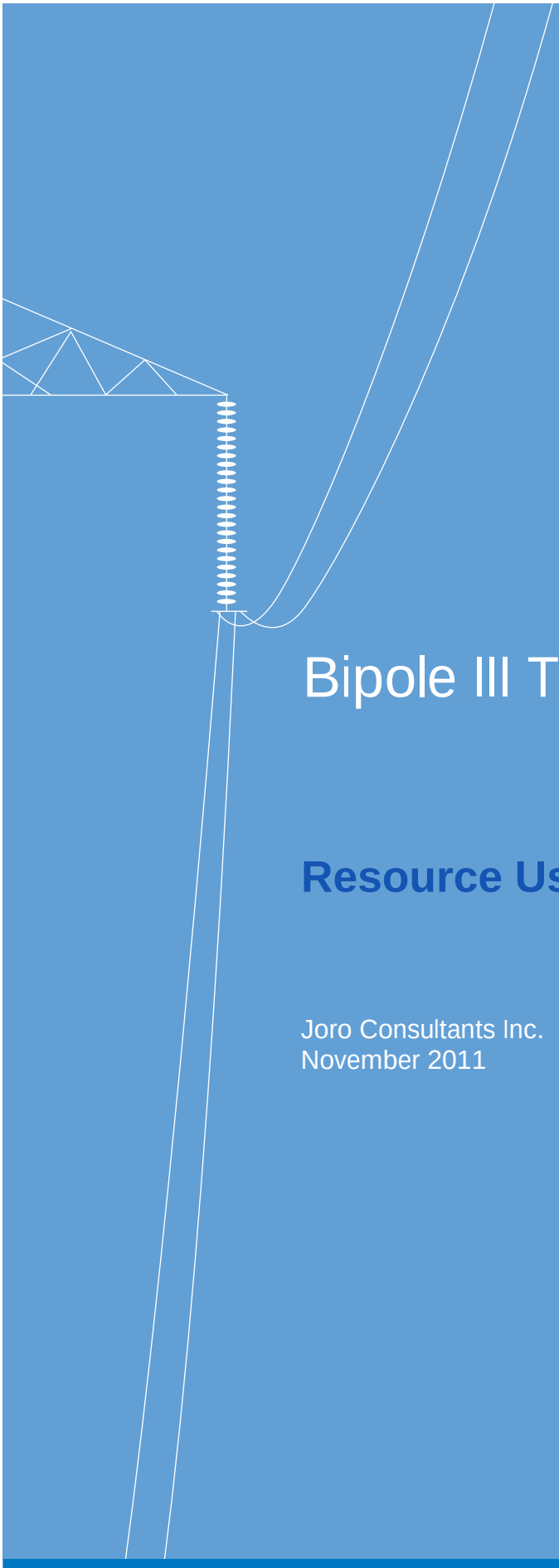

Bipole III Transmission Project

Resource Use Technical Report

Joro Consultants Inc.
November 2011

Manitoba Hydro

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Prepared by Joro Consultants Inc.

Prepared for: Manitoba Hydro

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1.0 INTRODUCTION

1.1 Statement of Purpose

Manitoba Hydro is proposing to develop a new 500 kilovolt (kV) high voltage direct current (HVdc) transmission line, known as Bipole III, on the west side of Manitoba. Approximately 75% of Manitoba Hydro's generating capacity is delivered to southern Manitoba via the existing HVdc Interlake corridor which is shared by the Bipole I and II transmission lines. Due to the heavy reliance on one transmission corridor and a single converter station in the south (Dorsey), the system is vulnerable to extensive power outages from severe weather (e.g., major ice storms, extreme wind events, tornados), fires, or other events.

Joro Consultants Inc. has been retained by Manitoba Hydro to gather and synthesize information on resource use in the Project Study Area in order to assist Manitoba Hydro in the completion of the Site Selection and Environmental Assessment (SSEA) for the proposed Bipole III transmission line project. The tasks identified to complete the SSEA included constraints identification and analysis in order to select alternative routes, alternative routes analysis, identification and assessment of a preferred route, preparation of an environmental impact statement and preparation of a project effects assessment for the Bipole III Project.

The report features an overview of resource use within the Bipole III Project Study Area. Environmental effects on resource use have been identified for trapping, hunting, outfitting and recreation, fishing, wild rice harvesting, berry picking, amphibian harvesting, traditional plant harvesting and other uses, from a variety of sources including published and unpublished literature, Aboriginal traditional knowledge (ATK), and interviews with resource users. Though interactions between wildlife and resource use are considered in this report, detailed assessment of the effects of Bipole III on wildlife are

available in the *Bipole III Mammals Technical Report* (Joro and WRCS, 2011) and the *Bipole III Caribou Technical Report* (Joro Consultants Inc. 2011a). Mitigation strategies for projected effects on resource use are outlined and recommendations provided.

1.2 Background

The proposed project will consist of a HVdc transmission line originating at a new converter station to be located near the site of the proposed Conawapa Generating Station on the Nelson River and terminating at a second new converter station to be located at the Riel site east of Winnipeg. The Project will also include new 230 kV transmission lines linking the northern converter station to the northern collector system at the existing 230 kV switchyards at the Henday Converter Station and Long Spruce Generating Station. Each of the converter stations will require a ground electrode facility connected to the station by a low voltage feeder line.

Studies have concluded that a new transmission line and associated facilities would improve system reliability and reduce dependency on Dorsey Station and the existing HVdc Interlake corridor. The Bipole III Transmission Reliability Project would also establish a second converter station in southern Manitoba, to provide another major point of power injection into the transmission and distribution system. In addition, Bipole III will reduce line losses on the existing Bipoles I and II and provide additional transmission line capacity from north to south. Following an assessment of system reliability options and review by the Manitoba Hydro Electric Board and the Province of Manitoba, the decision was made to develop Bipole III on the west side of the province.

1.3 Route/Site Selection

Manitoba Hydro transmission projects utilize a Site Selection and Environmental Assessment (SSEA) process to better understand the potential issues and concerns associated with the routing and siting of the transmission line and components, to assess

the potential for adverse effects and identify appropriate mitigation measures to manage the overall effect of the proposed project on the environment. This process was undertaken for the Bipole III Transmission Line Project.

The specific objectives of the SSEA process were to:

- Provide a description of the proposed transmission facilities to all stakeholders and the public.
- Select alternate routes and sites for transmission lines and associated facilities in a technically, economically and environmentally sound manner.
- Assess the potential impacts of the proposed transmission line and its associated facilities.
- Conduct the SSEA process with consideration of local input from potentially affected First Nations and other aboriginal communities, other communities and municipalities, land and resource users, interest groups, resource managers and the public at large, in a responsive, documented and accountable fashion.
- Find practical ways to mitigate potential negative effects and enhance benefits.
- Prepare an Environmental Impact Statement (EIS) that documents the results of the SSEA process.

Through study area characterization, the locations of sensitive biophysical, socio-economic and cultural features, technical (engineering) and cost considerations for transmission line routing were identified. The SSEA process utilized data from existing published sources, was supplemented by field studies and incorporated feedback from public and government involvement consultation, including Aboriginal traditional and local knowledge.

Through the SSEA process, three alternative route corridors were identified. The alternative routes selected avoided significant sensitivities where possible, and sought to minimize potential effects where avoidance was not possible or practical. A route selection matrix was developed to facilitate the evaluation of alternative routes on a segment-by-segment basis. The alternate routes were separated into 13 segments and evaluated and compared, by segment, considering geographic features, potential opportunities, technical considerations and professional judgment. During the course of the route selection process, several adjustments were made to the original alternative route segments based on additional input provided by the Environmental Assessment study team and various stakeholders (e.g., mining and agricultural interests).

A total of 28 factors were identified to evaluate the alternative routes. These factors included a full range of biophysical, socio-economic, land use, technical and stakeholder considerations. Evaluation criteria were identified for each factor that would facilitate three-tier (high, medium and low) ranking. Biophysical, socio-economic and land use rankings were based on the degree to which the factor is affected. Technical rankings were based on the degree to which the factor is a constraint while stakeholder rankings were based on the nature and degree of response. A four-tier ranking (very high, high, medium and low) was used for several biophysical factors where potentially significant implications on protected species and habitats were identified.

Stakeholder factors were applied to the segment rankings after the ratings were determined. Stakeholder response criteria were based on both a numeric count and a general expert assessment of the negative or positive commentary provided for certain segments. General commentary provided (e.g. diagonal routes are not preferred) was considered in the evaluation of relevant segments. The objective of the stakeholder evaluation was to select route segments with the lowest level of concerns or most favored as expressed by Aboriginal groups, municipal governments, stakeholder groups, and the

general public. A three tiered ranking system (fair, good, or poor) was based on numeric counts of comments provided plus expert assessment of feedback from all sources.

ATK was considered separately under the various applicable biophysical, socio-economic, land use and stakeholder factors. Where ATK confirmed a scientific finding, no change in ranking was made, but a note to that effect was included for that particular segment. Where ATK provided additional information about any of the 28 factors, it resulted in a higher ranking than what was determined previously.

The conclusion of the route evaluation and analysis process resulted in the selection of a Final Preferred Route (FPR) for the Bipole III Transmission Line.

SSEA scoping studies began with constraints assessment, and the development of an approach that was used for Alternative Routes Selection. Constraints identification primarily included the collection of existing data from government, private institutions and other land user groups. Scoping studies also included the limited collection of field data used to validate, and in some cases, supplement project constraint data gaps. All constraints data were imported into geo-spatial software in order to identify sites within the Bipole III Project Study Area that had the potential for increased risk of effects due to the construction of the Bipole III Transmission Line. All constraints data and a report were submitted to MMM Group for use in the development of Alternative Routes.

Final Preferred Route Site Evaluation Studies began shortly after the Preferred Route was selected. Field data was collected to help describe the existing environment near the PPR, provide comparative data (for context), to validate predictions, to develop the effects assessment, and to provide site-specific locations for mitigation. The FPR was subsequently selected by Manitoba Hydro.

1.4 Project Description

1.4.1 Bipole III General Structure[1]

Two basic tangent structure types will be used for the straight line sections of the Bipole III HVdc transmission line. In northern Manitoba, the line conductors will be suspended from guyed lattice steel structures. Guyed structure design and construction is beneficial in northern Manitoba as it can be adjusted to accommodate difficult or shifting foundation conditions, while also enabling periodic adjustment of the guys at their anchors, to accommodate for such movement. This is particularly important where permafrost may affect foundation stability and where construction access and maintenance may be hampered by difficult soil and terrain conditions. In the densely developed areas of southern Manitoba, self-supporting lattice steel structures will be used to reduce land acquisition requirement of tower foundations, reduce structural footprints and minimize potential impacts on adjacent farming practices.

Right of way (ROW) widths also will reflect access requirements for line construction and maintenance. Access is typically by surface vehicles and equipment but may also involve helicopters, particularly in the case of northern lines. Access is generally made on or along the ROW (i.e., “down-line”) from intersecting roadways. In cases of remote location or difficult terrain, however, it may be necessary to provide for secondary surface access to or along segments of the ROW.

[1] *NOTE: Section 1.4.1 to 1.4.7 – Project Description – are based on Bipole III Transmission Project: A Major Reliability Improvement Initiative provided by MMM (Date April 7th, 2011).*

Apart from removal of dangerous trees along the right-of-way edges, clearing procedures are normally confined to the ROW. Where access outside the right-of-way is necessary (e.g. by-pass trails) and has not been identified in advance[i], supplementary approvals will be obtained from Manitoba Conversation (e.g., work permits and timber permits relating to activity on provincial Crown lands) or from individual land owners. To facilitate such supplementary arrangements and avoid construction delays, every effort will be made to identify related access requirements as soon as possible during the clearing process.

Access for construction (and subsequent line maintenance) activities will generally occur along the right-of-way using existing public access roads or trails wherever possible. This enables maximum use of existing road access and minimizes the requirement for the development of new temporary trail access and the associated environmental effects. Minor deviations from the right-of-way may be necessary in severe terrain conditions. Unless required for on-going maintenance, the ROW access trails will not be regularly maintained post construction. Overall, the primary effect of construction of the HVdc Transmission Line and associated ROW is anticipated to be clearing of vegetation for construction of Project components and increasing access to project areas.

1.4.2 Converter Stations

Two converter stations will be constructed at both ends of the Bipole III line. In the north, the new Keewatinoow Converter Station will include converters with associated equipment and ancillary facilities. This arrangement is required to terminate the 230 kV transmission line connections to the northern collector system, to convert the AC power from the collector system to DC power at the +/- 500 kV level, and to provide the HVdc switching facilities necessary for termination of the new HVdc Bipole III transmission line. The new southern converter station will include the HVdc switchyard facilities necessary to terminate the new HVdc transmission line. The southern station (Riel) will consist of the converters and the ancillary facilities required to convert the DC power

from the Bipole III transmission line to AC power at the 230 kV level which is necessary for injection into the southern receiving system. Although otherwise similar in concept to the Keewatinoow Converter Station, the Riel converter facilities will include synchronous compensators used for voltage control, strengthening the system, supporting the Bipole III converters and adding system inertia for stability (Manitoba Hydro, 2010).

1.4.3 Ground Electrodes

Ground electrodes will be required at both the northern and southern Bipole III converter stations to enable ground return of electric current in the event of monopolar operation. The electrode site selection process was an iterative process of identifying and evaluating sites. Thirteen candidate electrode sites were initially identified within 50 km (approximately 31 mi.) of the proposed Keewatinoow converter station and later expanded to include an additional ten sites on the basis of technical criteria (Manitoba Hydro, 2010). Final site selection was based on the SSEA process and involved aboriginal interests in the site selection (Manitoba Hydro, 2010a). For the northern ground electrode two potential sites were considered acceptable for development. In rank order of technical preference, these sites are NES6 and NES7. The technically preferred site has been established as NES6, located within the Fox Lake Resource Management Area (See report- Bipole III Transmission Project: A Major Reliability Improvement Initiative, 2011, for further details).

The Riel ground electrode site selection process identified 11 candidate sites. Final site selection was based on the SSEA process, with potentially affected landowner's, residents, and affected stakeholders within the R.M. of Springfield. As a result of this process, Site SES1c a variation of SES1, ranked highest in technical review of the four alternatives and was selected as the final southern electrode site (See report- Bipole III Transmission Project: A Major Reliability Improvement Initiative, 2011, for further details).

1.4.4 Connection Line between Electrode and Converter Station

The low voltage connecting line between the electrode and the converter station DC switchyard will be an overhead pole line strung with two conductors and similar in scale to a distribution line. The electrode line conductor will be similar to that of the pole conductor in the HVdc line. If the electrode site is located along the access road, the electrode line is expected to be routed within the access road ROW (Manitoba Hydro 2010a).

1.4.5 Collector Lines

Based on prior design experience in northern Manitoba, guyed lattice steel structures have been identified as the preliminary design standard for straight (tangent) sections of the 230 kV northern collector kV transmission lines. As for the northern portion of the Bipole III HVdc line, guyed structures provide flexibility for tower construction and maintenance in difficult foundation and terrain conditions. Self-supporting lattice steel structures will be used for angle or dead-end towers where rock foundation conditions are present. Guyed lattice steel structures will be used in angle or dead-end locations where soil conditions are poor (Manitoba Hydro 2010a).

1.4.6 Site Access Roads

Site access roads will be used at various sites within the Bipole III Project footprint, with the majority of existing and planned access routes occurring in the Northern Study Area. The majority of site access roads required for the Project are pre-existing roads created through other projects and will be re-purposed for use in this project; however, some new site access roads will be required to be created for the Bipole III Transmission Project. The roadway network will permit on-site tractor trailer access for site development and equipment installation and maintenance, as well as access for employees and smaller service vehicles. Access roads will be used by heavy construction equipment for the

duration of the construction phase of the Project. Where access roads currently exist and can be rehabilitated for project use, rehabilitation and maintenance will be undertaken as soon as authorization for the Bipole III project is received. The extent of the required access road upgrading will be under ongoing assessment.

Precise layout and design requirements for the access and haul roads will be determined on the basis of the contractors' proposed construction methodology and subject to Manitoba Hydro approval.

1.4.7 Borrow Sites

Aggregates required for use in foundation construction will generally be transported from established and appropriately licensed sources off-site. Suitable material for backfill of excavated organic soils may be hauled from newly developed borrow areas along the right-of-way. Typically, borrow pit locations will be located along the right-of-way to minimize environmental disruption, haul distances, and cost. Where suitable sources are not available along or close to the right-of-way, nearby deposits may have to be identified and the surrounding brush cleared to gain access to the line. Selection, development, and reclamation of new borrow sites will be undertaken in accordance with provincial regulations and with the approval of the local Natural Resources Officer and local government authorities. Where borrow pits are required, exposed soils will be reclaimed by promoting re-growth of native vegetation and other mitigation measures in accordance with *The Mines Act (1991)*.

2.0 STUDY AREAS

The Bipole III Project Study Area for SSEA was determined by an alternate route evaluation process whereby routing options were identified and then ranked in sections by all disciplines of the environmental assessment process. The resulting Final Preferred Route (FPR) contained in the Bipole III Project Study Area is approximately 1,384 km

long and transects five distinct Ecozones: Hudson Plains Ecozone; Taiga Shield Ecozone; Boreal Shield Ecozone; Boreal Plains; and Prairie Ecozone. In composition, these ecozones represent 3%, 3%, 37%, 35%, and 23% of the Bipole III Project Study Area respectively. These varying ecological and environmental conditions influence the diversity and abundance of flora and fauna resulting in various resource use dynamics in the different ecozones.

2.1 Study Area Ecozones

2.1.1 Hudson Plain

The Hudson Plain Ecozone in Manitoba is located in the northeast corner of The Project Study Area and extends along the southern edge of Hudson Bay. Peatlands and marshes dominate this poorly drained ecozone. Trees that do exist in this transitional area between the Arctic tundra and boreal forest are typically sparse, scattered, and stunted. Such tree species include black spruce (*Picea mariana*), white spruce (*Picea glauca*), and tamarack (*Larix laricina*) along drier ridges, and balsam poplar (*Populus balsamifera*), white spruce, and paper birch (*Betula papyrifera*) in sheltered areas along watercourses (Smith *et al*. 1998; Natural Resources Canada 2007). Common mammals of the Hudson Plains Ecozone include American marten (*Martes americana*), arctic fox (*Alopex lagopus*), black bear (*Ursus americanus*), coastal caribou (*Rangifer tarandus groenlandicus*), gray wolf (*Canis lupis*), lynx (*Lynx canadensis*), moose (*Alces alces*), and muskrat (*Ondatra zibethica*). Polar bears (*Ursus maritimus*) are common along the coast of the Hudson Bay (Smith *et al*. 1998; Natural Resources Canada 2007).

2.1.2 Taiga Shield

The northwestern area of Manitoba is characterized by the features of the Taiga Shield Ecozone: rolling upland hills, lowland bog and fen peatlands, rocky outcrops, and glacial till forming eskers and kettle lakes. Stands of jack pine, black spruce, and tamarack cover the southern portion of this ecozone and transition to the treeless Southern Arctic ecozone

in the north. White spruce, balsam poplar, and paper birch are found along protected areas lining waterways (Smith et al. 1998). Common mammals found in the Taiga Shield Ecozone include arctic fox, barren-ground caribou (*Rangifer tarandus groenlandicus*), black bear, brown lemming (*Lemmus sibiricus*), gray wolf (*Canis lupus*), moose, polar bear, and weasel (*Mustela nivalis*) (Smith et al. 1998).

2.1.3 Boreal Shield

The Boreal Shield Ecozone stretches across most of north-central and eastern Manitoba, and is dominated by the metamorphic gneiss bedrock of the Canadian Shield, broad expanses of coniferous dominated boreal forest, and numerous lakes. Soils in this ecozone are typically thin, cool, acidic, and have low nutrient availability. Wet, oxygen poor, organic soils underlie wetland areas (Smith et al. 1998; Environment Canada 2000). Dominant vegetation cover includes closed stands of conifers, mostly white and black spruce, jack pine (*Picea banksiana*) and tamarack. Broadleaf species including white birch, trembling aspen and balsam poplar are more abundant towards the south (Zoladeski et al. 1995). Common mammals found in this ecozone include American marten, beaver (*Castor canadensis*), black bear, fisher (*Martes pennanti*), gray wolf, lynx, mink (*Mustela vison*), moose, muskrat, snowshoe hare (*Lepus americanus*), red-backed vole (*Cleithronomys gapperi*), striped skunk (*Mephitis mephitis*), white-tailed deer (*Odocoileus virginianus*), and woodland caribou (*Rangifer tarandus caribou*) (Smith et al. 1998; Environment Canada 2000).

2.1.4 Boreal Plains

The Boreal Plains Ecozone extends from the south Interlake to the north Interlake and west to the Saskatchewan border, comprising approximately 15% of Manitoba's landscape. Unlike the Boreal Shield, this ecozone is not dominated by bedrock and has fewer lakes. Although mainly forested, a considerable amount of land has been converted to agriculture including crops, hay land and pasture (Smith et al. 1998).

Mammals common to the Boreal Plains Ecozone in Manitoba include beaver, snowshoe hare, white-tailed deer, moose, elk (*Cervus canadensis*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), black bear, American marten, fisher, and lynx (Pattie and Hoffman 1990; Smith et al. 1998).

2.1.5 The Prairies

The Prairies Ecozone, found in the south-west corner of the province, is mostly made up of agricultural lands including crops, hay lands, and pastures, with small pockets of forested habitats located along rivers, shelterbelts, homesteads and various protected areas. Approximately 9% of Manitoba's total landscape is comprised of Prairies Ecozone that contains significant concentrations of wetlands located in the Neepawa area and adjacent to major water bodies such as Lake Manitoba (Smith et al. 1998).

Common mammals found in this Manitoba ecozone include elk, white-tailed deer, coyote, red fox, badger (*Taxidea taxus*), white-tailed jack rabbit (*Lepus townsendii*), eastern cottontail rabbit (*Sylvilagus floridanus*), striped skunk, Richardson's ground squirrel (*Spermophilus richardsonii*), red-backed vole, deer mouse (*Peromyscus maniculatus*), and northern pocket gopher (*Thomomys talpoides*) (Pattie and Hoffman 1990; Smith et al. 1998).

2.2 Project Infrastructure in the Study Area

The proposed Bipole III northern converter station (Keewatinoow) will lie within the Hudson Plain Ecozone, and the southern converter station (Riel) in the Prairies Ecozone. The proposed transmission line runs in between these two converter stations as described above, passing through the Hudson Plain, Taiga Shield, Boreal Shield, Boreal Plains, and the Prairies Ecozones.

3.0 METHODOLOGY

In order to assess the effects of Bipole III construction on resource users in the Local Study Area, a combination of desktop studies, consultation, and Geographic Information Systems (GIS) analysis was used. Peer-reviewed academic literature and reports were surveyed for information. Four rounds of public consultation were conducted to collect information from resource users in the study area. Additionally, a spatial GIS analysis of intersection between the FPR and allocated resource use areas, including Registered Traplines (RTLs) and Game Hunting Areas (GHAs) was completed to assess the potential effects of the Bipole III Transmission Line on resource use.

3.1 Desktop Studies

3.1.1 Literature Review

The purpose of this section will be to provide background to resource use in Manitoba specifically, with particular focus on activities occurring in and around the FPR. This section will review current historical and academic literature on the following resource uses occurring near the FPR: hunting; trapping; outfitting and recreation; fishing; wild rice harvesting; berry picking; amphibian harvesting and traditional plants and uses. Data used in this report with respect to licensed recreational hunting and commercial fur harvesting was provided by Manitoba Conservation.

3.1.2 Consultation

Four rounds of public consultation were incorporated into the assessment of alternative routes and the selection of the FPR and included resource users (stakeholders, First Nation and community members). Stakeholders were contacted with mailed questionnaires and follow-up meetings/phone calls discussing potential effects of the Bipole III Transmission Line on resource use in their respective areas of interest. Efforts were made to receive feedback from those contacted during the consultation period. The

topics of the responses focused on hunting, fishing and outfitting and recreation. Results and opinions expressed in surveys and meetings were summarized and incorporated in Section 4.0 (Existing Environment) for use in identifying potential environmental effects of the Bipole III Transmission Project.

3.1.3 Traditional Knowledge

The Aboriginal traditional knowledge (ATK) component for the Bipole III Project employs a methodology of cultural ecology[2]. ATK information was gathered through workshops and community meetings held in various Aboriginal communities within the study area. Oral history and mapping interviews were conducted based on a series of questions that were developed to include aspects of the biophysical and socio-economic environment associated with the Project. The questions developed were designed to be quantifiable and comparable to scientific data gathering methods and involved the following categories:

- Waterbodies/fish, amphibians and reptiles, clams and crustaceans
- Soils and terrains (landforms, rocks and minerals, soils)
- Forestry and vegetation
- Birds (importance, hunting, bird populations and habitat, access)
- Mammals
- Cultural and heritage resources
- Health and social connectivity
- Income/Economy

[2]Cultural ecology is centered upon the relationship between humans and the natural environment which they inhabit; it is a systems process that "…sees the modes of production of societies around the world as adaptations to their local environments" (Berkes 1999:62). ATK is not a static process; like any other part of culture, it is dynamic and evolving, adaptive and resilient.

The intent interviews was to assist in the characterization of the existing biophysical and socio-economic environment for the purposes of evaluating alternative routes to select the preliminary preferred route (PPR) and the overall assessment of biophysical and socio-economic components along the Final Preferred Route (FPR). Potential constraints within the study area were identified on a series of 1:50,000 NTS maps and the knowledge gathered incorporated into all aspects of the Environmental Assessment process.

3.1.3.1 Aboriginal Traditional Knowledge (ATK)

ATK materials, including literature, data and maps, were obtained from the following communities and reviewed (MMM, 2011):

- Baden
- Barrows
- Chemawawin
- Cormorant
- Dakota Plains
- Dakota Tipi
- Duck Bay
- Camperville
- Herb Lake
- National Mills
- Pelican Rapids
- Pikwitonei
- Powell
- Pine Creek
- Red Deer Lake
- Thicket Portage
- Waywayseecappo
- Westgate

Once collected, the ATK survey data were reviewed for species location information, species composition, and important features pertaining to the Valued Ecosystem

Components (VECs) and to other mammal species of interest. The locations of important sites and mammal habitats were also noted, especially in relation to the FPR.

3.1.3.2 Traditional Ecological Knowledge (TEK)

Key person interviews were conducted in October 2010 with first nations and commercial trappers across various locations. Persons from the Manitoba Trapping Association (MTA) zones 1, 4, 7 and individual traplines were interviewed by a representative of MMM Group using a list of pre-determined questions. The interview process was recorded via notes and with the use of maps provided by MMM Group. The traditional ecological knowledge (TEK) collected from trappers during the interview was provided to Joro Consultants Inc. Results of interviews were synthesized, summarized and can be found in Sections 4.2, 5.0, 6.0 and 7.0.

3.2 Spatial GIS Analysis

3.2.1 Trapping

Commercial trapping is a major resource use activity in with forty-five Registered Traplines (RTLs) intersected by the FPR and associated project infrastructure Local Study Area (Map Series 100). Fur harvest records made available by Manitoba Conservation for the intersected RTLs are presented in Appendix A.

3.2.2 Hunting and Outfitting

Manitoba regulates hunting of wildlife through seasons setting and bag limit restrictions on an area basis. Twenty Game Hunting Areas (GHAs) and four Game Bird Hunting Zones (GBHZ) are intersected by the FPR and associated project infrastructure Local Study Area (Map Series 200 and Map 3). A summary of hunting seasons is provided in Section 4.3.1. Wildlife Outfitting is regulated by Manitoba Conservation and operators of businesses directly involved with consumption of wildlife or fishery resources are required to obtain a *Resource Tourism Operators License.* Wildlife allocations for deer

are GHA based while black bear allocation areas are defined as discrete operating areas by Manitoba Conservation. Outfitting for game birds is generally not restricted to specific GHA's therefore specific information on game bird or waterfowl outfitters relative to the FPR is not available. A listing of the number of licensed outfitters having allocation areas within the intersected GHAs is presented in Table 2 (section 4.3).

3.3 Assessment of Cumulative Effects

Cumulative Effects Assessment (CEA) is an important step in determining the impact of anthropogenic and environmental factors on the long-term viability of the environment and its function as an ecosystem (Hegmann et al., 1999). Cumulative environmental effects can result when the environmental effects of a project are combined with the effects of other past, present and future projects or activities (Hegmann et al., 1999). While causal links can often be drawn between actions and consequences using the results of scientific studies and anecdotal reports, the consequences of multiple actions on the environment can be difficult to interpret. This is due to additive costs of cumulative actions as well as possible synergistic effects where resulting consequences can be relatively unique. In studying ecosystems this is often the case where varied aspects require consideration including past and present resource management regimes, species interactions, climactic conditions, variability based on geographic location, etc. (Hegmann et al., 1999).

The proposed Bipole III Transmission Project is a large project with many project components including transmission lines, converter stations, ground electrode facilities, construction camps, construction power station and marshalling yards. Each project component may have environmental effects that may act cumulatively with the effects of other components as well as the effects of other projects and activities in the assessment area. The CEA conducted examined the potential impacts of Bipole III development on resource use alongside other residual environmental effects of other projects,

development actions and environmental considerations. The CEA was undertaken to determine potential positive and negative effects on resource use within the Bipole III Project Area.

The CEA for resource use in the Bipole III Study Area was carried out firstly by identifying past, current, and future projects/ activities occurring in Manitoba which may overlap with Bipole III Project environmental effects. Potential cumulative effects were considered for those projects and activities anticipated to occur within the next 10 to 20 years (Hegmann et al., 1999). A list of projects/activities which were considered for the CEA included forestry activities (Tolko Inc. and Louisiana-Pacific Inc.), mining activities (i.e. Crowflight Minerals Inc., HudBay Minerals Inc., San Gold Corporation, Tantalum Mining Corporation of Canada, Ltd., Vale) and other Manitoba Hydro projects (i.e. Wuskwatim Transmission Project).

Once environmental and cumulative effects from projects (other than the Bipole III Transmission Project) were identified, residual effects resulting from the Bipole III Transmission Project were evaluated for their potential to contribute to cumulative effects on resource use in the Bipole III Project Study Area in conjunction with other projects/activities. Expert knowledge and professional judgment was used to determine cumulative effects for resource use as a result of the Bipole III Transmission Project in combination with other projects/activities. The potential cumulative effects that were identified are reported in Section 8.0 (*Cumulative Effects*) and discussed accordingly.

4.0 ENVIRONMENTAL ASSESSMENT

Due to the heavily reliance on literature for this review, the following Environmental Assessment Section was conducted in combination with review of the Existing Environment of resource use in the Project Study Area. Please see the Sections 4.2 (Trapping), 4.3 (Hunting), 4.4 (Outfitting and Recreation), 4.5 (Fishing), 4.6 (Wild Rice

Harvesting), 4.7 (Berry Picking), 4.8 (Amphibian Harvesting), and 4.9 (Traditional Plants and Medicines) for combined Existing Environment and Environmental Assessments.

4.1 Existing Environment

Right of ways (ROWs) are often used as access for multiple resource uses including among others, agriculture, forest crops (such as berries), grazing of cattle and wildlife, transportation, recreation and trapping. Guichon and Bakewell (1986) hypothesize that the cumulative effects of ROWs may appreciably influence other resource uses. The following is a review of resource use occurring in The Project Study Area. Additional information regarding fragmentation and interception of the Bipole III Transmission line ROW and associated components with resource use areas (such as traplines, game hunting areas and outfitting) can be found in the Bipole III *Fragmentation Technical Report* (Joro Consultants 2011b).

4.2 Trapping

4.2.1 Existing Environment Identified From Literature

Trapping seasons vary by species as well as location and peak times for optimum fur value vary by region (Manitoba Conservation 2011a). Pelt values vary by year, but typically wolverine pelts are the most valuable at just over $200 per pelt. Bobcat, otter, and lynx are also comparatively valuable species. Least valuable species include squirrel, weasel, and muskrat (Manitoba Conservation 2011a). Although the fur industry experienced significant decline in the past two decades, the sale and export of furs continues to provide economic benefit to many individuals and communities. In Canada, 741,800 wild pelts were sold in 2008, generating $92 million dollars in income (Statistics Canada 2010). The total value of raw fur exports, including ranch-raised and wildlife pelts, has risen from $135.8 million in 1996 to $371 million in 2008 (Statistics Canada 2009). From 2004-2006, wild pelts accounted for 64% of total pelt numbers and 44% of

total pelt sale revenue. This number declined in 2007-2008 to 30% of total pelt numbers and 20% of total pelt sale revenue (Statistics Canada 2009).

In 2008, a total of 1,745 RTL licenses were issued and 6,037 Open Area licenses sold in the province (Manitoba Conservation 2010a). This was the highest number of RTLs and license sales recorded since 2003. The purpose of a RTL is to allow the line-holder to have an exclusive opportunity to manage and harvest furbearers within the allocated RTL RTL. The RTL may be a line or a block on the landscape shared by eligible community members (Manitoba Conservation 2010a). RTLs are awarded through competitions held by local trapping organizations and Manitoba Conservation. RTL holders also can hire or appoint helpers, which requires the issuance of a "Helpers" RTL license approved by the line holder. Inactive line-holders may have their RTLs reassigned or advertized by Manitoba Conservation to make use of fur harvest opportunities (Manitoba Conservation 2010a). In the 2007-2008 trapping season, Manitoba trappers harvested 79,235 furbearers across Manitoba (Table 1) (Manitoba Conservation 2010a).

Table 1: Furbearers taken by Manitoba trappers 2007-2008 season (Government of Manitoba, 2010a)

Species	Number Trapped	Species	Number Trapped
Badger	156	Marten	18 670
Bear	42	Mink	5 006
Beaver	13 491	Muskrat	18 996
Bobcats	11	Otter	920
Coyotes	8 295	Squirrel	3 401
Fisher	1 706	Weasel	5 396
Foxes	2 130	Wolves	372
Lynx	609	Wolverine	25

Manitoban trappers require licenses as well as registered RTL permits. In order to obtain a trapping license, applicants must undergo a Trapper Education Course (Manitoba Conservation 2010a). Additionally, export permits are required in order to move raw

pelts outside of Canada (Manitoba Conservation 2010a). Persons engaging in trapping must adhere to provincial regulations governing the ethics and procedures of trapping activities.

There are also a number of Special Trapping Districts in the province, which are broken into Special Trapping Areas. The use of Special Trapping Areas allows for a greater flexibility in the regulations of trapping related matters unique to the local environment. Special Trapping Districts and Areas which intersect the FPR include the Northern Special Trapping District (consisting of the Saskeram/Summerberry/Clearwater Special Trapping Areas and Easterville RTL Section) and Southern Special Trapping District (consisting of the Delta Special Trapping Area [Delta, St. Laurent, Flee Island, St. Marks units], Oak Lake and Whitewater) (Manitoba Conservation, 2011a).

Trapping is also a traditional method of managing problem wildlife such as flooding (beavers) and depredation on live stalk (coyotes and grey wolves). Subsidies are given for the removal of problem beavers through the Problem Beaver Management Program (Manitoba Conservation 2010a). Additionally, predators such as coyotes, wolves, and black bear that threaten livestock or damage private property are managed by trapping. In 2008, 382 predators were taken under government initiatives (Manitoba Conservation 2010a). The importance of trapper involvement in managing problem wildlife will continue.

For the trapping of muskrat, lynx, marten, beaver, fisher, and raccoon (*Procyon lotor*),, certified traps must be used (Manitoba Conservation 2010a). Canada signed the "Agreement on International Human Trapping Standards" in 1997, which aimed to improve the welfare of animals being captured, and is considered a world leader in the progress towards humane trapping. This agreement was in response to public fears and controversy around the ethics of trapping (Andelt et al. 1999) and has allowed for ongoing exports of furs from Canada to the European community. Padded and modified

traps allow for significantly reduced trauma and injury to the captured animal (Andelt et al. 1999) and are required for many species in Manitoba (Manitoba Conservation 2010a). Humane traps tend to be higher in price, need repair, and may require additional training (Andelt et al. 1999).

Manitoban trappers are represented provincially by the Manitoba Trappers Association (MTA) which operates through Local Fur Councils (LFCs) (Manitoba Conservation 2010a). The sale of pelts and products acquired by trapping is in some cases a critical contribution to household incomes and in other cases is a supplemental source of income (Daigle et al. 1998). When trappers become inactive, it is normally due to low pelt prices. Trappers that remain active are generally motivated by reasons other than monetary gain (i.e., way-of-life) (Siemer et al. 1994).

Trapping provides psychological and emotional satisfaction for many who engage in it, though participation has been declining in a number of areas due mainly to suppressed market demand, high fuel and expense costs, posting of private land, the animal rights movement and forest fragmentation (Daigle et al. 1998). Core trappers may be more influenced by sociocultural, socioeconomic, and psychological factors than abundance or pelt prices. Many trappers, especially those who are of Aboriginal or First Nations decent use furbearers as a food source (Andelt et al. 1999). First Nations trappers receive a number of exceptions to provincial regulations, including the right to trap for food or ceremonial purposes in all seasons on lands to which they have right of access (Manitoba Conservation 2010a).

Trapping records obtained from Manitoba Conservation (Manitoba Conservation unpublished data 2009) identify a total of 18 furbearing species harvested from traplines in the Bipole III Local Study Area. In descending order of occurrence, the most common species trapped in the northern portion of the study area between 1996 and 2008 included

beaver, marten, and muskrat. Species that were rarely trapped included black bear and wolverine.

With the exception of the Western RTL District and Southern Special Trapping Districts, there are no RTL sections in the southern portion of the study area. The south is covered by four Open Trapping Zones. In descending order of occurrence, the most common species trapped between 1996 and 2008 included beaver, marten, and muskrat (Manitoba Conservation unpublished data 2009). Species that were rarely trapped included black bear, bobcat (*Lynx rufus*), and wolverine.

4.2.2 Environmental Effects Identified From Literature

Trappers use ROWs for traveling and setting traps along perimeters as they provide easy access to remote areas (Guichon and Bakewell 1986). Access depends on the remoteness of lines from nearby communities, concentration of trappers in the area, number of traplines crossed, and availability of other corridors for travel (Manitoba Hydro 2010b). Direct road access to the ROW may not be possible. However, in some areas, ROWs will allow trappers to access previously unexploited wildlife populations (Manitoba Hydro 2010b).

Methods of vegetation maintenance will also impact trapper access along ROWs, as well as the type and number of species using the corridor (Harriman and Baker 2003). It is possible that the edge effects of the ROW will attract additional small mammals and furbearing predators to an area, but this depends on the habitat quality and type (Manitoba Hydro 2010b).

Power lines routed through RTL areas may disrupt trappers and furbearers (Manitoba Hydro 2010b). Trapped species will generally respond to disturbance similarly to any other wildlife species. Some species, such as beaver and muskrat, will not be affected at all unless structures on which they depend are damaged, which is unlikely to occur

(Manitoba Hydro 2010b). Terrestrial furbearers will leave the area during the construction phase due to sensory and habitat disturbance, leading to a temporary decline in trapline productivity (Manitoba Hydro 2010b). The animals normally return to the area after construction has been completed. A more detailed review of wildlife responses to powerline construction can be found in the *Bipole III Mammals Technical Report* (Joro and WRCS 2011).

Little information is available from academic or technical sources on the effects of powerline construction on traplines. However, negative effects of transmission line ROW construction were observed by the BC Trappers Association in 1999. The organization filed a complaint against newly constructed powerlines by Royal Oak Mines Inc., as trappers claimed that traps, trails, and furbearer habitat were harmed by powerline construction (FPB 2001). Though construction regulations were followed, it was agreed that habitat had been altered and trapline facilities destroyed.

Manitoba Hydro is currently conducting a two year pilot project to assess the effects of hydro transmission line construction and operation on furbearer populations as they relate to trapper utilization and success along the Wuskwatim Transmission Line in the Snow Lake area. The results of this pilot project will provide insight into monitoring programs that are anticipated for the Bipole III project.

4.2.3 Results of GIS Analysis

GIS analysis identified forty-five RTLs that are intersected by the FPR and Project infrastructure Local Study Area (Map Series 100). Trapping records for RTLs intersected with the Project Study Area are presented in Appendix A. Trapping records specific to RTLs that are intersected by the FPR are presented in Appendix B. The FPR is also anticipated to intersect one open trapping zone (#2) (north and east of the Duck mountain

area) and STA Districts of Summerberry and Easterville (Manitoba Conservation, 2011a).

4.2.4 Environmental Effects Identified From Consultation

ATK gathered in interviews reported various trapping activities across areas in the FPR (Bipole III Aboriginal Traditional Knowledge Technical Report, 2011). All communities interviewed reported various aspects of trapping, including current and historical trapping in the Red Deer Lake area of beaver, fox and lynx trapping in the Lake Winnipegosis area, and general trapping activities around the McClarty Lake area. Despite this, many communities have reported that trapping has declined in their communities due to the declining prices for fur. Respondents stated that trapping was more than just a source of income, but rather it provides food and a unique way-of-life.

Trapping efforts were recorded across various times of year, though it was noted trapping generally occurred along rivers, during the spring. Interviewees reported that trappers generally used snares and leg hold traps (until legislation was passed banning specific types of leg hold traps). Fur bearing animals were trapped for both meat and use of the hide. Hide was stretched for sale and many people prepared the meat for consumption.

ATK interviews were used to identify trapping activities in the Wintering Lake area with a wide range of trapping activities noted. Results included information regarding former trapping areas, current marten trapping areas, beaver trapping along Indian River, mink, fox and lynx trapping, general trapping in Horse Shoe Bay area, and a community trapline area used by children collecting beaver, marten, and rabbits. RTLs and trapping activities were recorded in the Ochre River, Cranberry Portage, The Pas Summerberry Marsh, Tom Lamb, Split Lake, Ste. Rose, Wabowden, Long Lake, Cormorant, Mawdelsey Lake, Moondance creek and Duck Mountain area. Species noted to be actively trapped in these areas include beaver, fisher, fox, marten, mink, muskrat, otter,

wolf and wolverine, with beaver and marten the most commonly reported species. Beaver in particular is considered a problem species that causes flooding, and therefore is often a targeted species for trappers given municipal incentives to eradicate beaver in some areas.

A number of trappers were interviewed during the consultation process regarding potential effects of the Bipole III Transmission Line development. The following is a summary of responses and concerns obtained during the interviews:

Effects on Species/Environment:

- Respondents generally felt that there will be no environmental impacts from the construction and operation of the proposed project.
- It has generally been observed that furbearers have been previously seen crossing ROWs and using ROWs as travel corridors.
- It has generally been observed that once the transmission line is built, animals will migrate down the line to areas they previously did not use.
- It has generally been observed that big game species are often seen in ROWs. One respondent stated that grass growing in open areas created by the ROW attracts deer and moose.
- The majority of respondents noted that construction will cause temporary disturbance, but animals will return once vegetation is re-established.
- One respondent stated that animals are said to refrain from the transmission line ROW, but to what degree is unknown.
- One respondent stated that bears will be displaced when the bush is removed.

- One respondent stated clear-cutting operations have previously impacted pine marten population and the species will not cross the ROW. Another respondent stated that in areas where bush was removed for transmission lines, marten populations were displaced and it took a couple of years for them to adapt and return.

- One respondent noted the construction of the Churchill Transmission Line created disturbance as well as the ongoing noise and helicopter activity along the Nelson River. It was also noted that displaced animals have still not returned to this area.

- One respondent noted the effects of the line may extend three kilometres and noted that animals avoid the Churchill Transmission Line.

- The respondent from the Moondance Creek area stated that once the transmission line is built, there will be no hunting areas due to forest removal.

- One respondent stated trappers should be able to focus on other fur species away from the construction areas during the construction phase of this project.

- One respondent stated that the RTL system has provided a positive means of conserving animal populations.

- One respondent stated that the bush will regrow in areas where it was cleared for the ROW.

- One respondent stated concern regarding the creation of water crossings and the negative effect of removing timber right up to the waterway.

Trapping:

- The majority of respondents noted that existing linear features, specifically road and transmission lines, do not have impacts on trapping areas.
- The majority of respondents stated ROWs provide routes for trappers to follow. One respondent stated that clear cutting generally opens up new areas for trapper access.
- One respondent noted that they would use the proposed project route for travel to traplines, but would not trap along the ROW itself.
- The majority of respondents stated construction will restrict some travel and make access to traplines difficult for trappers.
- One respondent stated that Manitoba Hydro has impacted trapping areas around Cormorant over the years due to water structures out by Moose Lake that influences water levels.

Resource access:

- The majority of respondents noted that the ROW will result in an increase in public access to resource and trapping areas.
- The majority of respondents noted that the ROW will likely be used by snowmobilers.
- The majority of respondents noted that negative effects of increased access will be theft and vandalism. Respondents noted vandalism of snowmobiles and traps as examples of previous occurrences of negative activities. Some respondents noted that they are not concerned about vandalism along the proposed route.

- One respondent suggested that access points to the proposed ROW should be assessed on a case by case base.

- One respondent suggested that gates may be effective in limiting public access. Another respondent suggested that licenses or permits could be used to reduce impacts and access to ROWs.

- One respondent stated that the closer a trapper cabin is to a ROW, the more likely the trapper is to relocate their cabin.

- One respondent stated that snowmobile and ATV users have increased in the Duck Mountain and Gilliam areas and have come to impact that environment.

- One respondent noted that they felt like they had no voice with government or snowmobile clubs to address vandalism problems and requests for compensation.

Resources and the Economy:

- One respondent stated that individual trappers impacted by construction should be dealt with in a fair manner.

- One respondent stated that previous developments were good for the Cormorant community and Manitoba Hydro offered compensation packages for the displacement of animals due to the construction of the transmission line.

- The majority of respondents stated that the proposed project will be positive for the economy.

- One respondent stated that the transmission line will impact his activity as a resource user.

- One respondent stated they hunt and gather berries in transmission line area.

4.2.5 Summary of Effects on Trapping

Trapping records obtained from Manitoba Conservation (Manitoba Conservation unpublished data 2009) identify a total of eighteen furbearing species harvested from traplines in the Bipole III Local Study area. Effects on trapping will most likely be observed during the construction phase of the project, when access to some areas may be limited to local resource users.

In addition, species such as marten may be negatively affected by the development of ROWs, since this species actively avoids open and cleared areas. Bears may also be displaced once bush is removed from areas, in addition to other species which use forest cover. Those interviewed stated that construction will cause temporary disturbance, but animals will return once vegetation is re-established. This thought is generally supported by the literature (Manitoba Hydro 2010b; Jalkotzy 1997). It was stated that furbearers and big game, have been previously seen grazing in, crossing, and using ROWs as travel corridors. There was some concern raised by trappers that hunting will not continue in areas were forest cover is removed.

Trappers interviewed stated that linear features generally do not have an effect on trapping activities, though trappers will not trap on the ROW itself. Trappers will generally use ROWs as travel routes to access traplines and generally, construction of ROWs creates travel corridors allowing access to new areas for trappers. The only restriction which may arise during the lifespan of the proposed project is possible restriction of access to trapping areas during the construction phase.

The majority of trappers interviewed stated that the ROW will result in an increase in public access, specifically snowmobilers, to resource and trapping areas. In the past, this has led to an increase in theft and vandalism along some traplines. Restricting access to

the public, possibly through use of gates at access points or through a permit system, may help to reduce vandalism.

4.3 Hunting

4.3.1 Existing Environment Identified From Literature

Hunting is generally defined as the pursuit of wildlife with intent to capture and/or kill (Manitoba Conservation 2009). Hunting is permitted in Wildlife Management Areas (WMAs), most leased crown land, in restricted areas in Provincial Parks, Provincial Forests, and timber cutting areas (Manitoba Conservation 2009). Hunting is only allowed by permission of the owner on private land, conservation district lands, and First Nations lands. The proposed Project passes through twenty Game Hunting Areas (GHAs), intersected by the FPR and Project infrastructure Local Study Area (Map Series 200).

The regulated hunting season generally begins in early September, though specific hunting seasons vary based on species, Game Hunting Areas (GHAs) and Game Bird Hunting Zones (GBHZ), and method of hunting (ie. Rifle, archery ect.) (Manitoba Conservation, 2011b). Methods of hunting may include Centrefire Rifles, Shotguns, Muzzleloaders, Bows, and Crossbows, depending on the game hunted and the season (Manitoba Conservation, 2011b). Big game seasons (including black bear, white-tailed deer, gray wolf, coyote, elk, caribou, and moose) generally begin at the beginning of September and end in December. Licenses for hunting white-tailed deer, gray wolf, coyote, and black bear are based on season, not area. Other species licenses are only valid in the specified Game Hunting Area (Manitoba Conservation, 2011b). Bag limits are normally one animal (eg. bull elk, bull moose, wolf, ect) in a GHA, though some exceptions exist in specific areas.

As of 2011, a number of GHAs have been restricted or closed for moose hunting to allow populations to recover from decline, including GHAs 13, 13A,14, 14A, 26, 18, 18A, 18B

and 18C and parts/sections of GHAs 2A, 4, 7A and 17A (Manitoba Conservation, 2011b). Based on game hunting statistics for Manitoba's GHAs, 12,818 black bears, 3,798 elk, 9,435 moose and 78 caribou were harvested between 1993 and 2007.

Across the province, areas for bird hunting are broken into Game Bird Hunting Zones 1, 2, 3 and 4 (Manitoba Conservation, 2011b). Upland and game bird seasons (including Gray (Hungarian) partridge, grouse, ptarmigan, wild turkey, and migratory game birds including other ducks, coots and snipe, dark geese, white geese, snow geese, and sandhill cranes) begin in September and end in late December (with exception ptarmigan, which ends in February). Wild turkey hunting season also differs from other bird hunting seasons, with turkey hunting running from April to May, and the first two weeks in October. Total bag possession for birds for resident hunters per season varies from 8 to 20 upland game birds, 1 turkey, and 15 to 80 migratory game birds, with ranges varying based on species and time of year (Manitoba Conservation, 2011b).

In 1996, Manitoba hunters accounted for $24.8 million in economic activity, whereas non-resident (tourist) hunters contributed an estimated $30 million (Environment Canada 2000).

In Manitoba, a licence is required in order to hunt big game and game birds. There are a number of exceptions that exist such as exemptions for senior citizens, youth, and disabled persons. Licences are not required for small game such as rabbits, whereas furbearing animals, such as fox and red squirrel, may only be taken in season under a trapping licence (Manitoba Conservation 2009). First Nations' persons have the right to hunt for food or ceremonial purposes without a license and are not subject to restrictions concerning season, bag limits, and some equipment (Manitoba Conservation 2009).

As of 2012, applicants will have to present Hunter Education Certificates in order to purchase any type of hunting licence (Manitoba Conservation 2009). The Hunter

Education course is currently mandatory for all first-time hunters in the province. Restrictions exist on the type and calibre of weapons that can be used for different types of animals (Manitoba Conservation 2009). It is illegal to abandon or spoil the meat of deer, elk, moose, caribou, or game birds (Manitoba Conservation 2009). There are a number of other regulations concerning dress, vehicle use, party size, and other aspects of hunting (Manitoba Conservation 2009). Biological samples for many species are required to be submitted to Manitoba Conservation to monitor spread of disease ((Manitoba Conservation 2009). The trade in wild species and their parts is regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and permits are required for the export or import of black bear, gray wolf, and sandhill crane, their parts, or their derivatives.

Participation in hunting has been declining over recent decades, and is expected to continue to decline (Mackay and Campbell 2004). Despite this, public opinion in Manitoba is generally favourable towards hunting in the province when it is framed as a tourism product and even those most opposed to hunting believe that hunting fees which support wildlife management are beneficial (Mackay and Campbell 2004). Generally, Manitobans perceive trophy and sport hunting negatively. Living in a rural setting, either presently or previously, is correlated with more positive perceptions of hunting (Mackay and Campbell 2004).

Hunting, like other outdoor activities, is practiced for a variety reasons. Some hunt specifically for the meat, while others gain a sense of achievement through hunting, such as trophy hunting (Allen 1984). Hendee and Bryan (1978) found that reasons given for the enjoyment of hunting are similar to reasons given for the enjoyment of other forms of outdoor recreation. This suggests that hunters may share similar goals to participants of other outdoor activities, such as backpackers (Allen 1984).

The potential effects of adding a transmission line to a hunting area have been outlined by Allen (1984). Generally, the creation of a transmission line in a hunting area may result in new winter access trails for line construction and maintenance, thus increasing hunter access. Such an increase in access may be of benefit to some hunters (e.g. those that prefer high road access), while increased access may deter hunters who enjoy more remote activities. Allen (1984) also highlights that in addition to the main focus of hunting wildlife, many people enjoy hunting for the natural setting of the outdoors and use hunting as an opportunity to connect with nature. Therefore, the addition of a transmission line may decrease the quality of the activity to some hunters who place a high value on aesthetics (Allen 1984). Hunters who are interested in pursuing activities in remote, "untouched" forests may avoid deforested areas, or developed areas with structures such as transmission lines (Allen 1984).

The presence of a new transmission line ROW may provide hunting opportunities in designated hunting areas, resulting in a recreation benefit (Manitoba Hydro 2010b). Some game species may also benefit from an increase in favorable browse in the ROW. However, long-term access of hunters into previously unexploited areas may have negative local effects on the populations of some animals (Manitoba Hydro 2010b). Additional access opportunities may also facilitate the movement of poachers into the area.

Methods of vegetation maintenance used on the ROW will also affect hunter access as well as game occupancy in the area (Harriman and Baker 2003). Winter construction of the project may increase hunting access while winter roads are in use, and can increase hunting pressure on wildlife populations depending on the density of hunters and harvestable species in the area (Manitoba Hydro 2010b). However, these effects will only last the length of the season, as winter roads are no longer passable once thawed. The addition of the ROW may also influence the population demographics of species hunted

within the area. Alteration/removal of habitat may result in movement of some species away from the ROW (Manitoba Hydro 2010b).

4.3.3 Results of GIS Analyses

A number of GHAs and GBHZ are in the project study area. There are twenty Game Hunting Areas (GHAs) are intersected by the FPR and project infrastructure Local Study Area (Table 2) (Map Series 200). Within Manitoba Conservation's Northeast Region, including GHAs 3, 9, 9A and 10 (part), there are seven outfitter allocations in the project study area. Manitoba Conservation's Northwest Region includes GHAs 6A, 7, 7A, 8, 10 (part) and 11. There are eight outfitter allocations in these GHAs encompassing the Bipole III project study area. The Western Region of Manitoba Conservation includes GHAs 12, 14, 14A, 18B, 19A, 19B, and 24. There are 48 outfitter allocations in these GHAs encompassing the project study area. In Manitoba Conservation's Central Region, which includes GHAs 25B, 30, 31, 32, 33 and 34A, there are 18 outfitter allocations within the project study area. Parts of GBHZs 1, 2, 3 and 4 are in the project study area.

Table 2: Game Hunting Areas (GHAs) and Game Bird Hunting Zones (GBHZs) located partially or entirely within the Project Study Area.

GHAs and GBHZs located entirely within Project Study Area	GHAs and GBHZs partially located within Project Study Area
13	2
18B	8
19	9
23	10
23A	11
32	12
4	14
7	24
7A	30
RMP*	31
	33
	14A
	19A
	19B
	32
	34A
	35A
	6A
	4
	7
	7A
	9A
	GBHZ 1
	GBHZ 2
	GBHZ 3
	GBHZ 4

* RMP – Riding Mountain National Park

4.3.4 Environmental Effects Identified From Consultation

ATK gathered in interviews reported various hunting activities across areas in Project Study Area. All communities interviewed reported various aspects of hunting including large game, specifically moose, elk, white-tailed and mule deer (*Odocoileus hemionus*),

woodland caribou, barren-ground and coastal caribou, black bear, fox and wolf species which were identified as being included in traditional hunting within the Project Study Area from 1950 to 2010, with harvested species varying based on species availability in an area.

Of the traditionally hunted large game, interviewees stated that moose have been traditionally hunted in the Gilliam, Thompson, Snow Lake, The Pas, Swan River areas and in the surrounding areas of Riding Mountain National Park. Interviewees stated that deer have been traditionally hunted in the Swan River, The Pas and Riding Mountain National Park areas, while elk has been traditionally harvested in the areas surrounding Riding Mountain National Park. Finally, while it was stated that woodland caribou, barren-ground and coast caribou have all been traditionally hunted by various First Nations communities, interviewees identified that barren-ground caribou have been traditionally hunted specifically around Gilliam and surround areas. Many interviewees stated that though he Transmission Line ROW will increase access for hunting, many species will be scared off due to increased traffic and noise.

Small game harvesting within the Project Study Area was identified to include upland game birds (pheasant, ruffed grouse, sharp tail, partridge, ptarmigan), ducks, geese and rabbits. Interviewees stated that these small game have traditionally been hunted in the Gilliam, Thompson, Snow Lake, The Pas, Swan River areas and in the surrounding areas of Riding Mountain National Park.

Interviewees identified that autumn (fall) is the most important season for large and small game harvesting, followed by winter and then summer. The primary species hunted during these periods were moose, deer, upland birds and waterfowl. Also during these periods, berries and other edible plants are harvested during late summer through to fall freeze-up, while medicines are harvested throughout the year.

A number of outfitters responded to Manitoba Hydro's public consultation regarding potential effects of the Bipole III Transmission Line development on commercial hunting. The following is a summarization of responses:

- Concern that transmission line overlaps with established bait sites and loss of bait sites due to clearing.
- Concern regarding effects of transmission line on wildlife and habitat (current and future).
- Concern regarding removal of treed area where the ROW may be placed as the area is used as wintering and calving grounds for deer.
- Concern regarding forest alteration/removal may alter hunting practices.

4.3.5 Summary of Effects

Possible effects of the proposed project on hunting activities are anticipated to be seen during the construction phase of the project, when access to some resource areas may be limited. These effects may be mitigated through consultation and communication with resource users, both commercial and non-commercial, regarding timelines and access to these areas during the lifetime of the project. Creation of a notification system to convey upcoming construction and disturbance activities to resource users and the public may work to mitigate effects. Generally speaking, development of ROWs and associated access trails will benefit resource users through increased access to hunting and outfitting areas. This is generally seen as an advantage for hunters, though risk of theft and vandalism in hunting areas may also result from increased access.

Removal/alteration of game habitat is an effect which may vary based on species ecology. For example, an increase in favourable browse along the ROW may cause a corresponding increase in the present of game species; however, clearing of habitat for ROWs may come at the cost of removing calving and wintering habitat. An increase in

game species is anticipated to benefit non-commercial hunters and outfitters and a decrease would negatively impact these groups. Connectivity to other habitats may also be negatively affected through the construction of ROWs. Avoidance of clearing fragmented habitats is encouraged, where-ever possible.

Removal of prime hunting areas via removal of game habitat is a strong concern among resource users. Disturbance to game populations may be mitigated by routing the transmission line through non-forested areas and conducting construction during off-seasons for hunting (e.g., winter).

4.4 Outfitting and Recreation

4.4.1 Existing Environment Identified From Literature

For purposes of this report, an outfitter is defined as an individual who provides two or more outfitting services to others in connection with hunting, fishing, or ecotourism activities for gain, remuneration or reward (Manitoba Conservation 2008). Outfitting businesses tend to involve either the consumption of wildlife or fish resources, or ecotourism activities such as rafting, canoeing, hiking, wildlife viewing, horseback riding, and boat tours. All outfitters operating as businesses in Manitoba require a Resource Tourism Operators Licence, with the exception of those engaging only in ecotourism activities on private land (Manitoba Conservation 2008). Currently, there are approximately 78 known outfitters operating the Project Study Area (Per. Comm. MMM).

Outfitters that wish to construct lodges, outcamps, portable camps, campgrounds, or related facilities must apply for a permit to do so (Manitoba Conservation 2008). In order to outfit non-residents, outfitters must acquire an allocation of non-resident licences from Manitoba Conservation. For outfitters that engage in fishing activities, lakes are allocated

to the applicant (Manitoba Conservation 2008). The following table shows how many outfitters are operating in GHAs crossed by the FPR (Table 3).

Table 3: Number of Outfitters in GHAs within the FPR

GHA	Number of Outfitters
3	1
7	3
7A	2
8	3
9	2
9A	5
10	3
11	1
12	4
14	13
14A	13
18B	3
19A	13
19B	10
24	4
25B	7
30	6
31	3
32	1
33	1
34A	1

4.4.2 Environmental Effects Identified From Literature

Many of the benefits and problems associated with hunting and ROW development also apply to outfitting and recreation. In the case of outfitters providing hunting services, outfitters may indirectly benefit from increase in favorable browse found along a ROW,

as hunting opportunities may be more readily available if browse corresponds with increases in ungulate populations (Manitoba Hydro 2010b).

There are multiple benefits and problems associated with the creation of a ROW in an outfitting area. The addition of a linear corridor and associated seasonal access trails can result in access to areas outfitters previously could not access (Guichon and Bakewell 1986). This can result in increased use and ease of access for the users, resulting in a potential increase in financial gain. Additional access created by the ROW may also increase use of areas by snowmobiles and all-terrain vehicles (ATVs) in summer and winter (Guichon and Bakewell 1986). While ease of access may be of benefit to ATV and snowmobilers, increased access could lead to theft and vandalism for those with cabins and camps in the area (Guichon and Bakewell 1986).

It is widely acknowledged that fragmentation leads to a direct loss of habitat (Sanders et al. 1991). For outfitters providing services for hunting, destruction of commercial game habitat can jeopardize their enterprise. Consideration of forest type, species usage and next closest habitat of similar type should be considered before removing game habitat from an area. Also, as in hunting, many enjoying outdoor recreation and outfitting partake in such activities in part for an appreciation for the outdoors. If participants are seeking activities with a high aesthetic value (preferring a more natural setting), they may avoid recreational activities around a developed area (Allen 1984), such as a transmission line and associated ROW.

Generally, residents close to powerline construction have negative attitudes towards the development (Priestley and Evans 1996). However, perceptions vary according to the residents' use and familiarity with ROWs, and those who use ROWs for recreation perceive fewer health and safety related effects (Priestley and Evans 1996).

4.4.3 Results of GIS Analyses

Twenty GHAs are intersected by the FPR and Project infrastructure Local Study Area (Map Series 200). A listing of the number of licensed outfitters having allocation areas within the intersected GHAs is presented in Section 4.4.1, along with a map of outfitting lodge locations (Map 4). The distance of outfitting lodge locations to the FPR ranges from approximately 2 to 121 km, with an average outfitting lodge location from the FPR of approximately 50 km.

4.4.4 Environmental Effects Identified From Consultation

Eleven outfitters responded to Manitoba Hydro's public consultations regarding potential effects of the Bipole III Transmission Line development on outfitting and recreation. The following is a summarization of responses:

- Concern regarding removal of treed area where ROW may be placed as the area is used as wintering and calving grounds for deer, and may alter hunting practices if forest is altered/removed.
- Concerns with transmission line increasing vehicle traffic and potential theft from camps.
- Concerns that access to the outfitting areas may be restricted once transmission line is in place.
- Identification of support for the transmission line, given the new ROW may increase access to areas for outfitting activities.
- Identification that transmission line overlaps with bear bait sites.
- Concern regarding effects of transmission line on wildlife and habitat (current and future).
- General concerns with respects to the creation of the FPR.

- Concerns regarding transmission line passing over a swampy areas which are head waters to a river.
- General concerns regarding transmission line will across and clear habitat in outfitting area that has been used for hunting for over 25 years.

ATK gathered in interviews recorded tourism activities in only one community interviewed along the FPR. The activity noted was duck hunting with American tourists in the Lake Winnipegosis area.

4.4.5 Summary of Effects

Currently, there are approximately 78 known outfitters operating in the Project Study Area (Per. Comm. MMM). Possible effects of the proposed project on outfitting and recreation are anticipated to be seen during the construction phase of the project, when access to some resource areas may be limited. These effects may be mitigated through consultation and communication with resource users regarding timelines and access to these areas during the lifetime of the project. Alternatively, development of ROWs and associated access trails may work to benefit resource users through increased access to outfitting areas. However, vandalism as a result of increased access has been identified as a concern, and limiting access in sensitive areas may be preferable.

Removal/Alteration of game habitat is an effect which may vary based on species ecology. For example, game species and outfitters may benefit from an increase in favorable browse found along a ROW; however, clearing of habitat for ROWs may come at the cost of removing calving and wintering habitat. Connectivity to other habitats may also be negatively affected through construction of ROWs.

4.5 Fishing

4.5.1 Environmental Effects Identified From Literature

Fishing, both commercial and recreational, is known to occur all across Manitoba. A more detailed summary of activities occurring in the FPR Local Study Area can be found in the *Bipole III Aquatic Technical Report* (North/South Consultants Inc. 2011). There is little academic literature outlining the effects of ROWs and transmission lines on fishing, given that transmission lines are normally land-based and fishing is aquatically based. New transmission lines and associated ROWs could increase access for fishing along waterways, although special access concerns have not been previously noted for transmission line projects in northern Manitoba (Manitoba Hydro 2010b). It is generally thought that ROWs and their associated access trails could increase access to areas that were previously remote.

4.5.2 Environmental Effects Identified From Consultation

There have been several concerns raised by outfitters during the public consultation phase for Bipole III on fishing. Responses from public consultation include:

- Concern regarding effects of transmission lines crossing areas which are head waters to rivers.
- Concern regarding loss of access to lakes and boat launches for outfitting and activity sites during the construction period via restriction of public vehicle access.

ATK gathered in interviews recorded fishing activities in all communities interviewed, including Wintering Lake, Lake Winnipegosis, Red Deer Lake and the McClarty Lake areas. Respondents stated that they participated in traditional and contemporary (recreational, subsistence and commercial) fishing practices. Many respondents outlined locations of where they have traditionally fished; however, these areas cannot be named

due to privacy agreements. One respondent stated community members no longer like to eat fish from Kischi Sipi (Nelson River) as polluted water has begun to seep into local creeks. Another respondent stated few community members fish commercially, as is less economically viable than it has been in the past.

4.5.3 Summary of Effects

The effects of construction, operation and decommissioning of the proposed project and associated infrastructure are anticipated to have a minimal effect on fishing within the FPR. Effects seen will most likely be during the construction phase of the project, when access to some areas may be limited to local resource users. These effects may be mitigated through consultation and communication with resource users regarding timelines and access to these areas during the lifetime of the project.

4.6 Wild Rice Harvesting

4.6.1 Existing Environment Identified From Literature

Wild rice (*Zizania* sp.) is Canada's only native cereal crop (Archibold and Weichel 1985). It is an aquatic grass which grew along rivers and in lakes ranging from the Atlantic coast to the shores of Lake Winnipeg occurring as a natural crop prior to commercialization (Archibold and Weichel 1985). Wild rice grows best at water depths of 0.6 m or less, starting with an early spring runoff peak followed by a gradual decline in water levels over the summer (Archibold and Weichel 1985; Dore 1969; Thomas and Stewart 1969). This regime is typical of lotic (moving) waters and is home to a variation of wild rice called 'river rice'. Northern wild rice, or lake rice, is a separate variety of wild rice, which is better adapted for deeper waters ranging from 0.5-1.0 m (Archibold and Weichel 1985). In Manitoba, wild rice historically was found along the southeastern portions of the province, along the south and eastern portions of Lake Winnipeg and in select areas around southern Manitoba (Aiken 1988). Currently, there are two primary growing areas in Manitoba, one east of Lake Winnipeg in and around the Whiteshell area,

and one in the northwest around The Pas and Flin Flon (Manitoba Conservation, n.d.a). When harvesting wild rice, community members generally return to the same lakes year after year (O'Neil et al. 1997).

Wild rice harvesting generally occurs from August to October, weather and crop depending (Aiken 1988). Rice harvesting is done via mechanical or hand harvesting, based on what method the group or band prefers. Manitoba's wild rice harvesting is governed by the Wild Rice Act, passed March 1984. This act states that persons harvesting rice require a license to harvest, excluding band members, who may harvest rice for household purposes in areas designated for harvesting (Wild Rice Act 1984).

4.6.2 Environmental Effects Identified From Literature

There is little academic literature on wild rice harvesting, or on the effects of ROWs and transmission lines on the activity. During the construction phase of the transmission line and ROW, vehicle access to harvest sites may become limited for wild rice harvesters. However, the ROW may ultimately serve to increase access to harvest sites. If rice sites are located in remote areas, the ROWs may serve as a direct route for harvesters for accessing sites via ATV or through use of ROW access trails.

4.6.3 Environmental Effects Identified From Consultation

Respondents identified a number of locations where wild rice harvesting is conducted amongst First Nations communities; however, locations of these activities cannot be named due to confidentiality agreements.

4.6.4 Summary of Effects

There are 55 licensed wild rice harvesters, 13 block licenses and 167 production licenses listed in Manitoba. The effects of construction, operation and decommissioning of the proposed project and associated infrastructure are anticipated to have a minimal effect on wild rice harvesting within the area surrounding the FPR. Effects will most likely occur

during the construction phase of the project, when access to some areas may be limited/restricted for resource users. These effects may be mitigated through consultation and communication with resource users regarding timelines and access to these areas during the lifetime of the project. Development of the ROWs and associated access trails may work to benefit resource users through increased access to wild rice harvesting areas.

4.7 Berry Picking

4.7.1 Existing Environment Identified From Literature

Berries of interest found in Manitoba include Saskatoon berry, goose berry, raspberry, blueberry (*Vaccinium* sp.), cranberry (*Vaccinium* sp.), and strawberry (*Fragaria* sp.). Berry picking activity varies considerably based on the ecology and social composition of an area and holds important cultural value for some Aboriginal peoples (Parlee and Berkes 2006; Bipole III Aboriginal Traditional Knowledge Technical Report 2011; Terrestrial Ecosystems and Vegetation Assessment of the Bipole III Transmission Project 2011). Berries are thought not to have the same susceptibility to overharvesting as other resources, such as fish, wildlife, or timber (Parlee and Berkes 2006). Access rights to berry picking areas are generally governed by family groups, with flexibility for the inclusion of others varying based on berry type and availability (Parlee and Berkes 2006). Where berries are picked close to communities or developments, some resource users are fearful concerning contamination of berries due to exposure from road dust, garbage, or sewage (O'Neil et al. 1997).

In British Columbia, Harriman and Baker (2003) used stakeholder consultation to identify a variety of other resource uses along transmission line ROWs including aesthetic values, education value, cultural value, spiritual value, and medicinal/health value. They suggest that managing for wildlife and ecological values will aid in the positive contribution to other land-based resources (Harriman and Baker 2003).

4.7.2 Environmental Effects Identified From Literature

There is limited existing literature regarding the effects of transmission line development on berry picking. It has been previously found that where berries are picked close to communities or developments, some resource users are fearful concerning contamination of berries due to proximity to the development (O'Neil et al. 1997). Generally, residents close to powerline construction have negative attitudes towards the development (Priestley and Evans 1996).

Some berry species found in Manitoba, such as strawberry and raspberry, benefit from cleared areas with increased access to a lot of sunlight and may grow well in ROWs and edge of clearings. Other berries, such as high bush cranberry, prefer shaded, moist areas (Manitoba Conservation, 2010d) and may not persist in cleared ROWs.

4.7.3 Environmental Effects Identified From Consultation

All respondents state they themselves or First Nations community members harvest berries within their traditional areas. Berry species listed as being harvested include, cranberries, blueberries, strawberries and raspberries. Some respondents stated that there are some community members who are concerned that berry picky could be impacted by the construction of the Transmission Line.

4.7.4 Summary of Effects

Given the limited literature and data on berry picking in Manitoba, it is difficult to predict what the overall effects of construction, operation and decommission of the Bipole III project and its varying infrastructure will be on berry picking. The propagation and persistence of berry species will vary based on the current species existing in the area, the berry species ecology, and berry picking activities in local communities. If cultivation and maintenance of species occurs through community activities, possible negative effects of the Project and associated infrastructure may be mitigated.

4.8 Amphibian Harvesting

4.8.1 Existing Environment Identified From Literature

Nine species of amphibians and reptiles are protected by The Wildlife Act (2010), but little is known about their population status (Conservation Manitoba 2010c). Fourteen other amphibian and reptile species are also found in Manitoba, but are not protected. Detail of the existing environmental in the FPR Project Study Area with reference to amphibians can be the found in the *Bipole III Aquatics Technical Report* (North/South Consultants Inc. 2011).

In Manitoba, commercial amphibian harvesting has occurred since 1920 (Seburn and Seburn 1998). Northern leopard frogs (*Rana pipiens*), tiger salamanders (*Ambystoma tigrinum*) and red-sided garter snakes (*Ambystoma tigrinum*) were once harvested commercially in the Interlake and Westlake districts (Conservation Manitoba 2010c). These collected species were sold to biological supply houses and dealers in Canada, Europe and the United States.

Frogs, particularly northern leopard frog, were previously caught by local First Nations and Metis along Lake Manitoba beaches by hand to supply local dealers (Koonz 1992). As of 1973, a quota and season was instated, where a holder of an amphibian picker's license may hunt and sell northern leopard frogs/tadpoles for any purpose from August 1 to October 31, and for sale as sport fishing bait from May 1 to August 1 (Seburn and Seburn 1998). Demand for harvested leopard frogs as university laboratory specimens has since declined over the past decade (Koonz 1992).

4.8.2 Environmental Effects Identified From Literature

Given that demand for harvested amphibians has declined in recent years (Seburn and Seburn 1998), development impacts on this resource may be limited. Main impacts on amphibian and reptile harvesting will most likely be seen during construction, at which

time species of interest may be driven away from the construction site and/or access to harvesting sites may be limited. It has also been suggested that amphibian and reptile species are also sensitive to habitat fragmentation (Bevanger 1998), which may result in movement of species away from ROWs.

4.8.3 Summary of Effects

Given the limited literature and data on amphibian harvesting in Manitoba, it is difficult to predict the overall effects of construction, operation and decommission of the Bipole III Project and its varying infrastructure. Habitat fragmentation created through ROW construction may negatively impact amphibian populations collected in resource areas. Communication with communities who harvest amphibians should be undertaken to evaluate the potential effects of development on amphibian harvesting as the project develops. Currently, the amphibian harvesting industry is in decline, thus potential negative effect on amphibian activities which may be found in the area are likely to be minimal. Development of the ROWs and associated access trails may work to benefit resource users through increased access to remote areas used for harvesting.

4.9 Traditional Plants and Medicines

4.9.1 Existing Environment Identified From Literature

It has been widely documented that First Nations have traditionally used, and continue to use, a variety of plants for medicinal purposes (Parlee and Berkes, 2006; Bipole III Aboriginal Traditional Knowledge Technical Report, 2011; Terrestrial Ecosystems and Vegetation Assessment of the Bipole III Transmission Project, 2011). There is a wide array of traditional medicines gathered and used in Manitoba. Sweet grass (*Hierochloe odorata*) is a common plant within First Nations traditions. Sweet grass is often given as a gift out of respect, used during ceremonies, and also used for medicinal purposes (Small and Catling 1999). Sweet grass has also become commercialized within the last few decades, mainly exporting to the United States for use in traditional cleansing and other

ceremonial purposes (Belcher et al. 2010). Between 2003 and 2006, 4,600 to 9,000 sweet grass braids were sold out of one supplier from The Pas alone (Belcher et al. 2010).

Another wild plant which is cultivated and harvested in Manitoban First Nations is seneca snakeroot (*Polygala senega*) (Small and Catling 1999). Seneca snakeroot is commonly found in Manitoba, in dry, open habitats, such as grasslands and forest openings (Turcotte and Kenkel 1997). Seneca snakeroot has been used historically by First Nations as a remedy for cold symptoms and continues to be used today (Turcotte and Kenkel 1997). Due to overharvesting, this species has been virtually wiped out in the wild and, as a result, is now cultivated for export (Turcotte and Kenkel 1997). Three-quarters of the world's supply of wild snake root originates in the Interlake region of Manitoba, with major exports currently shipping to Japan, the U.S., Europe and Cuba (Turcotte and Kenkel 1997).

In addition to sweet grass and seneca snakeroot, a large variety of other plants are used as traditional medicines in Manitoba. These plants include cedar (*Cedru*s sp.), sweet flag (*Acorus* sp.), water lily (Nymphaeaceae), balsam, tamarack (*Larix laricena*), ginseng (*Panax* sp.), birch tree leaves (*Betula papyrifera*), Labrador tea, dandelion (*Taraxacum* sp.) root and leaves, alfalfa (*Medicago sativa*), wormwood (*Artemisia* sp.), yarrow (*Achillea millefolium*), red clover (*Trifolium pratense*), and juniper (*Juniperus* sp.) berries (Ames 1999).

Documentation of use of these traditional plants varies in Manitoba. Currently, there is no central source for information on the use of these plants. The information on traditional plant use is generally passed on through one-on-one interviews with people from individual communities. Plant use also differs across the province, varying on species availability and cultural influences (Small and Catling 1999).

4.9.2 Environmental Effects Identified From Consultation

ATK gathered in interviews reported identified the majority of First Nations communities harvest plants to varying degrees across the Study Area. Uses for plants harvested by First Nations community members include subsistence, traditional medicines, and economic gain. Sweet grass was noted as being particularly important to community members, with some people selling it as a source of income. Seneca root was also noted as a particular plant being regularly harvested by First Nations community members, Sugar from birch trees and harvesting firewood are also particular resources of interest used by community members. Respondents also noted that community members were concerned about their abilities to harvest their traditional plants after construction of the Transmission Line. Respondents stated they did not want chemicals used in the area as they may harm berries, animals, and the water system.

4.9.3 Environmental Effects Identified From Literature

Traditional plant use across Manitoba is diverse and varies based on the community and plant species within the area. The growth and persistence of traditional plants within and around construction sites and cleared areas vary based on species. Communication with communities who use traditional plants should be undertaken to evaluate the potential impacts of development on traditional plant species harvested (Baker and McLelland 2003). Some traditional plants, such as sweet grass and Seneca root, require high levels of exposure to sunlight (Turcotte and Kenkel 1997), and thus may grow well in cleared areas such as a ROW if proper cultivation is encouraged. To date, these species have been harvested in the wild, although research is currently investigating the maintenance and purposeful cultivation of these plants (Turcotte and Kenkel 1997).

Development is generally thought to contribute to a minimization of traditional land use (O'Neil et al. 1997). It has been previously found that residents close to power line construction have negative attitudes towards the development (Priestley and Evans 1996)

and some resource users are fearful concerning contamination (O'Neil et al. 1997), and thus may avoid resource use in developed areas all together. Some benefits may be seen for traditional plant harvesting in some areas as the ROWs may serve to improve site access by ATV or through use of ROW access trails if harvest sites are remotely located.

4.9.4 Summary of Effects

Given the limited literature and data on traditional plant harvest and use in Manitoba, it is difficult to predict what the overall effects of construction, operation, and decommission of the Bipole III Project and its varying infrastructure will be on traditional plant use. The propagation and persistence of traditionally used plants will vary based on the current species existing in the area, the species ecology, and plant use in the local community. If cultivation and maintenance of species occurs through community activities, possible negative effects of the project and associated infrastructure may be mitigated. Development of the ROWs and associated access trails may work to benefit resource users through increased access to remote areas used for harvesting.

Additionally, one respondent stated that the ROW will reduce the amount of harvestable timber, which will impact his activity as a resource user.

5.0 SUMMARY OF EFFECTS

Overall, the effects of construction, operation and decommissioning of the proposed project and associated infrastructure are anticipated to have a minimal effect on fishing, wild rice harvesting within the Local Study Area. Effects on hunting, outfitting, trapping, berry picking and amphibian harvesting vary and are outlined below. The majority of potential effects of the proposed project on the area have been mitigated through the routing and planning process (SEEA). Other potential effects of this project are noted below.

5.1 Site Preparation and Construction

The majority of effects identified in this report focus on the site preparation and construction phase of the Bipole III Project and its associated infrastructure. Removal/alteration of game habitat is an effect which will vary based on species ecology. Species which require forest cover may become displaced due to forest clearing for the ROW (e.g. Marten), while species which use ROWs for grazing and travel may persist and/or move into the area. Connectivity to other habitats may be negatively affected through construction of ROWs. Avoidance of clearing forested habitats through the SSEA process, which resulted from careful routing of the FPR, will serve to minimize issues surrounding fragmentation and connectivity.

Removal of prime hunting areas via removal of game habitat is a strong concern among resource users. Disturbance to game populations can generally be mitigated or minimized by conducting construction during off seasons for hunting (e.g. winter).

Generally speaking, development of ROWs and associated access trails may benefit resource users through increased access to resource use areas. This is seen as a benefit for resource users, though risk of theft and vandalism in hunting and trapping areas may also result through increased public access.

The growth and persistence of traditional plants and berry species within and around construction sites and cleared areas varies based on species; communication with communities who use traditional plants should be undertaken to evaluate the potential effects of development on traditional plant species harvested (Baker and McLelland 2003).

5.2 Operations

Currently, the amphibian harvesting industry is in decline, thus potential negative effects of transmission operations on amphibian activities which may be found are likely to be minimal. The propagation and persistence of vegetation and berry species will vary based on the current species existing in the area, species ecology and activities in local communities. If cultivation and maintenance of species occurs through community activities, possible negative effects of the project and associated infrastructure may be mitigated.

The ROW will most likely result in an increase in public access to resource use areas. Interviews with resource users indicated that in the case of the previously established Wuskwatim Transmission Line, the increase public access was in the form of snowmobilers and ATVs (MMM, 2010; Bipole III Aboriginal Traditional Knowledge Technical Report, 2011). ROW use is anticipated to be most intensive during winter months, during which snowmobiles and snowmobile clubs will be using the ROW for recreational purposed; however, ROW access is also anticipated during the spring, summer and fall, when ATVs will be using the ROW for recreation and outfitting purposes. It is particularly anticipated that for ATV use, ROW access will be highest during fall, with outfitters increasingly using the ROW for access to GHAs and outfitting areas. It is anticipated that this will also be seen as a potential effect with the Bipole III Transmission Project. Increased snowmobiler and ATV access is anticipated to lead to an increase in theft and vandalism along trap lines and outfitting areas, and thus is considered a potential effect of the Bipole III Transmission Project.

6.0 MITIGATION MEASURES

Manitoba Hydro's standard practices for environmental protection during the construction of transmission lines will generally reduce many of the effects of human activity, such as handling of hazardous and non-hazardous material, hazardous and

non-hazardous waste disposal, and regulations for personnel (e.g., no harvesting of area resources by work crews). The following mitigation measures are recommended for the minimization or avoidance of project effects on resource use areas (Table 4).

- The ROW and other project footprints should be cleared in winter to lessen disturbance of many resource activities, specifically hunting, fishing, and harvesting of plants.
- Long-term storage of cleared vegetation should be avoided so as not to impede wildlife movement, and to minimize the risk of forest fires.
- Trail maintenance activities should not prevent wildlife movement or restrict access to areas by resource users (e.g., snow piles or banks from snow clearing on trails).
- Hunting should be prohibited by project personnel and restriction of firearms in work camps areas to minimize wildlife mortality.
- Speed limits on access trails should be imposed to minimize the risk of collisions with wildlife and increase safety for local residents.
- Efforts should be made to contact local resource users and residents to inform them of when construction is to take place and access to areas will be limited.
- During operation of the transmission line, maintenance of riparian travel corridors should occur to benefit small and medium sized mammals and, in particular, furbearers.
- Efforts should be made to contact local resource users and residents to inform them of when line activity and maintenance is scheduled to occur to reduce impact on local resource activities.
- Maximizing aerial/helicopter-based line inspection and maintenance would reduce the need for ground-based inspection, reducing disturbance in the area.

- Deleterious effects on trappers may be mitigated through consultation and communication with resource users regarding timelines and access to these areas over the lifetime of the project.
- Increased public access to resource use areas via snowmobile and ATV routes may lead to an increase in theft and vandalism along trap lines and outfitting areas. Creation of access management plans in the vicinity of RTLs and outfitter allocations may help to mitigate these effects.
- Restriction of public access to resource areas may be mitigated through consultation and communication with resource users regarding timelines and access to these areas during the lifetime of the project.
- Creation of a notification system to convey upcoming construction and disturbance activities to resource users and the public may serve to mitigate potential effects.
- Timing of the construction phase of the proposed project may work to mitigate numerous possible effects on resource use. Conducting construction during the off-season for resource use activities, such as hunting, trapping, wild rice harvesting, berry picking, and traditional plant harvesting, could mitigate possible effects on activities.
- Proper timing (e.g., conducting construction and clearing during the winter) may help mitigate disturbance to animal populations, negative effects on plant growth, and restriction of access to resource users.

It is anticipated that all effects of the proposed project, with the application of decommissioning mitigation (removal of equipment and foundations, re-vegetation, etc.), are fully reversible over the long-term. Over time, the biophysical disruptions due to the project should be outweighed by ongoing naturally occurring variation (e.g., forest ecosystem succession, wildfire) or by human activity (e.g., agriculture, forestry).

Table 4: Resource Use Component Summary – Environmental Effects and Mitigation

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
Trapping	Trapline routes	Trapline route and length	Change in trapline length Change in trapline route	Change in trapline length due to tree harvesting/disturbance Change in trapline route due to tree harvesting/disturbance	Achieved through routing, avoidance of existing traplines	Trapline productivity maintained within acceptable levels
	Trapline Productivity	Trapline catch levels	Change in trapper income Change in number of active trappers Change in pelt sales	Change in trapline productivity due to tree harvesting/disturbance	Access management Routing of development Timing of construction Communication with trappers regarding construction plans/timelines Compensation for lost trapping areas/seasons	Trapline productivity maintained within acceptable levels
	Access	Number/extent of users	Change in number of trappers in the area Change in extent of area in which trapping operations occur	Change of furbearer species populations Change of trapper income due to increased competition	Access management Routing of development Timing of construction Communication with trappers regarding construction Compensation for lost trapping areas/seasons	Trapline productivity maintained within acceptable levels Furbearer populations maintained within their natural range of variability
Trapping	Infrastructure (traps, trapper's cabins, snowmobiles, etc.)	Damage to property	Change in reports and complaints of vandalism, theft, and/or property damage	Vandalism, destruction, theft	Access management Routing of development Compensation	Some damage may be unavoidable
Hunting (commercial and non-commercial)	Caribou	Habitat Regional and local population status	Habitat Hunting statistics Population status	Overharvest as a result of increased access. Habitat loss and fragmentation	Achieved through routing Avoidance of high density caribou areas. Access management Riparian management Sensitive sites management	Caribou populations maintained within their natural range of variability

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
	Game birds	Habitat	Habitat Hunting statistics	Overharvest as a result of increased access.	Achieved through routing. Avoidance of wetlands and congregating/staging areas Avoidance of major migration routes	Game bird populations maintained within their natural range of variability
	Elk	Habitat Regional and local population status	Habitat Hunting statistics Population status	Overharvest as a result of increased access. Habitat loss and fragmentation	Achieved through routing, avoiding high density areas Access management Riparian management Sensitive sites management	Elk populations maintained within their natural range of variability
	Moose	Habitat Regional and local population status	Habitat Hunting statistics Population status	Overharvest as a result of increased access. Habitat loss and fragmentation	Achieved through routing, avoiding high density areas Access management Riparian management Sensitive sites management	Moose populations maintained within their natural range of variability
	Harvest quantity	Hunter harvest levels	Change in hunter success Change in number of hunting licenses Change in animals harvested	Change in hunting success due to tree harvesting/disturbance	Access management Routing of development and timing of construction Communication with hunters and outfitters regarding construction plans/timelines Compensation for lost hunting areas/seasons	Hunting success/animal harvest maintained within acceptable levels

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
Hunting (commercial and non-commercial)	Access	Number/extent of users	Change in number of hunters/outfitters in the area Change in extent of area in which hunting occurs	Change of populations of hunted species Change of hunt success due to increased competition	Access management Routing of development and timing of construction Communication with hunters/outfitters regarding construction plans/timelines Compensation for lost hunting areas/seasons	Hunting success/animal harvest maintained within acceptable levels Hunted species populations maintained within their natural range of variability
Fishing (commercial and non-commercial)	Fish populations	Habitat	Change in available habitat Change in fishery productivity	Change in fish populations	Riparian buffer zones/management strategies Routing of development Vegetation control techniques which will limit runoff/pollution	Fish populations maintained within their natural range of variability
	Harvest quantity	Fishery harvest levels	Change in fishery output Change in number of fishing licenses purchased	Change in fishery output due to disturbance	Access management Routing of development and timing of construction Communication with fishermen/outfitters regarding construction plans/timelines	Fishery outputs and fish populations maintained within acceptable levels
Fishing (commercial and non-commercial)	Access	Number/extent of users	Change in number of fishermen and outfitters in the area Change in extent of area in which hunting occurs	Change of populations of fished species Change of fishing success due to increased competition	Access management Routing of development Timing of construction Communication with fishermen/outfitters regarding construction plans/timelines	Fisheries output maintained within acceptable levels Fish populations maintained within their natural range of variability
Berry Picking	Density, volume, and presence of berries	Habitat	Change in available habitat Change in number of berry pickers Change in reports of berry picking success	Change in berry quantities	Routing development to avoid known berry picking areas Vegetation control techniques which favour berry species	Berry levels maintained within their natural range of variability

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
	Harvest quantity	Berry harvest levels	Change in reports of berry picking success Change in number of berries harvested	Change in berry picking success due to tree harvesting/disturbance	Access management Routing of development Timing of construction Communication with berry pickers regarding construction plans/timelines	Berry harvest maintained within acceptable levels
	Access	Number/extent of users	Change in number of berry pickers in the area Change in extent of area in which berry picking occurs	Change in volume of berries harvested due to increased competition OR Change in volume of barriers harvested due to limited access	Access management Routing of development Timing of construction Communication with berry pickers regarding construction plans/timelines	Berry harvest maintained within acceptable levels Berry species populations maintained within their natural range of variability
Wild Rice Harvesting	Density, volume, and presence of wild rice	Habitat	Change in available habitat Change in crop outputs Change in number of wild rice farmers	Change in wild rice output	Riparian buffer zones/management strategies Routing of development to avoid water bodies Vegetation control techniques which will limit runoff/pollution of water bodies	Wild rice outputs maintained within their natural range of variability
	Harvest quantity	Wild rice harvest levels	Change in wild rice crop success Change in number of wild rice farmers Change in area farmed	Change in wild rice output due to disturbance	Access management Routing of development Timing of construction Communication with wild rice farmers regarding construction plans/timelines	Wild rice crop success maintained within acceptable levels
	Access	Number/extent of wild rice farmers	Change in number of wild rice farmers in the area Change in extent of area in which wild rice farming occurs	Change in number of farmers due to limited access	Access management Routing of development Timing of construction Communication with wild rice farmers regarding construction plans/timelines	Wild rice crop outputs maintained within range of natural variability

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
Traditional and Medicinal Plant Harvesting	Density, volume, and presence of desired plant species	Habitat	Change in available habitat Change in harvest outputs Change in number of harvesters	Change in harvesting output	Vegetation control techniques which will limit negative effects Routing of development away from known traditional sites for harvesting	Plant populations maintained within their natural range of variability
	Harvest quantity	Harvest levels	Change in harvest success Change in number of harvesters Change in areas harvested	Change in harvesting due to disturbance	Access management Routing of development Timing of construction Communication with harvesters regarding construction plans/timelines	Harvesting success maintained within acceptable levels
	Access	Number/extent of harvesters	Change in number of harvesters in the area Change in extent of area in which harvesting occurs	Change in number of harvesters due to limited access OR Change in available plants to harvest due to increased competition	Access management Routing of development Timing of construction Communication with harvesters regarding construction plans/timelines	Harvesting outputs maintained within acceptable levels
Recreation	Access	Number/extent of users	Change in number of recreational users of the area Change in extent of area in which recreational activity occurs	Vandalism of Bipole infrastructure due to increased use Destruction/relocation of species due to trampling, snowmobile use, compaction, noise, etc. Vandalism, destruction, and/or theft of private property Decline in recreational users due to access limitations created by construction	Access management Routing of development Timing of construction Communication with recreational users regarding construction plans/timelines	Recreational use maintained within acceptable levels Some property damage may be Unavoidable

Category	Component	Environmental Indicator	Measurable Parameter	Environmental Effect	Mitigation Measures	Residual Effect
Recreation	Aesthetics	Type of users	Change in recreation type	Users preferring more 'pristine' wilderness will abandon the area	Routing of development away from locations valued for aesthetic qualities Maintaining buffer zones Communication with recreational users regarding construction plans/timelines Avoiding development on highly visible locations (hilltops, across lakes used for recreation, etc.)	Recreational user base maintained within normal range of user types

7.0 RESIDUAL EFFECTS

Overall residual effects of the project vary, spanning across social and ecological factors of the project (Table 5). Generally, the project is not anticipated to have permanent adverse residual effects to terrestrial wildlife, after the implementation of mitigation. Residual effects associated with access to resource areas is anticipated to be temporary and is only expected to affect resource users during construction and periods of Project maintenance work. Residual effects associated with vegetation and habitat will vary based on species ecology.

Table 5: Residual Environmental Effects Assessment

1. Residual Environmental Effect	2. Direction	3. Ecological Importance	4. Societal Importance	5. Magnitude	6. Geographic Extent	7. Duration	8. Frequency	9. Reversibility
Loss of wildlife habitat from clearing for ROWs	Negative	Moderate	Moderate	Medium	Project	Medium-term	Infrequent	Reversible
Increased access to remote wilderness via ROWs and service trails	Positive	Low	Moderate	Small	Local	Medium-term	Intermittent	Reversible
Reduced access to wilderness areas due to construction	Negative	Moderate	Moderate	Small	Local	Medium-term	Intermittent	Reversible
Increased fragmentation of wildlife habitat	Negative	High	Moderate	Medium	Local	Medium-term	Infrequent	Reversible
Increased growth of plants requiring high amounts of sunlight in ROW	Positive	Moderate	Moderate	Small	Project	Medium-term	Intermittent	Reversible
Decreased growth and harvest of traditional plants	Negative	Moderate	Moderate	Small	Project	Medium-term	Intermittent	Reversible
Loss of bait sites due to clearing of forest for ROW	Negative	Moderate	Moderate	Small	Project	Medium-term	Infrequent	Reversible

1. Residual Environmental Effect	2. Direction	3. Ecological Importance	4. Societal Importance	5. Magnitude	6. Geographic Extent	7. Duration	8. Frequency	9. Reversibility
Loss of hunting grounds due to movement of wildlife away from ROW	Negative	Moderate	Moderate	Small	Project	Medium-term	Infrequent	Reversible
Increase traffic and theft from outfitting camps and trapping areas	Negative	Low	Moderate	Small	Local	Medium-term	Infrequent	Reversible
Restriction of access to resource areas during construction	Negative	Low	Moderate	Small	Local	Short-term	Infrequent	Reversible
Construction of transmission line over areas which are head waters for rivers	Negligible	Moderate	Moderate	Small	Local	Medium-term	Infrequent	Reversible

8.0 CUMULATIVE EFFECTS

The underlying concept of cumulative effects assessment (CEA) is the residual effects associated with transmission facilities, involving the presence of the line and stations and the cleared rights-of-way and station sites (Hegman et al. 1999). Effects associated with transmission line structures can include electrical effects (EMF), aesthetics, loss of wildlife habitat, forest resources and increased access (Wuskwatim Transmission EIS 2003).

Some of the effects identified (e.g., EMF and aesthetics) are effectively limited to the immediate environs of the rights-of-way and sites (Wuskwatim Transmission EIS 2003). Cumulative effects may be of concern at a broader regional level in the case of issues such as loss of wildlife habitat and increased access. Such effects are discussed here.

Cumulative Effects on Resource Users

With the increase in forestry activities (specifically Tolko and Louisiana-Pacific Canada Ltd.) and mining activities (specifically prospecting exploration, drilling, exploration, access roads, camps, establishment of mine) occurring in the project area, it is anticipated that there will be an increase in removal of game habitat in the area. This will cumulatively reduce hunting, trapping and outfitting opportunities within the Local Assessment and Project Areas. The accumulation of cleared forested areas and increasing road access to previously isolated areas will lead to an increase in public resource area use, including snowmobile clubs, ATV clubs, hunting, trapping, traditional plant harvest and general recreation. The effects of the Wuskwatim Transmission Line will also contribute cumulative effects of increased public access to remote areas in the Project Area and surrounding areas. These effects are anticipated to be seen within the vicinity of the Bipole III Transmission Line ROW, with most intensive use during winter months, during which snowmobiles and snowmobile clubs will be using transmission line ROWs

for recreational purposes. ROW access is also anticipated during the spring, summer and fall, when ATVs will be using the ROW for recreation and outfitting purposes. ATV use is anticipated to be at its highest during fall, when resource users and outfitters increasingly use ROWs for access to GHAs and hunting areas.

9.0 FOLLOW-UP/MONITORING

Follow-up/monitoring includes monitoring and the establishment of environmental management measures and is required in cases where there is uncertainty about the effectiveness of the mitigation measures for a cumulative effect, or in cases where a cumulative effects assessment is based on a new and/or innovative approach (Hegmann et al, 1999). The following monitoring measures may have applicability to various components or resource use in the Project Study Area.

The growth and persistence of traditional plants within and around construction sites and cleared areas vary based on species. Communication with communities who use traditional plants should be undertaken to evaluate the potential effects of the development on traditional plant species harvested (Baker and McLelland 2003). In order to monitor potential effects of the Bipole III Transmission Project on resources, it will be essential to maintain communication with outfitters, hunters, trappers, and other resources users during the construction and operation phases of the Project. Initiatives such as forums to discuss Project effects, public consultation sessions, mail-out-surveys, and other person-to-person communication methods should be undertaken.

Finally, continuation of monitoring projects for mammalian, avian and aquatic species within and surrounding the project area as detailed in the specific technical reports (Joro Consultants Inc. 2011a; Joro and WRCS 2011; North/South Consultants Inc. 2011) will be essential in determining long-term effects of the Bipole III transmission project on resources within the project area.

10.0 CONCLUSIONS

The construction and maintenance of the Bipole III Transmission Project and associated ROW will have a variety of effects on resource users within the Bipole III Project Study Area. The effects of construction and maintenance of the Bipole III Transmission Line is anticipated to have a minimal effect on fishing, wild rice harvesting due to minimal overlap of these activities with the project area. Removal of hunting areas through the disturbance of game species during the construction phase of the project in combination with the effects of fragmentation are strong concerns among resource users. Disturbance to game populations was minimized as much as possible during line routing through the SSEA process and can be further mitigated or minimized by conducting construction during off seasons for hunting (e.g., winter). Development of the ROW and associated access trails are generally seen to benefit resource users by creating increased access to resource use areas, specifically in the case of trapping areas, hunting and outfitting areas, berry picking and medicinal plant harvesting. Though this is a benefit for most resource users, risk of theft and vandalism also increases with increased public access to these areas.

Mitigation measures which can be used to reduce negative effects outlined in this report include consultation and communication with resource users regarding effects of the project seen by resource users in the local area; creation of a notification system to communicate Manitoba Hydro's activities to resource users; restricting resource area access to the general public (specifically ATV and snowmobiling clubs) and strategic timing of the construction phases for the ROW and associated infrastructure to minimize effects of construction during summer months and hunting seasons.

Some residual effects arising from the Bipole III Transmission Project (such as increased access to resource areas) will be positive for resource users in these areas. Other residual effects, specifically increased theft and damage to trapping, hunting, and outfitting areas,

disturbance of local flora and fauna, loss of hunting ground, and restriction of access to resource areas during construction phase of the project are anticipated to be negative to resource users.

Follow-up actions to address potential residual and cumulative effects of this project focus on communication with local communities and resource users, specifically regarding mammal movements within the project area, flora and fauna persistence in the project area and effects of the transmission project and associated infrastructure on resource areas. Additional monitoring projects, such as the trapper monitoring and furbearer monitoring projects (currently in pilot stage of development), Bipole III mammal monitoring, and caribou/wolf monitoring projects will aid in determining residual and overall effects of the Bipole III Transmission Project on resource use areas and resource users.

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12.0 APPENDICES

Appendix A: Trapping results (1996 to 2008) for RTLs overlapping with the Project Study Area.

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
CAMPERDUCK																						
	5			13	44	5		1	2				1	12	53		1	2	50		3	
Trapping Blocking	3131	22		169	225	292		4	109	2		1	39	463	253	14828	166	36	709	34	16	
Total for Camperduck	**3136**	**22**		**182**	**269**	**297**		**5**	**111**	**2**		**1**	**40**	**475**	**306**	**14828**	**167**	**38**	**759**	**34**	**19**	
CORMORANT																						
2	109			9	5	15		2	14				22	156	51	30	22		41	21		
3	19				22	19		3	5				1	58	19	150	4		43	16	1	
4	2				4	2			8				4	20	13	16	2		4	9		
5	26			6	27	31		2	17				5	110	50	48	16		15		2	
6	106	1		5	9	42		4	14	1			16	52	104	187	26		33	9		
7	68			3	50	29		2	27	1		1	4	134	21	255	21		47		3	
8	73			9	36	24		3	13				27	192	32	170	19		41	9	1	
10	68				5	1								26	32	38	8		4	1		
11	158	2			23	30			2				1	241	12	26	43		6			
12	28	1		1	39	25		3	3				3	49	14	108	10	2	34		2	
31													3	3								
UNKNOWN	20			1		1			2					6	1	51	1			1		
Total for Cormorant	**677**	**4**		**34**	**220**	**219**		**19**	**105**	**2**		**1**	**86**	**1047**	**349**	**1079**	**172**	**2**	**268**	**66**	**9**	
CRANBERRY																						
3	255			12	111	103		9	14				24	86	84	157	26		64	2	9	
4	90			3	25	26		2	4				1	4	68	130	43		4		1	
5	32				12	12							5	13	16		7		23	1	6	
6	56				3	1			1				1	3	5	13	14		3			
7	89			1	13	13			4				4	14	18	14	7		47			
8	106	1		8	178	28		8	19				18	92	89	7	35	1	6		3	
10	20				40	12			5				1	41	147		39		28			
14	145	3		15	38	19		3	2				17	150	29	1	30		1		5	
15	69				15	13		2	1				1	21	40	14	10		15		1	
17	55			1	1	3			4					4	30	7	13		6			1
22	174				40	56		7	28			6	32	322	200	118	141		74	12	44	3
23	222			1	64	18		5	10				4	107	138	92	71		4		13	
25	58			16	24				4				3	78	32	106	5				3	
26	69				14			4	4				2	21	21		4		2			
28	150			1	17	1		2	2				3	44	26		8		1			
29	126			7	54	16		5	8				45	91	147	6	71	1	41		5	2
30	52			1	17	13		1	4				3	5	30	2	18		6			

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
33	37			8	79	52			7				7	115	148	2	52		12		1	
35	215			1	5	44		3	3				16	7	29	75	54					
36	46	1		2	37	34		3	7					49	4		2		2	3		
UNKNOWN	20				1									7	1	15	1					
Total for Cranberry	**2086**	**5**		**77**	**788**	**464**		**54**	**131**		**6**		**187**	**1274**	**1302**	**759**	**651**	**2**	**339**	**18**	**91**	**6**
CROSS LAKE																						
Total for Cross Lake	**41**	**1**		**1**		**2**		**1**	**4**				**17**	**41**	**4**	**9**	**1**					
ZONE OF EASTERVILLE																						
9	1			4	5	30			3					7	8	33	37					
Easterville Elock	256	2		56	69	357		15	79				42	179	130	1882	318	5	91	33	17	
UNKNOWN	3			5		8			1					2	6	2766	8					
Total for Zone of Easterville	**260**	**2**		**65**	**74**	**395**		**15**	**83**				**42**	**188**	**144**	**4681**	**363**	**5**	**91**	**33**	**17**	
FLIN FLON																						
1	198			19	101	23		20	36	2			11	68	123	19	45		6		10	
2	306			5	110	44		6	24				28	80	225	34	79				21	1
3	39				37	9			1				4	15	74	7	41		6		8	
4	144			1	123	31		5	11	1			19	139	220	64	63		38		4	1
5	2			3		1		2	7	1				1	3	12						
UNKNOWN									1													
Total for Flin Flon	**694**			**41**	**383**	**108**		**42**	**93**	**4**			**62**	**315**	**653**	**152**	**228**		**63**		**44**	**2**
YOUTH																						
Total for Youth	**5**			**13**	**12**			**9**	**13**					**12**	**8**	**16**			**13**		**1**	
LIMESTONE																						
4	58				2	1		6	15	1			43	4	1208	22	35	16		3	4	6
5	54				8			10	23	4			24	11	532	18	49	2			2	
6	5								2						46	1		1				
13	5			1	2			2	8				10		243	7				2	1	2
Total for Limestone	**122**			**1**	**12**	**1**		**18**	**48**	**5**			**77**	**15**	**2029**	**48**	**84**	**19**		**5**	**7**	**8**
MOOSE LAKE																						
3	80			3	2	8		1	7						33	1	49	5		1	4	
4	9			3		5			1						8	1	305	3			1	
5	6			5	3	2			2						40	4	14	23				
6	21			2		8								3	83	2	680	1	1	8	6	
OPEN B	4			3		19		1	5					1	16	4	350	6		2	16	
UNKNOWN																	100					
UNKNOWN						2									9	2	82					
Total for Moose Lake	**120**			**16**	**5**	**44**		**2**	**15**					**4**	**189**	**14**	**1580**	**38**	**1**	**11**	**22**	**5**
NELSON HOUSE																						
1	18				5								1	1	15	9	19	3		2		

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
2	6													4	1							
4	18			1				1					3	47	14		7		3			
5	69				5	1		1	1	1			10	30	7	5	13					
6	78				3	3		1	4			2	11	211	11		6			1	1	
7														11	1						1	
8	36				9			1	3			1	7	278	14	3	3		5			
9	108			1		6		5	4			2	29	245	26		9					
10	315			1	24	13		2	15	2		7	40	216	43	168	24	1	39		3	1
11	159	1			1	4		4	4				9	359	22	2	10			1	2	
12	433			2	5	15		3	6			2	19	206	110	111	34		12	9		1
13	87				3	4		2	2	2		3	6	155	13	65	11		13		14	
14	16					1							2	28	3		1					
15	16					4			1	2			5	21	7		1					
16	12					1			1			1	1	13	4	30	3					
17	135				3	11		2	8	1			12	392	93	41	11		7		1	1
18	27												1	5	2	1	1					
19	14													9	3	16	1					
21	1				1			1	1				2	96	5		3		4		2	2
22	42				3	1		1		1		4	6	176	37	4	11		31		4	1
23	76				10	3		2	4				9	115	32	57	21		42			2
24	116					6		2	6	1		7	3	355	119	2	13		1			2
28	46				3	1		1	5	2			7	83	24		5		3			
33	35					2		2	3				2	61	20	210	4					
35	44				10				2				3	74	39	30	4		2	9		
37	71			4	27	17		7	23	5		3	17	165	73	3	30		16		3	8
39	313	1			12	21		8	9	2		11	31	432	79	47	39		14	3	4	2
40	62					3		2					5	39	13	16	4					
41	7								1					11			1					
42	88				3			2	2			2	8	68	15	11	7		3		1	1
43	14					1								15		10						
46	294				6	6		3	7				41	149	20	21	13			4		2
47	16												1	6	1	3	1					
49	263	1			13	1		7	19	2		1	5	263	116	141	28		30	6	1	1
53	150			3	56	10		7	36			2	23	469	70	30	28	2	73	2	9	3
62_63	17					1							1	14	4		1		8			
64_65																						1
UNKNOWN	7													8			1					
Total for Nelson House	**3209**	**3**		**12**	**202**	**136**		**67**	**167**	**21**		**49**	**320**	**4844**	**1050**	**1046**	**352**	**3**	**308**	**35**	**46**	**28**

PIKWITONEI

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
25	95	2		2	16	7		2	5				3	199	55	95	6	2	34	1	1	1
40	244			1	56	11		5	11	1		1	15	253	107	621	37		100		3	4
42	72				11	14		1	3			2	41	257	126	74	50		28		5	2
44	69				18	5			4	1		1	28	342	61	6	35		52		13	
46	119				4	8		2	6				1	113	30	13	28				3	
47	89			1	2				3			4	23	248	24	10	93					
50	305	1			110	13		5	22			4	91	543	174	597	54		106	6	2	2
56	6				6	1			1				4	91	19	1	2		26			
57	197				1	10		5	8	1		5	55	176	91	408	80		14		2	
58	43			1	7	4		2	2	1			27	346	42	5	7				4	5
65	102	1						1	2			1	5	133	16	39	7				1	
Total for Pikitonei	**1341**	**4**		**5**	**231**	**73**		**23**	**67**	**4**		**18**	**293**	**2701**	**745**	**1869**	**399**	**2**	**360**	**7**	**34**	**14**
PUKATAWAGON																						
1	162				2	8		3	8	1		1	4	117	80	74	26		5		4	
2	100					1		1	3	2			4	53	19	95	8			3		
3	429				4	11		1	5	1			4	137	35	158	22		11			2
4	15																					
6	19				5	2		1	3	2			4	58	13		7		20		11	1
7	74				24	5		3	11				19	288	110	1	23		3		8	1
8	41					6		2					1	13	7	29	7				2	
9	152					9			3				2	65	25	48	13					
10	65												5	24	4	11	3					
11	48					1		1						11		3	2					
12	120				4	6							9	112	17	102	8		10			
13	158	1				8		9	1				8	55	21		8					
19	59					1		1	1					7	10	4	2					1
20	3					3							5	19	4	8	1					
29					1									9	5		1		1			
44	367			1	6	14		7	8			1	14	235	65	167	32		19			1
Total for Pukatawagon	**1822**	**1**		**1**	**50**	**76**		**29**	**47**	**6**		**2**	**79**	**1229**	**424**	**706**	**165**		**71**	**3**	**25**	**6**
YCTA														12								
YTCA	10				4	1			4					14	9	6	2		2			
REDEER-SHOAL RIVER																						
BLOCK	9523	3		305	675	636		15	124	2			105	1180	626	14544	458	180	3875	265	64	
Total for Redeer-Shoal Rivier	9523	3		305	675	636		15	124	2			105	1180	626	14544	458	180	3875	265	64	
SHERRIDON																						
1	905	3	12	1	23	34		7	24				78	353	158	99	64		12	11		1
3	42			1									3	13	9		3					
4	187			1	2	14		4	6	1			17	106	59	107	35					

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
5	302				19	8		2	6				24	72	106	71	65			25		
6	87				3	3			2				2	13	30	7	8	1	5		1	
7	2							1					8	3	1		1					
9	81					3			1					11	20	27	21				1	
11	22				5		1	1					2	24	5		4					
12	169					8	1	2					25	44	62	234	30				3	
13	186				66	5	4	3	1				14	163	114	18	29		6		3	
14	217				2	13	2	6					6	97	130		36				13	1
16	146					8	1	4	1				2	10	26	145	8					
17	61					1		1					3	3	6	46	6					
18	126			1	19	31	1	3					24	120	100	79	79				2	
19	69					10	3	7					10	36	43	34	25					
20	104				2	6	1	4	1				11	39	47	13	18		18			
22	470	7		7	186	54	7	41	3				53	573	400	223	200	1	80		13	2
23	134					1	2	3					33	76	18	17	3					1
25	142			3		3							19	17	15	303	19					
26	448	1		3	3	11	1	5					16	108	65	238	41		5	10		
27	43					5	2	7					22	27	38							
97	33				13	5	1	1	2				2	16	3	167	2		5			
Total for Sherridon	**3976**	**11**	**12**	**17**	**343**	**223**	**41**	**127**	**9**				**374**	**1924**	**1455**	**1828**	**697**	**2**	**131**	**46**	**35**	**6**
SNOW LAKE																						
1	98			4	28	17	2	18					35	251	27	13	15				1	
2	20					4		4					5	48	9	15	5					
6	63			2	62	10	2	20					13	140	68	320	16		73		7	1
11	22				4									33	7	46	2		20			
12	143			2	52	19	4	9					20	123	180	420	20		54			
13	105			2	79	12	3	10					39	87	136	98	39		39		2	2
14	466			1	152	24	3	11	1				27	136	164	210	66		64		6	1
15	208			2	152	26	6	37	1				48	270	170	182	34		263		1	
16	54			7	27	2	2	7						87	29	72	7		28		1	
19	147				55	1	1	6					25	74	39	7	17		75		1	2
21	75	3			30	8		3					17	72	110	45	29		3			1
22	39				23	9		5	1				8	84	54	1	3				2	
23	88				82	14	1	2					28	85	110	60	49	5	211		2	
24	139				214	16	2	11					27	305	77	85	58		334		4	3
26	37				30	7	1	7					6	151	111	105	18		24			
29	49			2	10	5	1	1					7	34	26	3	21				2	
31	156			1	19	11	4	8					27	87	14	62	11		17		3	
33	11					2								19	3							

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
11_18	13				1			1						40	1		1				2	
4_32	186	2			13	3			2				31	152	72	34	25		31	4	3	
7_9	201	6			11	6		1	3					82	43	24	43		1			4
UNKNOWN					9	1							6	7	2		3		3			
UNKNOWN	16				31	1		3	3				1	50	4	44	1		75			2
Total for Snow Lake	**2336**	**11**		**23**	**1084**	**198**		**37**	**167**	**3**			**370**	**2417**	**1456**	**1846**	**483**	**5**	**1315**	**4**	**37**	**16**
SPLIT LAKE																						
10	25			1		4		4	27	9		55	4	1321	38		3				5	2
11	95					3		4	9	1		2	15	214	43	25	16					
12	352			1	25	15		17	35	1		22	8	495	140	195	17		39	7	6	
13	504				4	12		15	38	5		12	13	1456	131	52	105			1	8	2
14	148				3	6		1	8			21	8	756	53	11	20		6			
15	43					1		1	2			18	4	232	13	3	7					
16	95					5		2	3			4	2	269	36	10	19					
17	71					6	1	16	51			29		766	23		17				12	
18	101				5	4		25	58	6		83	12	1574	52	5	14				6	3
20	31	1												50	8	37	4		2		1	
21	52					2		1	7			20		279	14	2	4			3		2
22	109					5		3	6			23	2	410	24	22	15					
23	108					2		6	6	1		14	1	290	52	14	22				5	2
24	13								2			4	1	70	8		4					
25	155				8	3		11	7	1		11	20	629	134	65	47			3	1	
27	576	1			13	8	1	12	24	2		26	56	1041	139	338	69		41	2	2	9
28	42				2	2		4	5	1		6	17	261	78	6	2		4	4		
29	115								1			1	1	144	39		18					
30	9								3					50	4		5					
31	86					2		2	4	1		9		384	51	26	5					
32	135	1				4		18	28	6		9	14	327	47	18	12		1		4	1
33	2											6		74	11		3					
34	10					2			1				2	53	4		3					
35	6								1					31	9		2					
36	78					2		15	22			22	2	398	49	6	36		14		4	
38	36					1		5	1			1	1	104	20	2	8					
39	40								2			1		35	1	6	10					
40										1					38	2		1				
41		4								6					160	16		2			1	
42		10							2	21	2		10		286	16		3			4	1
43									2	2					20	1						
45		22											4		54			4				

Section Name and Trapline Number	Sum of BEAVER	Sum of BLACK BEAR	Sum of BOBCAT	Sum of COYOTE	Sum of ERMINE	Sum of FISHER	Sum of FOX, BLUE	Sum of FOX, CROSS	Sum of FOX, RED	Sum of FOX, SILVER	Sum of FOX, UNKNOWN	Sum of FOX, WHITE	Sum of LYNX	Sum of MARTEN	Sum of MINK	Sum of MUSKRAT	Sum of OTTER	Sum of RACCOON	Sum of SQUIRREL	Sum of WEASEL	Sum of WOLF	Sum of WOLVERINE
64												1		82	1							1
65	29	1		7		8		9	25	6		35	4	763	26	2	21		34		1	
66	26					1		2						9		24	3					
70	464				4	4		2	10	1		2	13	257	55	60	19		16	9	2	2
75	2	1				1						5		15	6							
Total for Split Lake	3594	5		9	64	103	2	179	416	43		456	200	13397	1344	929	540		157	26	65	25
THICKET PORTAGE																						
10	104				5	9			2				4	66	63	9	10		2			
11	72				2	6			2			2	1	153	48	1	15		6			
14	145					5		1	4					208	80	16	11		10	3		
26	107								1				1	98	40	87	48					
29	148	2		4	32	16		9	20	2	2	1	11	229	48	47	55		35		5	4
30	297	1		2	132	34		6	16	2		4	22	387	219	36	65	1	26	15	1	4
32	349	2		6	2	28		6	37	2		5	8	260	48	95	37				33	3
33	104											1		16	30	89	9				1	
Total for Thicket Portage	**1326**	**5**		**12**	**173**	**98**		**22**	**82**	**6**	**2**	**13**	**47**	**1417**	**576**	**380**	**250**	**1**	**79**	**18**	**40**	**11**
WABOWDEN																						
3	102			2	5	6		2	10				38	178	65	21	24		2			
6	155			1	39	8		1	16				32	192	161	126	42		3	18	10	4
9	88			1	9	4		1	4			2	27	171	92		31		1		2	
11	138				2	15		3	9			1	44	296	132	21	50				3	4
12	58								1					33	5	7	6				1	
13	138				29	5		4	9			1	14	232	47	199	10		1	9	1	
16	80	3			7	4			3	1			8	125	93	30	21				1	
17	90				35	4		1	7				34	176	51	2	27		7			3
18	48				24	1			1				5	79	11	28	2		1			
19	51			1	30	10		2	8	1			11	288	78	216	26		21		1	
21	256				53	6		11	21	2			28	347	93	45	33		5	3	6	
Total for Wabowden	1204	3		5	233	63		25	89	4		4	241	2117	828	695	272		41	30	25	11
Grand Total	**35467**	**80**	**12**	**806**	**4806**	**3136**	**2**	**594**	**1876**	**111**	**8**	**621**	**2482**	**36784**	**11324**	**47015**	**5255**	**241**	**7873**	**607**	**563**	**133**

Appendix B: Trapping Records by Species (1996-2008) for RTLs Intersected by the Local Study Area.

Section Name and Trapline Number	Beaver	Black Bear	Bobcat	Coyote	Ermine	Fisher	Fox, Blue	Fox, Cross	Fox, Red	Fox, Silver	Fox, Unkown	Fox, White	Lynx	Marten	Mink	Muskrat	Otter	Raccoon	Squirrel	Weasel	Wolf	Wolverine
Cormorant																						
2	109			9	5	15		2	14				22	156	51	30	22		41	21		
3	19				22	19		3	5				1	58	19	150	4		43	16	1	
4	2				4	2			8				4	20	13	16	2		4	9		
Total for Cormorant	**677**	**4**		**34**	**220**	**219**		**19**	**105**	**2**		**1**	**86**	**1047**	**349**	**1079**	**172**	**2**	**268**	**66**	**9**	
Cross Lake																						
23	N/A																					
0G	N/A																					
Total for Cross Lake	**41**	**1**		**1**		**2**		**1**	**4**				**17**	**41**	**4**	**9**	**1**					
Limestone																						
5	54				8			10	23	4		24	11	532	18	49	2				2	
Total for Limestone	122			1	12	1		18	48	5		77	15	2029	48	84	19		5		7	8
Pikwitonei																						
42	72				11	14		1	3			2	41	257	126	74	50		28		5	2
46	119				4	8		2	6				1	113	30	13	28				3	
47	89			1	2				3			4	23	248	24	10	93					
58	43			1	7	4		2	2	1			27	346	42	5	7				4	5
Total for Pikwitonei	**1341**	**4**		**5**	**231**	**73**		**23**	**67**	**4**		**18**	**293**	**2701**	**745**	**1869**	**399**	**2**	**360**	**7**	**34**	**14**
Snow Lake																						
1	98			4	28	17		2	18				35	251	27	13	15				1	
2	20					4			4				5	48	9	15	5					
31	156			1	19	11		4	8				27	87	14	62	11		17		3	

Section Name and Trapline Number	Beaver	Black Bear	Bobcat	Coyote	Ermine	Fisher	Fox, Blue	Fox, Cross	Fox, Red	Fox, Silver	Fox, Unkown	Fox, White	Lynx	Marten	Mink	Muskrat	Otter	Raccoon	Squirrel	Weasel	Wolf	Wolverine
32	N/A																					
Total for Snow Lake	**2336**	**11**		**23**	**1084**	**198**		**37**	**167**	**3**			**370**	**2417**	**1456**	**1846**	**483**	**5**	**1315**	**4**	**37**	**16**
Split Lake																						
10	25			1		4		4	27	9		55	4	1321	38		3				5	2
11	95					3		4	9	1		2	15	214	43	25	16					
12	352			1	25	15		17	35	1		22	8	495	140	195	17		39	7	6	
15	43					1		1	2			18	4	232	13	3	7					
16	95					5		2	3			4	2	269	36	10	19					
18	101				5	4		25	58	6		83	12	1574	52	5	14				6	3
22	109					5		3	6			23	2	410	24	22	15					
23	108					2		6	6	1		14	1	290	52	14	22				5	2
25	155				8	3		11	7	1		11	20	629	134	65	47			3	1	
27	576	1			13	8	1	12	24	2		26	56	1041	139	338	69		41	2	2	9
28	42				2	2		4	5	1		6	17	261	78	6	2		4	4		
70	464				4	4		2	10	1		2	13	257	55	60	19		16	9	2	2
Total for Split Lake	**3594**	**5**		**9**	**64**	**103**	**2**	**179**	**416**	**43**		**456**	**200**	**13397**	**1344**	**929**	**540**		**157**	**26**	**65**	**25**
Thicket Portage																						
3	N/A																					
11	72				2	6			2			2	1	153	48	1	15		6			
14	145					5		1	4					208	80	16	11		10	3		
Total for Thicket Portage	1326	5		12	173	98		22	82	6	2	13	47	1417	576	380	250	1	79	18	40	11
Wabowden																						
1	N/A																					
2	N/A																					

Section Name and Trapline Number	Beaver	Black Bear	Bobcat	Coyote	Ermine	Fisher	Fox, Blue	Fox, Cross	Fox, Red	Fox, Silver	Fox, Unkown	Fox, White	Lynx	Marten	Mink	Muskrat	Otter	Raccoon	Squirrel	Weasel	Wolf	Wolverine
6	155			1	39	8		1	16				32	192	161	126	42		3	18	10	4
9	88			1	9	4		1	4			2	27	171	92		31		1		2	
11	138				2	15		3	9			1	44	296	132	21	50				3	4
21	256				53	6		11	21	2			28	347	93	45	33		5	3	6	
47	N/A																					
48	N/A																					
Total for Wabowden	**1204**	**3**		**5**	**233**	**63**		**25**	**89**	**4**		**4**	**241**	**2117**	**828**	**695**	**272**		**41**	**30**	**25**	**11**

N/A: No Information was available for Trapline

[i] Manitoba Hydro is attempting to reduce supplementary approval requirements by identifying access requirements outside the line right-of-way in advance of construction. This will entail use of LiDAR/DEM remote sensing technology (Light Detection and Ranging/Digital Elevation Model), as well as establishment of an initial access road inventory, so as to minimize clearing requirements by taking advantage of existing cut lines or trails.

Bipole III Transmission Project
Resource Use Technical Report

Map Series

Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Registered Trapline

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-01

File Location: \GIS\Transmission_EIS\MapLayouts\MBHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt

Manitoba Hydro

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N

0 5 10 Kilometres
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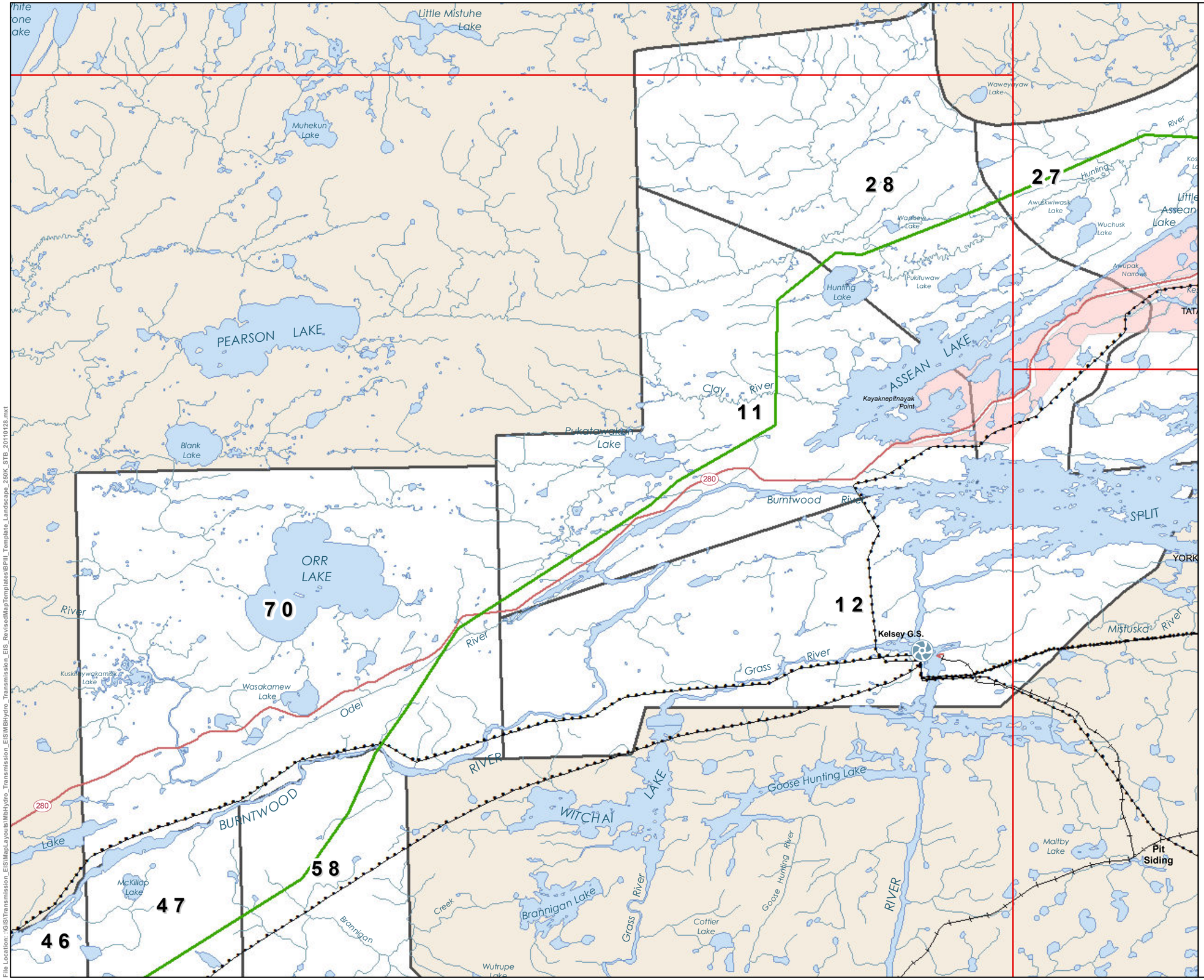
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-02

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Manitoba Hydro

Bipole III Transmission Project

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N

0 5 10 Kilometres
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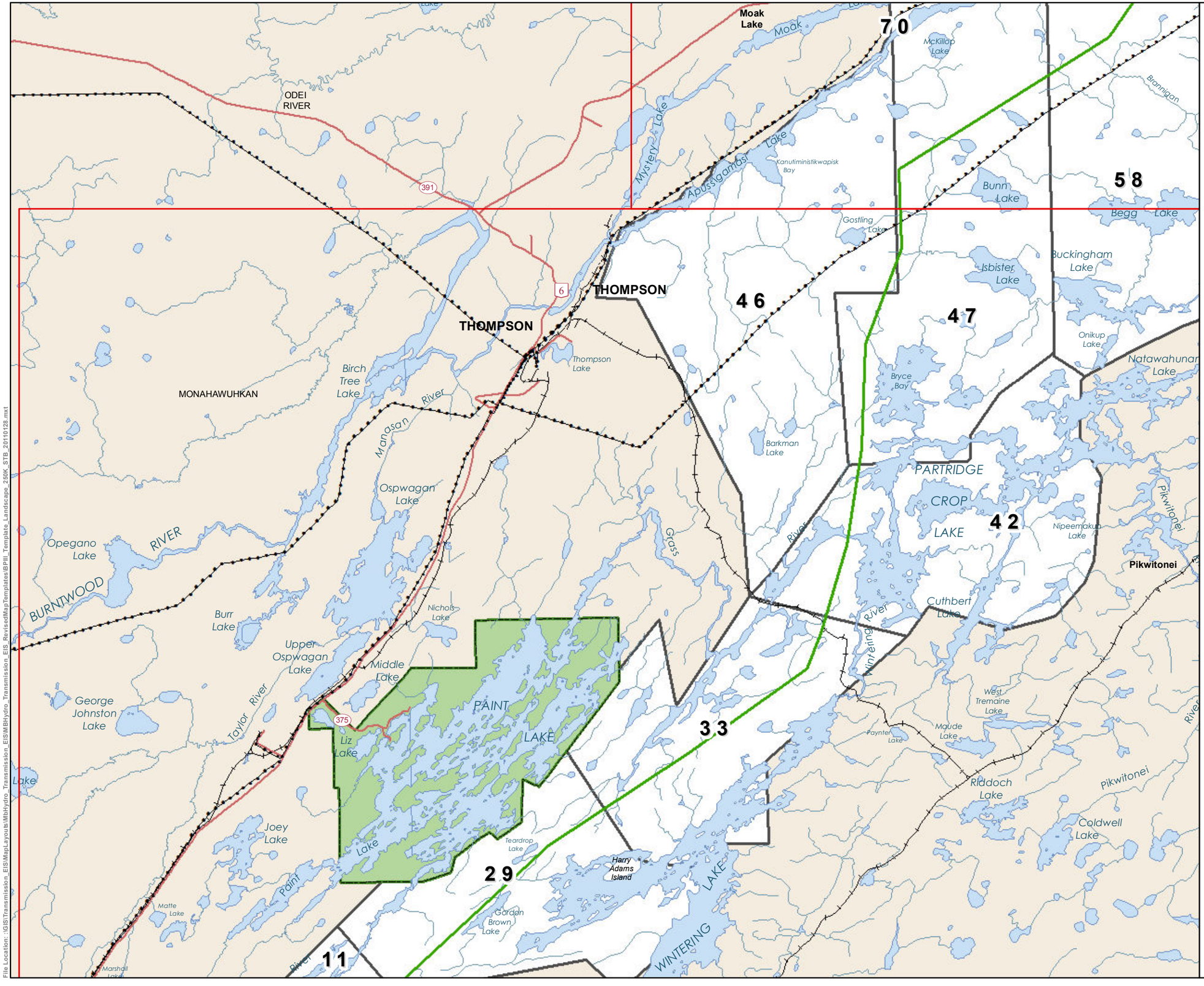
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-03

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Bipole III Transmission Project

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Resource Use

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Landbase

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N

0 5 10 Kilometres
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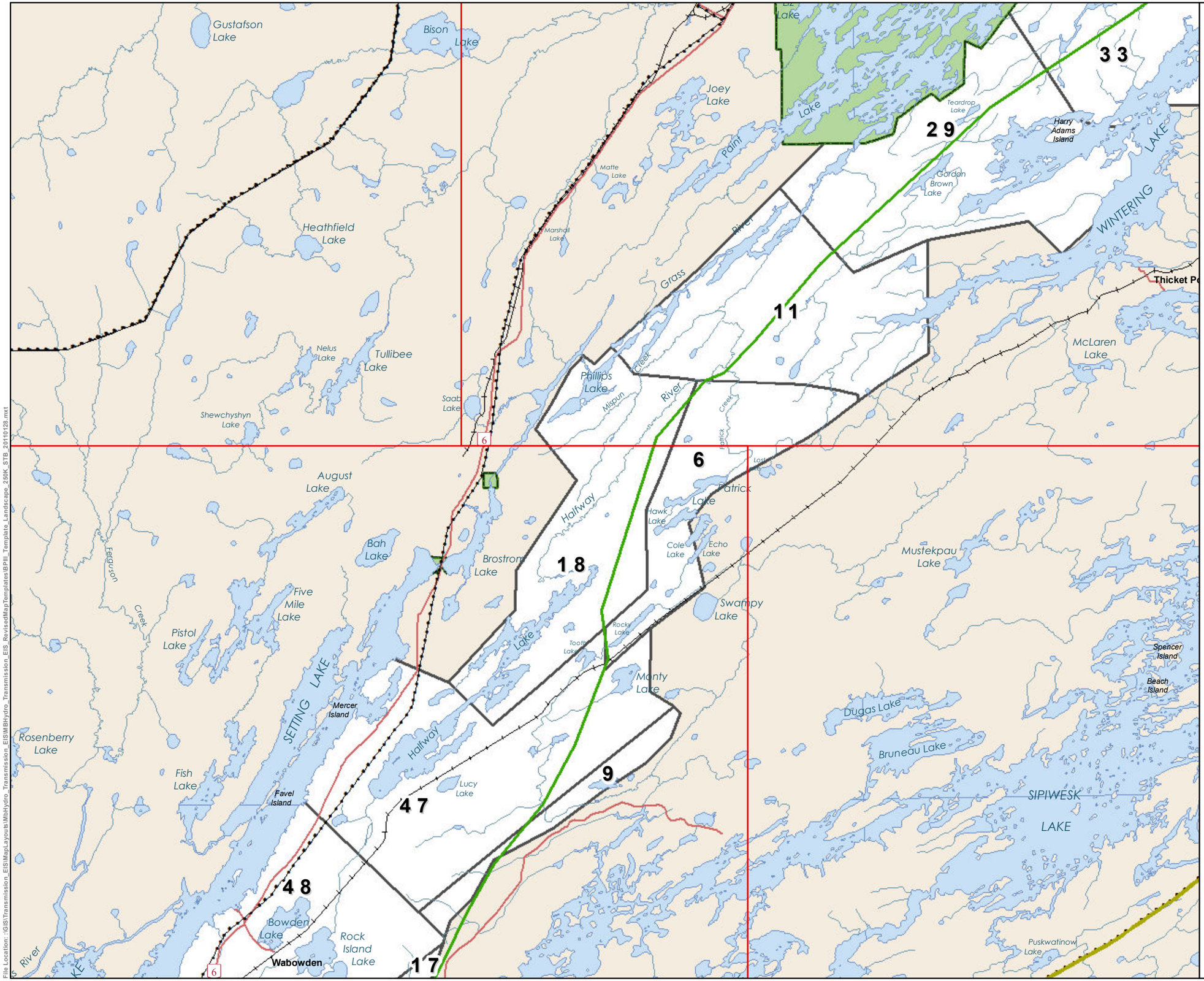
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-04

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Manitoba Hydro

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Resource Use

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Landbase

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N

0 5 10 Kilometres
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1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-05

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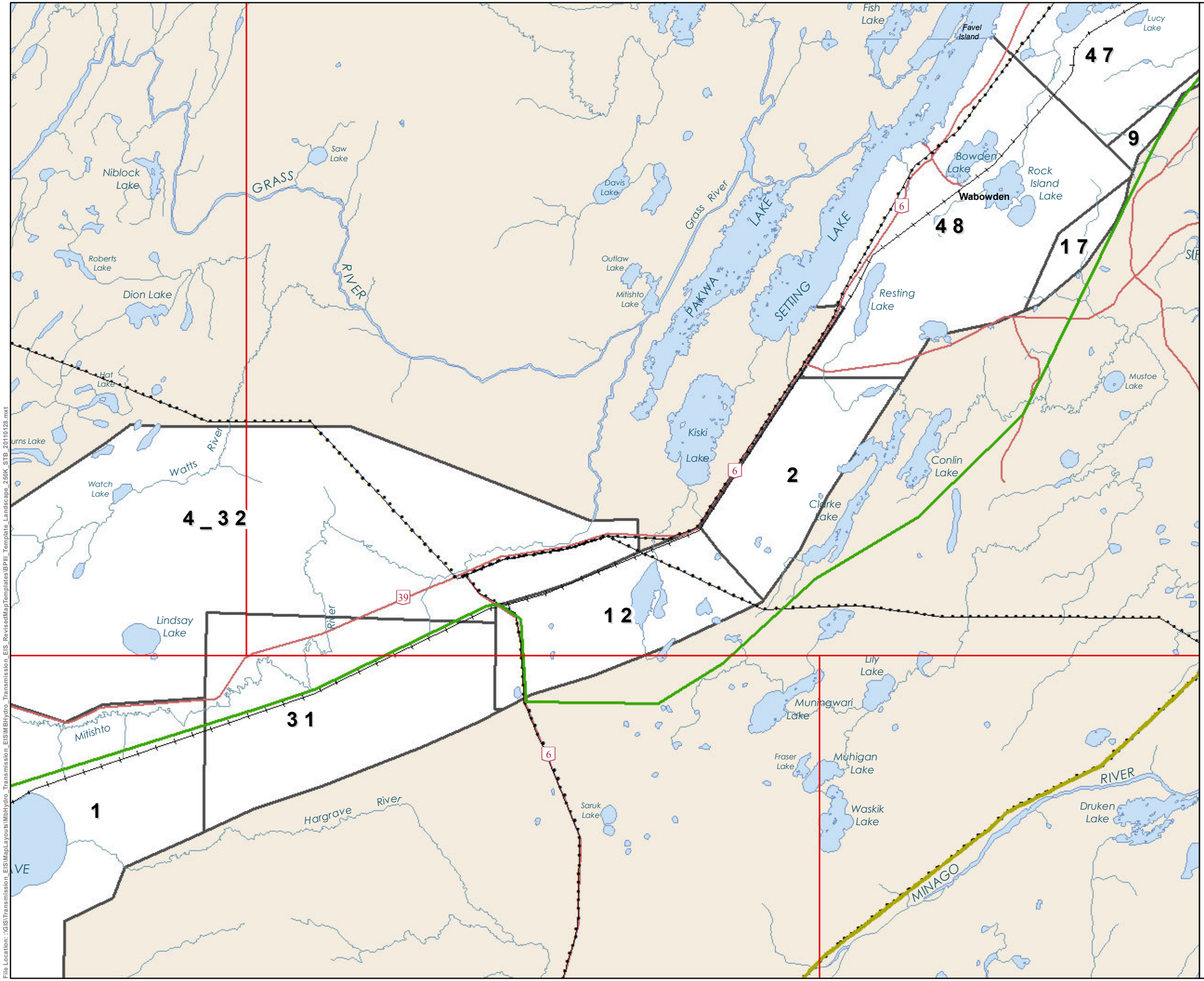

Manitoba Hydro

Bipole III Transmission Project

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Resource Use

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Landbase

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Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
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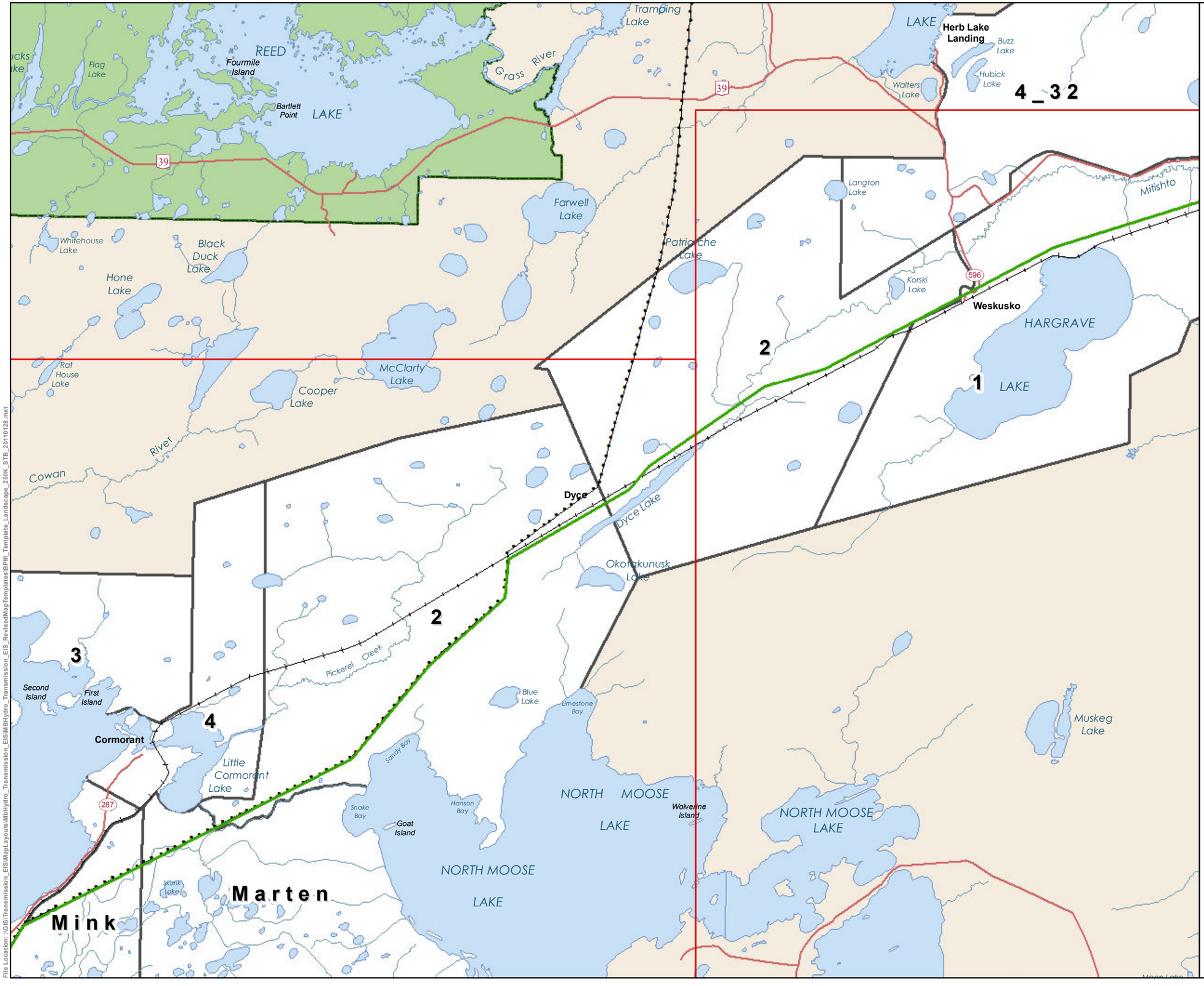
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-06

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Manitoba Hydro

Bipole III Transmission Project

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Existing

- Converter Station
- Generating Station
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- Transmission Line

Resource Use

- Registered Trapline

Landbase

- Road
- Railway Line
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- Park Reserve

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Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

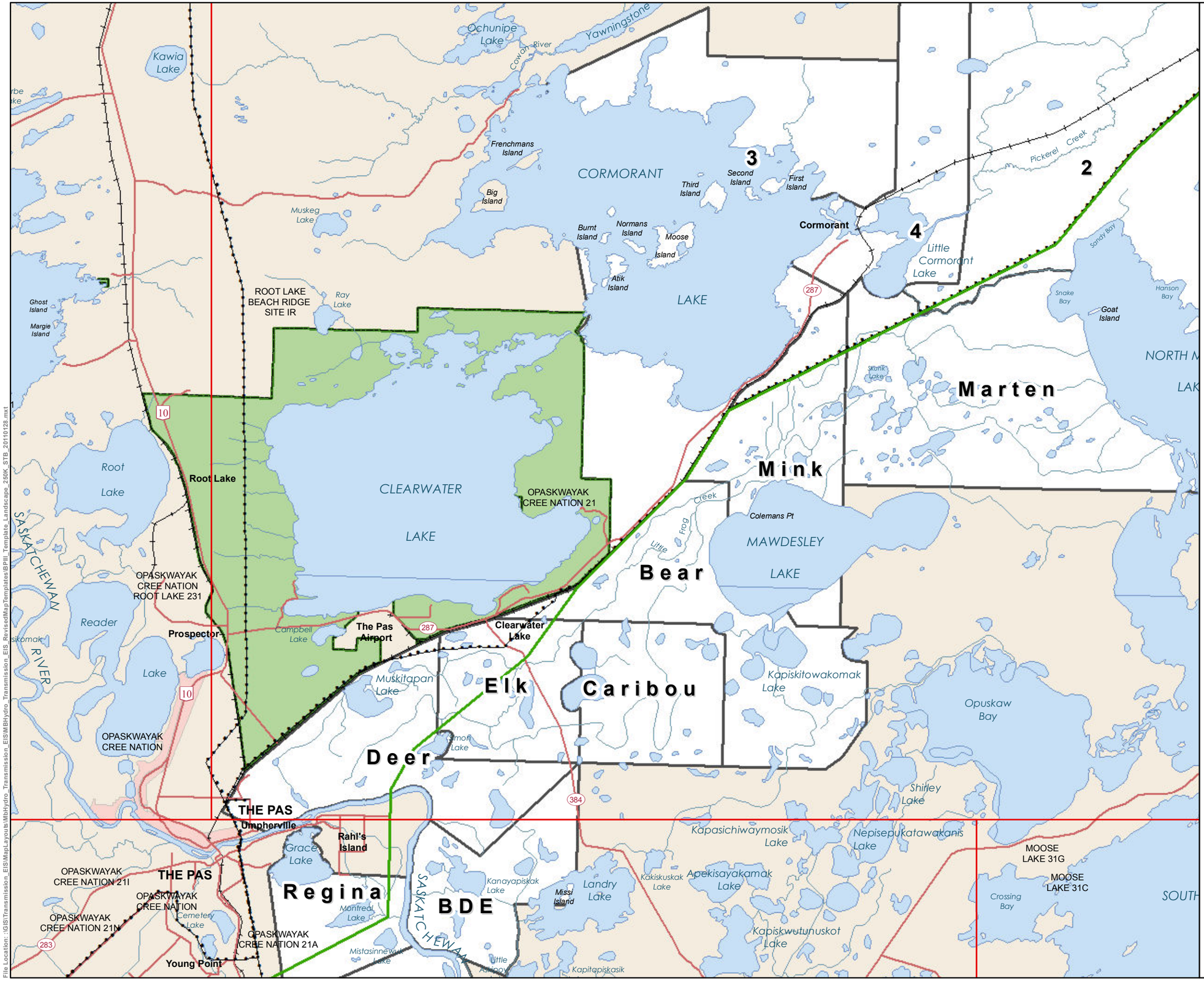
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-07

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Manitoba Hydro

Bipole III Transmission Project

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Resource Use

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Landbase

- Road
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- Park Reserve

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Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

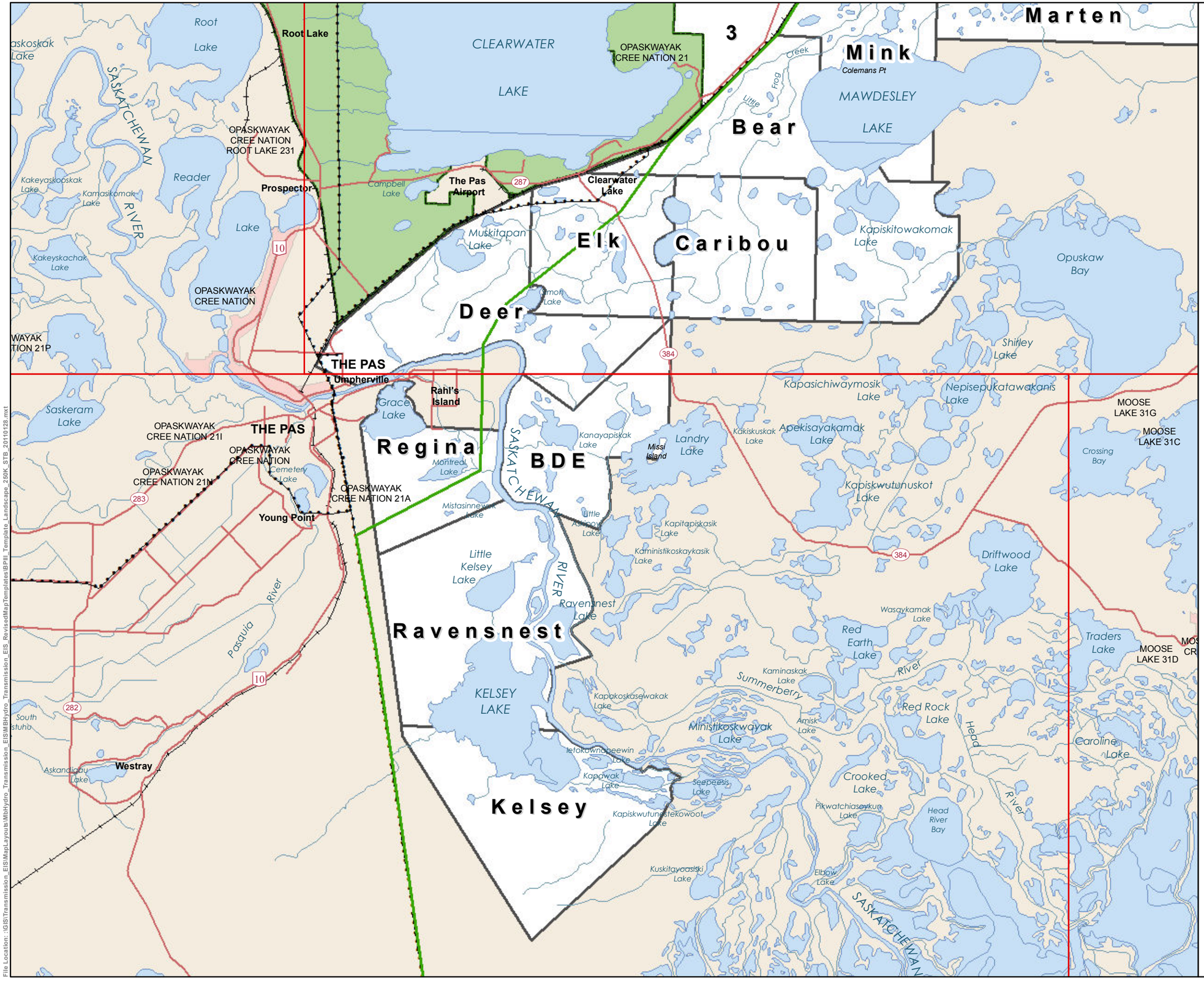
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-08

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Manitoba Hydro

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Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
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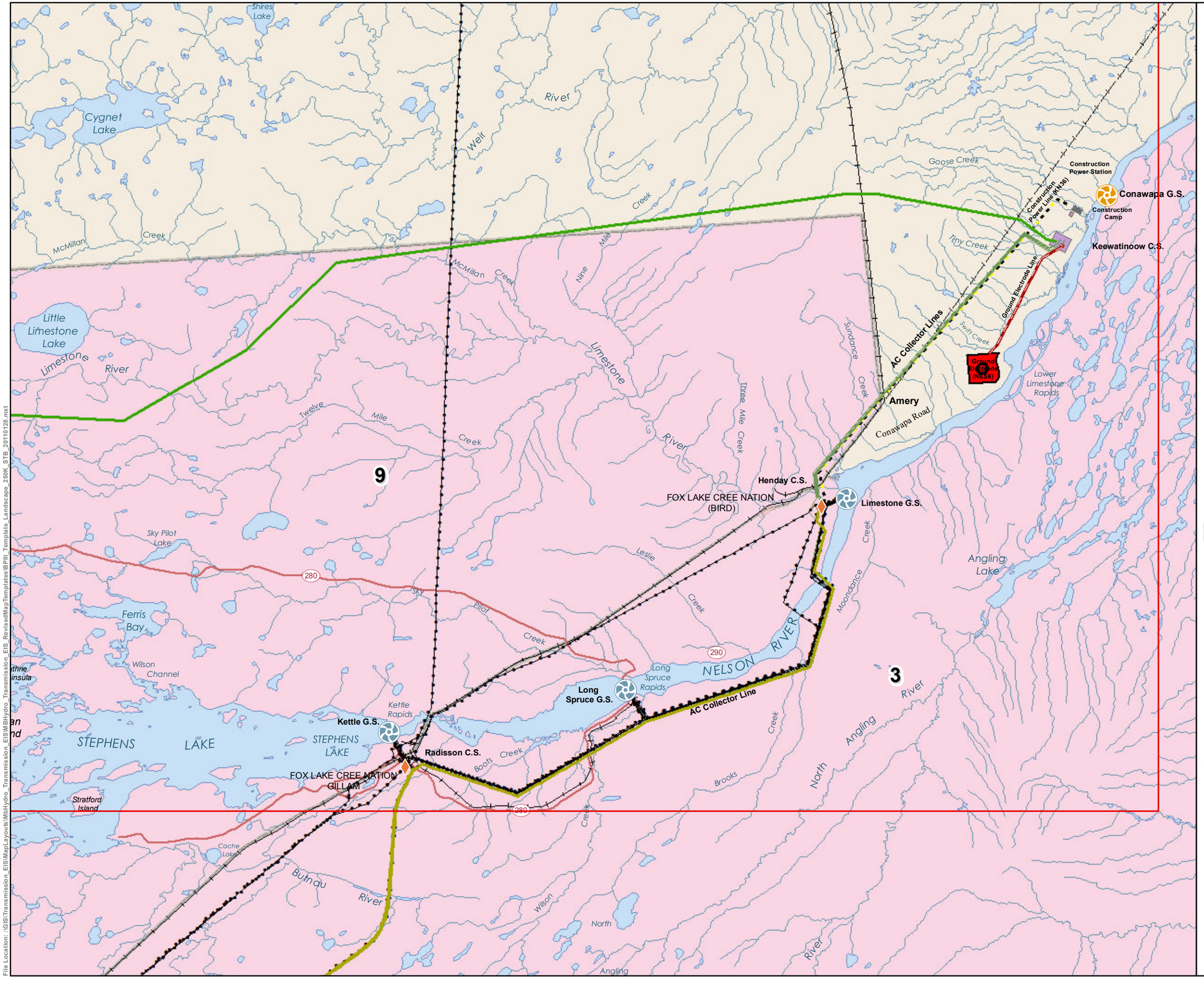
1:250,000

Registered Traplines

RTL's Intersecting the Final Preferred Route

Map 100-09

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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Resource Use

- Game Hunting Area

Landbase

- Road
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Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-01

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt

Manitoba Hydro

Bipole III Transmission Project

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N

0 5 10 Kilometres
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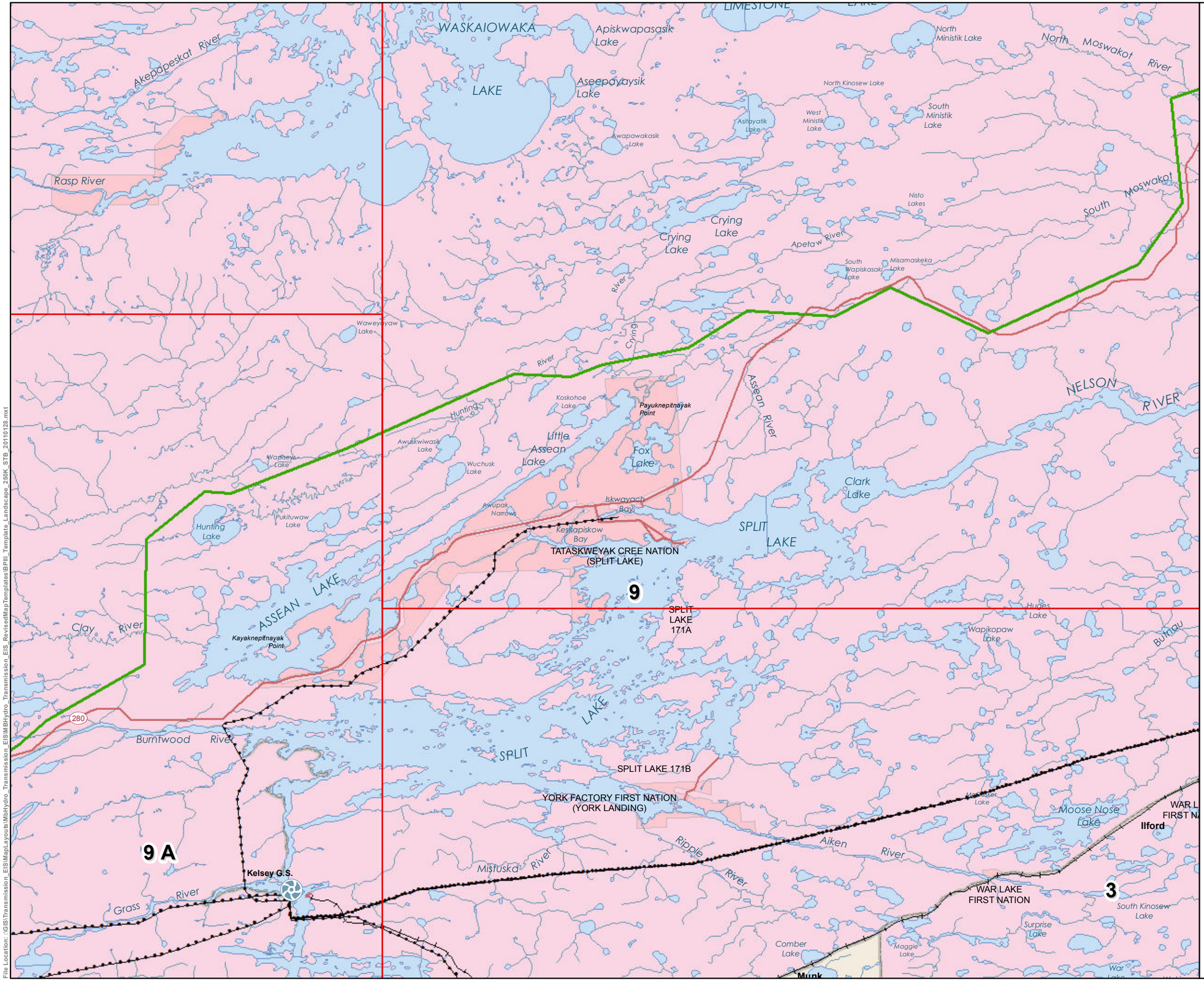
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-02

File Location: ...\GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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Manitoba Hydro

Bipole III Transmission Project

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N

0 5 10 Kilometres
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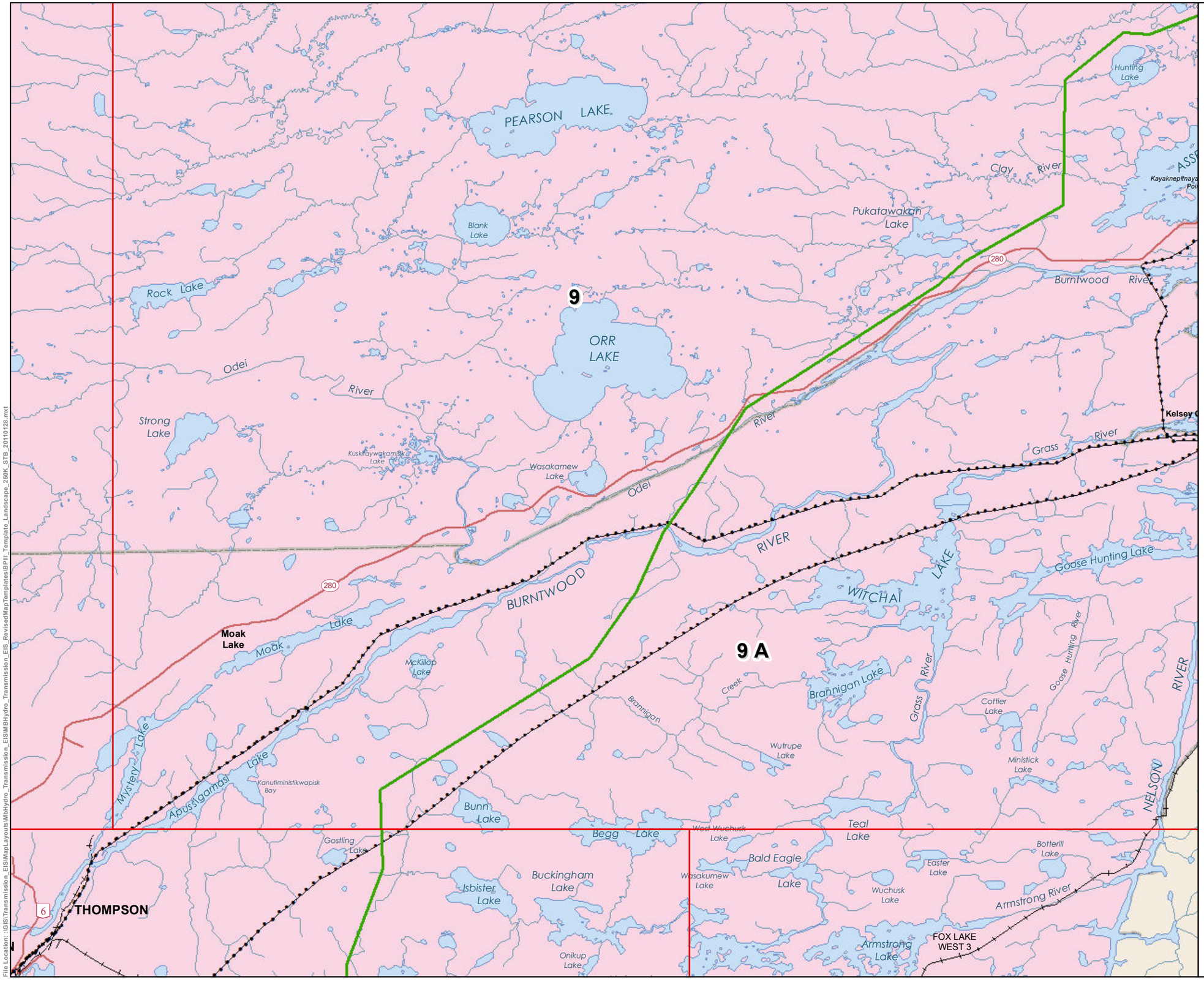
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-03



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N

0 5 10 Kilometres
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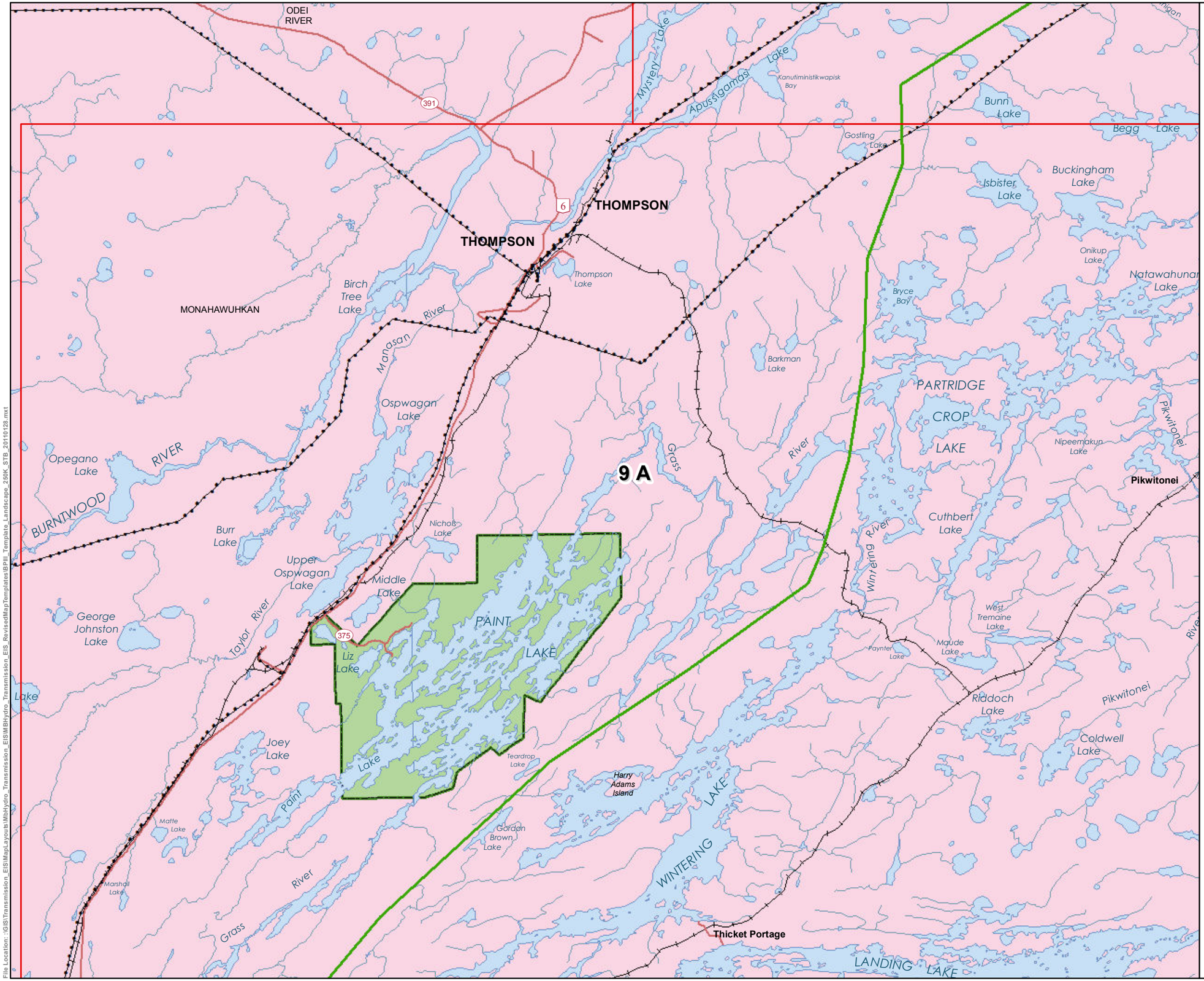
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-04



Manitoba Hydro

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N

0 5 10 Kilometres
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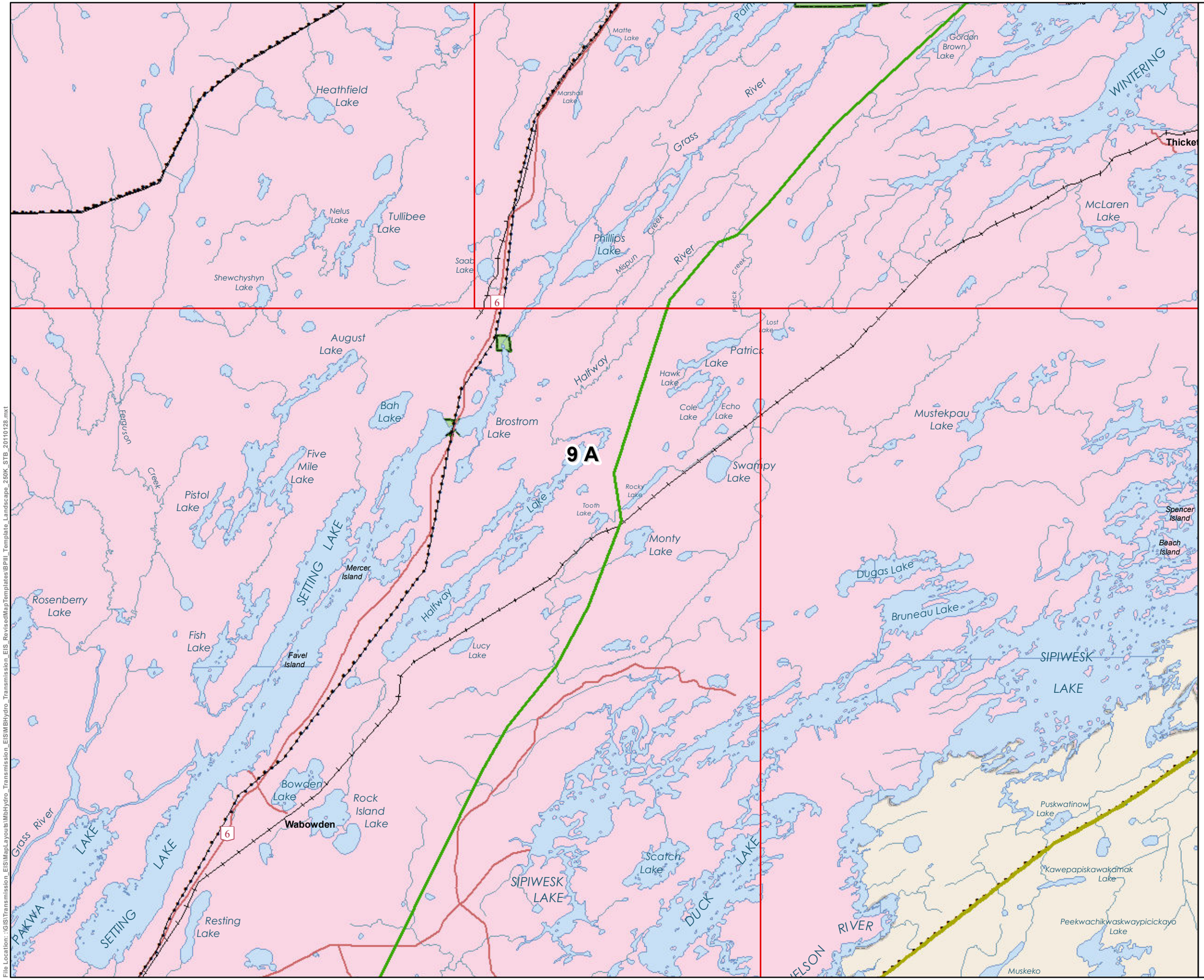
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-05

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EISMBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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0 5 10 Kilometres
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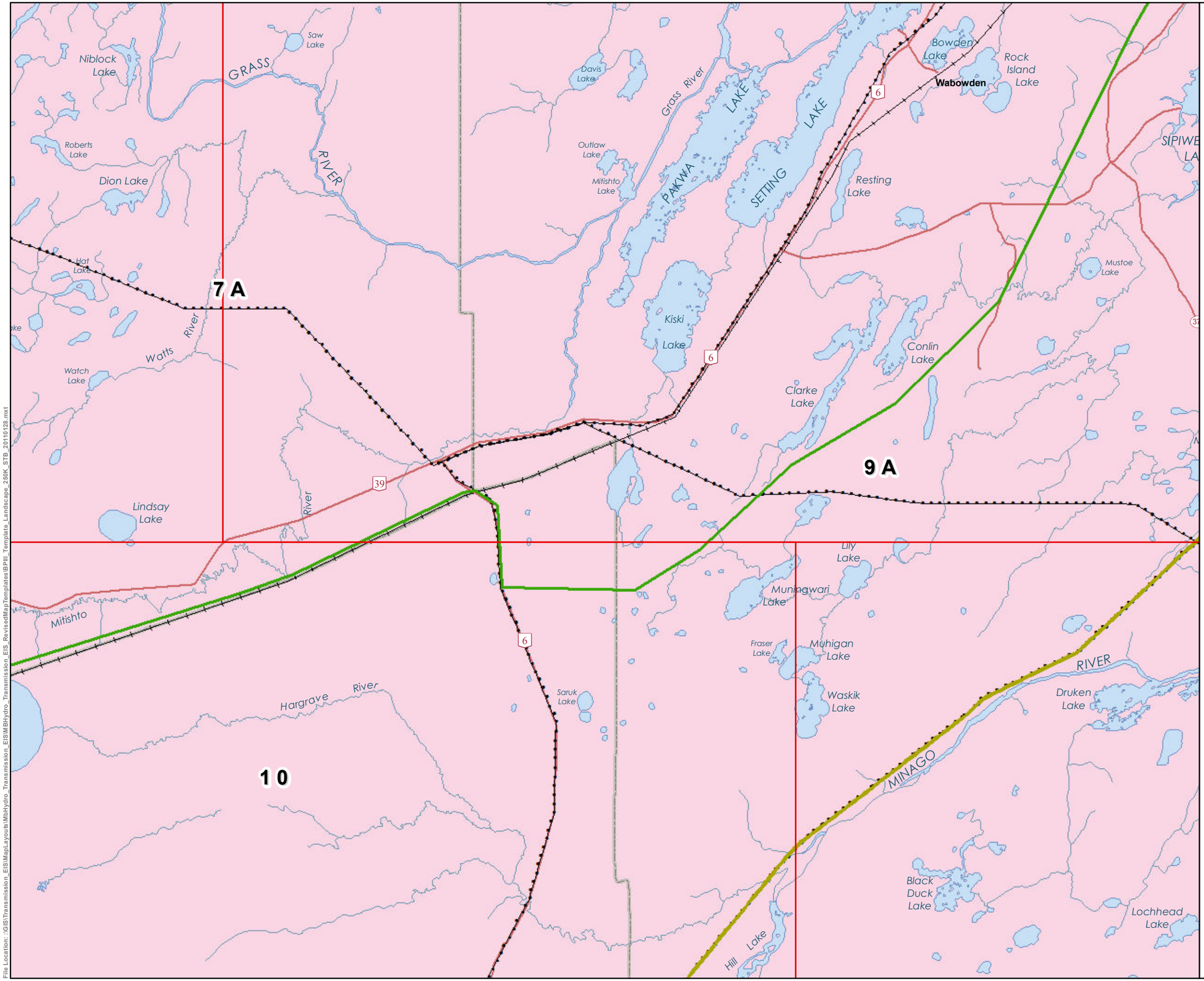
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-06

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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Manitoba Hydro

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Landbase

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N

0 5 10 Kilometres
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1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-07

Manitoba Hydro

Bipole III Transmission Project

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Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-08

File Location: \\GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt

Manitoba Hydro

Bipole III Transmission Project

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Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-09

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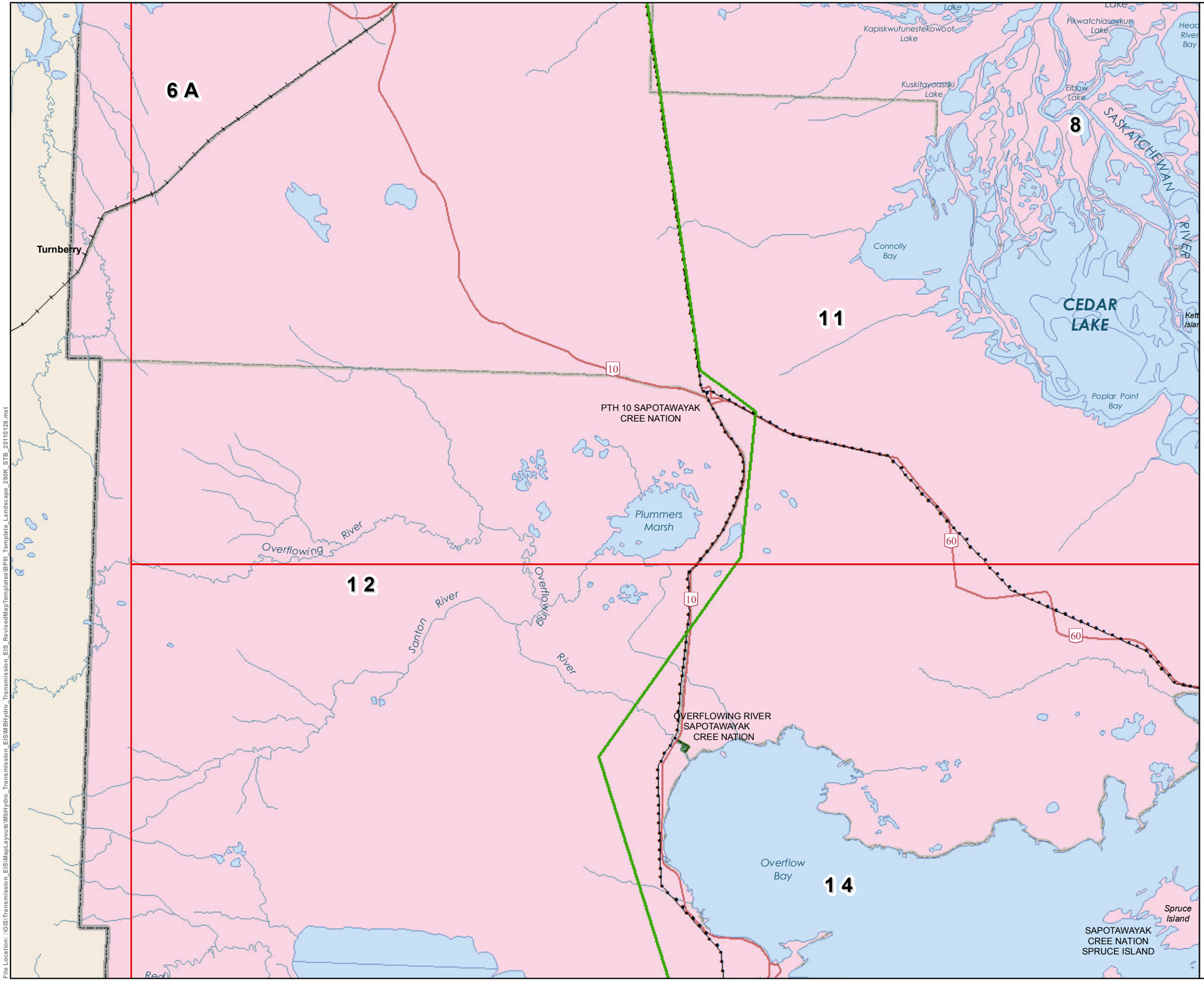

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N

0 5 10 Kilometres
0 3 6 Miles

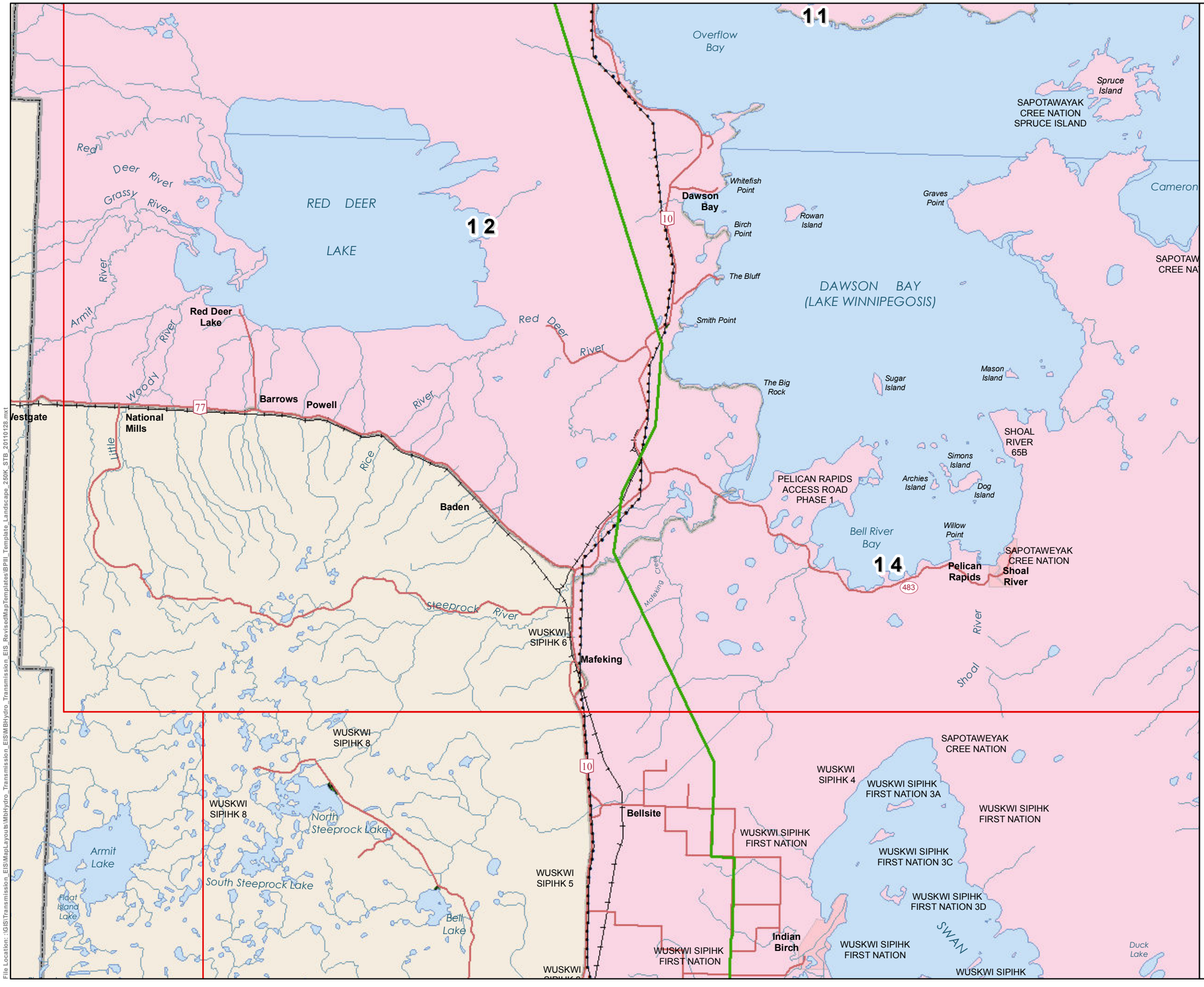
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-10

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_Revised\MapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

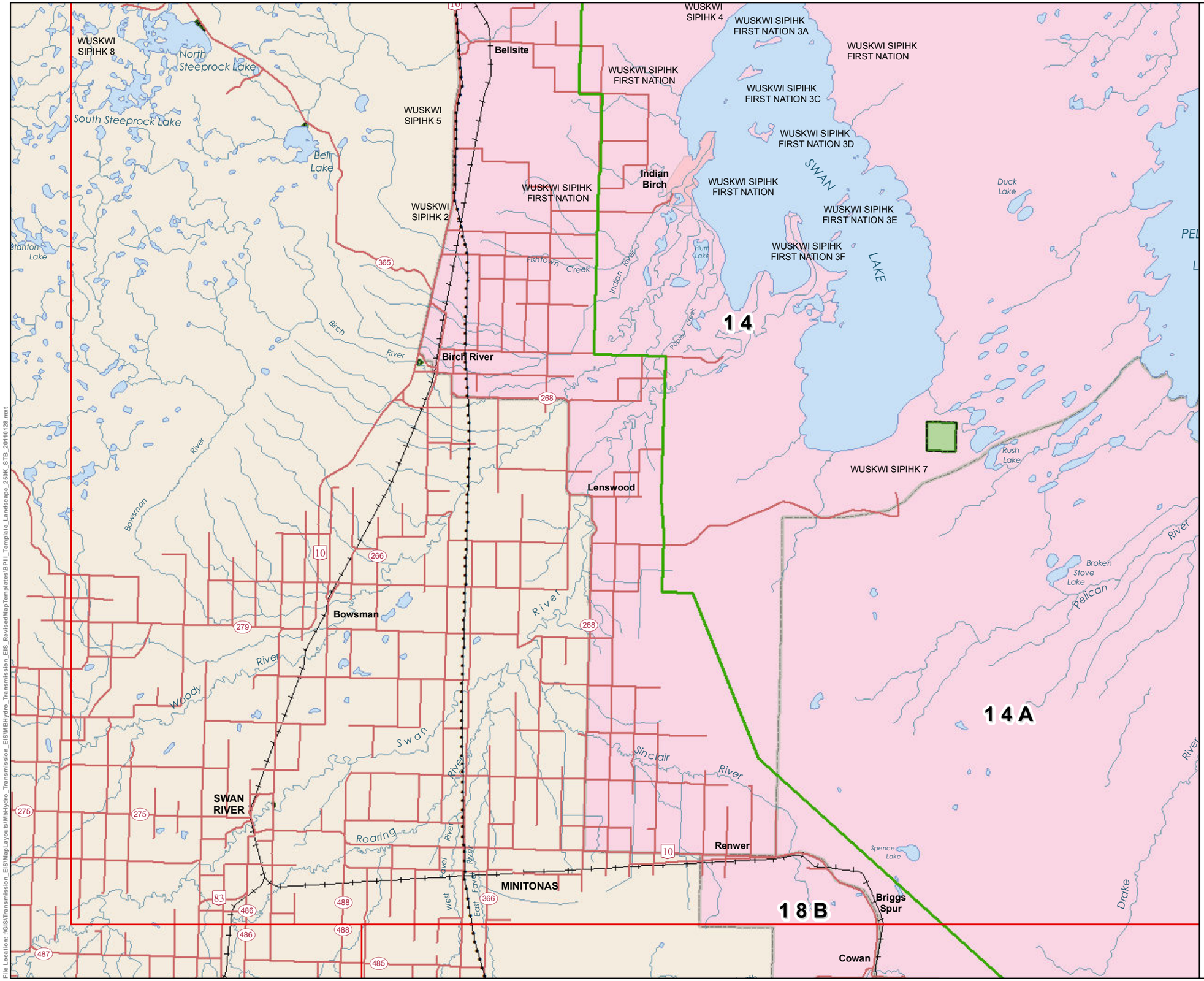
0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-11



Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-12

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt

Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

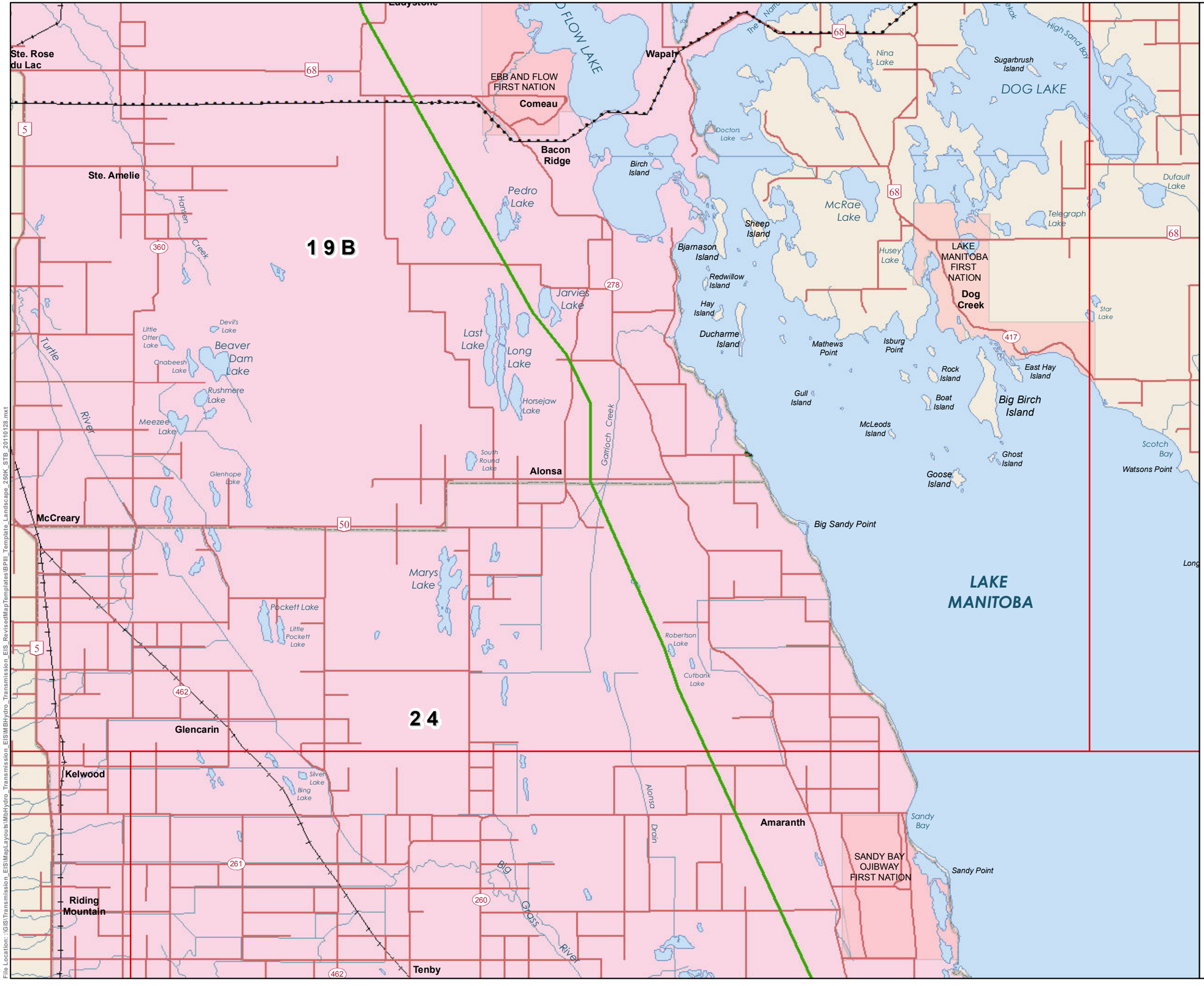
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-13

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



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Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

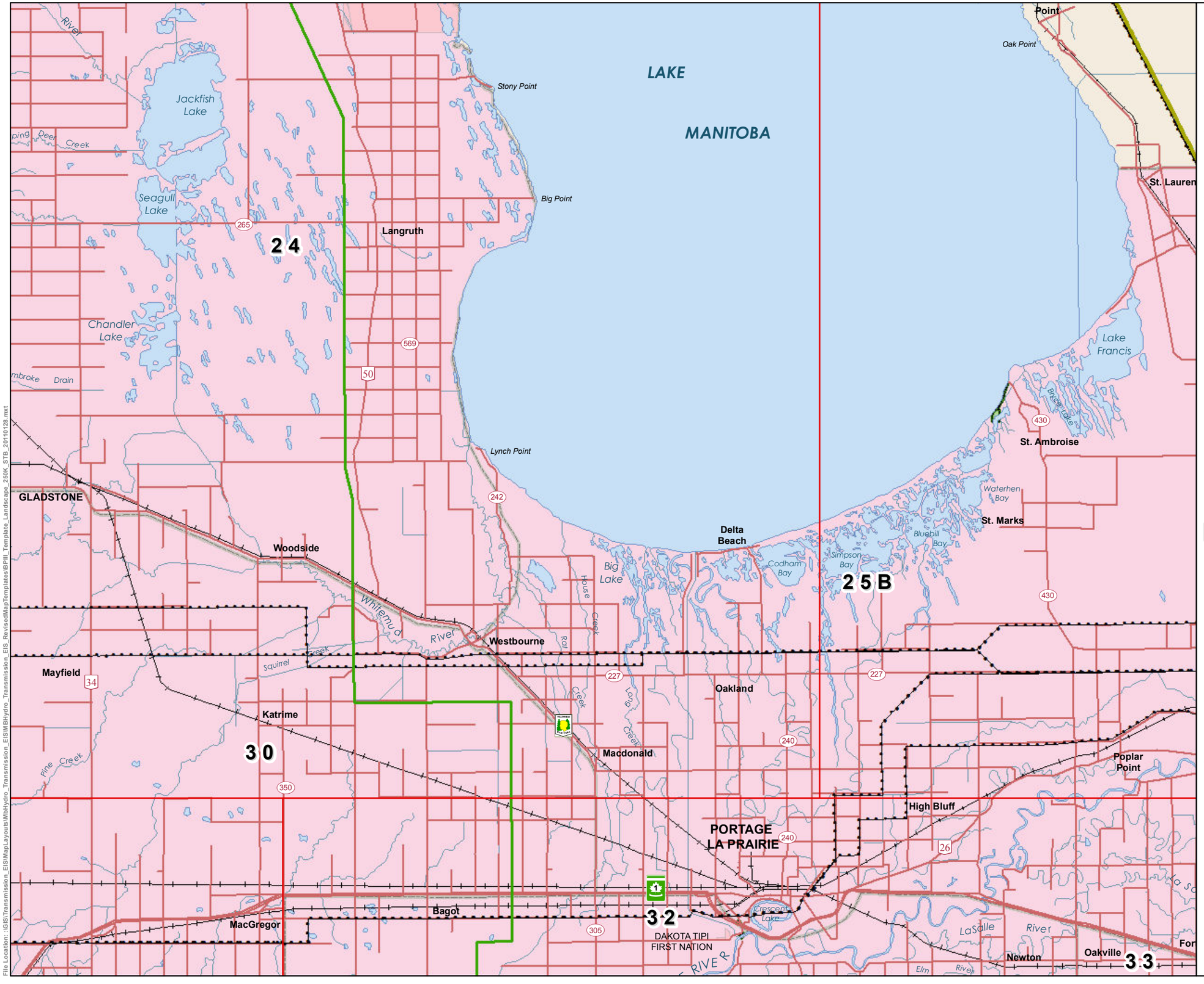
0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-14



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Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

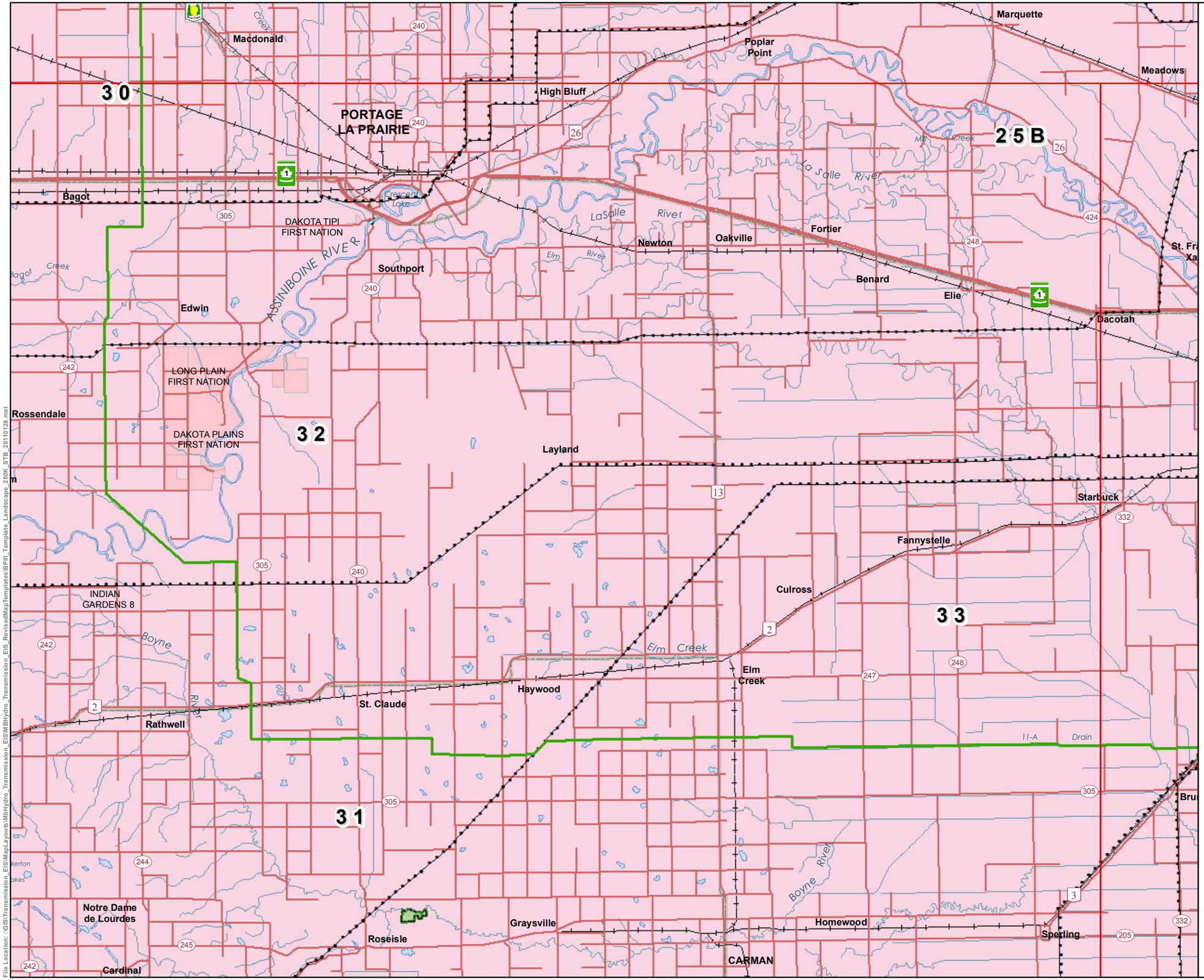
0 5 10 Kilometres
0 3 6 Miles

1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-15



Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

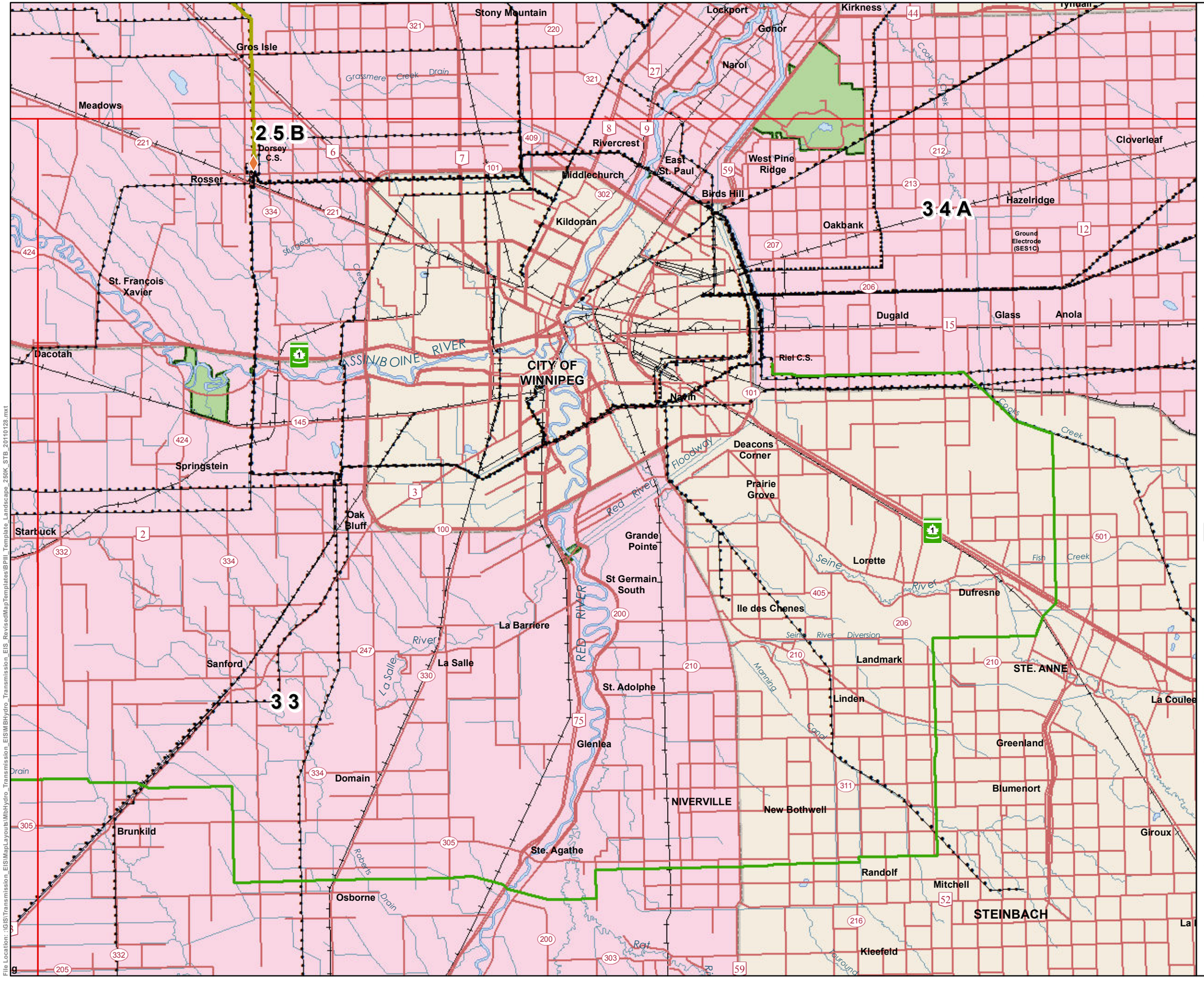
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-16

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_260K_STB_20110128.mxt



Manitoba Hydro

Bipole III Transmission Project

Proposed

- Final Preferred Route (66m ROW)
- AC Collector Lines
- DC Electrode Line
- Construction Power (KN36)
- Generating Station
- Keewatinoow Converter Station Boundary
- DC Electrode Site
- Keewatinoow Camp

Existing

- Converter Station
- Generating Station
- Bipoles I and II
- Transmission Line

Resource Use

- Game Hunting Area

Landbase

- Road
- Railway Line
- Abandoned Railway Line
- First Nation
- Park Reserve

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, MMM, ProvMB
Date Created: January 28, 2011

N

0 5 10 Kilometres
0 3 6 Miles

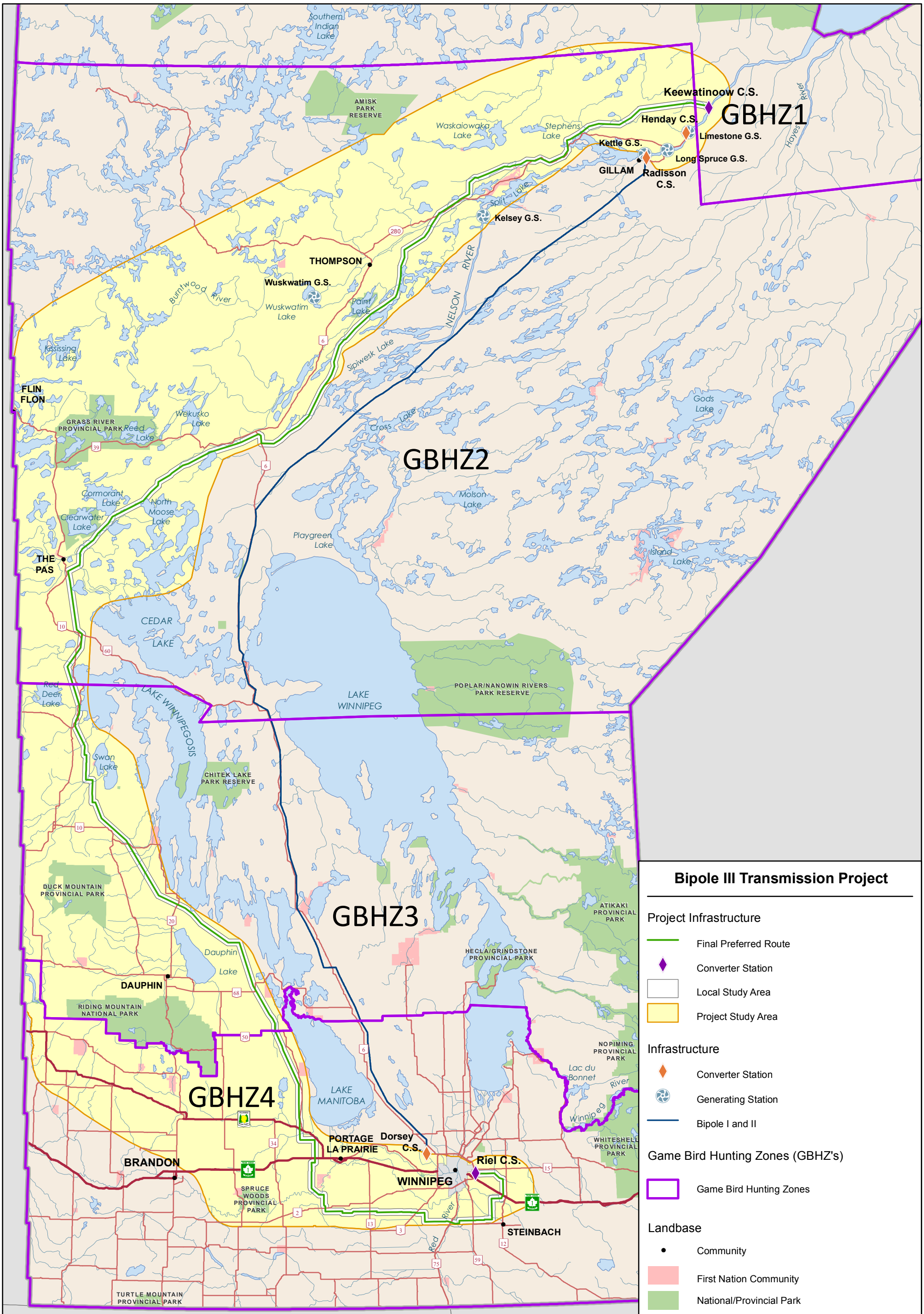
1:250,000

Game Hunting Areas

GHA's Intersecting the Final Preferred Route

Map 200-17

File Location: \GIS\Transmission_EIS\MapLayouts\MbHydro_Transmission_EIS\MBHydro_Transmission_EIS_RevisedMapTemplates\BPIII_Template_Landscape_250K_STB_20110128.mxt



Bipole III Transmission Project

Project Infrastructure

- Final Preferred Route
- Converter Station
- Local Study Area
- Project Study Area

Infrastructure

- Converter Station
- Generating Station
- Bipole I and II

Game Bird Hunting Zones (GBHZ's)

- Game Bird Hunting Zones

Landbase

- Community
- First Nation Community
- National/Provincial Park

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, MMM, Stantec, ProvMB, NRCAN
Date Created: October 24, 2011

0 25 50 Kilometres
0 25 50 Miles

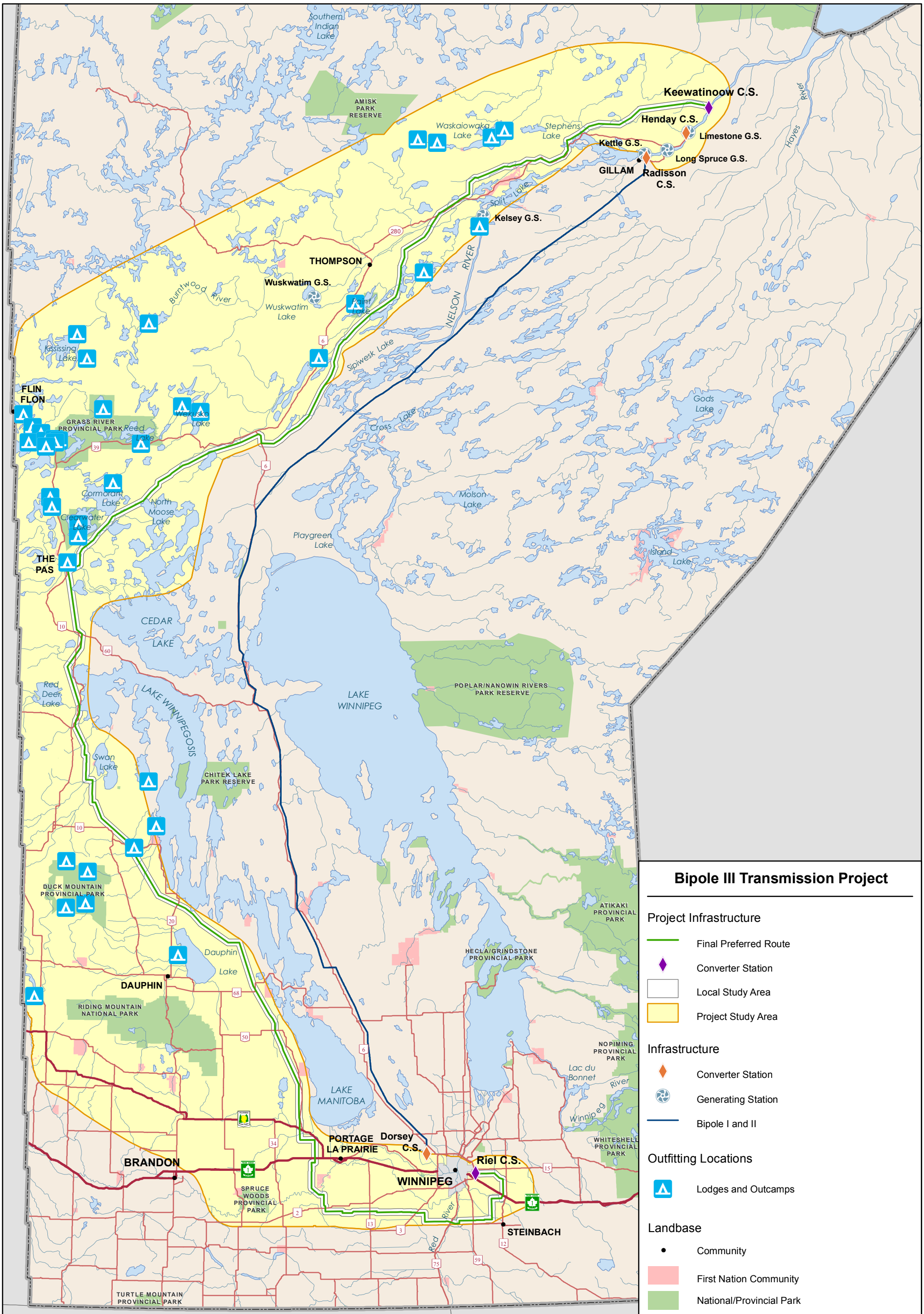
N

1:2,500,000

Game Bird Hunting Zones

Intersected by the Final Preferred Route and Local Study Area

Map # 3



Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, MMM, Stantec, ProvMB, NRCAN
Date Created: October 24, 2011

0 25 50 Kilometres
0 25 50 Miles

N

1:2,500,000

Locations of Lodges and Outcamps in the Project Study Area

Map # 4