TABLE OF CONTENTS

7.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVE ROUTES AND SITES 7-1

7.1 NORTHERN AND SOUTHERN PROJECT COMPONENTS ROUTE/SITE SELECTION PROCESS 7-2

7.1.1 Keewatinoow Converter Station and Associated Facilities 7-4

7.1.1.1 Keewatinoow Converter Station 7-4

7.1.1.2 Northern Construction Camp 7-7

7.1.1.3 230 kV AC Northern Collector and Construction Powerline Routes 7-7

7.1.1.4 Northern Ground Electrode Site 7-11

7.1.1.5 Northern Ground Electrode Line 7-15

7.1.2 Riel Converter Station 7-15

7.1.2.1 Southern Ground Electrode 7-16

7.1.2.2 Southern Ground Electrode Line 7-20

7.2 BIPOLE III HVDC TRANSMISSION LINE: ALTERNATIVE ROUTE IDENTIFICATION PROCESS 7-20

7.2.1 Regional Constraint Criteria 7-20

7.2.1.1 Biophysical and Socio-Economic Features/Constraints 7-21

7.2.1.2 Technical (Engineering) and Economic Constraints 7-22

7.2.1.3 Routing Opportunities 7-22

7.2.2 Overview of the Routing Process for the Bipole III Line 7-23

7.2.2.1 Mapping of Biophysical, Socio-Economic, Technical (Engineering) Features/Constraints and Routing Opportunities 7-24

7.2.2.2 Public Consultation 7-24

7.2.2.3 Aboriginal Traditional Knowledge 7-25

7.2.2.4 Identification of Alternative Routes 7-25

7.2.3 Description of Alternative Routes 7-26

7.2.4 Preliminary Evaluation of Alternative Routes A, B and C 7-28

7.3 PRELIMINARY PREFERRED ROUTE SELECTION PROCESS 7-30

7.3.1 Overview of Process 7-30
7.3.2 Initial Selection of the PPR from Route Alternatives (Outcome 1) 7-31
7.3.2.1 Initial Preferred Route (From RSM analysis) 7-32
7.3.3 Final Selection of a Preliminary Preferred Route (Outcome 2) 7-44
7.4 FINAL PREFERRED ROUTE SELECTION 7-49
7.4.1 Route Adjustments by Section 7-51
7.4.1.1 Sections 1 and 2 7-51
7.4.1.2 Section 4 7-52
7.4.1.3 Section 7 7-52
7.4.1.4 Sections 8 and 9 7-53
7.4.1.5 Section 10 7-53
7.4.1.6 Other Small Route Adjustments 7-53
7.5 DESCRIPTION OF FINAL PREFERRED ROUTE 7-54

APPENDICES

APPENDIX 7A Preliminary Preferred Route Selection Process

APPENDIX 7B Preliminary Preferred Route Adjustments

LIST OF TABLES

Page

Table 7.1-1: Summary of Ratings for Alternative Keewatinoow Converter Station Sites 7-5
Table 7.2-1: Bipole III Line: Regional Features/Constraints Considered in Alternative Routes Identification 7-23
Table 7.2-2: Features/Constraints[1] and Routing Opportunities within the Local Study Area for the Three Main Alternative Routes 7-29
Table 7.3-1: New Alternative Route Segments Identified for Evaluation 7-45
Table 7.3-2: Route segment in the Preliminary Preferred Route 7-49

LIST OF FIGURES

Page

Figure 7.3-1: Route Selection Process 7-31
Figure 7.4-1: Potential Re-alignment of Transmission Right-of-Way to Address Farming Concerns 7-51

LIST OF MAPS

		Page
Map 7-1	Project Study Area	7-59
Map 7-2	Potential Sites Considered for Keewatinoow Converter Station	7-60
Map 7-300	Northern Project Components	7-61
Map 7-300-1	Northern Project Components	7-62
Map 7-300-2	Northern Project Components	7-63
Map 7-300-3	Northern Project Components	7-64
Map 7-300-4	Northern Project Components	7-65
Map 7-4	Keewatinoow Converter Station Potential Ground Electrode Site	7-66
Map 7-5	Candidate and Preliminary Preferred Sites Considered for Keewatinoow Ground Electrode	7-67
Map 7-6	Riel Converter Station Potential Ground Electrode Sites	7-68
Map 7-7	Candidate and Preliminary Preferred Sites Considered for Riel Ground Electrodes	7-69
Map 7-8	Bottleneck Areas within Project Study Area	7-70
Map 7-9	Alternative Route Segments	7-71
Map 7-1000	Alternative Route Segments and Sections	7-72
Map 7-1000-01	Alternative Route Segments and Sections	7-73
Map 7-1000-02	Alternative Route Segments and Sections	7-74
Map 7-1000-03	Alternative Route Segments and Sections	7-75
Map 7-1000-04	Alternative Route Segments and Sections	7-76
Map 7-1000-05	Alternative Route Segments and Sections	7-77
Map 7-1000-06	Alternative Route Segments and Sections	7-78
Map 7-11	Preliminary Preferred Route	7-79
Map 7-1200	Adjustments Considered for the Final Preferred Route	7-80
Map 7-1200-01	Adjustments Considered for the Final Preferred Route	7-81
Map 7-1200-02	Adjustments Considered for the Final Preferred Route	7-82

Map 7-1200-03	Adjustments Considered for the Final Preferred Route	7-83
Map 7-1200-04	Adjustments Considered for the Final Preferred Route	7-84
Map 7-1200-05	Adjustments Considered for the Final Preferred Route	7-85
Map 7-1200-06	Adjustments Considered for the Final Preferred Route	7-86
Map 7-13	Alternative Route Options Through Thompson Nickel Belt Area	7-87
Map 7-14	Final Preferred Route	7-88

7.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVE ROUTES AND SITES

This chapter outlines the approach that was used to identify and evaluate alternative routes/sites for the Bipole III transmission line and other Project components. A description of the components of the Bipole III Project (the "Project") is found in Chapter 3, Project Description. This chapter provides an overview of the approach to route/site selection. The methodology and activities undertaken to select and evaluate the alternative routes/sites are provided along with a description and comparison of alternative routes/sites, and a description of the preferred routes/sites. The approach used to identify and evaluate sites for the Keewatinoow Converter Station and associated facilities, along with the Riel Converter Station ground electrode is outlined below in Section 7.1. This is followed by the approach used to identify the Final Preferred Route for the Bipole III line in Sections 7.2 to 7.5.

The objectives of the route/site selection processes for the Project were to minimize adverse biophysical and socio-economic impacts, and to satisfy technical and cost requirements for the Project. The Site Selection and Environmental Assessment (SSEA) process (Chapter 4, Approach to Assessment) for the Project commenced with the definition of a Project Study Area that was sufficiently broad to allow for the identification of several alternative routes for the Bipole III line (Map 7-1). Within the Project Study Area, study areas were identified for the Keewatinoow Converter Station, the ac collector and construction power lines in the north, the northern ground electrode and associated electrode line, as well as for the southern ground electrode and electrode line.

Manitoba Hydro utilized a two-stage approach (route/site identification, and route/site evaluation and selection) to select alternative routes for the Bipole III line and routes/sites for the other project components that, while recognizing cost and technical considerations, will have the greatest positive and least negative effect on people and the environment. The stages of the route/site selection processes have included review and comment by stakeholders including directly affected Aboriginal communities, landowners, elected municipal officials, interest groups, other interested parties, and government representatives (Chapter 5, Environmental Assessment Consultation Program). The alternative route/site selection processes used regional and site-specific biophysical, socio-economic and cultural features to identify and evaluate alternative routes/sites and to select preferred route/sites for the Bipole III line and other project components.

Careful routing and siting of transmission facilities is critical to avoidance and minimization of potentially adverse effects associated with their development. As such, the process of identification and comparison/evaluation of alternative routes (as outlined in this chapter) is based on generic criteria related to environmental issues and concerns, project-specific criteria identified during the course of Project Study Area delineation and characterization, including initial consultation, and on the technical and economic feasibility requirements of the transmission facilities. Amongst the various economic criteria identified, line length was used for the comparison of alternative routes within the context of the study area established for the Project.

The range of issues/concerns and related impacts will vary for the different Project components (e.g., Bipole III transmission line, northern and southern converter stations, and associated ground electrodes, and ac transmission connections to Manitoba Hydro's northern collector system) and for the specific areas being studied (i.e., northern resource areas versus southern agricultural areas; undeveloped lands versus more intensively developed lands, etc.). The SSEA process is tailored to match the particular requirements of the Project components and the corresponding issues.

Based on prior experience with siting and environmental assessments for similar transmission projects, SSEA-related issues typically cover a spectrum of biophysical and socio-economic issues and concerns. Some will relate specifically to potential environmental effects, while others will reflect perception of potential land use conflicts and related effects on the enjoyment or value of property. Related concerns may vary regionally in relation to such factors as geographic context and property tenure, as well as existing and prospective land and resource use patterns. SSEA studies conducted in the biophysical and socio-economic disciplines helped determine potential impacts, assess the associated effects and identify mitigation measures for negative effects.

Chapter 8, Effects Assessment and Mitigation, addresses the potential impacts along the preferred routes/sites and identifies mitigative measures to address those effects and any residual effects.

7.1 NORTHERN AND SOUTHERN PROJECT COMPONENTS ROUTE/SITE SELECTION PROCESS

Sites for Keewatinoow Converter Station and the northern ground electrode were established principally on the basis of technical siting criteria (i.e., engineering criteria) and a corresponding overview of area conditions. Alternative sites for the converter station were identified within approximately 5.5 km (3.4 miles) of the Conawapa

Generating Station as a result of technical requirements. There is a technical requirement that the ground electrode be located within 50 km (31 miles) of the Keewatinoow Converter Station site. The selection of the route for the ground electrode line was determined once the preferred location of the electrode was identified. A construction power station and work camps are also required for the Keewatinoow development. Alternative sites for the construction power station and construction camps were identified in close proximity to the potential Conawapa Generating Station site to allow for possible reuse as part of the potential development of Conawapa. The technical considerations involved in siting of these components are discussed in Chapter 3, Project Description.

The Keewatinoow Converter Station, construction power station, northern ground electrode and electrode line, as well as portions of the collector and construction power lines are located in the Fox Lake Resource Management Area (RMA) and the Fox Lake Traditional Territory.[1] The process for engagement with Fox Lake Cree Nation in relation to the Project is described in Chapter 5, Section 5.4.3.1.

Approximately 226 km of the Bipole III transmission line as well as a portion of the related facilities is located within the Split Lake Resource Management Area (SLRMA). The Keewatinoow Converter Station and related facilities, as well as approximately 15 km of the Bipole III transmission line are also located in the broader Split Lake Resource Area, just outside the SLRMA.[2] The process for engagement with Tataskweyak Cree Nation in relation to the Project is described in Chapter 5, Section 5.4.3.6.

The site for the Riel Converter Station is owned by Manitoba Hydro and was established through the Riel Reliability Improvement Initiative Project, which received its Environment Act Licence in April 2009. There is a technical requirement that the ground electrode be located within 50 km (31 miles) from the Riel Converter Station site. Sites for the ground electrode were established based principally on technical siting criteria and a preliminary technical overview of area conditions (Chapter 3, Project Description). Routing of the electrode line was deferred pending identification of the preferred location of the electrode, and is subject to further public consultation with the RM of Springfield and affected landowners. As with the northern components, the alternative sites/routes were subject to environmental assessment input from biophysical

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[1] The Fox Lake Resource Management Area and the Fox Lake Traditional Territory are defined in the 2004 Impact Settlement Agreement (ISA) between Fox Lake Cree Nation, Manitoba Hydro, and Manitoba. Portions of the Fox Lake Traditional Territory overlap with the Split Lake Resource Management Area.

[2] The Split Lake Resource Area and the Split Lake Resource Management Area are defined in the 1992 NFA Implementation Agreement. Portions of the Split Lake Resource Area overlap with the Fox Lake Resource Management Area.

and socio-economic disciplines, which were considered in the selection of the preferred site/route.

7.1.1 Keewatinoow Converter Station and Associated Facilities

7.1.1.1 Keewatinoow Converter Station

As discussed in Chapter 3, Section 3.5.1.1, Manitoba Hydro conducted a technical site selection and evaluation process to identify alternative sites and assist in identifying a preferred site for the Keewatinoow Converter Station. The Keewatinoow Converter Station site selection process involved identifying candidate locations within close proximity (5.5 km [3.4 mile]) of the potential location of the Conawapa Generating Station. The site selection process involved an evaluation of alternative locations based on a set of critical pass/fail technical requirements, and consideration of construction and operational benefits for each alternative. Ten sites were initially identified and evaluated in total; some sites did not meet the critical pass/fail requirements and hence, five sites remained for more detailed evaluation.

Environmental Features/Constraints

All five candidate sites, NCS1a, NCS1b, NCS3, NCS4a and NCS4b, for the Keewatinoow Converter Station are located in the Fox Lake RMA (Map 7-2). Technical specialists evaluated potential biophysical, socio-economic (land use) and heritage resource features/constraints with respect to the alternative sites. Table 7.1-1 presents a summary of the ratings of each alternative converter station site as low, moderate or high for level of constraint by each technical discipline. Alternative sites that have been rated as low, had no major issues or concerns identified and are the most favoured sites; moderate ratings indicate there were moderate issues or concerns with these sites, but the sites are somewhat favoured; and high ratings indicated the site is the least favourable from an environmental perspective due to a high number of issues/concerns.

Table 7.1-1: Summary of Ratings for Alternative Keewatinoow Converter Station Sites

	NCS1a	NCS1b	NCS3	NCS4a	NCS4b
Aquatic Resources	Moderate	Moderate	Moderate	High	Low
Terrestrial Invertebrates	Low	Low	Low	Low	Low
Amphibians & Reptiles	High	High	Moderate	Low	Low
Birds	Low	Moderate	Low	Moderate	Low
Northern Mammals	Low	Low	Low	Low	Low
Vegetation	Low	Low	Low	Low	Low
Forestry	Low	Low	Low	Low	Low
Soils and Terrain	Low	Moderate	Low	Low	Low
Land Use	Low	Low	Low	Low	Low
Heritage Resources	Low	Low	Low	Low	Low

Note: Alternative sites rated low had no major issues/concerns identified and are the most favoured; moderate ratings indicate moderate issue/concerns so the sites are somewhat favoured; sites rated high were the least favourable from an environmental perspective due to a high number of issues/concerns. Ratings and information provided by each discipline for the alternative Keewatinoow Converter Station sites were based on desk-top (high level) evaluation. Field investigations related to the alternative converter station site selection were subsequently conducted in order to make further determinations as to the potential differences amongst the sites.

In terms of the alternative sites for the Keewatinoow Converter Station, from an environmental perspective:

- Site NCS4b was the most favoured site by each discipline. This site had no moderate or high ratings associated with it.
- Site NCS3 was the next most favoured site with eight low ratings and two moderate ratings. The moderate ratings are a result of the presence of three stream tributaries in the site that may support small-bodied fish in the spring and some potential for suitable anuran breeding habitat for the SARA listed species of concern – the Northern Leopard Frog—as well as two common anuran species, the wood frog and boreal chorus frog.
- Sites NCS1a, NCS1b and NCS4a were the least favoured sites as each site had some moderate ratings and one high rating. High ratings for NCS1a and NSC1b were a result of a high potential for suitable anuran breeding habitat for the SARA listed species of concern – the Northern Leopard Frog—as well as two common anuran species, the wood frog and boreal chorus frog. NCS4a had a high rating for aquatics which is a result of the presence of Goose Creek in the site.

All sites were rated as having no known occurrences of rare and endangered species. However, some sites do have the potential for rare and endangered species to occur as a result of the presence/absence of specific habitat that is indicative of these species occurring (i.e., suitable anuran habitat, riparian areas for bird habitat). Field investigations related to the converter station site selection were conducted, where required, in order to make further determinations as to the potential differences between sites. The selection of the preferred converter station site was subject to satisfying technical criteria as outlined below. Review with Fox Lake Cree Nation as to the criteria for identifying the alternative converter station sites was undertaken.

Technical Constraints

From a technical perspective, all five alternative sites for the Keewatinoow Converter Station were considered acceptable. Based on a field exploration program and the findings in a geotechnical site evaluation, an optimized location between the top two ranking sites NCS4a and NCS4b was selected as the site for Keewatinoow Converter Station (Map Series 7-300). This site, referred to as NCS4, met all the critical pass/fail technical requirements, and had the most favourable construction and operational benefits in comparison to the other alternative sites. Optimizing a site between NCS4a and NCS4b allowed for all the technical requirements to be met while maximizing the benefits of the two sites. NCS3, and NCS1a and b were ranked second and third respectively. A description of the rationale for selecting Site NCS4 from a technical perspective is in Chapter 3, Project Description, Section 3.5.1.1.

As noted above, input from the technical specialists from both biophysical and socio-economic perspectives was incorporated in the evaluation and assessment of the selected northern converter station site. NSC4b was most favoured. Although NSC4a did have a moderate and high rating for birds and aquatics, optimization of the site between the two minimizes potential environmental effects.

Based on a follow-up field survey of the preferred site (NCS4), evidence of archaeological resources (i.e., possible burial sites and a small campsite) was encountered. Further follow-up heritage resource field investigations occurred in the summer of 2011. Based on the field investigations, the site of the possible burials is located within existing fencing and, based on discussions with Historic Resources Branch, the site will be permanently fenced prior to any construction activities. The second site, which is a small campsite, has been disturbed by a road. This site will require further archaeological investigation and monitoring during construction. Ongoing discussions are being held with Fox Lake Cree Nation and further discussions will occur with the Heritage Resources Branch prior to site development.

7.1.1.2 Northern Construction Camp

A start-up camp is required for the Project and was selected based on technical criteria as outlined in Chapter 3, Project Description, Section 3.5.4.8. Two alternatives were considered and evaluated for the main construction camp as follows:

- To the south of the Conawapa access road near the site of the potential Conawapa Generating Station site; and
- To the north of the Conawapa access road.

Manitoba Hydro also considered housing options in the Town of Gillam for the main construction camp.

Technical considerations with respect to site selection for the alternative construction camp sites included available access, size requirements, soil conditions and terrain (Chapter 3, Project Description, Section 3.5.4.8). From an environmental perspective, the construction camp alternatives were considered as part of the converter station site selection assessment. There was little difference in the two locations from an environmental perspective.

The preferred main construction camp site is located near the Keewatinoow Converter Station construction area and is adjacent to the south side of the Conawapa access road, to the north of the Nelson River (Map Series 7-300). The preferred site is an old burn site which limits the amount of clearing required. It was determined that establishing a construction camp near the Keewatinoow Converter Station site, in the vicinity of the proposed Conawapa Generating Station site, would be considered best based on available access, size, soil conditions and terrain. The selection of this site facilitates its subsequent reuse for possible future generating station development and avoids the cost and environmental effects of duplicating facilities in two different locations. The location also avoids concerns about potential adverse effects associated with having a camp located near the community of Bird which have been raised as an issue by Fox Lake Cree Nation.

7.1.1.3 230 kV AC Northern Collector and Construction Powerline Routes

Routes for the 230 kV northern collector lines were selected to maximize use of existing rights-of-way. One line will extend from the Long Spruce Generating Station to the Keewatinoow Converter Station and four lines will extend from Henday Converter Station to the Keewatinoow Converter Station. The 138 kV construction power line will be an extension of the existing KN36 line originating at Limestone to a construction power station to be located in the vicinity of the Keewatinoow Converter Station site. The collector line between Long Spruce Generating Station and Henday Converter

Station is on an existing Manitoba Hydro right-of-way, while the section between Henday and the Keewatinoow Converter Station site for the collector lines and the construction powerline is new right-of-way.

The existing right-of-way for the collector line between Long Spruce Generating Station and Henday Converter Station was identified based on previous planning studies conducted by Manitoba Hydro associated with the development of the Long Spruce Generating Station and the Henday Converter Station. The siting of the new right-of-way was based on finding a technically and functionally feasible route between the Henday Converter Station and the Keewatinoow Converter Station site, including satisfying NERC reliability requirements (Chapter 3, Project Description).

The existing right-of-way between Long Spruce Generating Station and Henday Converter Station is approximately 25 km (15 mile) in length. It extends south and then east to the Henday Converter Station, proceeding south and then north of PR 290, with a crossing of the Nelson River upstream of the Limestone Generating Station. The right-of-way has a width varying between 335 and 581 m (1,099 and 1,906 feet). The new transmission right-of-way between Henday and the site for the Keewatinoow Converter Station is approximately 27 km (17 miles) in length. It extends north and east on the north side of the Conawapa access road terminating at the site for the Keewatinoow Converter Station (Map 7-4).

As outlined below, technical specialists evaluated the features/constraints from biophysical and socio-economic perspectives for the collector lines and construction powerline rights-of-way.

Soils

The northern collector line and construction powerline routes are located in an area dominated by Organic Cryosols which represent the dominant soil type. Other important soils are Organic soils and Eutric Brunisols. The Brunisols are associated with mineral deposits that border streams. The rights-of-way are dominantly very poorly to poorly drained (731.4 ha, 89%) and consist mostly of mesic (509 ha, 62%) and fibric (222 ha, 27%) soil textures.

Aquatics

The collector lines and construction powerline have a total of 43 watercourse crossings, consisting mostly of various tributaries of the Nelson River. The crossings were rated for fish habitat and sensitivity to disturbance. Based on the habitat assessments, four watercourse crossings were considered to provide "No Fish Habitat". These crossings were wetlands with no connection to other waterbodies. Watercourse crossings considered "Marginal" fish habitat included 31 of the crossings. These crossings

consisted of upstream habitat of tributaries, far from their confluence with the Nelson River. They were within bog/fen habitat, which likely support only forage fish. Watercourse crossings considered "Important" fish habitat included eight of the crossings. These crossings included major rivers such as the Nelson and Limestone rivers with known indicator and forage fish populations. They also included downstream habitat of tributaries, close to their confluence with the Nelson River. Crossings of tributaries with known indicator and forage fish populations were also considered "Important", even if these crossings were within upstream bog/fen habitat, as indicator fish are likely to use this habitat to some extent. No crossings were considered to have "Critical" fish habitat.

For habitat sensitivity to disturbance, five watercourse crossings were considered to have a "Low" rating. Four of these crossings consisted of wetlands with "No Fish Habitat", and one was a small tributary with no signs of instability. Crossings considered to have "Moderate" habitat sensitivity to disturbance included 38 of the crossings. Most of these crossings (34) consisted of tributaries with broad, soft floodplains. Also, two tributaries had unknown bank conditions, and the Nelson and Limestone Rivers had exposed soil banks, indicating potential instability. No crossings were considered to have "High habitat sensitivity" to disturbance.

Vegetation

Based on land cover classification, vegetation cover types for the rights-of-way included exposed land (17.5 ha), tall shrub (90.8 ha), treed wetland (11.1 ha), wetland shrub (217.6 ha), wetland herb (17.8 ha), dense coniferous (52.3 ha), open coniferous (124.6 ha), sparse coniferous (279.8 ha) and a very minor component of dense mixedwood (<0.01 ha). The footprint for the collector lines also included 192.6 ha of riparian habitat and 544.1 ha of bog wetland.

Mammals

Spatial habitat datasets were utilized in evaluating and modeling specific components of mammal and caribou habitat for the collector and construction power lines rights-of-way. The habitat-based assessment tool identified habitat areas for specific individual mammals and VECs, including beaver, marten, moose and caribou. Based on the predictive model, the rights-of-way for the lines consisted of 6.9 ha of beaver habitat (0.71% of the Local Study Area); 215 ha of American marten habitat (7.4% of the Local Study Area); and 114 ha (0.77% of the Local Study Area).

In this region, migratory caribou (coastal and barren ground) are occasional migrants and occupants. These include the coastal populations, the Pen Island and Cape Churchill herds, and the Beverley-Qamanirjuaq barren ground caribou. With respect to caribou,

two predictive models were utilized, including calving habitat and winter habitat. The area of calving habitat within the rights-of-way was determined to be 360 ha (0.25% of the Local Study Area), whereas the area of winter habitat was determined to be 743 ha (0.44% of the Local Study Area).

Birds

Breeding bird surveys in the Hudson Bay Lowland Ecoregion, which the collector line footprint is located in, yielded 92 bird species observed 4,736 times at 502 locations. Passerine species were the most observed birds, with 64 species, followed by colonial waterbirds (41 species), waterfowl (28 species) and woodpeckers (20 species). In the Hudson Bay Lowland Ecoregion, the most commonly recorded bird species were white-throated sparrow (n = 403), fox sparrow (n = 387) and Lincoln's sparrow (n = 327). Fourteen bird species were sampled a single time including blue-winged teal, belted kingfisher, common merganser, spruce grouse and broad-winged hawk. Of those bird species identified as Valued Environmental Components (VECs), habitat for 11 species was noted in the collector line and construction power line rights-of-way including mallard, sandhill crane, bald eagle, ruffed grouse, sharp-tailed grouse, pileated woodpecker, yellow rail, short-eared owl, common nighthawk, olive-sided flycatcher, and rusty blackbird.

Reptiles and Amphibians

Wetlands are essential for the breeding stage of all Manitoban amphibian species, and are found throughout the Province, including the northern collector and construction power line rights-of-way which are within the Hudson Bay Lowland Ecoregion. The total area of habitat classes intersected or present within the 4.8 km (3.0 mile) Local Study Area around the rights-of-way for the collector lines and construction powerline includes: 0.7 km^2 of wetland habitat, 0.2 km^2 of herb wetland habitat, 2.3 km^2 of shrub wetland habitat, and 0.3 km^2 of treed wetland habitat.

Protected Areas Initiative, Areas of Special Interest, Reserve Lands and Treaty Land Entitlements

No issues were identified with respect to Protected Areas Initiative (PAI) lands, Areas of Special Interest (ASIs), Reserve Lands or Treaty Land Entitlement (TLE) land selections. East of the existing rail line to the Port of Churchill on Hudson Bay, a portion of the right-of-way for the lines crosses through the southeast edge of the Churchill Wildlife Management Area (WMA). No issues are expected to arise from the construction and operation of the collector lines or construction powerline in terms of PAIs/ASIs.

Land Use

From a land use perspective, the routes for the collector lines and construction power line are located within the municipal boundaries of the Town of Gillam, and in a portion of the Fox Lake and Split Lake Resource Management Areas (RMAs). The rights-of-way for the lines from Henday to the Keewatinoow Converter Station site cross the rail line to Churchill at two points (at Limestone and Amery). Other linear infrastructure crossed includes PR 290, as well as existing transmission lines.

Heritage Resources

A heritage resource impact assessment (HRIA) for the collector lines and construction powerline was conducted in summer 2011. Although access to some areas along the rights-of-way was limited, no heritage concerns were identified.

7.1.1.4 Northern Ground Electrode Site

Site selection for the northern ground electrode involved identifying sites with desirable engineering/technical characteristics within a 50 km (31 mile) radius of the preferred site for the Keewatinoow Converter Station (Map 7-5). As outlined in Chapter 3, Section 3.5.1.2, the identified sites were evaluated and ranked according to technical criteria. Alternative sites that were considered technically feasible were evaluated by study team specialists including socio-economic and biophysical disciplines.

Thirteen of the initially considered alternative sites were reviewed from a biophysical and socio-economic perspective. Although all sites were considered viable options, some issues/constraints were identified with some of the alternative sites that would make them less preferred from an environmental perspective.

Biophysical Features/Constraints

Birds

With respect to birds, there were differences between the alternative sites as a result of the presence of riparian habitat versus upland habitats. The presence of water influences bird communities, generally making them more productive and diverse. Sites NES1 to NES6 are generally located within or adjacent to, riparian habitats typically dominated by black spruce or tamarack forest and sparsely treed peatlands. Sites NES10 to NES12 are located next to waterbodies and/or watercourses. Bird populations generally have higher densities in wetland, creek and riparian habitats.

A review of the alternative sites indicated that most listed species are unlikely to occur in Sites NES1 to NES6 and NES10 to NES12, but there is a small potential for a few listed

species such as rusty blackbird, olive-sided flycatcher, yellow rail and short-eared owl to inhabit the area. A potential loss of habitat and habitat fragmentation could be associated with the ground electrode line and development of a maintenance road to the site. Therefore, distance to a road is important in the evaluation of the sites. Site NES5 and NES11 are the greatest distance from existing access, and therefore would likely be the least favourable sites for minimizing habitat loss or fragmentation.

Habitat in the vicinity of Sites NES7, NES8 and NES9 is open to sparse conifer (upland habitats). Habitats tend to be more fragmented in this area due to the proximity of the former town of Sundance, gravel pits, sewage lagoons and roads created to access the potential Conawapa Generating Station. Bird populations could have lower densities and diversity at these upland sites when compared to wetland, creek and riparian habitats at Sites NES1 to NES6 and NES10 to NES12. There is a small potential for a few listed species such as common nighthawk to inhabit the area as it prefers edges and openings in upland forest. Due to the open and sparse conifer habitat and the locations of Sites NES7, NES8 and NES9 adjacent to the Conawapa access road, fewer potential effects on bird communities are anticipated with these alternatives.

Aquatics

The alternative sites located near water sources that are of potential concern are ranked from lowest to highest for potential impact to fish and fish habitat (i.e., Sites NES9, NES13, NES7, NES4, NES5, NES3, NES1 and NES2). The potential effect on adjacent aquatic environments is due to in-stream construction, diversion of flow, placement of deleterious substances in or near fish bearing water, and water withdrawals from fish habitat. Sites with no watercourse overlap are preferred from an aquatics perspective and are ranked from lowest to highest in potential impacts (Sites NES6, NES10, NES12, NES11 and NES8). Of the eight additional alternative sites, five overlap with Leslie Creek (Sites NES14, NES15, NES16, and NES18) and two overlap an unnamed tributary of Leslie Creek. Leslie Creek is a known Brook Trout creek and continues to support this heritage species.

Amphibians and Reptiles

With respect to herpetiles, ground electrode sites that have been labelled as "good" terraces (i.e., generally dry sites on flat to gently sloping river terraces) are preferred. One species of concern listed under SARA (i.e., the northern leopard frog), was identified as potentially occurring in the area. Issues related to amphibians in the area and anuran habitat include potential impacts from construction activity, placement of deleterious substances in and near waterbodies used by local anurans; and water withdrawals from anuran breeding habitat. As there was considerable overlap of sites with respect to suitability, sites were more broadly categorized in four groups of potential impact

(ranked from lowest to highest for potential impacts to anurans and anuran habitat). Sites within each group were categorized and were relatively flexible in terms of the ranking, as follows in descending order of preference: Sites NES2, NES11, NES7, NES6 and NES4 (Group 1); Sites NES3, NES1 and NES5 (Group 2); Sites NES10 and NES8 (Group 3); and Sites NES12, NES9 and NES13 (Group 4).

Vegetation

Two plant species of concern were observed in the vicinity of the alternative ground electrode sites. These were Herriot's sage and arctic bluegrass. No protected species were known to be located at the alternative sites. Field assessments were conducted at nine alternative ground electrode sites, during which 58 different plant species were recorded. Snow willow was the only species of conservation concern observed during the surveys at potential Sites NES4 and NES7. This species is ranked as uncommon (S3) by the MCDC. No species listed by COSEWIC or under SARA or MESA were observed during the surveys. Sites NES5, NES6, NES10, NES11, and NES12 were preferred. Sites NES4 and NES7 were both occupied by species of concern and therefore the least preferred or if selected, would require mitigation to reduce the potential effect on these species.

Caribou and Mammals

Field studies were conducted to assess the alternative sites in relation to distribution and habitat requirements of coastal caribou and northern mammals. In general, electrode sites in proximity to existing access were preferred. Evidence of short-term winter use by Cape Churchill coastal caribou was present in the form of discernable winter trail and cast antlers for Sites NES1, NES2, NES3, NES4, NES5 and NES6. These sites were considered less preferred than Sites NES14 to NES21. Sites NES7, NES8, NES9 and NES13 were situated near riparian habitats. Aerial surveys of Site NES9 revealed evidence of winter use by coastal caribou. Because of caribou presence, this site was considered one of the two least preferred sites. Evidence of winter mammal sign was observed at Site NES11 from aerial and winter surveys. The area is infrequently occupied by Cape Churchill and Pen Island caribou.

Trails were observed at Sites NES14 to NES21; however, there was no evidence from either a habitat or distribution perspective for caribou and northern mammals. Sites NES14 to NES21s were contained within areas of existing disturbance and were considered favourable locations for the ground electrode. No evidence was noted for either northern mammals or caribou at Site NES12, although trails were present. Higher habitat diversity was observed at Site NES 12 relative to the other alternative sites. Site NES12 was more remote in relation to existing access routes than the other alternative sites. As such, it was considered one of the two least preferred sites from a coastal

caribou and northern mammal perspective, owing to a greater degree of habitat fragmentation that would result from construction activities.

Socio-Economic Features/Constraints

Land Use

From a land use perspective, Sites NES1 to NES13 are located in the Churchill WMA. A portion of the WMA is identified as an ASI under Manitoba's PAI. None of the sites fall within the ASI boundary. Sites NES1 to NES8, NES10, and NES13 are within the Fox Lake RMA, whereas Sites NES9, NES11 and NES12 are not. With the exception of NES12, all other sites are within the Fox Lake Traditional Territory as defined in the 2004 Fox Lake Impact Settlement Agreement (ISA) [Chapter 5, Section 5.4.3.1]. Sites NES11 and NES12 are located in the Split Lake RMA. Sites NES1 to NES9 and NES13 are in the municipal boundaries of the Town of Gillam. NES10 to NES12 are located within unorganized territory.

The Conawapa access road provides access to Sites NES1 to NES 9 and NES13. No road access is available for Sites NES10 to NES12. There is rail access to the east of NES11. As there is a preference that the ground electrode site be located near existing access (which is a siting criteria), Sites NES1 to NES9 and NES13 are more desirable sites based on this criteria. NES 8 and NES9 are in proximity to existing borrow areas.

Heritage Resources

There are two provincially registered archaeological sites near SitesNES8 and NES9. Due to the presence of granular borrow areas near NES3, NES4, NES8 and NES9, there is potential for palaeontological material to be present. No evident heritage resources were found near NES10 and NES11. However, because NES11 has been identified near the Weir River HBR crossing, in an area known for its extensive fishery, pre-European contact and historic weir structures may be present in the river. As a result, potential historic fishing campsites may be present.

Technical Constraints

From a technical perspective, the three ground electrode sites that showed the best geophysical characteristics were selected for further evaluation and ranking (Sites NES4, NES6 and NES7) [Chapter 3, Project Description, Section 3.5.1.2]. Criteria considered in the evaluation and ranking of candidate electrode sites consisted of:

- Interference with the surrounding facilities, including the ground potential rise on soil near the facilities, which can result in corrosion of facilities;
- Stray currents or problems due to transferred potentials;

- Geophysical and geographical characteristics of the sites (i.e., slope of the ground, permafrost, water courses and obstructions); and
- Construction cost.

From a geophysical and geographical perspective, NES6 was determined to be the best as it is a level site with adequate moisture and no evidence of permafrost. NES4 and NES7 are both sloping sites, with some permafrost and have either a stream or creek running through them.

The three sites were ranked in order of preference: NES6, NES7 and NES4. All three sites were considered technically feasible for development with sites NES6 and NES7 offering the lowest interference effects on proposed transmission lines. NES6 was determined to be technically feasible offering the lowest overall interference effects, and is the preferred site (Map Series 7-300). Site NES7 will remain in consideration as a possible site alternative should unforeseen site-specific environmental considerations make NES6 unfeasible to mitigate. A description of the rationale for selecting Site NES6 from a technical perspective is in Chapter 3, Project Description, Section 3.5.1.2.

Follow-up field investigation to determine the presence of heritage resources on the preferred site occurred in the summer of 2011. No heritage resources were identified.

Detailed design for the recommended site NES6 commenced in early 2011 and involves a refined measurement program and additional interference studies. Detailed design will determine the exact footprint, type and location of the electrode. Detailed surface resistivity, electro-osmosis, detailed sub-surface geology, permafrost, and well water production rates will also be determined.

7.1.1.5 Northern Ground Electrode Line

Manitoba Hydro considered two options for routing the ground electrode line. The possibility of routing either along an existing cut line (i.e., a former construction power route that was cleared in the 1980s) or along the existing Conawapa access road were investigated. A road alignment option would mean constructing more guy supports to follow curves in the access road and crossing the line back and forth across the road to facilitate the required guying. The preferred route for the line is along the existing cut line, which is also the most direct route (Map Series 7-300).

7.1.2 Riel Converter Station

The Riel Converter Station site will be located at the existing Riel Station, which is west of PR 207 in the eastern half of Section 26, Township 10, Range 4 E.P.M in the RM of

Springfield (Map 7-6). A portion of the station site (and related transmission line rights-of-way) was purchased at the time of development of the 500 kV Dorsey-Forbes international transmission line D602F. The site was later enlarged to reflect earlier plans for Bipole III development and ongoing conceptual planning for development of the station.

The site is currently being developed as part of The Riel Reliability Improvement Initiative which received its Environmental Act Licence in 2009. General site preparation and the majority of infrastructure required for the Riel Converter Station has been or is being completed as part of Riel Sectionalization. Site infrastructure for Riel Sectionalization includes development of overall site grading and drainage, internal roadways, station lighting, station security, oil containment systems, domestic water and wastewater systems, fire suppression systems, station grounding, communications facilities, and some ancillary buildings and equipment. Expansion of infrastructure in the site (i.e., additional oil containment facilities, fire suppression systems, communications facilities, etc.) will be required to accommodate the Project (Chapter 3, Project Description, Section 3.6). Input from technical specialists from biophysical and socio-economic perspectives was incorporated into the environmental assessment of the Riel Converter Station (Chapter 8, Effects Assessment and Mitigation).

7.1.2.1 Southern Ground Electrode

Site selection for the southern ground electrode involved identifying sites with desirable characteristics within a 50 km (31 mile) radius of the Riel Converter Station site. As discussed in Chapter 3, Project Description, Section 3.6.1.2, the identified sites were evaluated and ranked according to technical criteria. Alternative sites that were considered technically feasible were evaluated by study team specialists, including socio-economic and biophysical components.

Seven potential ground electrode sites were initially investigated by study team specialists for the Riel Converter Station, all located in the RM of Springfield (Map 7-6). The alternative sites were evaluated based on each site encompassing one section of land (259 ha [640 ac.]). Five of the alternative sites were located north of PTH 15 and two sites were located south of PTH 15. Six of the seven sites were located east of the community of Anola and PTH 12.
One site was located midway between the community of Anola and the Hazelridge area to the west of PTH 12. The sites evaluated were as follows:

- 21-11-6 EPM (Site 1);
- 26-11-7 EPM (Site 2);

- 13-11-7 EPM (Site 3);
- 24-10-7 EPM (Site 8);
- 20-11-8 EPM (Site 9);
- 8-11-8 EPM (Site 10); and
- 9-10-7 EPM (Site 11).

Based on the evaluation of alternative sites for the ground electrode, four sites were ranked in order of preference: Site 1, Site 3, Site 10 and Site 2. All four sites were considered technically feasible for development with Site 1 having the lowest overall electrical interference effects. Based on the technical constraint evaluation, Sites 1, 2, 3 and 10 were considered for further evaluation as possible sites for the ground electrode. All of these sites were reviewed from biophysical and socio-economic perspectives as outlined below.

Biophysical Issues/Constraints

Forestry

Site 10 would have limited effects on forestry values as the majority of the site is classified as wetlands and therefore non-productive in forestry terms. Forestry values are substantially higher on Sites 2 and 3, both being mostly forested and with a high capability for forestry.

Aquatics

Of the sites identified, Site 1 is removed from any water source and is located on farmland. Sites 2 and 3 are forested with shallow wetland areas with potential connection to the headwaters of Cooks Creek. The sites are likely not fish bearing. Site 1 is preferred.

Amphibians and Reptiles

In terms of the presence of amphibians, reptiles and terrestrial invertebrates, shallow wetland areas in Sites 2 and 3 could potentially act as breeding habitat for some anurans requiring more ephemeral breeding spots, such as wood frogs and boreal chorus frogs. The alternative sites are ranked Site 2 and Site 3, with Site 1 being preferred.

Birds and Mammals

In terms of birds and mammals, the most apparent difference between the alternative sites is the amount of forest habitat available. The presence or absence of natural forest

cover has a larger tendency to influence bird and mammal communities, generally making them more productive and diverse than those compared to croplands. Of the alternative sites assessed, Site 1 would likely have the least amount of negative effects on birds and mammals as it consists primarily of agricultural croplands. There is low overall potential for rare or endangered bird or mammal species occurrences. If rare and endangered species were present, they would more likely be located in nearby wetlands, shrublands or grasslands as opposed to forest areas.

Vegetation

Several plant species of conservation concern were previously observed in the vicinity of the alternative ground electrode sites. Field assessments were conducted at four alternative ground electrode sites, during which 129 different plant species were recorded. Two species of concern were observed, including: showy lady's-slipper (Sites 2 and 3); and black ash (Site 10). Both of these species are ranked by the MCDC as uncommon (S3). No species listed by COSEWIC or under SARA or MESA were observed at the time of the surveys. Other than species of conservation concern, no other issues/constraints (i.e., prairie) were observed. Sites 1, 2, 3 and 10 were known to support species of concern. Sites 2 and 3 were the least preferred due to greater than one species of concern being observed on each site.

Socio-Economic Issues/Constraints

Land Use

From a land use perspective, Site 1 (22-11-6 EPM) was not preferred given the number of rural residences and farmsteads in the section, followed by Sites 2 and 3. Site 10 has no rural residences or farmsteads in the section.

Agriculture

From an agricultural perspective, including field severance and agricultural productivity, Section 21-11-6 EPM (Site 1) had the most productive soils and was being cropped. Section 26-11-7 EPM (Site 2) had some limited agricultural activity, while Sections 13-11-7 EPM (Site 3) and 8-11-8 EPM (Site 10) were not currently being utilized for agriculture.

Heritage Resources

In the RM of Springfield, many sites of a native origin have been disturbed over the years by cultivation. No known areas of potential concern have been identified according to Manitoba Historic Resources Branch records.

Technical Constraints

Although all sites (Sites 1, Site 3, Site 10 and Site 2) were considered technically feasible for development of the ground electrode because of land use issues with Site 1, Site 1c, which is adjacent to Site 1, was identified. Subsequent evaluation indicated that Site 1c was preferred from a biophysical perspective although it is currently under agricultural production, and contains two residences and two shelterbelts. In the summer of 2011, a Heritage Resource Impact Assessment was conducted for the Site 1c. The site was under agricultural production and no heritage materials were found.

In terms of technical issues, Site 1c had the lowest overall interference effects. Based on the evaluation, Site 1c (termed SES1c) was selected as the preferred site for the southern ground electrode (Map 7-7; Chapter 3, Project Description, Section 3.6.1.2). Site 3 (termed SES3) will remain in consideration as a possible site alternative should unforeseen site-specific environmental considerations make Site SES1c unfeasible to mitigate.

Detailed design for the recommended site SES1c commenced in early 2011 and involves a refined measurement program and additional interference studies. Detailed design will determine the exact footprint, type and location of the electrode. Detailed surface resistivity, electro-osmosis, detailed subsurface geology, and well water production rates will also be determined.

Consultation

A consultation process was conducted for the southern ground electrode as part of Round Four of the EACP. The process included a presentation to the RM of Springfield, a landowner information event and a Public Open House. The purpose was to present the alternative sites for the ground electrode, respond to issues, ideas and concerns, and to gain feedback on the sites. During the consultation process, feedback provided from landowners within a half-mile of the preferred ground electrode site indicated that about half had some concern with the site while about half indicated they had no concern. Specific issues noted by participants included concern about the potential impacts of a ground electrode on EMF, property values and safety. Manitoba Hydro contacted the two owners of three properties that would need to be purchased for site development. Property purchases for the site seem to be feasible. Public Open House responses indicated limited concerns with the preferred site for the southern ground electrode.

7.1.2.2 Southern Ground Electrode Line

Manitoba Hydro is in the process of selecting a route for the southern ground electrode line in the RM of Springfield to connect Riel Converter Station to the preferred ground electrode site in 20-11-06 EPM (Map 7-7) The design of the electrode line will closely resemble the line currently in service for Dorsey convertor station (Figure 3.6-5). It is also similar in size to distribution power lines common along roadsides in rural Manitoba. It is anticipated that it can be routed on existing road or other rights-of way. The preferred route for this line is currently being determined and adjacent landowners and the RM of Springfield will be notified of its location prior to route finalization. The preferred route and any responses from local landowners adjacent to the preferred route will be provided to Manitoba Conservation in December 2011.

7.2 BIPOLE III HVDC TRANSMISSION LINE: ALTERNATIVE ROUTE IDENTIFICATION PROCESS

The SSEA studies for the Project commenced with the definition of a study area that reflected the basic functional requirements of the Project and was considered sufficiently broad to allow identification of several alternative routes for the Bipole III HVdc transmission line (Map 7-1). The northern and southern limits of the Project Study Area were based on the conceptual location of the Keewatinoow Converter Station and the site of the southern converter station at Riel Station. The western boundary is the Manitoba-Saskatchewan boundary, while the eastern boundary was established, in part, by the existing location of Bipoles I and II and the need to maintain separation from them. The eastern limit has also been defined by the presence of large water bodies (i.e., Cedar Lake, Lake Winnipegosis and Lake Manitoba).

7.2.1 Regional Constraint Criteria

Potential issues and sensitivities in terms of biophysical, socio-economic, technical (engineering) and cost considerations were translated into a list of regional features/constraints criteria. The list evolved as the SSEA process progressed to include additional input from technical specialists and feedback from the EACP (Chapter 5). The biophysical, socio-economic, and technical (engineering) criteria listed in Table 7.2-1 represent features/constraints which should generally be avoided by alternative routes.

For purposes of alternative routes identification, regional data were considered. Broad preferences between alternative routes were based on distinctions apparent at the regional level. As a result, development buffers (termed Local Study Areas) which were 4.8 km (3.0 mile) wide and centered on the alternative routes were identified along each of the alternative routes to allow for potential effects on site-specific features/constraints to be avoided or mitigated during the identification of a preliminary preferred route and detailed routing process.

7.2.1.1 Biophysical and Socio-Economic Features/Constraints

A listing of biophysical and socio-economic features/constraints which were considered to be potentially affected by the Project was developed (Table 7.2-1). The listing reflects previous experience with similar transmission projects, Aboriginal Traditional Knowledge (ATK), local knowledge, and stakeholder input during the EACP, technical specialist input and particular features of the Project Study Area itself. All features/constraints were considered to be important and, as such, were not formally prioritized. The listing was intended to identify sensitive features/constraints for the purpose of alternative route identification and comparison. Potential impacts and mitigation opportunities were examined during the alternative routes evaluation and comparison, and the preferred route selection process.

Biophysical features/constraints included park reserves, ecological reserves, protected areas under the Protected Areas Initiative [PAI]), National parks and Provincial wilderness parks, Areas of Special Interest (ASI) and other high and moderate priority areas under PAI, other provincial parks, provincial forests and Wildlife Management Areas (WMAs), critical habitat (e.g., caribou calving areas) and important bird habitat areas, species at risk (areas of concern, rare plant species and communities) and conservation program/project sites (e.g., Manitoba Habitat Heritage Corporation [MHHC], Ducks Unlimited Canada [DUC], etc.).

Socio-economic features/constraints included First Nation Reserve Lands, Treaty Land Entitlement (TLE) selections, Northern Flood Agreement lands, existing towns, villages and settlements (including areas designated for future urban development), municipal parks and other recreational areas/facilities, military land reserves, intensive agricultural operations, mineral interests and operations, communication towers, and airport and aerodrome facilities.

In many cases, these criteria reflect some formal recognition of their importance either through Federal, Provincial or regional designation (e.g., designated/dedicated parks and conservation management areas), mineral resource exploration/extraction areas (e.g., Thompson Nickel Belt) and/or regulatory protection (e.g., species at risk).

7.2.1.2 Technical (Engineering) and Economic Constraints

Table 7.2-1 outlines technical (engineering) and cost constraints which were identified for the Bipole III line. In terms of technical (engineering) constraints, where feasible, routing through major waterbodies, extensive area of deep peat and widespread permafrost areas should be avoided. A general technical review of alternative routes was undertaken to examine the implications of constructing and operating the line.

In terms of cost constraints of routing a transmission line, limiting the line length and number of heavy angle structures is considered. For comparison of alternative routes, line length and the number of heavy angle structures were used as a preliminary proxy for cost. Where site-specific constraints were identified, preliminary cost estimates of technical solutions were developed.

Reliability criteria are intended to reduce the risk of major outages to power supply (Chapter 2, Needs and Alternatives). In terms of the Manitoba Hydro transmission system, this means maintaining separation of the Bipole III line from other major transmission lines and, in particular, Bipoles I and II, in order to minimize the risk of a common failure arising from a single catastrophic event (e.g., a tornado or an ice storm). This also means minimizing the number of transmission line crossings and the associated risk that this entails.

7.2.1.3 Routing Opportunities

Within the Project Study Area, two general types of routing opportunities were identified – those associated with existing linear rights-of-way and those associated with the land base. In terms of existing linear rights-of-way, these included existing transmission lines (subject to the system reliability criterion requiring separation from major transmission lines), road and rail rights-of-way (both existing and abandoned), and undeveloped municipal road allowances.

In terms of the land base in agricultural Manitoba, marginal agricultural lands and pasture lands were considered as potential routing opportunities. Lands with limited or no agricultural use, native and non-native pasture and haylands, and tame forage areas generally involve less concern about disruption of agricultural practice than do more productive and more intensively used agricultural lands. Related routing opportunities are relatively local in character and, given the functional requirements of the HVdc transmission, the only feasible alternative may be routing through productive agricultural lands in some areas.

Table 7.2-1: Bipole III Line: Regional Features/Constraints Considered in Alternative Routes Identification

Biophysical and Socio-Economic Features/Constraints:
Park Reserves, Ecological Reserves, Designated Protected Areas
National Parks/Provincial Wilderness Parks
Areas of Special Interest, high and moderate priority areas (Protected Areas Initiative [PAI])
Other Provincial Parks, Provincial Forests, Provincial Wildlife Management Areas
Conservation Program/Project Sites (Manitoba Habitat Heritage Corporation [MHHC], Manitoba Wildlife Federation (MWF))
Critical Habitat (e.g., caribou calving areas)
Important bird habitat (e.g., major wetlands, waterfowl hot spots (Ducks Unlimited Canada [DUC])
Species at Risk – areas of concern, rare plant species and communities
First Nation Reserves/Treaty Land Entitlement Selections/Northern Flood Agreement Hold Areas
Existing Towns, Villages and settlements (including areas designated for future urban development)
Municipal parks/other recreation areas and facilities
Military Land Reserves/Department of National Defence (DND) Bases
Intensive agricultural operations (e.g., row cropping, irrigation, organic farms)
Mineral interests, aggregate deposits, quarries and pits
Communication towers/facilities
Airports/Aerodromes and Airfields
Technical (Engineering) Constraints:
Large waterbodies (e.g., greater than 500 m in width)
Areas of steep terrain
Widespread permafrost/deep peatland areas
Transmission line crossings
Proximity to Bipoles I and II HVdc transmission lines and other major transmission line rights-of-way
Number of Heavy Angle structures
Line length
Potential Routing Opportunities:
Existing occupied/abandoned transmission line rights-of-way
Other Linear Rights-of-Way (provincial highways, roads, railways)
Pasture lands/marginal agricultural lands
Unoccupied Crown lands

7.2.2 Overview of the Routing Process for the Bipole III Line

The following provides an overview of the routing process for identification of alternative routes for the Bipole III line.

7.2.2.1 Mapping of Biophysical, Socio-Economic, Technical (Engineering) Features/Constraints and Routing Opportunities

In order to identify alternative routes, environmental information about the biophysical and socio-economic features of the Project Study Area (i.e., vegetation, wildlife and aquatic resources, locations of communities, conservation areas, economic land uses such as agriculture, and heritage resources, etc.), were assembled from existing published sources of information. Through this process, which involves characterizing the Project Study Area, the locations of sensitive biophysical and socio-economic features (potential impact areas) and routing opportunities (e.g., existing transmission line rights-of-way; other linear rights-of-way) were identified. A preliminary listing of potential issues and concerns was developed and was subsequently translated into the features/constraints as outlined in Table 7.2-1. Identification of the alternative routes considered technical (engineering) and cost considerations such as maintaining separation of Bipole III from other major transmission lines, suitable soil conditions for tower footings, avoiding large water bodies, minimizing line length, the number of heavy angle structures, etc.

Features/constraints and opportunities were mapped as regional features to produce Project Study Area features/constraint and opportunity maps. Results of the study area characterization, as well as features/constraint data, were documented on maps. The regional features/constraint and opportunity data were digitally mapped on a set of Geographic Information System (GIS) and National Topographic System (NTS) base maps at a 1:250,000 scale. GIS was used to manage and store all of the mapped information and to standardize raw data derived from sources at different scales. The features/constraint and opportunity maps were the main tools used in the alternative routes identification process.

The data collection process involved contact with a variety of local and provincial government agencies, as well as institutional and private organizations (e.g., DUC, MHHC, MWF, NCC, etc.), and literature searches of both published and unpublished reports and data sets. In some instances, original data (e.g., agricultural data) were collected through field work for the purpose of determining specific alternatives. The compiled data were applied as route selection criteria to identify and characterize the alternative routes.

7.2.2.2 Public Consultation

The EACP involved four rounds of consultation (Chapter 5). Rounds 1 and 2 are pertinent to the identification of alternative routes for the Bipole III line. From early 2008 to the winter of 2008, Manitoba Hydro conducted introductory Round 1 meetings with planning districts, elected officials and the leadership of northern and southern

communities in the general area under consideration for routing the Bipole III HVdc transmission line. A series of Regional Open Houses was held throughout the Project Study Area. Round 2 activities were initiated in early 2009 and continued to the fall of 2009. Round 2 included discussions with elected officials, First Nation Leadership and Northern Affairs Community (NAC) councils of communities in the Project Study Area, planning districts, resource users, landowners, interest groups, government departments, as well as Regional and Community Open Houses.

Rounds 1 and 2 focused on providing an introduction to the Project, and identifying potential constraints, opportunities, and issues to assist in identifying alternative routes. In particular, Round 2 elicited a number of suggested routing constraints and opportunities which were taken into consideration in identifying alternative routes for the line. This included the identification of abandoned railway lines in the Swan Valley Planning District that could offer potential routing opportunities, a preference to route the Bipole III line to the east of the Town of Swan River, and the presence of a number of organic farms in the Big Grass Planning District.

7.2.2.3 Aboriginal Traditional Knowledge

In undertaking the Bipole III planning and assessment process, Manitoba Hydro wanted to be respectful and inclusive of different forms of knowledge. As outlined in Chapter 5, Manitoba Hydro recognizes the importance of early and meaningful engagement of Aboriginal communities in project planning processes, including the importance of incorporating ATK perspectives.

As described in Chapter 5, the Bipole III ATK process included community participation in ATK workshops undertaken by the Manitoba Hydro study team and community-led studies funded by Manitoba Hydro, but undertaken independently of the ATK workshop process. In total, 19 communities participated in 15 ATK workshops, and seven communities undertook self-directed studies.

The route selection process identified and evaluated alternative routes based on a variety of criteria, including community input, local knowledge, ATK, and socio-economic, biophysical, technical and cost considerations. Incorporation of the findings of the ATK process into the selection of the preferred route was complicated as the process took place at different points in the Project planning process.

7.2.2.4 Identification of Alternative Routes

The first stage of the identification of alternative routes consisted of identifying routing features/constraints and bottleneck areas in the Project Study Area, along with input on

routing features/constraints in the Project Study Area during Rounds 1 and 2 of the EACP. Technical (engineering) constraints, cost considerations and possible routing opportunities were considered in the identification of alternative routes. This information assisted in narrowing down the areas where alternative routes could be identified in the Project Study Area.

The locations of Moose Lake (North and South), and Red Deer Lake create two bottleneck areas (Map 7-8). Northwest of North Moose Lake and South Moose Lake, which are a routing constraint, is the Tom Lamb WMA, along with the Clearwater Lake Provincial Park and the Cormorant Forest Reserve. In addition, there are other interests in the area including Opaskwayak Cree Nation and Mosakahiken Cree Nation Reserve Lands. A second bottleneck area occurs in the vicinity of Red Deer Lake as the Porcupine Forest Reserve and Lake Winnipegosis are located to the south and southeast. Red Deer Lake is a sizeable lake which is located between Lake Winnipegosis and the Manitoba-Saskatchewan border. Other constraints in this area include a TLE selection along the Red Deer River.

During the initial stage of the process, which was the identification of alternative routes, three "main" alternative routes (Alternatives A, B and C), including a development buffer (4.8 km [3.0 mile] wide centered on the routes and termed the Local Study Area, were identified for the line. This allowed for route adjustments to avoid site-specific features. A number of connections were identified between the three main alternative routes to allow for routing options between them. This allowed for connectivity between route segments to minimize potential negative effects by moving to another alternative route segment. The alternative routes and connections were systematically refined and reduced to enable more detailed evaluation, and, ultimately, to select a preliminary preferred route for the line.

During the second stage of the process, which was the comparison of the alternative routes, more detailed analysis was undertaken to compare and evaluate the alternative routes identified within the Local Study Areas. The following section describes the three main alternative routes for the line.

7.2.3 Description of Alternative Routes

The following provides an overview of the three main alternative routes for the Bipole III line. The alternative routes are illustrated on Map 7-9. As noted above, input from stakeholders including communities and other potentially affected parties was sought in identifying (Rounds 1 and 2 of the EACP) and comparing the alternative routes (Round 3 of the EACP). All three routes originate at the proposed site of the Keewatinoow

Converter Station, and then proceed southwest, south and then southeast to the Riel Converter Station site, east of the City of Winnipeg.

From Keewatinoow to Riel, Alternative Route A is progressively the most northern, western and southern route. It is the longest and the least direct route of the three main options. Alternative Route A crosses north and west of Nisichawayasihk Cree Nation (NCN) Reserve Lands at Nelson House to a point northwest of the Town of Snow Lake. From there, Alternative Route A proceeds south to the southwest of the community of Snow Lake before proceeding east of the Grass River Provincial Park. Alternative Route A then proceeds west, to a point near the Manitoba-Saskatchewan border where it proceeds south. South of The Pas, the route proceeds south to the west of Red Deer Lake and Riding Mountain National Park. Southwest of Riding Mountain, the route extends in a southeast direction between Neepawa and Portage la Prairie where it proceeds easterly to a crossing point of the Red River south of Ste. Agathe. It then proceeds north and west into the Riel Converter Station site.

As it extends from Keewatinoow Converter Station to Riel Converter Station, Alternative Route B is progressively the most southern and eastern route, and is also the shortest. It crosses to the southeast of the City of Thompson, and east of the community of Snow Lake, and then proceeds south to the southeast of the community of Cormorant and Clearwater Lake Provincial Park. South of The Pas, Route B proceeds south and is the closest route to Lake Winnipegosis and Lake Manitoba. South of Portage la Prairie, it extends east as the northern most route across the Red River and then extending north-east into the Riel Converter Station site.

Alternative Route C uses a combination of both Alternatives A and B for short segments as it extends westerly from the Keewatinoow Converter Station. It is the central route through the majority of the Project Study Area and is intermediate in length. Route C crosses to the south of NCN Reserve Lands at Nelson House to a common point with Alternative Route A, northwest of the community of Snow Lake. Alternative Route C then proceeds south on the same alignment as Alternative Route A to a point southwest of Herb Lake Landing. From here, Route C shares the same alignment as Alternative Routes B to a point southwest of Tom Lamb WMA. Alternative Route C then proceeds south and continues to be mainly located to the west of Alternative Route B where it isn't sharing the same route as either Alternative Route A or B. South of Portage la Prairie, it is routed between Routes A and B. It shares a common Red River crossing with Alternative route B before continuing east, north and west into the Riel converter station.

7.2.4 Preliminary Evaluation of Alternative Routes A, B and C

The Local Study Areas (a 4.8 km [3.0 mile] wide band centred on each alternative route) for the three main alternative routes (A, B and C) tend to either cross or avoid regional features/constraints to a similar extent. In terms of the Local Study Area, all three main alternative routes avoid:

- Species at Risk – Areas of Concern; and
- National Parks.

Features/constraints which are crossed or in the vicinity of the alternative routes to varying degrees, but which can be avoided at the preferred route selection stage, include:

- First Nation Reserve and Treaty Land Entitlement (TLE) lands;
- Ecological Reserves, Provincial Wilderness Parks;
- Protected Areas Initiative (PAI) - high and medium priority protected areas;
- Provincial Natural and Heritage Parks;
- Caribou calving areas;
- Waterfowl locations;
- Manitoba Habitat Heritage Corporation (MHHC)/Ducks Unlimited Canada (DUC) /Manitoba Wildlife Federation (MWF) / Nature Conservancy of Canada (NCC) project/program sites; and
- Existing towns, villages and settlements.

Constraint features crossed to a similar extent by or in the vicinity of the three alternative routes include:

- Medium priority Areas of Special Interest (ASIs);
- Other provincial parks and provincial forests;
- WMAs;
- Important Bird Areas;
- Major Rivers/Creeks;
- Other Crown Land parcels;
- Aggregate deposits/sand deposits / mining interests; and
- Community Pastures.

Table 7.2-2 provides an overview of the three main alternative routes in terms of features/constraints and routing opportunities.

Table 7.2-2: Features/Constraints[1] and Routing Opportunities within the Local Study Area for the Three Main Alternative Routes

Regional Feature	Route A (Western)	Route B (Eastern)	Route C (Central)
Approximate Length (km) [5]	**1,485**	**1,290**	**1,350**
Environmental			
Overlap with Ecological Reserves / National Parks	1	1	1
Overlap with High – Medium Priority Protected Areas	19	23	18
Overlap with High – Medium Priority Areas of Special Interest	4	3	2
Overlap with Provincial Parks and Forest Reserve Areas	5	3	4
Overlap with Wildlife Management Areas	3	8	4
Overlap with Important Bird Areas / Waterfowl Locations	3	3	2
Approximate Length through DUC / MHHC Project Land Areas (km) [2]	390	207	239
Major River/Creek Crossings (#)	30	25	29
Agricultural / Forest / Crown			
Agricultural Land Cover Crossed (km) [3]	401	207	292
Overlap with Community Pastures (potential routing opportunity)	1	3	4
Forested Land Cover Crossed (km) [3]	458	465	458
Agricultural Crown Land Crossed (km) [4]	115	134	133
Routing Opportunities			
Opportunity to Parallel Existing Transmission and Sub-transmission Lines (km) [6]	211	250	473
Opportunity to Parallel Existing PTHs/PRs (km) [6]	389	326	320
Opportunity to Parallel Existing Rail (km) [6]	58	98	82

Notes:

1. Based on overlap of the feature with the 4.8 km (3.0 mile) Local Study Area centered along each of the along alternative routes.
2. Distances are approximations derived from 1:750,000 GIS mapping.
3. Based on National Land Cover Classification data (Agricultural consists of cultivated land and annual crops only; Forested consists of coniferous, broadleaf and mixed wood covers).
4. Based on Provincial Agricultural Crown land data.
5. Based on distance of main A, B, and C routes centred within 4.8 km (3.0 mile) Local Study Area.
6. Lengths are taken from GIS database using a 2 km (approx.) buffer along the alternative routes.

7.3 PRELIMINARY PREFERRED ROUTE SELECTION PROCESS

7.3.1 Overview of Process

Round 3 of the EACP presented the alternative routes for the Bipole III line (Chapter 5). The approach involved stakeholder meetings and Public Open Houses in communities near the alternative routes. Input received through the EACP and ATK processes contributed to the evaluation/comparison of the alternative routes.

Subsequent to Round 3 of the EACP a process was begun to select a preliminary preferred route for the Bipole III line. The first step was the formation of a multi-disciplinary committee to develop a process for Preliminary Preferred Route (PPR) selection. A committee of discipline specialists was formed in January 2010 to review public, stakeholder, and Aboriginal input obtained through the EACP, and discipline specific studies conducted on evaluating the alternative routes.

The process of PPR selection was guided by Manitoba Hydro's and the study teams' recognition that the greatest opportunity to minimize Project related negative effects is avoidance of constraints/features through the routing process. Therefore, the PPR selection process involved a multi-step approach with several outcomes (Table 7.3-1). The initial alternative routes were evaluated and compared on a segment by segment basis by section. It included input from stakeholders and the public during Round 3 of the EACP. Also important were the results of study team specialists' analysis that were also conducted on a segment basis.

The evaluation and analysis was based on 27 pre-established criteria representing biophysical, socio-economic, land use, technical considerations and stakeholder and public input (Appendix 7A, Table 7A-1). Route segments were independently rated and the results recorded on a route selection matrix (RSM) for comparison purposes (Step 2; Table 7.3-1). The outcome of this step was the selection of an initial preferred route (Step 3). In several sections of the Project Study Area, a clear route preference was not evident. This process also highlighted routing constraints along some segments that required either route adjustments or the identification of new alternative segments to address identified constraint issues. This iterative approach of alternative segment adjustment/identification, evaluation and comparison served to, where possible, bypass identified constraints and/or minimize potential Project effects to the extent possible. This finally led to the selection of the PPR that was presented in Round 4 of the EACP.

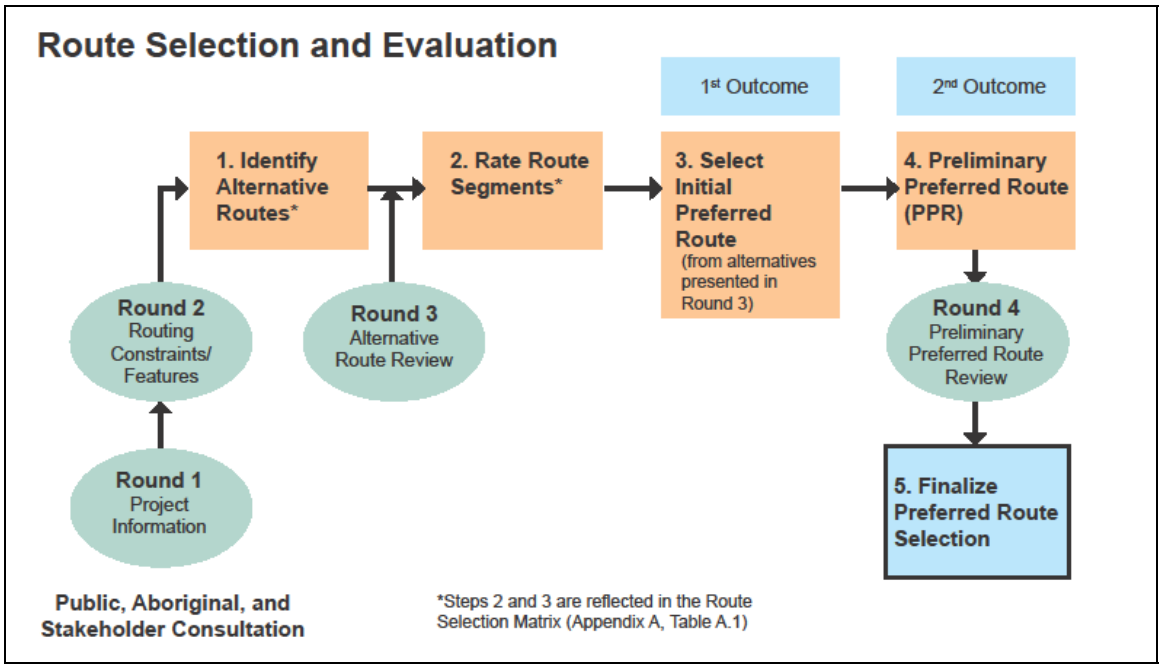

Figure 7.3-1: Route Selection Process

7.3.2 Initial Selection of the PPR from Route Alternatives (Outcome 1)

A criteria list was created for evaluation of the multiple route segments and comparison between segments. The Route Selection Matrix (RSM) was a tool to assemble and record input during this stage of the process from the various disciplines, as well as technical and stakeholder input (Appendix 7A, Table 7A-1).

The alternative routes identified for the HVdc transmission line were made up of numerous segments, each one starting and ending at a node or point of intersection. In order to conduct a comparison and evaluation of the various routes and segments the Project Study Area was broken down into 13 sections (Map 7-9). Within each section a comparison was made between the segments making up the major route alternative (A, B or C) or sub-routes of these. A separate sheet for each of the 13 sections demonstrates the comparison and evaluation process (Appendix 7A, Table 7A-1).

A total of 27 criteria appear in the RSM tables for the rating of each segment. Biophysical factors used in the evaluation of alternative routes included vegetation, forestry, birds, mammals, caribou, core communities, fragmentation, soils and terrain (local), aquatics, and amphibians and reptiles. Socio-economic factors included population density, culture/heritage, resource use and lodges/tourism. Land use factors

included land use (i.e., airports, communications facilities, etc.), PAIs/ASIs, TLEs, and agriculture. Technical criteria included separation from Bipoles I and II, foundation conditions, number of angle towers, construction access, and line length.

An additional criteria was added in the RSM for Aboriginal input. If there was a concern expressed from Aboriginal consultation for a particular segment and area, it could raise the constraint level for any criteria mentioned by that source. It was indicated in the matrix by adding a pattern to the cell for the particular segment and criteria of concern. Further information on the criteria is contained in Appendix 7A, Table 7A-1.

Evaluation of the alternative route segments (in each of the 13 sections) was carried out by the committee of discipline specialists. The specialists responsible for each particular discipline provided ratings for each route segment based on their studies, analysis and knowledge. When determining their ratings the specialists considered each segment to be a 4.8 km (3.0 mile) wide band, termed the Local Study Area. This allowed some flexibility in rating as some constraints could potentially be avoided within the Local Study Area.

The ratings were entered into the RSM matrix and formed the basis for arriving at an initial numeric rating (considering 23 criteria) for each segment. This was followed by including consultation input from multiple sources (four criteria) and an overall evaluation for route selection. Once all the information and data was compiled into the matrix, the committee collectively decided on the selection of a route in each of the 13 sections. In some cases, this also had to consider decisions made in adjacent sections for continuity of a preliminary preferred route. The committee recorded the rationale for selection in each of the sections. This included ATK information that was available at the time. Additional information regarding the matrix and factors used in the evaluation of alternative routes, along with the matrix itself, is provided in Appendix 7A.

7.3.2.1 Initial Preferred Route (From RSM analysis)

The outcome of the analysis recorded in the RSM was the initial selection of a preliminary preferred route. The following provides a description for this initial outcome from the RSM (Appendix 7A, Table 7A-1).

From the Keewatinoow Converter Station, the route proceeds westerly across the Hudson Plains Ecozone, a very sparsely populated area dominated by extensive bogs and fens. The route crosses through the Stephens Lake ASI, which is unavoidable, prior to moving into the better drained Boreal Shield Ecozone, northeast of Stephens Lake.

The route then crosses PR 280 near Orr Lake and heads southwest across the Odei, Burntwood and Grass rivers staying east of Paint Lake Provincial Park, while taking advantage of forestry activities east of PTH 6 to PR 373. It avoids most caribou range in

the area, and follows the Hudson Bay Railway (HBR) line to PR 384 (Moose Lake road), moving south to cross the Saskatchewan River east of The Pas. South of The Pas, the initial preferred route generally follows PTH 10 and an existing transmission line to Mafeking where it moves southeast to Cowan, minimizing impacts to agricultural lands in the Swan River valley.

The initial preferred route loosely follows the western shores of lakes Winnipegosis and Manitoba taking advantage of compatible land uses such as woodlands, pasture and forage lands to PTH 16. Entering prime agricultural lands, the route uses road allowances and other utility right-of-ways, where possible, to minimize potential negative effects. It crosses the Assiniboine River southwest of Long Plain First Nation. Continuing east and south it avoids most sand prairie ecotypes, crossing PTH 2 west of Ste Claude, then heading east to cross the Red River approximately 2.0 km (1.2 miles) south of Ste. Agathe.

East of the Red River, the route crosses through a more densely populated rural setting that includes rural residences and barn complexes. It moves north past the Village of Landmark, east to avoid the community of Dufresne and crosses the TransCanada Highway before heading north to an existing transmission line right-of-way, where it parallels the Dorsey to Forbes, Minnesota (D602F) 500 kV international transmission line west into the Riel Converter Station site.

A detailed description of the initial preferred route, as selected using the RSM, is outlined below along with the rationale for the selection in each of the 13 sections. The ratings in the RSM reflect the level of constraint or potential effect for a given route segment. Higher ratings in the RSM were considered to be less favourable (Appendix 7A, Table 7A-1).

Section 1

In Section 1, the route (Segments B1C1, B2C2 and B3C3) [termed Route B] extends from the Keewatinoow Converter Station site to the north arm of Stephen's Lake (Appendix 7A, Table 7A-1 - Section 1 Map). Section 1 is in the Winisk River Lowland Ecodistrict, where the terrain is flat and poorly drained with extensive bogs, fens and widespread permafrost. Further west and in the Knee Lake Ecodistrict, the terrain is an undulating to ridged morainal plain with mostly small to medium sized lakes. Permafrost is common but discontinuous (Smith *et. al.,* 1988). The initial preferred route crosses through the Fox Lake and Split Lake RMAs. The closest communities to the route are Bird and the Town of Gillam. The principal road is PR 280. In addition, the HBR rail line crosses through the area and through the communities of Gillam and Bird en-route north to Churchill.

Fragmentation is rated high in all alternative route segments in this section due to the remote nature of the area. Three segments (A2, A3 and B2C2) had a very high rating in terms of core communities although, overall, there was less of a concern along the initial preferred route because the remaining segments (B1C1 and B3C3) were rated low in terms of core communities. The high rating for aquatics for Segment B2C2 along the route is due to the high number of stream crossings. However, this can be mitigated through the final preferred route alignment and tower placement at water crossings. Segments B3C3 and A3 both have a high rating in terms of PAIs-ASIs and TLEs because of the Stephens Lake ASI and a York Factory First Nation TLE at Little Limestone Lake. Although all alternative route segments are rated high in terms of separation distances from Bipoles I and II, the initial preferred route segments have fewer heavy angle towers than the Route A segments.

Section 2

From northwest of Stephen's Lake, the initial preferred route segments chosen (Segments B4C4, B5C5, B6C6 and B7C7) [termed Route B] generally extend westward to Pukatawakan Lake passing north of Assean Lake (Appendix 7A, Table 7A-1 Section 2 Map). The eastern half is in the Knee Lake Ecodistrict, which is characterized by an undulating to ridged morainal plain with mostly small to medium sized lakes and common but discontinuous permafrost, while the western half crosses the Orr Lake Ecodistrict, which is an undulating to hummocky morainal plain blanketed with clayey and glaciolacustrine soils. Depressions consist of peat plateau and palsa bogs (Smith *et. al.,* 1988). This portion of the route is located in the Split Lake RMA and crosses north of the community of TCN. PR 280 crosses between Split and Assean Lakes and the Burntwood River to the west.

There are fewer concerns respecting mammals (i.e., moose) and aquatic resources along the initial preliminary preferred route than the other alternatives in Section 2. Fragmentation is equally high for all alternative route segments due to the remote, undeveloped nature of the area. Segment B5C5, which is part of the selected route, does cross through the Stephens Lake ASI, which required further discussions with Manitoba Conservation. Mining association representatives expressed concerns regarding segment B7C7 in terms of potential mining exploration and extraction. The initial preferred route in this section has low to medium concerns for all other factors.

In this section, in terms of technical factors, the initial preferred route segments have fewer angle towers and better construction access.

Section 3

The initial preliminary preferred route in Section 3 (segment B8C8) [termed Route B] extends from Pukatawakan Lake to south of Orr Lake and remains in the Orr Lake Ecodistrict (Appendix 7A, Table 7A-1 Section 3 Map). This segment is located in the Split Lake RMA. There are no communities in proximity to the initial preferred route. The only major transportation infrastructure is PR 280, which parallels the Odei River in this section.

Segment B8C8 is preferred in terms of mammal and core communities. While it has a higher rating for aquatics due to the number of stream crossings, these concerns can be addressed through the final preferred route alignment and tower placement. Segment B8C8 has low to moderate concerns for all other factors. Segment A7 (part of Route A) is rated very high in terms of mammals, while segment AA1 is high in terms of resource use and TLEs, as a result of the number of Registered Traplines intersected and proximity to two TLEs. Segment A7 is also rated high in terms of PAIs/ASIs. The initial preferred route requires less heavy angle towers, is shortest in length, and has the best construction access, although it offers less separation from Bipoles I and II.

Section 4

From Orr Lake, the initial preferred route (Segments B9, BB2 and B10G) [termed Route B] runs southwest and crosses northwest of Paint Lake Provincial Park. It then continues south, passing east of Wabowden and PTH 6, and then follows the HBR line southwest to Dyce Lake (Appendix 7A, Table 7A-1 Section 4 Map). After crossing through the Orr Lake Ecodistrict, the route crosses into the Pikwitonei Ecodistrict, which is typified as an undulating to hummocky glaciolacustrine plain with granitic rock outcrops and widespread organic deposits (Smith *et. al.* 1988). East of the City of Thompson, the route enters the Sipiwesk Lake Ecodistrict, which is an extension of the glaciolacustrine plain, but with more prominent rock outcrops and widespread organic deposits. It crosses PTH 6 at Ponton and the Playgreen Lake Ecodistrict, a primarily level, poorly drained peatland. At Hargrave Lake, it crosses the Cormorant Lake Ecodistrict, a hummocky morainal plain covered by thin discontinuous glacial till veneers. The City of Thompson and the communities of Wabowden and Ponton, and cottage developments at Paint Lake and Setting Lake, are located in this section. Infrastructure includes PTHs 6 and 39, PRs 280 and 373, the HBR line, several active mines, forestry developments, winter roads and existing transmission lines.

In this section, route selection was difficult due to a number of features/constraints. Segments B9, BB2 and B10G (the initial preferred route) have fewer concerns about mammals and habitat fragmentation when compared with the other route alternatives. Segments B10, C9 and C10 have very high ratings in terms of caribou as does B10G.

Segment AC1 is rated very high in terms of fragmentation, while A8 and C10 are rated high. Segment B9 has a high rating for aquatics due to the number of stream crossings. These issues can be addressed through the final preferred route alignment and tower placement. There are similar aquatics issues along segment A9. Segment BB2, which is part of the initial preferred route, is rated high in terms of amphibians and reptiles unlike the other segments. As part of the ATK process, the community of Herb Lake Landing identified a garter snake pit in this segment which will be avoided through the alignment of the Final Preferred Route.

The initial preferred route segments avoid developed areas around Snow Lake and Wekusko Lake. It had a medium rating in segment B9 and a high rating in segment BB2 for land use, principally due to mining concerns, and had low to medium ratings for all other socio-economic and land use factors. There were similar concerns along Segments B10 and C9 in this section. The potential for route adjustment to address mining industry concerns was investigated further, particularly in the Thompson Nickel Belt. This included consideration in making minor route adjustments to avoid known high value mineral areas of interest identified by mineral companies, as well as investigating options to avoid the high mineral potential area of the Thompson Nickel Belt entirely.

Segments A9, B10, C9 and AC1 were rated very high in terms of heritage - culture, while segments which are part of the initial preferred route were rated low to medium. Segment A9 was rated high in terms of PAIs/ASIs, while A9, C9 and AC1 were rated high for TLEs. The preferred route segments were rated low for TLEs/ASIs and TLEs. Segment B10 was rated high in terms of resource use and lodges-tourism issues.

Herb Lake Landing residents identified areas of community activity, areas for recreation (i.e., popular canoe route on the Grass River) and local resource use in segment B10. Risk of disruption to community life was viewed as higher along Segments BB2 and B10 compared to the other options in this section as a result of the proximity of these routes to the community.

From the comments received at Community Open Houses, the initial preferred route was preferred in this section. Segments in route A received negative responses from communities and the general public.

Section 5

In Section 5, the initial preferred route (Segment B11C13) [termed Route B] extends from Dyce Lake to south of The Pas (Appendix 7A, Table 7A-1 Section 5 Map). After crossing the Cormorant Lake Ecodistrict, it crosses the Summerberry Ecodistrict, a complex of flat alluvial deposits and horizontal fens before crossing The Pas Moraine Ecodistrict, a slightly curved drumlinized morainal feature extending from Lake Winnipeg to Rocky Lake. Communities in proximity include Cormorant, Clearwater

Lake cottage developments, Opaskwayak Cree Nation and the Town of the Pas. Infrastructure includes the HBR line, PRs 287 and 384, and PTH 10, The Pas and Grace Lake airports, and existing transmission lines.

There are a relatively high number of features/constraints associated with all segments in this section. Segments AA2 and A12 have very high ratings in terms of caribou and AA2 has a very high rating for mammals. B11C13 has a high rating for caribou and a medium rating for mammals. In terms of caribou, through the ATK process, Cormorant identified two main areas of core caribou habitat along this segment. The other alternatives in this section cross through core winter areas and known calving complexes (A12 and AA2).

Segments A12 and AA2 were rated high in terms of forestry because of the high percentage of productive forest lands, as well as harvest/renewal sites and permanent sample plots. Portions of all the routes were rated high for birds.

There are concerns with respect to lodges, resource use, cottage areas along Segment AA2. All segments in this section were rated as high in terms of resource use. Segments A13 and A14 were also rated high in terms of TLEs. Segment AA2 overlaps with mineral exploration licences and mining claims. Segment B11C13 is in proximity to a provincial park and provincial forest, and crosses through the Tom Lamb Wildlife Management Area (Area of Special Interest under the Protected Areas Initiative).

B11C13, the initial preferred route, is shorter than the other segments and has better access for construction than the other segments. It does have a high proportion of angle towers compared to its length. In Segment AA2, potential future developmental issues on the Local Government District of Cranberry Portage resulted in a poor rating in the section in terms of stakeholder input. Little concern was expressed regarding the route (B11C13). It was rated fair in terms of Aboriginal communities and good from all other EACP stakeholders. From the comment sheets received at the Community Open Houses, the initial preferred route was preferred in this section.

ATK studies from Cormorant validated and confirmed most of the biophysical findings. In the case of mammals (moose and caribou), the rating for B11C13 was changed to High as Cormorant was concerned about further fragmentation of habitat along the route segment. Due to the proximity of the community to the preferred route, information was provided only for this alternative.

Section 6

The initial preferred route (Segments B14, B13C15, B15C17 and B16C18) [termed Route B] continues from south of The Pas to the Red Deer River (Appendix 7A, Table 7A-1 Section 6 Map) leaving The Pas Moraine Ecodistrict in the vicinity of PTH 60 and

crossing through the Overflowing River Ecodistrict. This district is a flat lowland plain dominated by shallow and deep organics. Communities in the section include Overflowing River, Dawson Bay and cottage/housing developments at the Red Deer River. Infrastructure consists of PTHs 10 and 60, and an existing transmission line.

The initial preferred route segments avoid concerns that the other segments do not, including caribou, fragmentation, culture-heritage, and PAIs/ASIs. Segment B13C15 does have a high rating for core communities, whereas other segments are rated low or medium. Segment B14, which is part of the preferred route, has a high rating for resource use as does Segment A14. All segments except for Segment A14 had a high rating for TLEs.

The initial preferred route does intersect the proposed Summerberry WMA between The Pas and PTH 60 but was considered the best option as it parallels an existing transmission line through this area and is the most direct route. It also intersects the recently established Red Deer WMA. This was unavoidable because of the choice of routing clear of the existing Lake Winnipegosis Salt Flats Ecological Reserve and its associated springs. The intricacies of routing through these areas were discussed in detail with Manitoba Conservation, resulting in agreement as to exclusion corridors within the WMAs specifically for the HVdc transmission line. The preferred route segments in this section have varying low or medium ratings for other factors. The preferred route segments have better foundation conditions and construction access.

Alternative Route B was preferred by stakeholders that commented on the alternatives in this section. Pelican Rapids, Dawson Bay and Barrows NACs provided information pertaining to all route segments in the section which included: moose hunting areas, a caribou herd and migration area, furbearer trapping areas (beaver and muskrat), plant harvesting areas (sweet grass), freshwater spring and fish spawning locations, and snake pits and breeding dens. Much of the input related to domestic resource use areas used by these communities.

Section 7

The initial preferred route (Segments B18 and B19C20) [termed Route B] in Section 7 extends from the Red Deer River to Cowan (Appendix 7A, Table 7A-1 Section 7 Map), crossing the Swan Lake Ecodistrict, which is a level to gently sloping alluvial and glaciolacustrine plain. Communities in the section include Mafeking, Bellsite, Indian Birch, Birch River, Lenswood, Briggs Spur and Cowan. Existing infrastructure includes PTH 10, PR 268 and numerous municipal roads between Birch River and Cowan.

The route in this section (B18 and C19C20) has fewer issues than the other alternatives. Segment A15 (alternative Route A) has very high ratings in terms of birds and mammals. Segment A15 (alternative Route A) and segment C19 (alternative Route C) have very

high ratings in terms of culture-heritage. There are also high ratings with respect to land uses in these segments. Segments A15, B18 and C19 were all rated high in terms of TLEs. Segment B19C20, which is part of the initial preferred route, also involves an unavoidable crossing of Swan-Pelican Provincial Forest. In terms of technical factors, there was little difference in the segments although the preferred route is the shortest.

Several public responses suggest a preference for alternative Route B in this section. Ducks Unlimited Canada indicated a preference for alternative Route C due to concern regarding effects of the line on waterfowl habitat and flyways between Swan Lake and feeding areas on agricultural lands. Feedback from many stakeholders suggested alternative route A was not preferred mainly because of the additional line length and elevated potential environmental effects. From the comment sheets received at the Community Open Houses, Alternative Route B was preferred.

Section 8

The initial preferred route in Section 8 (Segments BB3 and B22) extends from Cowan to Ebb and Flow First Nation (Appendix 7A, Table 7A-1 Section 8 Map) moving out of the Swan Lake Ecodistrict and crossing the Dauphin Ecodistrict, which is a level to gently sloping glaciolacustrine plain. It then crosses the Alonsa Ecodistrict with its distinct north-south oriented ridge and swale topography. Communities in this section include Pine Creek, Camperville, Pine River, Pulp River, Winnipegosis, Fork River, Volga, Weiden, Rorketon, Eddystone, and Ebb and Flow. Infrastructure includes PTHs 20, 68 and 278, PR 269, 271, 276, 364, 481 and 489, along with numerous municipal roads and existing transmission lines.

Segments B22 and BB3 are preferred through this section due to the low rating in a number of factors. In areas where this segment is rated higher, other segments are also rated the same or higher. Segment A15 has a very high rating with respect to mammals, while Segments A15 and C21 both had a very high rating in terms of birds. Segments B21 and BB3 both had very high ratings in core communities. Segment B22, which is also part of the initial preferred route, had a high rating in birds and, amphibians and reptiles. A15 was also rated high in terms of amphibians and reptiles. From a biophysical perspective, most of the remaining factors for the preferred route segments were rated low and medium, whereas other segments had high ratings in vegetation, forestry, mammals and aquatics.

Segments A15 and C21 rated very high in terms of culture-heritage. A15, C21 and C22 also rated high in terms of land use, and A15 was rated high in terms of TLEs. In terms of the Land Use category, Segments B22 and BB3 have low ratings for all factors except for one medium rating for BB2. BB3 is rated high in terms of resource use as are all the

other segments except Segments B22 and C22. While segment BB3 has foundation issues, these can be overcome by transmission line design at a higher cost.

Generally, stakeholder feedback suggested that the shortest route and the route that would have the least effects to agriculture, was preferred. Four municipalities formally opposed Segment A15 (Route A) in their jurisdictions. There were letters received regarding the potential effects on the Little Saskatchewan River Valley, agricultural concerns and added line length with respect to the route segments for alternative A. Ducks Unlimited Canada representatives indicated a preference for Segments C21 and C22 (route C) in order to minimize the potential impact through the prairie pothole region as did one municipality. Five municipalities preferred B segments, which included the initial preferred route. From the comment sheets received at the Community Open Houses, alternative Route B was preferred, and there was high negative response to alternative Route A.

Camperville and Pine Creek community members use this section extensively, as does Waywayseecappo in the vicinity of Riding Mountain National Park. Camperville and Pine Creek indicated that they use resources in the region for medicines, community activities and as a source of income. With respect to B21, ratings for vegetation, aquatics, culture-heritage and resource use were changed to High as a result of the ATK provided. These communities indicated that the potential disruption to community life would be higher for Segment B21 as opposed to segment BB3, the latter of which is part of the preliminary preferred route.

Section 9

From Ebb and Flow, the initial preferred route (Segments B23 and B24) [termed route B] extends generallysouth (west of PTH 50) to the Assiniboine River and south of Long Plain First Nation (Appendix 7A, Table 7A-1 Section 9 Map). After crossing the Alonsa Ecodistrict, the route crosses the Gladstone Ecodistrict, a level glaciolacustrine plain, near PTH 16 and then crosses the gently sloping sandy soil MacGregor Ecodistrict. The Shilo Ecodistrict, north of the Assiniboine River, is characterized by fine to coarse sand deposits with fine sands blown into dunes. The Stockton Ecodistrict includes the Assiniboine River valley, a level to hummocky lacustrine plain with loamy to sandy soils (Smith et al, 1988). Communities in this section include Alonsa, Silver Ridge, Harcus, Amaranth, Langruth, Sandy Bay First Nation, Westbourne, Woodside, Bloom, Bagot, Long Plain First Nation and Rosendale. Infrastructure includes PTHs 1, 2, 16 and 50, PRs 242, 261, 265, 278 and 305, CNR and CP rail lines, numerous municipal roads, existing transmission lines and weather and radar stations associated with the Southport Airport.

While Segment BA4 has the lowest rating in this section, it includes segment A17C24 at its southerly extension which received high ratings primarily because of the diagonal crossing of farm land, and negative stakeholder feedback. A17C24 was also rated high in terms of land use, primarily related to proximity to communities. Segments B23 and B24 are preferred from this perspective. Segment B24 also has potential effects on agriculture due to active and potential irrigation. All segments rated high or very high in terms of culture-heritage, and B24 was rated high in terms of TLEs because of the presence of a number of Long Plain First Nation TLE selections along this segment.

In terms of biophysical factors, A17C24 was rated high for aquatics, while B23, part of the preferred route was rated high for birds, and amphibians and reptiles. The latter was primarily due to the presence of sandy soils, and the high amount of wetlands.

In terms of technical issues, all route segments are similar – segment B24 does require a higher number of heavy angle structures.

Segment A17C24 was rated as a poor routing option by the general public due primarily to diagonal alignments and concern regarding effects of this on agriculture. Segment B23, which is part of the initial preferred route, was favoured by both the RM of Glenella and the RM of North Norfolk. Ducks Unlimited Canada representatives preferred route C alternatives in this section.

Section 10

The initial preferred route in Section 10 (Segments A18C25 and C26) moves from the Assiniboine River to just west of Brunkild (Appendix 7A, Table 7A-1 Section 10 Map) entering the northeast portion of the Pembina Hills Ecodistrict, which is characterized by rolling to hummocky topography. The route crosses through the MacGregor Ecodistrict and the north end of the Winkler Ecodistrict, which is a relatively flat glaciolacustrine plain with Black Chernozemic soils. It then enters the western portion of the Winnipeg Ecodistrict, which is a level clayey glaciolacustrine plain, which forms the central lowland of the Red River Plain (Smith et al, 1988). Communities in this section include St. Claude, Hayward and Elm Creek. Infrastructure includes PTHs 2 and 13, PRs 240, 248 and 305, numerous municipal roads and existing transmission lines.

The segments in this section all have limited biophysical concerns - all were rated low or medium except for soils-terrain in Segment A18C25 which is high. Segments are similar in terms of socio-economic and land use categories. Segment A18C25, which is part of the initial preferred route, along with Segments B25 and BB6 are rated high in terms of culture-heritage. Segment B25 includes an airstrip and communication towers which resulted in a high rating in terms of land use. Segment BB6 includes TLE and private land selections by Long Plain First Nation which resulted in high ratings for this factor.

All segments cross high agricultural capability lands and intensive agricultural use areas with active and potential irrigation, and hence all are rated high in terms of agriculture. Agricultural concerns can be addressed through route adjustment to eliminate diagonal placements and to locate along existing linear features (e.g. drains, roads) where possible. The initial preferred route segments have varying low or medium ratings for other factors. In terms of technical factors, segments in this section are similar in ratings. As such, there was no preference in segments from a technical perspective in this section.

The initial preferred route received the least negative public response and was noted as the preference by one municipality. The RM of Grey opposes the Project, and the RM of Dufferin prefers not to have the line cross their jurisdiction. Strong opposition was heard at the Elm Creek Open House regarding all alternative routes. Suggestions were provided to seek routing opportunities such as drainage ditches in less populated areas. There was strong concern regarding diagonal routing through agricultural lands. Ducks Unlimited Canada representatives noted that Route C would be preferred in this section to Winnipeg in order to minimize the potential impact of routing through the prairie pothole region.

Section 11

From west of Brunkild, the initial preferred route (Segment A20) [termed route A] extends to the Red River (Appendix 7A, Table 7A-1 Section 11 Map) in the Winnipeg Ecodistrict (see Section 10). Communities in the section are Brunkild and Ste. Agathe. Infrastructure includes PTHs 3 and 75, PRs 305, 330 and 332, two CNR rail lines, numerous municipal roads and several existing transmission lines.

Segment A20 has very few concerns in terms of the factors, with the exception of a high rating for birds due to the potential for bird strikes at the Red River crossing. This rating is shared with the other segment crossings of the river in this section. Segment C27 crosses intensively cropped areas and has a diagonal line placement which is typically not preferred in agricultural areas. The preferred route has low and medium ratings for other factors. In terms of technical factors, segment A20 was preferred as it had low to medium ratings for all factors.

While there were many responses indicating concern for potential effects on agricultural lands in this section, the most common stakeholder response regarding a preference was for alternative Route A (Segment A20) as it has fewer residences and farms in its vicinity. The RM of Grey is opposed to segment C27 due to concern regarding agriculture activities and residences. Alternative Route A (Segment A20) is less densely populated and routing opportunities were noted along this alternative from Keystone Agriculture Producers and RMs in the area.

Section 12

The initial preferred route in Section 12 (Segments A21 and A22) [termed Route A] extends from the Red River to just northeast of Randolph (Appendix 7A, Table 7A-1 Section 12 Map) in the Winnipeg Ecodistrict. Communities in this section include Niverville, Tourond, New Bothwell and Randolph. Infrastructure includes PTHs 52 and 59, PRs 200, 206, 216, 246 and 305, and numerous municipal roads. The route crosses the CPR line and existing transmission lines. This section is the most densely populated with yard sites and livestock barn complexes.

Segments A21 and A22 are preferred as segment C30 has the highest population density and a high rating in terms of culture-heritage. Directly affected RMs in the section objected to this segment. Vegetation concerns along the preferred route are considered to be manageable. Segments A21 and A22 in this section have low to medium ratings in other factors.

The initial preferred route (Segments A21 and A22) was perceived to have the least potential effects on residences by the RM of Ritchot.

Section 13

The initial preferred route in Section 13 (Segment A23) [termed Route A] extends from Randolph north and then west to the Riel Converter Station site north of the Deacon Reservoir (Appendix 7A, Table 7A-1 Section 13 Map) remaining within the Winnipeg Ecodistrict. Communities in this section include Landmark, Dufresne, and housing along the Seine River, Dugald and outskirts of the City of Winnipeg. Infrastructure includes PTHs 1, 15 and 101, PRs 206, 207, 210, 311 and 501 along with numerous municipal roads, existing transmission lines, Winnipeg's aqueduct, the Deacon reservoir, Red River Floodway and Lyncrest Airfield.

Segment A23 avoids most of the concerns associated with the other segments. Segments C31 and B28 were rated high in terms of land use issues including proximity to developed areas, an aerodrome and an ecological reserve. Segment B28 was rated high with respect to vegetation and birds, as well as culture-heritage factors. In terms of biophysical, socio-economic and land use technical factors, the initial preferred route (Segment A23) was preferred as it had low to medium ratings for all factors.

There was a negative stakeholder response to segment B28 due to existing and potential residential development. The RM of Tache expressed concern with respect to all alternative routes.

7.3.3 Final Selection of a Preliminary Preferred Route (Outcome 2)

The first evaluation/comparison of the alternative route segments identified an initial preferred route for most sections of the Bipole III line. This evaluation/comparison of alternative route segments also, in some instances, identified segments with features/constraints that required adjustments to route segments within the 4.8 km (3.0 mile) wide Local Study Area. In other cases, the identification of new alternative route options was required. Reasons for adjustments and identification of new options were attributed to a variety of constraints including caribou, mining interests and agriculture, as well as stakeholder input through Round 3 of the EACP.

Where adjustments to alternative route segments were identified outside of the 4.8 km (3.0 mile) Local Study Area, new evaluations were undertaken by technical specialists. The evaluations of new options were conducted in a manner consistent, to the extent possible, with the approach undertaken in the evaluation of original alternative route segments. A total of sixteen new alternative route segments were identified for consideration to address routing concerns raised through consultation and analysis (Table 7.3-1). This was not done until an initial route selection had been made as the issues were usually site specific and would not apply to all of the alternatives). The new segments are also shown on Map Series 7-1000 and in Table 7.3-1.

Table 7.3-1: New Alternative Route Segments Identified for Evaluation

Segment	Length (km)	Section*	Comments
B7C7-1	47.2	2	New
B9-1	98.9	3	New
B9-2	83.0	3	New
B10-1	179.4	4	New
B18-1	78.6	7	Adjustments
B22-1	104.7	8	Adjustments
B23-1	146.3	9	Adjustments
C22BA4-2	86.4	9	Adjustments
C22BA4-1	7.9	8,9	New, very short cross-over
A17C24-1	54.4	9,10	New
B24-1	67.4	9	Adjustments; joining of former B24 & A18C25
C26-1	29.2	11	Adjustments; joining of former C27 & CA2
A19-1	29.2	11	Adjustments; part new
A21-1	28.5	12	Adjustments
A23-2	33.3	13	New
A23-1	36.7	13	New

* Refers to evaluation sections developed for the first round of alternative route segment evaluations (Map Series 7-1000).

Apart from the sixteen new alternative route segments, further issues regarding mineral resources, comments provided by mining companies and the Mining Association of Manitoba, caribou concerns raised by the Manitoba Conservation Integrated Resource Management Teams (IRMTs), and the specific selection of the Keewatinoow Converter Station site resulted in the identification of additional route segments. These adjustments were identified at a late date after the main PPR selection process. As such these route adjustments received a separate segment designation (P1 toP4). The adjustments required further evaluation to ultimately identify the preliminary preferred route.

Section 1

The only change created for this section after the initial preferred route selection was to align the Bipole III transmission line route with the preferred placement of the Keewatinoow Converter Station. This was a relatively short segment identified as P4 (Map Series 7-1000).

Section 2

Segment B7C7-1 was identified to address concerns of interference with mineral interests. The Mining Association of Manitoba Inc. (MAMI) registered strong opposition to any alternative route that traversed the Thompson Nickel Belt area. After consideration by the study team, a new alternative route was proposed numbered B7C7-1. This segment moved the transmission line off of the main area of high mineral interest. A review of the segment using the 23 criteria from the RSM resulted in a high constraint rating for technical criteria only (Appendix 7A, Table 7A-2). The criteria for foundations and angle towers were rated as high. Although resulting in some increases in cost, the segment was adopted for the PPR. The segment was also reviewed by the Provincial Integrated Resource Management Team (IRMT) who did not express any specific concerns over the new segment.

Sections 3 and 4

Although additional new alternative routes B9-1, B9-2 and B10-1 were identified and considered to resolve issues related to mineral interests, these were discounted over concerns relating to habitat fragmentation and potential effects to caribou and their habitats. The results of the evaluation of the new segments are shown in Appendix 7A, Table 7A-2. New segment B9-2 rated somewhat favourably for route consideration. However, Segment B10-1 had high ratings for six criteria and was not considered further. Without this segment the upstream Segments B9-1, and B9-2, were no longer viable.

Late in the process MAMI provided a map of alternative routings which led the committee to consider several more segments in the area that would reduce potential effect on mining and exploration in the Thompson Nickel Belt. These segments were identified as P1, and P2 which modified Segments B9 and BB2.

P1 had the advantage, aside from addressing the mining industry concerns, of missing some recreation areas by going east of Paint Lake Provincial Park. P2 was considered because it was further west from the community of Wabowden and avoided the active Bucko Lake area. The P1 and P2 segments were accepted and became part of the Bipole III preliminary preferred route in section 4.

Section 5

A small alteration identified as P3 was done south of Montreal Lake in Ralls Island to deal with the proximity of a residence to the preferred route.

Section 7

A new alternative route, B18-1, was identified to mitigate diagonal alignment over agricultural lands and was adopted as part of the preliminary preferred route in that section. The segment also takes advantage of paralleling a road allowance. There were some high ratings relating to the proximity to outfitter allocations and crossing part of the local community pasture (Appendix 7A, Table 7A-2). These were considered manageable and the segment accepted as part of the Preliminary Preferred Route (PPR) (Map 7-11).

Sections 8 and 9

An adjustment to Segment B22 to avoid an existing Wildlife Management Area (WMA) resulted in the new B22-1 alternative, which, in conjunction with segment BB3, formed the preliminary preferred route through Section 8. B22-1 also avoided a number of culture/heritage sites identified for B22.PPR selection in Sections 8 and 9 was revisited due to a number of issues related to agriculture, conservation, and biophysical concerns. Additional segments were created at the southern end of Section 8 to allow consideration of original Segments C21/C22 and BC3 as possible routing options in this area. Route adjustments and new alternatives sought to address the concern by Manitoba Conservation over the use of the ecologically sensitive Arden ridge and the diagonal crossing of agricultural land. Segments C22BA4-1 and C22BA4-2 and C22-1 were created to address these issues (Appendix 7A, Table 7A-2).

In Section 9 two segments were added to deal with similar issues as in Section 8. Route adjustments were required to address the issues relating to the Arden Ridge and agricultural issues such as diagonal routing and irrigation (existing and potential). This resulted in Segments A17C24-1, and B23-1 being added for consideration. With the addition of these segments routing in both Sections 8 and 9 could be reconsidered.

Since the ratings in Section 8 were somewhat close originally, the new considerations took into account which combination of new segments resolved the most issues. In Section 8 the comparison focused on Segments BC3 and the new B22-1. A decision at that point decided the entry point to Section 9 and whether or not routing would be located near the Arden ridge. B22-1 was chosen as it avoided the WMA and reduced the concerns with culture and heritage, and reduced line-length and number of angle structures in comparison to a route involving Segments C22 and A17C24-1. The segments making up the PPR in Sections 8 and 9 are B22-1, BB3, B23-1.

Section 10

Segment B24-1 was created to deal with diagonal routing across farmlands, proximity to First Nation land, and finding a suitable crossing of the Assiniboine River. B24-1 replaces Segments B24 and A18C26.

Section 11

Section 11 Segments C26-1 and A19-1 were identified to address concerns over diagonal alignments and recommendations from the municipalities to take advantage of linear features such as drains. The two new segments offered alternative ways of getting to segment A20 the preliminary preferred route in this section. As a result C26-1 was selected to accomplish the cross over from route C to route A at this point.

Section 12

Development density along the original selected segment of A21 required some adjustment to create separation form residences and farmyards. A new segment (A21-1), selected as the preliminary preferred route, also addressed concerns over diagonal alignments and proximity to housing east of the Red River crossing.

Section 13

New segment alternatives A23-1 and A23-2 were identified to address residential housing and developments, specifically along the Seine River. Both segments require in-field placement of the transmission line due to density of rural residences. Segment A23-2 affected the least residential properties in the Seine River area and was selected for the PPR.

The PPR selection process was concluded with the review of new segments above and was made public in August 2010 as part of the Round 4 EACP. The final segment alignment for the PPR is shown in Table 7.3-2 and Map 7-11.

Table 7.3-2: Route segment in the Preliminary Preferred Route

Preliminary Preferred Route	Segment(s)
Section 1	B1C1, B2C2, B3C3, (P4)
Section 2	B4C4, B5C5, B6C6, B7C7-1
Section 3	B8C8
Section 4	B9 (P1), BB2 (P2), B10G
Section 5	A12, A13, (P3)
Section 6	B14, B13C15, B15C17, B16C18
Section 7	B18-1, B19C20
Section 8	B22-1, BB3
Section 9	B23-1
Section 10	B24-1, C26
Section 11	A20, C26-1
Section 12	A21-1, A22
Section 13	A23-2

7.4 FINAL PREFERRED ROUTE SELECTION

The preliminary preferred route was presented as part of Round 4 EACP (Chapter 5) beginning in August 2010. The purpose of Round 4 was to respond to issues and concerns raised during Round 3, to present the preliminary preferred route and to gain feedback on the route. Round 4 included stakeholder meetings and Public Open Houses in communities near the preliminary preferred route. In addition, a series of landowner information centres was undertaken to provide further opportunity for landowners to discuss the Project one-on-one with Manitoba Hydro representatives.

Stakeholder feedback during Round 4 was important in identifying the Final Preferred Route for the Bipole III line. During Round 4, stakeholders were advised that minor route adjustments would be considered as part of identifying a Final Preferred Route for the Bipole III transmission line. Route adjustments were considered within a multi-disciplinary analysis framework. A synopsis of the route adjustments considered as a result of consultation feedback, and the associated outcomes are outlined below (Appendix 7B- Preliminary Preferred Route Adjustments; Map Series 7-1200).

Through the EACP, participants in agricultural portions of the Project Study Area raised concerns about the loss of agricultural land and productivity due to tower placement, as well as the general nuisance they thought would be caused by the presence of the HVdc transmission line. Participants were advised that there would be one to two towers on each quarter section. Towers would be centred within the 66 m wide right-of-way. The right-of-way would typically be aligned so as to minimize any disruption arising from the

towers and the conductors. One of the concerns raised by some farmers, in cases where the right-of-way was proposed to be parallel and adjacent to a road allowance, was the offset distance between the towers and the edge of their field or property line. In these cases, the distance between the field edge and the base of the tower would be approximately 95 feet. This would not permit some farm implements (e.g., many sprayers are 120 feet wide) to be easily manoeuvred between the tower and the property line, thus rendering all the lands in between less effectively farmed, and hence, less productive.

After Round 4, Manitoba Hydro assessed this concern and proposed a re-alignment of the right-of-way. Where the preliminary preferred route right-of-way was located parallel and adjacent to a road allowance, Manitoba Hydro would re-align the right-of-way in-field to facilitate passage of large equipment between the towers and the property or field edge (Figure 7.4-1). The distance of the re-alignment in-field will be subject to discussions with directly affected landowners during easement negotiations. This realignment is proposed for southern Manitoba from a point in the vicinity of the route crossing of PTH 16 south to the Riel Converter Station site (to correspond to the area where intensive agricultural operations along the route are most prevalent). North of PTH 16, the final preferred route right-of-way is proposed to remain coterminous with the edge of the road allowance. In situations where machinery would be unable to manoeuvre, Manitoba Hydro will consider compensation.

Where the preliminary preferred route was on a half mile line, it was indicated to landowners that the line would be centred on the half mile line and would require an easement from the owner(s) on both sides where the ownership was different. Where specific landowner concerns were not at issue, the Final Preferred Route remains on the half mile line. In some situations, where the issue of equipment clearance arose due to a property edge or obstruction (e.g., a fence line) along the half-mile, the final preferred route was adjusted. In a manner corresponding to the previously described realignment proposed along road allowances, final alignment in these circumstances will be subject to discussion with directly affected landowners during easement negotiations.

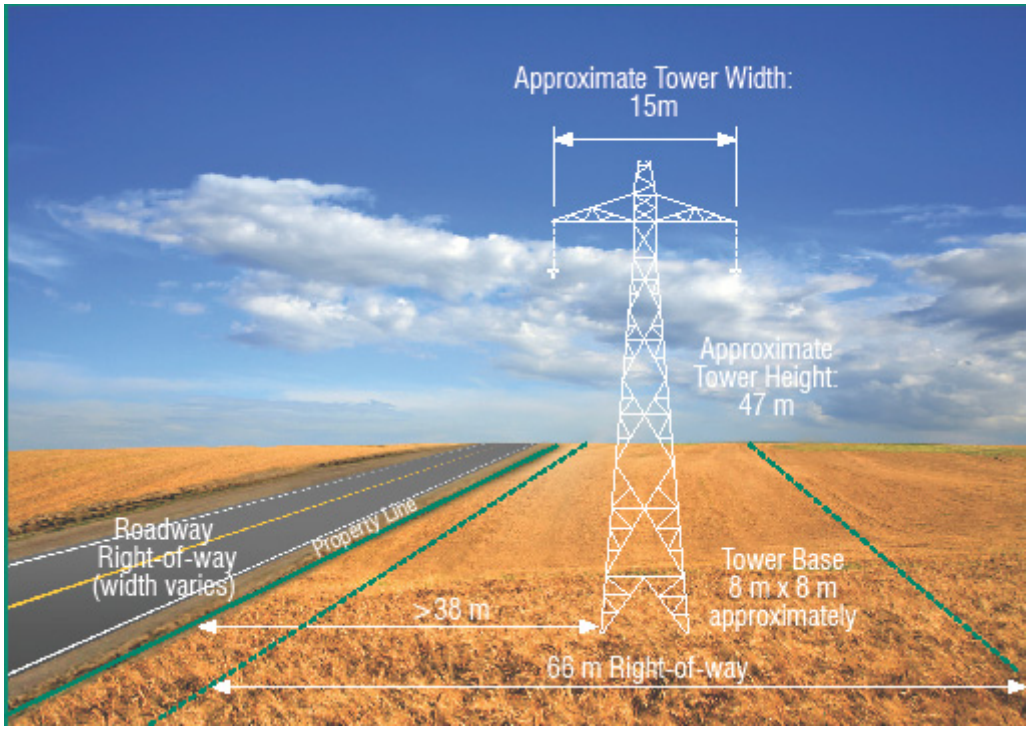

Figure 7.4-1: Potential Re-alignment of Transmission Right-of-Way to Address Farming Concerns

7.4.1 Route Adjustments by Section

7.4.1.1 Sections 1 and 2

In Sections 1 and 2, TCN proposed that several adjustments be made to the preliminary preferred route where it crosses through the Split Lake RMA. TCN suggested that the preliminary preferred route follow PR 280 as much as possible and that the separation distance between the route and Assean Lake be maximized as TCN has selected a TLE parcel in this area. In addition, TCN suggested that the route be adjusted to cross west of Hunting Lake, which was identified as an important area to the community. In addition to TCN's concerns, an outfitter operating in the southwest portion of the Split Lake RMA expressed concern with the close proximity of the preliminary preferred route to a cabin and developed bear bait stations. In response to TCN's concerns, the preliminary preferred route was adjusted to follow PR 280, and maximize separation between Assean Lake/Assean Reserve Lands and the route. These adjustments also served to address outfitter concerns through this area.

7.4.1.2 Section 4

In Section 4, numerous competing rationale were considered for making an adjustment to the preliminary preferred route in the vicinity of the Thompson Nickel Belt and Halfway Lake. Concerns with respect to routing included presence of caribou and important habitat, potential restrictions on mining exploration (particularly with exploration techniques), impact to recreational areas and communities, and proximity to Bipoles I and II. Manitoba Hydro investigated four alternative options, including maintaining the preliminary preferred route, and participated in several meetings with mining industry representatives. Map 7-13 illustrates the four options considered. The results of the additional analysis of the four options and input received from stakeholders resulted in the decision to choose another route option as part of the preferred route in this area. The route option selected involved an alignment that crossed through an area east of the Thompson Nickel Belt, Halfway Lake and the community of Wabowden before rejoining the preliminary preferred route alignment at Ponton, just south of the junction of PTH 6 and PTH 39.

The adjustment described above in Section 4 resolved an issue along the preliminary preferred route south of Wabowden and PR 373. In this area, the preliminary preferred route originally crossed through an existing seed orchard considered to be a high value site to Manitoba Conservation Forestry Branch.

7.4.1.3 Section 7

In Section 7, Manitoba Conservation requested that the preliminary preferred route be routed to avoid crossing through the proposed Red Deer WMA and ensure that a local salt spring that feeds into an existing ecological reserve be avoided. Upon review, it was determined that the preferred route was the most viable in terms of not affecting the salt spring and minimizing the extent to which the proposed WMA was crossed. Manitoba Hydro identified tower placement adjustment or "tower spotting" as a suitable design measure to avoid identified areas of concern.

In Section 7, it was determined that a potential corner tower location on private land in the Birch River area would affect a set of granary bins that had been placed by the landowner on the highest point on the flood-prone property. Discussion with neighbouring landowners resulted in the acceptance of an adjustment to relocate the preliminary preferred route to the north side of the road allowance for approximately 4.8 km (3.0 mile) in an east-west direction to avoid this concern.

7.4.1.4 Sections 8 and 9

Several adjustments were made to the preliminary preferred route in Sections 8 and 9 to address various landowner concerns. In the RM of Alonsa, minor route adjustments were made to relocate the route further away from the residential yard site and into the adjacent forest cover to minimize visibility from the property. In another location, a landowner expressed concern about the proximity of the route to Robertson Lake, a waterfowl staging lake and also a Ducks Unlimited Canada project site. The preliminary preferred route was adjusted slightly west to avoid the open water and wetlands area. Manitoba Hydro will also consider the placement of bird diverters on the line through this area.

A further adjustment was made in Section 9 just north of the Assiniboine River crossing. The landowner expressed the concern that the route would impact an existing irrigation pivot and split the management unit. The preliminary preferred route was adjusted slightly northerly to reduce the potential for impacts. Further adjustment to eliminate the potential effect was not possible as it would have resulted in an impact to an existing WMA parcel (part of the Whitemud Watershed WMA and a designated protected area under the PAI).

7.4.1.5 Section 10

In Section 10, an adjustment was made to the preliminary preferred route to avoid crossing through a property that has been developed by the landowners as a 'natural park'. In addition, landowners in the vicinity have livestock fences and shelterbelts for cattle that were identified along the half-mile line which would be impacted by the route. The preliminary preferred route was moved to the east, off the half mile line and adjacent to it, for approximately 4.8 km (3.0 mile) to avoid these concerns.

7.4.1.6 Other Small Route Adjustments

Through Sections 9 to 13 of the preliminary preferred route, numerous other small adjustments were made, where possible, to address the following landowner concerns or suggestions. This included placement of the preliminary preferred route directly on the half mile line to split compensation between landowners and lessen potential effects; adjustments of the preliminary preferred route to the opposite side of the road allowance; movement of the alignment off the half-mile line, and willingness to accommodate the movement of an angle tower onto a property owner's land. In one other instance, in Section 12, a landowner expressed concern with the proximity of the preliminary preferred route to a residence. A change in the route alignment was deemed

viable at this location. This involved offsetting the start of a diagonal route alignment to a parcel of land half-a-mile further east, thus increasing the separation distance on the affected parcel.

Manitoba Hydro also suggested route adjustments, particularly where the preliminary preferred route was aligned in a parallel fashion to existing transmission line rights-of-way. Manitoba Hydro reviewed seven locations involving five 230 kV transmission lines (i.e., P19W [Ponton to the Wabowden area], H75P [Herblet Lake to The Pas area], F27P [Flin Flon to The Pas area], D14S [Dorsey to Somerset], R49R [Ridgeway to Richer]), and one 500 kV transmission line (i.e., D602F [Dorsey to Forbes in vicinity of the Riel Converter Station area]) with respect to parallel alignments. Given varying line lengths of transmission lines paralleled, minimum separation distances were determined from tower centre of the existing transmission line to the tower centre of the preliminary preferred route for the Bipole III line. The minimum recommended separation distances adopted ranged from 63 m (207 feet) for D14S to 98 m (321 feet) for D602F which is a 500 kV ac transmission line.

7.5 DESCRIPTION OF FINAL PREFERRED ROUTE

The final preferred route for the Bipole III line starts and terminates at the Keewatinoow and Riel Converter Station sites, respectively, is approximately 1385 km in length, and follows a course west of lakes Winnipegosis and Manitoba (Map 7-14). Starting in the north, in Section 1, the final preferred route proceeds westerly for approximately 92 km (57 miles) through a sparsely populated area before it crosses an abandoned rail right-of-way and the existing HBR line. It is then routed through the Churchill WMA (a portion of which is also designated as an ASI) for approximately 14 km (8.7 miles). The portion that is routed through the ASI is approximately 4.8 km [3 miles] in length. East of the HBR line, the final preferred route is located within the Town of Gillam boundaries, and crosses through the Fox Lake RMA as defined under the ISA. West of the HBR line, the final preferred route crosses through unorganized territory and through the Stephens Lake ASI just northeast of Stephens Lake for approximately 61 km (38 mile).

In Section 2, the final preferred route proceeds in a southwesterly direction south of Limestone and Waskiaowaka lakes and north of the TCN Reserve Lands for a total length of approximately 118 km (73 mile). The route crosses through the Stephens Lake ASI in this section for approximately 15 km (9 miles). In Section 3, the final preferred route continues in a southwesterly direction between Pukatawakan and Orr lakes for a distance of approximately 28 km (17 miles). The preferred route then crosses PR 280

and parallels the road for approximately 2.5 km (1.5 miles) east of Orr Lake and just north of the Odei River before crossing the Burntwood River.

From the crossing of the Burntwood River, the final preferred route continues in a southwesterly direction in Section 4, to a point west of Bryce Bay and Partridge Crop Lake, for a distance of approximately 290 km (180 miles), staying east of Paint Lake Provincial Park. Southeast of Paint Lake Provincial Park, the final preferred route proceeds south, to the east of Wabowden and then west to the Ponton area, avoiding numerous mining claims and mineral lease areas within the Thompson Nickel Belt. From the Ponton area, the final preferred route proceeds southwesterly for approximately 80.5 km (50 miles) southwest to the Dyce Lake area. In Section 5, from Dyce Lake to The Pas area, the final preferred route crosses through the Tom Lamb WMA (and ASI) for approximately 50 km (31 miles) before crossing the Saskatchewan River east of The Pas. The total distance of the final preferred route in Section 5 is approximately 101 km (63 miles).

In Section 6, south of The Pas, the final preferred route generally crosses through unorganized territory to the Red Deer River where it flows into Dawson Bay on Lake Winnipegosis for a distance of approximately 104 km (65 miles). The final preferred route crosses three proposed WMAs. The proposed Red Deer WMA (to be protected under PAI) is crossed by the final preferred route for approximately 27 km (17 miles). The proposed Summerberry WMA portions (both protected and unprotected) are crossed for approximately 17 km (10 miles) and 29 km (18 miles) respectively. In Section 7, the final preferred route generally proceeds in a southeasterly direction, between the Porcupine Mountains and Swan Lake, from Mafeking to Cowan for approximately 112 km (69 miles). The final preferred route crosses through the RMs of Mountain (North) and Minitonas. It crosses numerous parcels of agricultural Crown land for a distance of approximately 65 km (40 miles), principally located north and east of Bellsite and Mafeking, west of Swan Lake at Indian Birch, and north and east of Cowan.

In this section, the final preferred route crosses through the Swan-Pelican Provincial Forest Reserve for approximately 15 km (9 miles) and is routed on the west sides of the forest reserve to the Steeprock WMA, north of Mafeking, and the Lenswood Community Pasture, east of Lenswood. The final preferred route does include some localized soil and terrain concerns that are considered manageable. Crossing of the Swan-Pelican Provincial Forest in this section is not avoidable.

Through Section 8, the final preferred route generally follows south easterly along the western shores of lakes Winnipegosis and Manitoba for approximately 156 km (97 miles) taking advantage of compatible land uses such as woodlands, pasture and forage lands to a point south of Eddystone, west of Ebb and Flow Lake. The final preferred route crosses through the RMs of Mountain (South), Mossey River, Lawrence and the

northern half of Alonsa. Through this area, the final preferred route crosses through agricultural Crown land parcels for approximately 83 km (51 miles), many of which are not avoidable.

In Section 9, the final preferred route continues in a southerly direction along the western shore of Lake Manitoba, south of Eddystone to a point where it crosses the Assiniboine River southwest of the Long Plains First Nation Reserve. The total length of the preferred route in Section 9 is approximately 168 km (104 miles). The final preferred route crosses through the southern half of the RM of Alonsa, and through the RMs of Lakeview, Westbourne, the western edge of Portage la Prairie, North Norfolk and South Norfolk. It crosses prime agricultural lands and irrigation potential areas taking advantage of road allowances and other utility right-of-ways where possible. The final preferred route crosses through parcels of agricultural Crown land for approximately 23 km (14 miles).

Designated lands in the vicinity of the final preferred route include the Alonsa Community Pasture, the Langruth WMA, and the Lakeview Community Pasture (all on the west side of the route); and two parcels of the Whitemud Watershed WMA at the Assiniboine River crossing.

The final preferred route continues generally in a straight west to east alignment for approximately 76 km (47 miles) in Section 10 south of PTH 2. It is located south of the communities of St. Claude, Haywood, Elm Creek and Fannystelle through the RMs of Grey, Dufferin and a small portion of Macdonald. The final preferred route principally crosses through high agricultural capability lands and intensive agricultural use areas with active and potential irrigation. The agricultural concerns were addressed further through route adjustments to eliminate diagonal placements and alignment along existing linear features (e.g., drains, roads) where possible.

In Section 11, the final preferred route crosses to the north of Brunkild and to the south of Domain to a crossing of the Red River approximately 2 km (1.2 miles) south of Ste. Agathe. The final preferred route in Section 11 is approximately 42 km (26 miles) long crossing through the RMs of Macdonald and Ritchot. Through this section, it crosses through the river lot survey pattern to the west and east of the Red River for approximately 6 km (4 miles). East of the Red River the final preferred route crosses through a more densely populated rural setting that includes a considerable concentration of rural residences, intensive agriculture and barn complexes.

The final preferred route in Section 12 crosses for approximately 35 km (22 miles) in an easterly and then northerly direction through parts of the RMs of Ritchot and Hanover. In Section 13, the final preferred route runs north past the Village of Landmark on its east side, north and then east to avoid the community of Dufresne, and crosses the TransCanada Highway before heading north to an existing transmission line right-of-

way, where it parallels the existing D602F transmission line west into the Riel Converter Station site.

In Section 13, the final preferred route is approximately 50 km (31 miles) in length, crossing through the RMs of Tache, Ste. Anne and Springfield. Intensive agricultural use, and farm and rural residential development predominate. Even though the final preferred route minimizes proximity to extensively developed areas and pockets of rural residential development, route adjustment was required near Lorette and Dufresne to further minimize potential impacts to existing residential development, particularly in the vicinity of the Seine River. Some field tower and diagonal line placement may be required to avoid housing and intensive livestock facilities.

REFERENCES

Smith *et. al.*. 1998. Terrestrial Ecozones, Ecoregions and Ecodistricts of Manitoba, An Ecological Stratification of Manitoba's Natural Landscapes. Agriculture and Agri-Food Canada, Research Branch, Brandon Research Center, Land Resources Unit, Winnipeg, Manitoba.