelines. There is one notable gas pipeline located in the vicinity of the Project, south of Elie. Manitoba Hydro will follow a communication/engagement protocol whereby appropriate stakeholders will be engaged regarding Project construction activities and schedule.

The Project would cross railways at two locations along the length. The aforementioned communication/engagement protocol will be implemented to ensure minimal disruption of services and risk of damage.

Effects on recreation may occur as well, specifically related to snowmobile trails running north and south through Elie and from there towards Beaudry Park to the east. In the RM of Cartier along the Assiniboine River crossing, Lido Plage road is popular with local residents as a bicycling and walking route.

Table 8-8 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Personal, Family and Community Life

Topics falling under this heading that were raised during the PEP and through previous experience and professional judgment include public safety related to Project construction activities (traffic and worksite) and human health effects from vibration and dust.

Public safety concerns raised during the PEP related primarily to potential risks associated with traffic incidents due to Project-related traffic in the area (employees as well as heavy trucks) as well as worksite accidents. Additional information regarding the Project traffic will be made available as Project design is finalized. Standard Manitoba Hydro and workplace health and safety protocols will be followed on the construction site. Noise, vibration and dust could be created by Project activities, particularly where tower construction is taking place, as a result of heavy equipment operation.

Table 8-9 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

8.2.3.2 Operation

Biophysical

The biophysical concerns regarding Project operation only direct effects to the VEC, Short-eared Owl. Direct effects on the VEC include collisions with maintenance vehicles and the transmission line and associated structures (Table 8-10). No residual effects were determined to be significant.

Land Use

The Project will have a long life expectancy and, therefore, will have long term effects on property and residential development. Concerns raised during the PEP included the limitations for future development on property due to the Project (particularly where easement is required for residential property) and the potential for property damage. Manitoba Hydro has opted for a double-circuit tower design at the Assiniboine crossing. This eliminates the need for additional easement and reduces the level of concern on the part of residents immediately adjacent to the existing D12P ROW with respect to health and future development opportunities at this location.

Several open house attendees raised concerns about the effect of the Project on property values. Manitoba Hydro's position is that the presence of transmission lines does not significantly affect residential property values. This has been informed by ongoing Manitoba Hydro monitoring in selected areas north of the City of Winnipeg.

Table 8-11 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Table 8-8 Infrastructure – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Potential for damage to local roads depending on their weight allowance and the nature of Project-related truck traffic using them (especially where access is required via quarter-mile roads).	• Construction will be undertaken during winter months when roads are expected to be frozen and therefore less susceptible to damage. • Manitoba Hydro will communicate with appropriate parties regarding construction activities and schedule, including the MIT and the RMs.	Minor damage to roads	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential for disruption to traffic.	• Manitoba Hydro standard procedures to be followed when construction is undertaken adjacent to roads and where it crosses roads. This will include proper workplace health and safety measures (e.g., signage) as well as undertaking construction at crossings at non-peak traffic times (for high volume routes). • Contact and engagement with relevant stakeholders (e.g., MIT and RM's), including notification regarding construction schedules. • Applicable design specifications associated with infrastructure crossings will be respected and appropriate mitigation will be applied as required.	Minor disruption to traffic	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential for damage or disruption to municipal water infrastructure.	• No mitigation required. Tower 'spotting' will be undertaken to avoid potential damage or disruption to municipal water infrastructure. • Contact and engagement with relevant stakeholders (e.g., RMs), including notification regarding construction schedules. • Applicable design specifications associated with infrastructure crossings will be respected and appropriate mitigation will be applied as required.	Minor damage or disruption to municipal water infrastructure.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential for damage or disruption to gas pipeline.	• Tower "spotting" will be undertaken in a way to avoid potential issues. • Contact and engagement with relevant stakeholders (e.g., including notification regarding construction schedules).	Minor damage or disruption to gas pipeline.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential for damage or disruption to communications infrastructure.	• Tower "spotting" will be undertaken to avoid potential issues. • Contact and engagement with relevant stakeholders (e.g., MTS), including notification regarding construction schedules.	Minor disruption or damage to communication infrastructure	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Potential for damage or disruption to railways.	• Manitoba Hydro standard procedures to be followed when construction takes place over rail lines. • Construction to be undertaken with respect for rail schedule. • Contact and engagement with relevant stakeholders (e.g., CPR and CNR), including notification regarding construction schedule.	Minor disruption or damage to local infrastructure	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
There is a potential for disruption to recreation activities in selected areas of the Study Area, including along existing snowmobile trails that intersect the Project as well as along Lido Plage Rd (e.g., bicycling) in the vicinity of the Assiniboine River crossing.	• Review of potential effects and appropriate mitigation measures subject to standard Manitoba Hydro procedures for contact and engagement with relevant stakeholders (e.g., including notification regarding construction schedules). Applicable design specifications associated with infrastructure crossings (including signage) will be respected and appropriate mitigation will be applied as required.	Minor disruption of recreation activities.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Table 8-9 Personal, Family and Community Life – Summary of Potential Construction Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
There exists the potential for public safety risks associated with incidents due to Project-related traffic (workforce and materials).	• Mitigation related to Project traffic to be determined as design and schedule is finalized; expected to include standard safety procedures, designated truck routes and signage.	Minor risk of traffic incidents.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
There is also potential risk to public/personal safety associated with on-site activities.	• During construction, the ROW will be considered an active construction site. Therefore, access will be limited to only those individuals required to be there. Anyone accessing the site will undergo an orientation. Standard workplace health and safety measures, including appropriate signage will be applied.	Minor risk of on-site incidents.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Potential risks to human health resulting from nuisance effects related to noise, vibration and dust resulting from the use of machinery on the construction sites	• Where construction takes place near communities and residences, consideration will be given to completing the work during daylight hours. • Manitoba Hydro will monitor noise, vibration and dust where construction takes place in close proximity to residences.	Construction-related nuisance effects including noise, vibration and dust.	Context - I Magnitude/geographic extent - I Duration - I Frequency - II Reversibility - Likelihood of occurrence - II
Potential risk of accidental spills or mishandling of hazardous materials.	• With respect to spills and hazardous materials, accidents and malfunctions are discussed in Section 8.4.	Spills or mishandled hazardous materials.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Table 8-10 Biophysical – Summary of Potential Operational Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Direct effect -Mortality/injury of Short-eared Owl due to collisions with maintenance vehicles	• Posted speed limits will be followed • All maintenance vehicles will stay within established roads and rights of way • Minimize ROW routing through grassland habitat	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Direct effect -Mortality/injury of Short-eared Owl due to collisions with transmission line and structures	• Minimize disturbance to grassland habitat	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Agriculture

Placement of the Project along the Final Preferred Route does not create additional farm management unit splits, as these were created by the construction of D12P transmission line.

Agriculture issues and concerns related to Project operation raised through the PEP were wide-ranging and included:

- Removal of agricultural land from production;
- Challenges related to increased costs and inconvenience associated with farming practices (including size of equipment);
- Property damage;
- Weed infestation underneath the towers;
- Health and safety regarding livestock;
- Interference with irrigation systems; and
- Restricted aerial spraying.

Concerns related to removal of agricultural land from production relate to surface area taken up by the towers themselves. Project towers will be placed on Manitoba Hydro-owned land, removing this land from production.

Challenges related to increased costs and inconvenience for farmers refer primarily to the difficulties of navigating around the tower structures (e.g., in between the Project and the existing D12P transmission line and between the Project and other boundaries, including property boundaries). As noted above, Manitoba Hydro owns the land that would be in between the two transmission lines and a portion of the Project ROW (excluding the requirement for an additional 15 m at most locations along the line).

For any added ROW requirements, easements will be entered into with owners of affected farms. The easements include financial payments that can offset a portion or all of the added operating costs.

During the PEP, concerns were also raised regarding the potential for damage to property during Project operations due to ongoing or periodic ROW and tower maintenance. Manitoba Hydro has standard compensation practices and policies in place for addressing these issues.

Table 8-11 Land Use – Summary of Potential Operational Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Encroachment on private land, impeding options for future development.	• Routing/design consideration includes double-circuit towers across Assiniboine River crossing to eliminate need for easement for additional ROW at this location. • Easements will be negotiated with landowners where required along other portions of the line. • Municipal and local development policies and by-laws will be respected.	Minor hindrance of future development options.	Context - I Magnitude/geographic extent - I Duration - III Frequency - I Reversibility - III Likelihood of occurrence - I
Property damage	• A compensation policy is in place for landowners with properties that will be directly affected by the ROW and for any physical damages resulting from ongoing maintenance. If damage occurs as a result of ongoing ROW maintenance on portions of ROW designated under easement, landowners will be compensated as per standard MB Hydro compensation policy.	Minor property damage.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Decrease in property values	• No mitigation required. It is Manitoba Hydro's position that the presence of transmission lines does not significantly affect residential property values. • Manitoba Hydro currently monitors, and will continue to monitor property values in the vicinity of their projects.	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I

Other concerns raised during the PEP included:

- Weed growth under the tower structures - Manitoba Hydro will be responsible for weed control and maintenance under the tower structures and will work with adjacent land owners to determine the best course of action;
- Health of livestock (related to EMF) – Manitoba Hydro maintains that there are no known adverse health effects associated with EMF on human or animal health. Several studies have been undertaken to support this and various scientific agencies/groups have convened to evaluate this research. This includes the World Health Organization (2007), the Federal Provincial Territorial Radiation Protection Committee (2005), Health Canada (2010) and others.
- Irrigation systems – there are currently no known irrigation systems in the Study Area that would be affected by the Project.
- Aerial crop-spraying – the Project will run in parallel to the existing D12P transmission line, limitations on aerial spraying are already observed.

Table 8-12 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Economy

Effects on economy will be negligible as no new operating or maintenance jobs will be created. A contract may be required for vegetation management. This type of work could be done by local contractors.

Table 8-12 Agriculture – Summary of Potential Operational Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Removal of agricultural lands from production	• Although Manitoba Hydro's compensation policy takes into account removal of agricultural land from productivity, in this case, towers will be located on land owned by Manitoba Hydro. The remaining ROW will be available for agricultural purposes.	Removal of agricultural lands from production	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - I
Inconvenience and increased costs of farming.	• Potential for inconvenience related to equipment navigation around structures will vary depending on location, characteristics of the land and the type of farming equipment used. Tower placement will have been undertaken with these issues in mind. • Standard compensation policies will apply for the portion of the ROW (15 m) under easement to the landowner. • Monitoring should be undertaken to determine if the Project has any effects on cropping practices, production, etc. (related to portion of land not currently owned by Manitoba Hydro).	Inconvenience associated with farming.	Context - I Magnitude/geographic extent - I Duration - III Frequency - II Reversibility - II Likelihood of occurrence - II
Property damage	• If damage occurs as a result of ongoing operations and maintenance of the transmission line and ROW, compensation will be provided. This will apply to the portion of the ROW designated under easement (15 m).	Minor property damage.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility – I Likelihood of occurrence - I
Weeds around and under towers	• Area under the towers will be maintained through agreements with adjacent landowners or by line maintenance crews. • Manitoba Hydro will prepare a monitoring plan to include monitoring of weeds along the ROW.	Weeds around and under structures.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - II

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Health and safety concerns regarding livestock	• No mitigation required. Based on prior experience and associated literature, livestock operations should not experience any Project-related effects.	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility – I Likelihood of occurrence - I
Interference with irrigation systems where soils have irrigation potential.	• Issues related to interference with irrigation systems will be considered on a site-specific basis. Tower locations will be selected in a manner that minimizes potential effects, with consideration to possible future irrigation system usage. • Monitoring of potential future irrigation systems should be undertaken.	Interference with future irrigation system potential.	Context - I Magnitude/geographic extent - I Duration - II Frequency - I Reversibility - I Likelihood of occurrence - I
Restricted aerial spraying	• Project to run parallel to existing transmission line. Aerial sprayers are already restricted in their use.	Restricted aerial spraying.	Context - I Magnitude/geographic extent - I Duration - III Frequency - II Reversibility - II Likelihood of occurrence - I

Infrastructure

The line consists of the following linear development crossings:

- Seven major road crossing (at PR 221, PTH 26, PR 424, PTH 1, PR 332, PR 248 and PTH 13);
- Two major railway crossings (one crossing where the line exits Dorsey Station and one in the vicinity of Dacotah near the intersection of PR 332 and PTH 1); and
- One substantive gas pipeline located south of Elie.

The Project will also be located, along certain points, in the relative proximity of telecommunication infrastructure. Relevant parties, including Manitoba Infrastructure and Transportation (MIT), Canadian Pacific Railway (CPR), Canadian National Railway (CNR) and Manitoba Telecom Services (MTS) were consulted as required by Manitoba Hydro. With respect to infrastructure, during operations, Manitoba Hydro will follow a communication/engagement protocol whereby relevant stakeholders will be engaged regarding Project operations activities (e.g., maintenance).

Effects on recreation may occur as well, specifically related to snowmobile trails running north and south through Elie and from there towards Beaudry Park to the east.

Concerns were also raised during the PEP about interference from the Project on local cellular phone, satellite and internet services. Manitoba Hydro has noted that these operate at wavelengths that differ from electromagnetic fields. There is no anticipated effect.

Table 8-13 provides a summary of effects and mitigation related to infrastructure. No residual effects were determined to be significant.

Personal, Family and Community Life

In the context of Project operations, topics falling under this heading that were raised during the PEP and through previous experience and professional judgment include human health concerns (e.g., EMF) and aesthetics. Concerns related to human health and EMF were raised during the PEP. Manitoba Hydro monitors scientific literature on this topic, which indicates that there are no known human health effects associated with EMF exposure Participants also noted concerns related to exposure to herbicides used as part of ongoing ROW (including tower structure) maintenance (e.g., weed control).

With respect to aesthetics, a number of participants during the PEP expressed concern over the adverse visual impact of another transmission line in the vicinity of their residences. The preferred route follows the existing D12P transmission line. Therefore, the Project is not expected to contribute negatively in a substantial way.

Table 8-14 provides a summary of potential effects, mitigation (including monitoring and follow-up where applicable). Residual effects after mitigation are identified and environmental assessment significance criteria are presented. No residual effects were determined to be significant.

Table 8-13 Infrastructure – Summary of Potential Operational Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Potential disruption to infrastructure (e.g., traffic, railways, pipelines) where Project intersects with roads (due to emergency access requirements and ongoing ROW maintenance.	• To minimize disruption, relevant agencies (e.g., MIT and RMs) will be notified regarding operations and maintenance schedules.	Minor disruption to traffic.	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility - I Likelihood of occurrence - II
Interference on local cellular phone, satellite and internet services.	• No mitigation required. No effects as these services operate at different frequencies than those created by the Project.	Negligible	Context - I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility – I Likelihood of occurrence - I
Interference with recreation activities, specifically, snowmobile trails that run north-south in the area of Elie and east to Beaudry Park.	• Review of potential effects and appropriate mitigation measures subject to standard Manitoba Hydro procedures for contact and engagement with relevant stakeholders (e.g., including notification regarding construction schedules).	Minor disruption of recreation activities	Context – I Magnitude/geographic extent - I Duration - II Frequency - I Reversibility - I Likelihood of occurrence - I

8.3 MANITOBA HYDRO STATIONS: DORSEY CONVERTER STATION 230-KV SWITCHYARD AND PORTAGE SOUTH STATION

Equipment modifications and additions will be made to the Dorsey Converter Station 230-kV Switchyard and Portage South stations. These will take place on existing Manitoba Hydro-owned property, within fenced areas (Section 3.2.2).

8.3.1 Potential Effects

The project footprint of the Dorsey Converter Station 230-kV Switchyard will be confined to the current disturbance area, thereby eliminating most of the potential biophysical and socio-economic effects of this Project component. Additional detail regarding construction process (e.g., use of implosives to splice conductors) will be provided as Project design is finalized. Mitigation and monitoring related to these effects (e.g., signage/notification) will be undertaken under existing protocols for the two stations associated with the Project. Further detail can be found in the EPP (Chapter 9).

8.3.1.1 Biophysical Effects

Terrain and Soils

Potential biophysical effects to terrain and soil may come as a result of construction within the station. Soil contamination is a potential effect during construction activities from potential spills from construction vehicles (e.g., fuel, oil, or hydraulic fluid). All upgrading activities will occur within the current station foot print, thereby eliminating additional disturbance

Air Quality

Potential effects to air quality that have been identified during the construction phase of the project. This includes fugitive dust generated by movement of vehicles during the construction activities (e.g., access construction, materials and equipment hauling). Fugitive dust is anticipated as the result of increase vehicle traffic over dirt roads and yards during dry conditions. Using effective dust suppression programs and appropriate construction windows (winter construction) will eliminate the effect of fugitive dust emissions.

Table 8-14 Personal, Family and Community Life – Summary of Potential Operational Effects to VECs and Mitigation (see Tables 4-1 to 4-3 for Significance Criteria Details). No residual effects were determined to be significant.

Potential Effect	Mitigation, Monitoring and Follow-up	Residual Effect	Significance Criteria
Potential risks to human health associated with EMF.	• No mitigation required. No known effects on human health associated with EMF.	Negligible	Context – I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility – I Likelihood of occurrence - I
Risks associated with accidental spills or mishandling of hazardous materials (e.g., herbicides).	• Accidents and malfunctions are discussed in Section 8.4.	Minor health risks associated with hazardous materials.	Context – I Magnitude/geographic extent - I Duration - I Frequency - I Reversibility – I Likelihood of occurrence - I
Reduced aesthetics resulting from addition of Project to landscape.	• None required. Project will run parallel to existing D12P transmission line, minimizing additional effect associated with the Project.	Reduced aesthetics	Context - I Magnitude/geographic extent - I Duration - III Frequency - I Reversibility - III Likelihood of occurrence - III

Water Quality

Potential effects to water during construction have been identified. These may affect the quality of both surface and groundwater. Effects to surface and groundwater water quality may occur as the result of accidental deleterious substance spills, Mitigation methods, such as proper storage of hazardous waste materials, will reduce the potential for accidental releases.

8.3.1.2 Socio-economic Effects

Project construction and operation are not anticipated to have notable effects on aspects of land use, agriculture and economy. Potential concerns relate primarily to infrastructure (roads) and personal, family and community life (public safety and human health) during construction only.

Infrastructure

Potential effects to infrastructure include effects from increased traffic on existing transportation infrastructure. This traffic will consist of both employee traffic and heavy equipment traffic. After mitigation measures, potential effects are not expected to be significant (Section 8.2.3). During construction, Project traffic will utilize roads in the vicinity of both stations. This traffic will consist of both employee traffic and heavy equipment traffic. Road specifications (e.g., weight capacity) will be considered as Project design is finalized in order to mitigate potential damage to these roads. Construction is typically expected to take place in the winter (although this may not be the case for work on the Dorsey and Portage South stations) thereby minimizing potential effects on the roads during that time of year. Throughout construction, Manitoba Hydro will consult with the appropriate RM regarding construction process, schedule and road conditions. Potential mitigation measures will be determined through this consultation but may include additional road maintenance (e.g., grading) as required. As a result of mitigation, potential effects are not expected to be significant.

Personal, Family and Community Life

Concerns related to personal, family and community health during Project station construction activities may include:

- Effects on public safety may be associated with increased traffic as well as station safety. Additional traffic is not expected to contribute prominently to traffic levels. Therefore, effects associated with increased traffic incidents are not expected. Existing security and safety measures at the sites will reduce the likelihood of public safety incidents at the site (e.g., fencing, lights, and video camera).
- Noise, vibration and dust may be generated from construction activities. These effects will be temporary and intermittent, and will typically fall within acceptable levels of relevant guidelines. Where necessary, mitigation consisting of planning and

design will be applied. During operation, all existing station risk management and mitigation measures will be extended to the modifications therefore no potential effects are anticipated and no additional mitigation measures are required.

8.3.2 Valued Environmental Components

No VECs have been identified for the Manitoba Hydro Switchyards. The disturbance footprint of the components will remain unchanged from the current footprint of the station; therefore, VECs identified for the Transmission line will not be applicable to this component.

8.4 ACCIDENTS AND MALFUNCTIONS

As a result of construction and operations, there is potential for accidents or malfunctions that could affect the biophysical and socioeconomic environment .If any of these contingency events occurs, it may create a risk to public health and safety or may potentially affect wildlife, fish and terrestrial and aquatic habitat. As a precaution to these potential accidents and malfunctions, requirements such as fire response and emergency preparedness for handling and use of hazardous materials and malfunctions have been addressed. Issues regarding public safety are addressed during the discussion of each of the Project components (Sections 8.2.3.1, 8.2.3.2, and 8.3.1.2).

During construction and operational activities, hazardous material are handled and generated. Commonly generated and handled hazardous materials include fuels, oil, lubricants, gasoline, solvents, and pesticides. Accidental releases of hazardous material may result from Project activities due to failure of station components or human induced error such as: incidences during fueling of equipment; the use of heavy equipment during construction, decommissioning and operations; the filling of converter station equipment with insulating oil at station; commissioning and operations; and the storage, transportation and handling of hazardous materials. Dependent on the nature and magnitude of the accident or malfunction, there is potential for effects to the biophysical environment including soil, groundwater, surface water, and the aquatic environment.

In response to releases of hazardous materials to the environment, follow-up requirements will include measurements of the environment through analytical analysis of relevant parameters (e.g., air, water and soil). Analysis may be recommended for petroleum hydrocarbons (PHC) (Benzene, Toluene, Ethylbenzene, Xylenes [BTEX], Mineral Oil and Grease [MOG]) and herbicides. Relevant criteria within Manitoba Water Quality Standards Objectives and Guidelines (MWQSOG 2011) and the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME 2011) would form the threshold levels for restoration of environments from any spills or leaks. Spills in and adjacent to wetlands and waterbodies will be of concern to fish and wildlife. Spills of contaminants, such as PHC, are difficult to clean-up and if not contained quickly may cause contamination of the aquatic environment potentially

damaging aquatic life and habitat. Mitigation methods will be addressed in the EnvPP developed for the Project.

All potential accidents will be proactively approached by good planning and prevention with the use of protocols, plans and mitigation measures implemented for all hazardous material to be used on site. The Environmental Protection Plan outlines hazardous material and petroleum products use, handling and storage and appropriate emergency preparedness and response. All spills and leaks will be reported to regulatory authorities in accordance with provincial requirements including regulations under the *Dangerous Goods Handling and Transportation Act*.

General mitigation measures implemented to prevent and respond to accidental spills/releases of hazardous materials include:

- An Emergency Preparedness and Spill Response Plan will be developed and an emergency response spill kit will be kept on-site at all times in case of fluid leaks or spills from machinery;
- Construction crews will be adequately trained in spill prevention and clean-up procedures;
- Storage and handling of fuel, lubricants and other potentially hazardous materials within dedicated areas at work sites and marshalling yards in full compliance with regulatory requirements;
- All storage areas of harmful substances, such as fuels, chemicals and herbicides will be stored in locations greater than 100 m from the ordinary high water mark (HWM) of any waterbody;
- All clean-up in storage areas, and sites where incidental spillage occurs, will be completed in accordance with regulatory standards;
- Any spills of hazardous substances will be cleaned up immediately and reported to the local Natural Resources Officer;
- Marshalling yards will be located on low permeability soils and upland sites, where possible;
- Equipment refuelling and maintenance will be conducted greater than 100 m from the stream's ordinary HWM and away from wetlands;
- All transfer of hazardous materials will be attended at all times;
- All fuel spills or leaks will be reported to the Manitoba Hydro Project Manager or delegate immediately upon discovery;
- All vehicles, machinery and construction materials will arrive on site in good working order (i.e., clean and free of leaks);
- All manufacturer machinery and equipment guidelines, procedures and spill prevention and emergency response measures will be adhered to;
- All hazardous waste material, such as Hazardous materials, soils to be remediated or disposed of, fuel containers and other materials will be stored in approved areas and

disposed of according to Manitoba Hydro's Hazardous Materials Management Handbook and in accordance with regulatory requirements;
- Only clean construction materials and equipment will be used; and
- The Canadian Wildlife Service (CWS) will be informed of all incidents where the spill of toxic pollutants will harm or potentially harm wildlife species and/or species at risk, in accordance with the National Policy on Oiled Birds and Oiled Species at Risk (CWS 2000).

Other potential contingency events include accidental fires, which may result in affects to air quality or wildlife and habitat loss. Station fire suppression systems are currently in place for Dorsey Converter Station 230-kV Switchyard and Portage South Station. The water supply systems are designed to ensure there is sufficient pump and water storage capacity to adequately contain and extinguish any station fires. The stations are also designed with oil containment and drainage systems. These systems collect any oil and water from leaks, spills or fires and treat and separate the oil in oil/water separators prior to release to the environment. In the event of a station or other construction site fire, follow-up monitoring would be required.

Worker safety will be regulated under provincial legislation. All activities, construction and operations, will be undertaken in compliance with Workplace, Safety and Health requirements, to prevent accidents and injury. Manitoba Hydro is committed to establishing and maintaining a safe workplace and injury prevention through its corporate goals.

8.5 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

8.5.1 Context

Manitoba Hydro has undertaken considerable research respecting the vulnerability of its transmission facilities to the risk arising from extreme weather like flooding, severe synoptic wind and ice events or tornadoes. In addition, Manitoba Hydro monitors and conducts research on the potential effect of climate change (e.g., permafrost effects). Manitoba Hydro's research suggests that the probable outcome of current climate trends will be higher mean temperatures and precipitation, especially during winter months.

8.5.2 Potential Effects and Significance

The location of the Project well below the permafrost line in Manitoba limits the potential climate change-related effects on temperature and precipitation. The most likely potential effect is flooding, as evidenced by the 1 in 300 year flood event that occurred in 2011 within the Assiniboine and La Salle River systems. Protection (i.e., proactive mitigation) against the effects of future flood events can be achieved during the design phase of the Project (e.g., incorporating flood protection into station

facilities; installing conductor to ground clearances in excess of current standards). The Project design criteria account for a 1 in 150 year severe weather event.

8.6 CUMULATIVE EFFECTS

8.6.1 Introduction

Cumulative effects are defined as changes to the environmental resulting from human action in combination with other past, present and future human actions (Hegmann et al. 1999). The cumulative effects assessment for the Project was developed based on guidance provided under the *Canadian Environmental Assessment Act* and the Cumulative Effects Assessment Practitioners Guide (Hegmann et al. 1999). Additional guidance is also provided by the Cumulative Effects Working Group (CEWG), which was established to give direction on conducting cumulative effects assessments in Canada. In addressing the assessment of a single project, such as is required in this EA Report for the Project, the CEWG states that:

> "…an assessment of a single project (which is what almost all assessments do) must determine if that project is incrementally responsible for adversely affecting a VEC beyond an acceptable point (by whatever definition). Therefore, although the total cumulative effect on a VEC due to many actions (defined as projects and activities) must be identified, the CEA must also make clear to what degree the project under review is alone contributing to that total effect. Regulatory reviewers may consider both of these contributions in their deliberation on the project application (Hegmann et al. 1999)."

8.6.2 Cumulative Effects Assessment Scoping

The spatial boundary for the Project's cumulative effects assessment is the Project Study Area. Cumulative effects of the Project are assessed for adverse residual effects to VECs (Sections 8.2 and 8.3) that have the potential to interact with the effects of other past, current, or future projects and human activities. VECs with no residual effect or a positive residual effect are not included in the cumulative effects assessment. Finally, the cumulative effects assessment only includes adverse residual effects on VECs that overlap both spatially and temporally with the effects of other projects and human activities.

Project and human activities were selected for inclusion in the cumulative effects assessment based on the following criteria:

- Past Projects: Projects within the Study Area whose ongoing effects can be reasonably expected to change in the future and, as a result of those changes, interact with this Project's adverse residual effects.
- Current Projects: Projects in construction, development or operation within the Study Area.

- Future Projects: Projects approved for construction/development or in the permitting stage within the Study Area.
- Prospective Projects: Projects announced in the Study Area (e.g., wind farms, transmission expansion, government vision statements) but not yet moving along a development or permitting pathway, and any projected changes in land use patterns (e.g., changes in agricultural activity).

8.6.2.1 Past and Current Project and Activities

Two past and current projects were initially considered as part of the cumulative effects assessment (Table 8-15). Reasons for subsequent exclusion from the cumulative effects assessment include a lack of spatial or temporal overlap with the Project, or prior inclusion in the Effects Assessment (Sections 8.2 and 8.3).

8.6.2.2 Future and Prospective Future Projects and Activities

Six future and prospective projects were initially considered as part of the cumulative effects assessment (Table 8-16). Reasons for subsequent exclusion from the cumulative effects assessment include a lack of spatial or temporal overlap with the Project.

8.6.3 Assessment of Cumulative Effects on VECs

VECs were included in the cumulative effects assessment (Table 8-17) if there was an adverse residual effect of the Project on the VEC and if there was a spatial and temporal overlap of Project effects with the effects of other projects and human activities. The co-location of the Project with the existing D12P ROW greatly reduces the potential for cumulative effects to VECs; only negligible cumulative effects are expected as the result of Project construction and operation.

Table 8-15 Past and Current Projects and Activities in the Project Study Area.

Project or Activity	Interaction	Included / Excluded
Upgrades to or maintenance of existing D12P transmission line	Potential low risk of cumulative socio-economic effects on local communities and on regional infrastructure during construction activity associated with upgrades or maintenance. Scale of effects dependent on the size of work forces and temporal window of work activity.	Included
Existing utility and transportation corridors	Multiple utility and transportation corridors exist within the Study Area. The addition of an additional corridor (i.e., Project ROW) could exacerbate existing habitat fragmentation effects, facilitate encroachment of invasive species, and increase access to native habitats by recreational users.	Included, but primarily addressed as part of earlier baseline and effects assessment.

Table 8-16 Future and Prospective Projects and Activities in the Project Study Area.

Project or Activity	Interaction	Included / Excluded
Bipole III	The Manitoba Hydro proposed Bipole III project is currently undergoing Federal and Provincial environmental reviews. The final preferred route will pass west and south of the final preferred D83P route. The proposed Bipole III route will not intersect the D83P study area. The closest approach of the Bipole III route to the D83P project is 22.3 km southwest of the Portage South Station.	Excluded – No spatial effects overlap with Project.
Prospect of further development of new transmission lines in Southern Manitoba	Based on Manitoba Hydro's Ten Year Development Plan (2009) there is a prospect of further development of new transmission lines in southern Manitoba, principally around and south of the City of Winnipeg(e.g., Letellier / St. Vital line; St. Vital-LaVerendrye 230-kV Transmission Line Project). Other proposed southern transmission line concepts that may overlap with the Project would occur only after comprehensive route selection and environmental impact assessment, extensive public engagement and approval and licencing by the relevant regulatory authorities. In service dates are uncertain.	Excluded – No spatial effects overlap with Project.
New International Transmission Line	Manitoba Hydro is planning to implement an additional US transmission line from Winnipeg to the Canada-US border. The line would also include equipment additions and modifications to the Dorsey and / or Riel stations. The project would not occur without comprehensive route selection and environmental impact assessment, extensive public engagement and approval and licensing by the relevant regulatory authorities. ROW and line effects will have minimal spatial overlap with the Project.	Excluded – minimal spatial overlap with Project

Wind energy development	The Dakotah Wind Energy Project has been proposed within the Study Area, in the vicinity of the Town of Elie. The project acquired an Environment Act licence in 2006 but has not yet completed a power purchase agreement. The project will be developed in a agriculturally dominated landscape.	Excluded – No spatial effects overlap with Project.
Residential development within the Study Area	Expected to utilize available land set aside for the purpose of development. Expected to follow municipal and/or provincial development guidelines which would serve to limit interactions with other projects and mitigate any project-related effects.	Included, but primarily addressed as part of earlier baseline and effects assessment.
Current and future agricultural activities	With appropriate water and vegetation management practices, residual effects of agricultural development on key VECs are expected to be minimal	Included (but to a limited extent)

Table 8-17 Potential Coincidence of Effects on Socioeconomic Environment (orange cells = adverse residual effect of Project; white cells = no adverse cumulative effects; yellow cells = negligible adverse cumulative effects).

	Socioeconomic Component				
	Land Use	Agriculture	Infrastructure	Economy	Personal, Family, and Community Life
D83P Project					
Cumulative Effects					
D12P Line					
Existing Utility and Transportation Corridors					
Residential Development					
Current and Agricultural Activities					

8.7 SUSTAINABLE DEVELOPMENT

Sustainable development is an important component in the project lifecycle. Manitoba Hydro aims to implement sustainability practices during the planning, design, construction, operation and maintenance, and eventual decommissioning of the Project through the development of sustainable development cooperate policies as well as following and meeting Manitoba's Principles and Guidelines of Sustainable Development, as scheduled under *The Sustainable Development Act* (SDA) (Section 8.7.1).

As part of the sustainability analysis and ensuring the criteria of the SDA have been met, aspects of the Project have been compared to sustainability indicators (Section 8.7.2). The indicators have been selected based on similar projects and the final list will be finalized prior to the initiation of construction and incorporated into the follow-up program for the Project.

8.7.1 Sustainable Development

The general definition of sustainable development has been adopted from the Brundtland Commission Report entitled *Our Common Future*, as to "meet the needs of the present without compromising the ability of future generations to meet their own needs" by the Province of Manitoba (United Nations World Commission on Environment and Development 1987). Application of sustainable development is considered a general philosophy which includes the ethical approach to guide individual and collective behaviour with respect to the environment, the economy and social well-being. The SDA was established in 1998 creating framework through which sustainable development is to be implemented by the provincial public sector ad promoted in private industry and society. The SDA sets out principles and guidelines as the framework for implementing sustainable development within the Province. All of Manitoba's Crown Corporations are required to establish and adopt a corporate sustainable development policy to complement sustainable development.

Manitoba Hydro incorporates sustainability into all aspects of its operations to achieve environmentally sound and sustainable economic development. Manitoba Hydro has implemented a Plan-Do-Check Environmental Management System (EMS), registered to the ISO 14001 Environmental Management System standard, as their method to enable environmental compliance and protection. An additional key component of the EMS is Manitoba Hydro's Environmental Management Policy that guides all of the corporation's operations (Manitoba Hydro 2008).

Manitoba Hydro developed its corporate sustainability development policy in 1993 as compliment to the Provincial Framework. The policy contains 13 principals (Manitoba Hydro 1993) designed to meet the needs of the present without compromising the ability of future generations to meet their needs:

1. Stewardship;
2. Shared responsibility;
3. Integration of environmental and economic decisions;
4. Economic enhancement;
5. Efficient use of resources;
6. Prevention and remedy;
7. Conservation;
8. Waste minimization;
9. Access to adequate information;
10. Public participation;
11. Understanding and respect;
12. Scientific and technological innovation; and
13. Global responsibility.

In addition to provincial and corporate principals and policies, Manitoba Hydro is a member of the Canadian Electricity Association (CEA) Sustainable Electricity Program. This industry-specific program is focused on allowing the holistic management of sustainability by the Canadian electricity sector. As a condition of the program, Manitoba Hydro must report on sustainability indicators covering social, environmental and economic performance; CEA releases an annual report of industry performance relative to these sustainability indicators.

Manitoba Hydro has acknowledged that the construction of the Project has significant environmental activity. This acknowledgment has led Manitoba Hydro to elevate the following commitments above other corporate activities:

- Preventing or minimizing any adverse impacts, including pollution, on the environment and enhancing positive impacts by using previously existing impact footprints and twinning old transmission line infrastructure;
- Continually improving our EMS and policies;
- Meeting or surpassing regulatory requirements and other commitments;
- Considering the interests and utilizing knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;
- Reviewing our environmental standards, objectives and targets annually to ensure improvement in our environmental performance; and
- Ensuring transparent documentation and reporting our activities and environmental performance.

8.7.2 Project Sustainability Assessment

Manitoba Hydro and the Province of Manitoba's sustainable development principles and guidelines have been incorporated into the planning, design, construction, operation and maintenance, and eventual decommissioning of the Project, where applicable (Table 8-18). All of the core principals have been assessed and principals similar in nature have been amalgamated. The indicators will be finalized prior to commencing construction and will be incorporated into the Project Environmental Protection Program.

8.7.3 Conclusions

This sustainability assessment indicates that the Project is a good example of sustainable development. It is a project that will allow the transfer of power to southwest Manitoba, preventing unacceptably low system voltages during winter peak single contingency outages and provide a reliable supply of electricity is accessible to residents of southwestern Manitoba today, as well as to future generations. The Project demonstrates Manitoba Hydro's sustainable development policies and how they embody general sustainable development principles, ensuring that there is consideration of the environment, economy, health and social well-being through integrated decision-making during all phases of the project. Appropriate design and implementation has avoided, minimized or compensated for environmental and social effects, as a result of a comprehensive environmental assessment process that included public, stakeholder and Aboriginal participation. In addition, plans will also be developed to minimize waste, protect the environment and rehabilitate construction sites (Hegmann et al. 1999).

Table 8-18 Project Sustainability Assessment

MB Sustainable Development Principal and guidelines	Comment	Indicator
Integration of environmental and economic decisions Economic decisions should adequately reflect environmental, human health and social effects. Environmental and health initiatives should adequately take into account economic, human health and social consequences.	The goal of Manitoba Hydro's site selection process for the Project was to balance environmental, economic and social considerations in selecting the preferred Project route (Chapters 4 and 7). A total of 22 factors were used to evaluate select the preferred route in tow general categories: biophysical and socio-economic. Once the preferred route was selected, environmental and economic considerations were further considered in the environmental assessment of the preferred route.	Report on Environmental Protection Plan and mitigation effectiveness through the Environmental Inspection Program (Chapter 9). Conduct frequent inspections of work sites and report regularly. The number and type of incidents will be tracked and addressed during the construction phase of the Project.
Stewardship The economy, the environment, human health and social well-being should be managed for the equal benefit of present and future generations. Manitobans are the caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations. Today's decisions are to be balanced with tomorrow's effects. Integrated decision-making and planning …encouraging and facilitating decision making and planning processes that are efficient, timely, accountable and cross-sectoral and which incorporate an inter-generational perspective of future needs and consequences.	Increasing power demands in western Manitoba have led to load growth on the Manitoba Hydro 230-kV system. Manitoba Hydro forecasting studies indicated that without voltage support, transmission planning criteria would be violated at the Portage South station. Specifically, load growth in western Manitoba has led to unacceptably low system voltages during winter peak single contingency outages. The Project will provide economic benefits to Manitobans with the major economic benefit from the construction phase.	Goods and services purchased in or from: • Manitoba • Local businesses/suppliers • Aboriginal businesses/suppliers Percent of total project workforce that is Aboriginal. Health and safety - Accident frequency: Number of accidents per 200,000 hours worked.
Shared responsibility and understanding Manitobans should acknowledge responsibility for sustaining the economy, the environment, human health and social well-being, with each being accountable for decisions and actions in a spirit of partnership and open cooperation. Manitobans share a common economic, physical and social environment. Manitobans should understand and respect differing economic and social views, values, traditions and aspirations. Manitobans should consider the aspirations, needs and views of the people of the various geographical regions and ethnic groups in Manitoba, including aboriginal peoples, to facilitate equitable management of Manitoba's common resources.	Planning, designing, constructing, operating and maintaining the proposed Project involves many departments within Manitoba Hydro, as well as external consultants and contractor staff. Personnel gained an awareness of technical and environmental issues associated with the project and considered such concerns to arrive at balanced project decisions. Construction Phase EnvPPs will be created for the construction phase of the Project, followed by an Operations Phase EnvPP. The purpose of the plans are to provide for the effective implementation of mitigation measures and follow-up actions, as well as the application of regulatory requirements, environmental guidelines and best practices identified in the Project EA Report. EnvPPs help to ensure that contractors and field staff effectively fulfill their responsibilities for protecting the environment during the life of the Project. Environmental Inspectors will be on-site during construction, and detailed inspection and reporting functions are identified to ensure construction activities occur in a responsible fashion. Successful and effective implementation of EnvPPs is dependent on the shared responsibilities of Manitoba Hydro, regulators, contractors and stakeholders.	Number of Environmental Inspectors on-site during construction. Number of training sessions for contractors on EnvPPs

MB Sustainable Development Principal and guidelines	Comment	Indicator
	Two rounds of public engagement were held for this Project. The purpose of Round One was to introductive the Project, describe the SSEA process, identify potential routing issues, present alternative routes and receive feedback on them. The purpose of Round Two was to present the preferred route, describe outcomes from Round One, identify any outstanding routing issues and obtain input on potential mitigation measures. Participants in both rounds included Rural Municipality Councils, Aboriginal peoples, key residents and other stakeholders and the general public. Feedback received during these engagements was instrumental in the selection of the preferred route and identifying key issues to be addressed during the environmental assessment process. Project information has been and will continue to be shared with all individuals and communities that are interested and/or potentially affected by the proposed Project during the regulatory review, project construction and operation phases.	
Efficient use of resources Encouraging and facilitating development and application of systems for proper resource pricing, demand management and resource allocations together with incentives to encourage efficient use of resources; and Employing full-cost accounting to provide better information for decision-making.	The decision to proceed with the development of the Project was made after careful consideration of a range of other options (Chapter 2). The SEAA process (Chapters 4 and 7) was employed to facilitate the selection of a route with minimal and efficient use of monetary resources and natural capital. During construction of the project all activities and personnel will be working under the auspices of the EMS framework and governance including Manitoba Hydro's Environmental Management Policy.	Total volume of recycled materials used during project construction.
Prevention Manitobans should anticipate, and prevent or mitigate, significant adverse economic, environmental, human health and social effects of decisions and actions, having particular careful regard to decisions whose impacts are not entirely certain but which, on reasonable and well-informed grounds, appear to pose serious threats to the economy, the environment, human health and social well-being. Rehabilitation and reclamation Manitobans should: • Endeavour to repair damage to or degradation of the environment; and Consider the need for rehabilitation and reclamation in future decisions and actions	A proactive approach was taken through the identification of alternative routes and ultimately the selection of the preferred route to avoid adverse environmental effects and enhance positive project effects. Habitat of species at risk has been avoided, and future residential development in rural municipalities was accommodated. Through the comprehensive environmental assessment process it has been determined that there will be no significant residual adverse effects with the application of mitigation measures. Remediation plans will be prepared to manage remediation activities and any contaminated sites identified as a result of the Project. Borrow areas, construction sites, access roads and other Project components that are no longer required will be decommissioned and lands will be restored as required. EnvPPs will be implemented during the construction and operation phases of the Project to ensure contractors and field staff can effectively fulfill their responsibilities for protecting the environment. An adaptive management approach will be implemented for the project and	Number and volume of spills during the construction phase of the Project. Number of available project components decommissioned and/or restored (e.g., total number of borrow areas reclaimed).

MB Sustainable Development Principal and guidelines	Comment	Indicator
	what is learned through project monitoring will be taken into account in making any necessary changes to activities to address issues in an expeditious manner and to remedy any unforeseen issues.	
Waste minimization and substitution Encouraging and promoting the development and use of substitutes for scarce resources where such substitutes are both environmentally sound and economically feasible. Reducing, reusing, recycling and recovering the products of society	It is recognized that hazardous and non-hazardous waste materials will be generated during construction of the transmission line and associated facilities. Waste generated by the Project will be collected, managed and disposed of in accordance with provincial legislation and guidelines. Hazardous materials will be managed in accordance with Manitoba Hydro's Hazardous Material Management Policy (2003). Opportunities to reduce, reuse and recycle non-hazardous wastes will be taken whenever possible.	Total quantity of waste generated (per thousand tonnes) during the construction phase of the project. Total quantity of waste materials diverted from landfills.
Public participation Establishing forums that encourage and provide opportunity for engagement and meaningful participation in decision-making processes by Manitobans. Endeavouring to provide due process, prior notification and appropriate and timely redress for those adversely affected by decisions and actions. Striving to achieve consensus among citizens with regard to decisions affecting them.	Two rounds of public engagement were held for this Project. The purpose of Round One was to introductive the Project, describe the SSEA process, identify potential routing issues, present alternative routes and receive feedback on them. The purpose of Round Two was to present the preferred route, describe outcomes from Round One, identify any outstanding routing issues and obtain input on potential mitigation measures. Participants in both rounds included Rural Municipality Councils, local First Nations and the MMF, key residents and other stakeholders and the general public. Feedback received during these engagements was instrumental in the selection of the preferred route and identifying key issues to be addressed during the environmental assessment process.	Number of notifications sent to communities/property owners prior to construction on their property/jurisdiction. Number of locations where project information is made available to the public.
Access to information Encouraging and facilitating the improvement and refinement of economic, environmental, human health and social information. Promoting the opportunity for equal and timely access to information by all Manitobans.	Project information has been and will continue to be shared with all individuals and communities that are interested and/or potentially affected by the proposed Project during the regulatory review, project construction and operation phases.	
Research and innovation Encouraging and assisting the researching, development, application and sharing of knowledge and technologies that further our economic, environmental, human health and social well-being.	A number of modern technologies and software were used in the design of the transmission line towers that results in improved reliability and more cost effective solutions. Light Detection and Ranging (LiDAR) was used to survey the preferred route and played an instrumental role in many aspects of design. LiDAR is a remote sensing technology that can measure the distances to objects or properties of a target using pulses from a laser. For the Project the information from LiDAR was imported into a software program to create 3D visual renderings that assisted in generation of the line profile, span optimization and development of the tower family. With respect to design, the application of the Reliability-Based Design method will deliver design of the transmission line towers to a prescribed reliability level with higher confidence than traditional deterministic methods. The following factors are expected to contribute to the overall reliability of the	Project reliability and successful operation with minimal outages. Number of customer complaints related to electrical device interference.

MB Sustainable Development Principal and guidelines	Comment	Indicator
	Project: Design loads: Selection of design loads have been based on statistical analysis of the most current weather data as recorded at various weather stations. Scientific analysis of the data was used to predict these loads for a chosen reliability level corresponding to a 150-year return period. Material Strength: Load and strength factors have been derived from statistical functions separately for each of the transmission line components. This allows one to design transmission line towers in such a way that will allow it to fail in a prescribed mode if it is exposed to weather loads in excess of its capacity. Consequences of such failure can be easier handled by the use of proper mitigation measures. Security Measures: The transmission line will be designed to resist uncontrolled failures through the introduction of special security load cases and the provision of "anti-cascading" towers. Should the line fail due to a weather event exceeding line capacity, the damage is expected to be contained to the line section rather than allow the propagation of the failure in an uncontrolled manner.	
Global responsibility Manitobans should think globally when acting locally, recognizing that there is economic, ecological and social interdependence among provinces and nations, and working cooperatively, within Canada and internationally, to integrate economic, environmental, human health and social factors in decision-making while developing comprehensive and equitable solutions to problems.	Manitoba Hydro considers the potential transboundary effects (e.g., GreenHouse Gas [GHG] emissions) from its projects and takes them into account during project planning. Overall, It is anticipated that the Project will not have any significant adverse transboundary effects through GHG emissions.	Amount of atmospheric emissions of GHGs from Project vehicle fleet.
Conservation and enhancement Maintain the ecological processes, biological diversity and life-support systems of the environment. Harvest renewable resources on a sustainable yield basis. Make wise and efficient use of renewable and non-renewable resources. Enhance the long-term productive capability, quality and capacity of natural ecosystems.	The Project is subject to a comprehensive environmental assessment to identify the effects of the project on the environment and communities and to mitigate any adverse effects. Through the routing process the most sensitive ecological areas were avoided. The conclusion from the Environmental Assessment Report is that the Project is not expected to result in any significant adverse effects with the implementation of mitigation measures. Any potentially sensitive sites along the preferred route and at associated facilities will be protected through specific measures for each site that were identified by discipline experts.	The success of the EnvPP implementation as measured by annual review.

9.0 ENVIRONMENTAL PROTECTION, FOLLOW-UP AND MONITORING

9.1 INTRODUCTION

Mitigation measures, monitoring and other follow-up actions identified in the effects assessment (Chapter 8) will be implemented through an Environmental Protection Program. Manitoba Hydro's Environmental Protection Program provides the framework for implementing, managing, monitoring and evaluating environmental protection measures consistent with regulatory requirements, corporate commitments, best practices and public expectations. Environmental protection, management and monitoring plans will be prepared and implemented under the environmental protection framework to address environmental protection requirements in a responsible manner. Socio-economic elements will be encompassed within the Environmental Protection Programs.

The purpose of this Environmental Protection, Follow-up and Monitoring chapter is to outline how Manitoba Hydro will implement, manage and report on environmental protection measures, monitoring and other follow-up actions as well as regulatory and policy requirements and other commitments identified in the Project EA Report. The environmental protection program was developed in accordance with Manitoba Hydro's vision, goals and environmental policies.

The Corporate Vision is:

> "To be the best utility in North America with respect to safety, rates, reliability, customer satisfaction, and environmental leadership, and to always be considerate of the needs of customers, employees, and stakeholders" (Manitoba Hydro 2010).

One of the corporation's goals is *"To protect the environment in everything we do"*. This goal can only be achieved with the full commitment of Manitoba Hydro management, employees, consultants and contractors at all project stages from planning and design through the construction and operational phases. Manitoba Hydro's Corporate Environmental Management Policy (Manitoba Hydro 2008) states that:

> "Manitoba Hydro is committed to protecting the environment. In full recognition of the fact that corporate facilities and activities affect the environment, Manitoba Hydro integrates environmentally responsible practices into its businesses, thereby:
> - preventing or minimizing any adverse impacts, including pollution, on the environment, and enhancing positive impacts;
> - continually improving our Environmental Management System;
> - meeting or surpassing regulatory requirements and other commitments;

- considering the interests and utilizing the knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;
- reviewing our environment objectives and targets annually to ensure improvement in our environmental performance; and
- documenting and reporting our activities and environmental performance."

9.2 ENVIRONMENTAL PROTECTION PROGRAM

9.2.1 Overview

Manitoba Hydro's Environmental Protection Program provides the framework for the delivery, management and monitoring of environmental and socio-economic protection measures that satisfy corporate policies and commitments, regulatory requirements, and environmental protection guidelines and best practices. The Program describes how Manitoba Hydro is organized and functions to deliver timely, effective, and comprehensive solutions and mitigation measures to address potential environmental effects. Roles and responsibilities for Manitoba Hydro employees and contractors are defined, and management, communication and reporting structures are outlined. The Environmental Protection Program includes the what, where and how aspects of protecting the environment during the pre-construction, construction, operation and decommissioning of the Project.

9.2.2 Organization

The organizational structure of the Environmental Protection Program includes senior Manitoba Hydro management, and project management and implementation teams that work together to ensure timely and effective implementation of environmental protection measures identified in environmental protection plans (Figure 9-1). Manitoba Hydro senior management is responsible for the overall Environmental Protection Program including resourcing, management and performance, and is accountable for regulatory compliance, policy adherence and stakeholder satisfaction. The Environmental Protection Management Team is composed of senior Manitoba Hydro staff and is responsible for the management of environmental protection plans including compliance with regulatory and other requirements, quality assurance and control, and engagement with regulators, stakeholders, local First Nations and the MMF. The management team is supported by environmental consultants and advisors. The Environmental Protection Implementation Team is composed of Manitoba Hydro operational field and office staff, and is responsible for the day-to-day implementation of environmental protection plans including monitoring, inspecting and reporting. The implementation team works closely with other Manitoba Hydro staff on an as required basis.

9.2.3 Roles and Responsibilities

Roles and responsibilities for delivery of the Project and implementation of environmental protection measures are illustrated in general terms in Figure 9-2.

- The Construction Supervisor/Site Manager has overall responsibility for the implementation of the environmental protection plans and reports to a Section Head or Department Manager.
- The Licensing and Environmental Assessment Department oversees the development of environmental protection documents and associated inspection and monitoring programs.
- The Construction Contractor is responsible for ensuring work adheres to the environmental protection plans and reports to the Construction Supervisor/Site manager.
- Environmental Officers/Inspectors have the primary responsibility to confirm that environmental protection measures and specifications are implemented as per the environmental protection plans as well as provide information and advice to Construction Supervisor/Site Manager.
- Manitoba Hydro Field Safety, Health and Emergency Response Officers are responsible for the development and execution of the safety program and Occupational Health and Safety practices at the various construction sites.
- Other Manitoba Hydro employees including engineers and technicians provide information and advice to the Construction Supervisor/Site Manager.

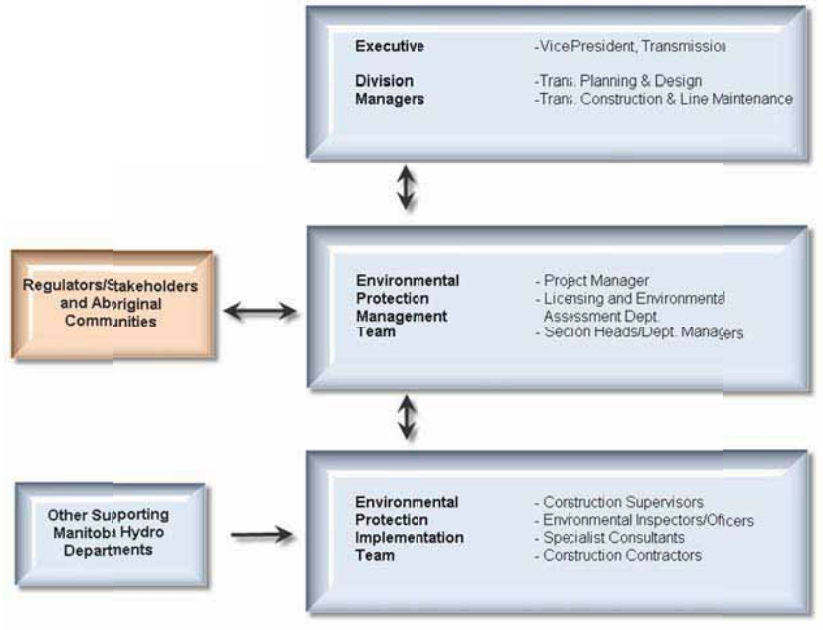


Figure 9-1 Environmental Protection Organizational Structure

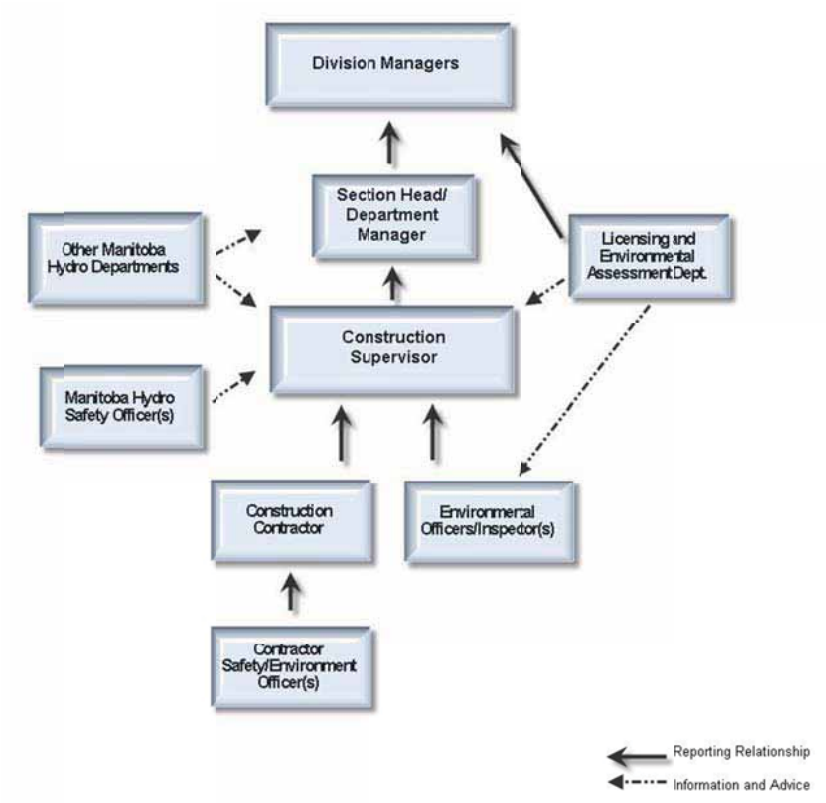


Figure 9-2 Typical Organizational Lines of Reporting and Communication.

9.2.4 Resources

Ensuring that adequate resources are allocated to the environmental aspects of project planning, development, implementation and operation is key to successful implementation of environmental protection measures and follow-up including monitoring and other requirements. Manitoba Hydro commits resources early in the planning cycle to ensure effective environmental assessment, mitigation and monitoring. Teams of engineers and environmental professionals develop preventative or avoidance mitigation measures that include design, routing and siting alternatives. In addition, there are resource allocations for the delivery and implementation of specific environmental protection measures to meet corporate policy and government regulatory requirements. Manitoba Hydro is committed to staffing the Environmental Protection Program with sufficient Environmental Inspectors and providing required support including training, financial resources and equipment.

9.2.5 Environmental Management

Manitoba Hydro is certified under the ISO 14001 Environmental Management System standard and is subject to requirements of the standard including annual audits to verify its environmental performance. An Environmental Management System is a framework for developing and applying its environmental policy and includes

articulation of organizational structure, responsibilities, practices, processes and resources at all levels of the corporation. The Environmental Management System includes commitments to comply with legislation, licenses, permits and guidelines, conduct inspections and monitoring, and review the results for adherence to requirements. The ISO standard ensures quality, performance and continual improvement in the delivery of Manitoba Hydro's Environmental Protection Program.

9.2.6 Environmental Protection Documents

Several environmental protection planning documents are developed for different project phases, components and activities. The documents include environmental protection, management and monitoring plans. The level of detail captured in the various plans increases as the project advances through planning, design, construction and operation phases, and the environmental assessment and licensing process (Figure 9-3).

Prior to the commencement of construction activities, a Construction Phase EnvPP will be prepared. The Construction Phase EnvPP will provide a high level of detail required to implement the general and specific environmental protection measures and will cover the construction period from beginning to end.

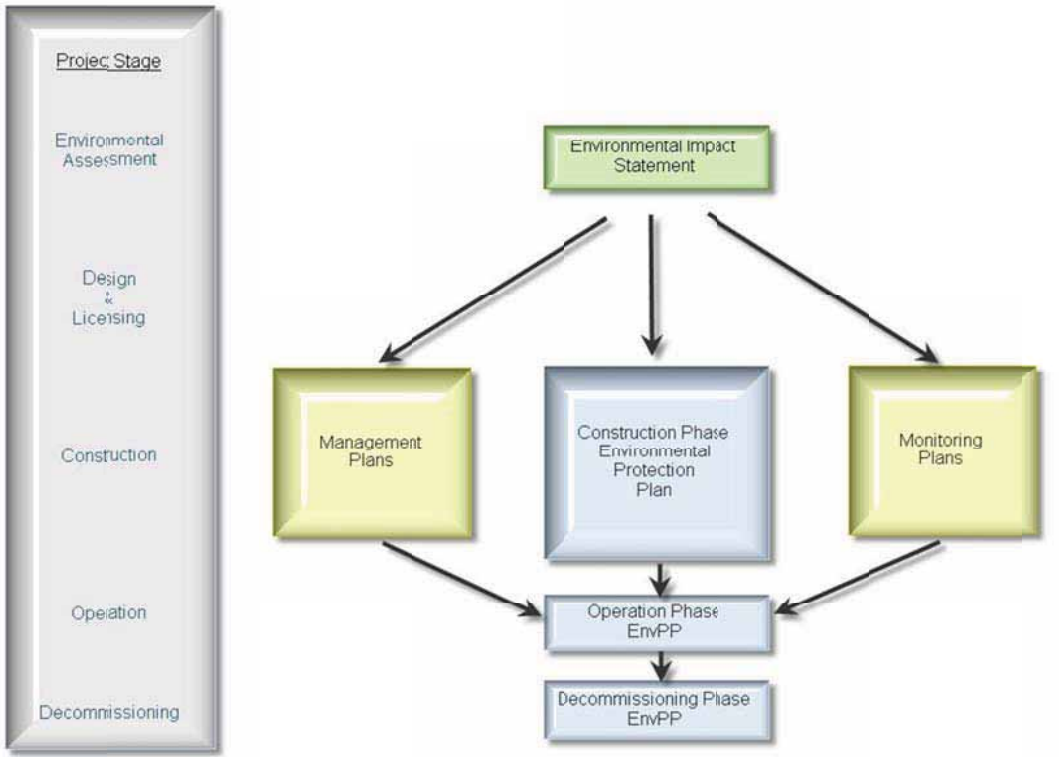


Figure 9-3 Typical Environmental Protection Documents

The Operation Phase EnvPP will be prepared prior to completion of the Project and will cover the period from commissioning to the eventual decommissioning of the Project. A Decommissioning Phase EnvPP would be prepared prior to the eventual decommissioning of the Project.

Management plans are prepared in response to specific environmental issues identified during the environmental assessment of the Project. Typical environmental issues include erosion control and emergency response. Management plans are structured documents that provide reasoned and approved courses of action to address environmental issues. Management plans are also prepared in response to regulatory requirements and responsible management practices.

Monitoring plans are prepared in response to specific follow-up requirements identified during the environmental assessment of the Project. Follow-up requirements include those actions implemented to confirm compliance with regulatory requirements and to assess the effectiveness of the environmental assessment. Example follow-up actions include invasive vegetation management, water quality protection, and the protection of fish and fish habitat.

9.2.7 Pre-construction Activities

Manitoba Hydro will obtain all licenses, permits, authorizations and other approvals including property agreements, rights-of-way easements and releases prior to commencement of construction of each individual project component or segment. Any additional terms and conditions of these approvals will be incorporated into the Construction Phase EnvPP. Any additional approval requirements to be obtained by the Contractors will be identified and communicated to the successful bidders. Pre-construction contacts will be established with provincial and federal regulatory authorities including Manitoba Conservation and Water Stewardship, Department of Fisheries and Oceans, Transport Canada and others, and formal points of contact will be identified.

Licensing and Environmental Assessment Department will typically participate in the tender/direct negotiated contract development process to ensure environmental requirements will be included as contract specifications. All bidders are required to list and defend their environmental record and must have an environmental policy including a commitment to environmental protection.

Meetings will be held with the successful contractors to review the environmental protection requirements, establish roles and responsibilities, management, monitoring and other plans, inspection and reporting requirements, and other submittals. Prior to the start of construction, contractor employees will be trained and/or oriented on environmental protection requirements. Manitoba Hydro and contract employees, project managers, consultants and others working on the proposed Project will be required to attend orientation sessions.

9.2.8 Construction Activities

A number of activities occur during construction of the Project to implement environmental protection measures and ensure compliance with regulatory requirements. Such activities include meetings with contractors, working with regulators, inspection and compliance, works stoppage and emergency response.

The Project Manager, Construction Supervisor/Site Manager, Environmental Officer/Inspector and Licensing and Environmental Assessment staff will meet with regulatory authority points of contact at the beginning of the Project to outline construction plans and schedules, and will request regular meetings to provide updates on project progress, environmental protection measure implementation and regulatory compliance. Manitoba Hydro will fulfill all regulatory requirements for submission of inspection, monitoring and other reports. Regulators will be notified immediately in case of emergencies situations, environmental accidents or other incidents in accordance with regulatory requirements. Any proposed changes or alterations to the construction project, environmental protection measures or monitoring activities will be reviewed with the appropriate regulatory authorities.

Manitoba Hydro will establish a comprehensive integrated environmental inspection program to comply with regulatory requirements, implement environmental protection measures and meet corporate environmental objectives.

9.2.9 Work Stoppage

The duty to stop work rests with everyone encountering situations where the environment, including biophysical, socio-economic and heritage resources, are threatened by an activity or occurrence that has not been previously identified, assessed and mitigated. Work stoppage is also to occur in the event of an environmental accident, extreme weather event or exposed human remains. Individuals discovering such situations are to inform their supervisor who will report the matter to the Construction Supervisor/Site Manager immediately who will issue a stop work order. The Contractor is also required to stop work voluntarily where construction activities are adversely affecting the environment or where mitigation measures are not effective in controlling environmental effects. Remedial action plans or other environmental protection measures will be developed and implemented immediately after discussion and prior to resumption of work if previously halted. Work is not to resume until the situation is been assessed and responded to and the Construction Supervisor/Site Manager approves the resumption of work. All stop work orders will be documented, reported to regulatory authorities (if applicable) and reviewed at construction meetings.

9.2.10 Emergency and Contingency Response

Spills of hazardous substances, fires and explosions, environmental accidents, heritage resource discoveries and other emergency or contingency situations require immediate action and response in accordance with established response plans. Provincial, federal and municipal authorities, and Manitoba Hydro personnel are to be notified in

accordance with regulations and emergency and contingency response plans. These plans provide names of emergency responders, up to date contact information and notification procedures. Contractors are also required to have emergency response plans outlining contacts and response measures to exigent situations including hazardous materials spills, heritage resource discoveries, environmental accidents and fires or explosions. Manitoba Hydro has emergency response coordinators to deal with spills of hazardous and other substances.

9.2.11 Tools and Resources

An Environmental Protection Information Management System (EPIMS) will be developed as a central repository of environmental protection information including but not limited to:

- Environmental protection documents;
- Reference information such as regulations and guidelines;
- Daily, weekly and monthly inspection reports;
- Environmental incident reports; and
- Monitoring program field data and reports.

The environmental inspection program will employ modern electronic recording, reporting and communication systems using field computers, geographic positioning systems and digital cameras Electronic forms will be transferable to supervisors and project managers thereby enabling rapid communication and response to emerging situations. Field computers will have project and other reference information needed for effective implementation of environmental protection measures including regulations, guidelines, licences, permits, engineering drawings, specifications, maps, reports and data.

The EPIMS will monitor and report on environmental protection implementation, regulatory compliance and incident reporting. EPIMS will be the mechanism to provide reporting and tracking of environmental protection performance, and the foundation of an auditable environmental protection program.

Manitoba Hydro personnel will maintain ongoing communications with Manitoba Conservation and Water Stewardship, other provincial and federal departments, and local First Nations and the MMF as necessary regarding implementation of the Project environmental protection plan. The Construction Supervisor/Site Manager and Environmental Officers/Inspectors will maintain ongoing communications with the Contractor and contract staff through daily tailboard meetings and weekly or otherwise scheduled construction meetings at the worksite.

9.3 ENVIRONMENTAL PROTECTION PLAN

9.3.1 Overview

The Environmental Protection Plan is the main implementation instrument under the Environmental Protection Program.

The EnvPP documents the environmental protection measures to provide for compliance with regulatory and other requirements, and to achieve environmental protection goals consistent with corporate environmental policies. Manitoba Hydro's environmental protection plans are designed as "user-friendly" reference documents that provide project managers, construction supervisors/site managers and contractors with detailed lists of environmental protection measures and other requirements to be implemented in the design, construction and operation phases of a project. Environmental protection measures are organized by construction component and activity, and environmental component and issue to assist project personnel in implementing measures for specific work sites and activities.

The EnvPP is a key element in implementing effective environmental protection and minimizing the potential adverse environmental effects identified in the EA Report. It also outlines actions to identify unforeseen environmental effects and to implement adaptive management strategies to address them. An important component of an EnvPP is monitoring and updating which serves to ensure that environmental protection measures remain current and to provide for continual improvement of environmental performance.

9.3.2 General Environmental Protection Measures

General environmental protection measures for the Project include mitigation measures and follow-up actions identified in the EA Report including design mitigation, provincial and federal regulatory requirements, best practice guidelines, Manitoba Hydro environmental policies and commitments, and input from stakeholders, local First Nations and the MMF, and the general public.

9.3.3 Specific Environmental Protection Measures

Specific environmental protection measures are provided for environmentally sensitive sites identified in the Project EA Report. Environmentally sensitive sites are locations, features, areas, activities or facilities along or immediately adjacent to the transmission line right of way and other project components that were determined to be ecologically, socially, economically or culturally important and sensitive to disturbance by the Project and, as a result, require site-specific mitigation measures. The sites include riparian vegetation and fish habitat.

For the Construction and Operation Phase Environmental Protection Plans, orthophoto map sheets will provide Manitoba Hydro project managers, construction supervisors and employees, and contractors and contract employees with detailed site-

specific environmental protection information that can be implemented, managed, evaluated and reported on in the field. The orthophoto map sheets will be provided in paper and electronic formats which will be used by Manitoba Hydro, contractor and regulatory staff on laptop computers in field offices, vehicles and aircraft.

9.3.4 Follow-up Activities

Follow-up is an activity carried out to verify the accuracy of the environmental assessment of a project, assess the effectiveness of measures taken to mitigate adverse effects and determine compliance with regulatory requirements. Follow-up identified in Chapter 8 will be implemented through inspection, monitoring, management and auditing actions.

Inspection

Inspection is the organized and routine examination or evaluation, including observations, measurements and sometimes tests, of a construction project or activity. Inspection results are compared to pre-defined requirements or standards to determine whether an activity conforms to these requirements. Inspection provides an essential function in environmental protection and implementation of mitigation measures. Much of the success in environmental protection will be attributable to how well environmental inspection is carried out during the construction phase of a project. Manitoba Hydro is establishing a comprehensive and integrated environmental inspection program to ensure effective implementation of environmental protection measures, compliance with regulatory approvals and fulfillment of corporate environmental objectives. The inspection program includes hiring and training of Environmental Inspectors to be on-site during all construction activities. Trained inspectors visit work sites daily and inspect for compliance with license terms and conditions, and adherence to environmental protection measures. Inspection activities are recorded in journals and daily inspection forms that are submitted to the Construction Supervisor. Weekly and monthly summary reports are also submitted to the Manitoba Hydro Project Manager and senior management as required or requested.

Monitoring

Monitoring is the continuing observation, measurement or assessment of environmental conditions at and surrounding a construction project or activity. Two main types of monitoring are typically undertaken for environmental assessments: 1) environmental monitoring to verify the accuracy of the predictions made and the effectiveness of the mitigation measures implemented; and 2) compliance monitoring to verify whether a practice or procedure meets legislated requirements. Monitoring determines if environmental effects occur as predicted, residual effects remain within acceptable limits, regulatory limits, criteria or objectives are not exceeded and mitigation measures are as effective as predicted. Monitoring also allows for adaptive management where monitoring results show there is a need for additional environmental protection or enhancement.

Monitoring plans will describe parameters to be monitored, methods to be used, roles and responsibilities, and reporting schedules. Monitoring will be carried out by Manitoba Hydro and may be contracted to environmental consultants that possess the necessary expertise, equipment and analytical facilities.

Management

Management is the control of pre-defined environmental effects, issues and concerns through the implementation of reasoned and approved courses of action. Management plans will be prepared to address important management issues, regulatory requirements and corporate commitments identified in the Project EA Report. The management plans will describe the management actions, roles and responsibilities, evaluation mechanisms, updating requirements and reporting schedules. The following management plans will be prepared prior to the construction of the Project:

- Erosion protection and sediment control plan;
- Emergency preparedness and response plan;
- Solid waste/recycling management plan.

The above plans will be prepared by Manitoba Hydro or the Contractor and may be contracted to environmental consultants that possess the necessary expertise and experience.

9.3.5 Review and Updating

The Construction Phase EnvPP will be reviewed annually or at the end of each construction season. Reviews will be conducted by Manitoba Hydro personnel in consultation with the Contractor, and regulators. Checklists will be used to ensure that reviews address all required information in a consistent manner. The results of each review will be summarized in a report that documents the issues addressed and provides recommended updates to the environmental protection plan.

9.4 SUMMARY

This section outlined the Environmental Management Program under which environmental protection commitments, mitigation measures and follow-up actions identified in the Project EA Report will be implemented, managed, reported and evaluated. The purpose, organization, responsibilities, management, communication and other aspects of the Environmental Management Program are described. EnvPPs are described as they relate to the construction, operation and decommissioning stages in the project planning cycle and environmental assessment and licensing process. Implementation of follow-up actions including inspection, management and auditing are discussed. Specific environmental management and monitoring plans are also identified.

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