MANITOBA – MINNESOTA TRANSMISSION PROJECT
Environmental Impact Statement

ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS ON HERITAGE RESOURCES

CHAPTER 12
SEPTEMBER 2015

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

LIST OF MAPS

ABBREVIATIONS AND ACRONYMS

BP	before present
CEAA	*Canadian Environmental Assessment Act, 2012*
CEnvPP	Construction Environmental Protection Plan
CHRPP	Cultural and Heritage Resources Protection Plan
ESA	environmentally sensitive area
ha	hectare
HRB	Historic Resources Branch
HRIA	Heritage Resources Impact Assessment
kV	kilovolt
LAA	local assessment area
NEB	National Energy Board
MCWS	Manitoba Conservation and Water Stewardship
MMTP	Manitoba–Minnesota Transmission Project
PDA	Project development area
PTH	provincial trunk highway
RAA	regional assessment area
RM	rural municipality
ROW	right-of-way
RPA	route planning area
RVTC	Riel-Vivian Transmission Corridor
SLTC	Southern Loop Transmission Corridor
SVTC	St. Vital Transmission Complex

GLOSSARY OF TECHNICAL TERMS

Aeolian sand	Sand transported and deposited by wind.
Archaeological site	A location where past human activities have been recorded.
Assemblage	A group of artifacts recurring together at a particular time and place, and representing the sum of human activities.
Artifact	Any object showing evidence of manufacture, alteration or use by humans; also referred to as cultural or archaeological material.
Burial	Heritage resources that consist of isolated burials, abandoned homestead cemeteries and found human remains such as individual skeletal elements.
Blow dirt	Soil and sediment particles transported and deposited by wind.
C-soil horizon	Clay material deposited by Lake Agassiz.
Campsite	Indicated by the presence of generalized debris such as stone flakes and tools, pottery fragments, hearths, and bone fragments.
Cemetery	A tract of land reserved by a local government authority or religious group for the burial of deceased community or congregation members.
Centennial farm	Any farm greater than 20 ha, and demonstrates ownership of the same parcel of land over a time span of 100 years.
Cultural landscape	Areas or locations that are important in exemplifying human use or shaping of the natural landscape such as quarry sites, gardens, or trap lines. Areas or locations with little tangible evidence of human events yet are culturally important owing to the activities that are known to have taken place there (*e.g.,* battlefields, landing sites).
Designated site	A site of provincial or municipal importance that has been legally protected under Part I of *The Heritage Resources Act* (1986).
Diagnostic	An artifact that is indicative of a particular time period or cultural group.

Ecoregion	Characterized by distinctive regional ecological factors, including climate, physiography, vegetation, soil, water, and fauna.
Ecozone	An area of the Earth's surface representative of large and very generalized ecological units characterized by interactive and adjusting abiotic and biotic factors.
Farmstead site	Indicated by structural or artifactual remains relating to agricultural occupations or activities.
Furrows	Lines or ruts on the ground surface where plowing has occurred.
Heritage resource	Any work or assembly of works of nature or of human endeavour that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural, scientific or aesthetic features, and may be in the form of sites or objects or a combination thereof.
Historic Period	The period following the arrival of Europeans, and specifically, the period corresponding with Euro-Canadian fur trade commerce and settlement. The period is generally divided into Early (A.D. 1700 to 1821), Middle (A.D. 1821 to 1870) and Late (A.D. 1870 to 1945).
Industrial site	Indicated by structures or artifacts related to specialized manufacturing activities.
Integrity	The degree to which an archaeological site is intact both vertically and horizontally.
Isolated find	An individual artifact collected from the surface of a site with no other artifacts nearby.
Lithic tool	A stone that has been altered to be used for cutting, scrapping or chopping.
Metis Land Grants	Land distributed to Metis families under provisions of *The Manitoba Act* (1870).
Pedestrian transect	A line of undetermined length walked by an archaeologist to observe the surface for artifacts and along which shovel tests are placed.
Permanent settlement site	Structures indicating a permanent settlement site.
Plow zone	The area of cultivation in an agricultural field.

Precontact Period	The period of First Nation occupation and settlement prior to the arrival of Europeans. The period is generally divided into Early (12,000 to 6,500 BP), Middle (6,500 to 2,500 BP) and Late (2,500 to 300 BP).
Provenience	The recorded horizontal and vertical location of an artifact.
School site	The location of an abandoned/active school building.
Seasonal round	First Nation and Metis pattern of movements between different locations on the landscape timed to the seasonal availability of plant and animal resources.
Shovel test	The below surface examination of soils and search for artifacts by digging a square hole and recording the location, recoveries if present and soil types.
Structural site	Indicated by constructed features whose functions are not evident based on the structural remnants or artifacts.
Uninterpreted site	Sites that are not readily described by one of the above categories.
Workshop site	Indicated by a concentration of stone flakes or discarded stone tools.

12 Assessment of Potential Environmental Effects on Heritage Resources

12.1 Introduction

Manitoba Hydro is proposing construction of the Manitoba–Minnesota Transmission Project (MMTP, or the Project), which involves the construction of a 500 kilovolt (kV) AC transmission line in southeastern Manitoba. The transmission line would originate at the Dorsey Converter Station northwest of Winnipeg, continue south around Winnipeg and within the Existing Transmission Corridor (Existing Corridor), the Southern Loop Transmission Corridor (SLTC) and the Riel–Vivian Transmission Corridor (RVTC), to just east of Provincial Trunk Highway (PTH) 12. The transmission line then continues southward on a New Right-of-Way (New ROW) across the rural municipalities of Springfield, Tache, Ste. Anne, La Broquerie, Stuartburn and Piney to the Manitoba–Minnesota border crossing south of the community of Piney. The Project also includes the construction of terminal equipment at the Dorsey Converter Station, electrical upgrades within the Dorsey and Riel converter stations, and modifications at the Glenboro South Station requiring realignment of transmission lines entering the station.

Based on the above description, the assessment of the Project is divided into three components:

- transmission line construction in the Existing Corridor, extending from Dorsey Converter Station to just east of PTH 12;
- transmission line construction in a New ROW, extending south from the Anola area to the border by Piney; and
- station upgrades—at Glenboro South Station, Dorsey Converter Station and Riel Converter Station—and transmission line realignment work at Glenboro South Station.

This chapter discusses the potential environmental effects of the Project on heritage resources. Heritage resources include objects and properties that are of importance for their architectural, historical, cultural, environmental, archaeological, palaeontological, aesthetic, or scientific value. Heritage resources are the tangible remains of past land use activities, are non-renewable and are susceptible to loss or damage as a result of Project activities. The value of heritage resource sites is measured not only by the individual artifacts they contain, but also by: the information about the past that might be obtained from studying the objects; the spatial relationships of artifacts within sites; the context of assemblages and sites across the landscape; and their identity within the cultural landscape. These values are based on the definition of heritage resources listed in *The Heritage Act* and also relate to the discussion of heritage resources impact assessments in Section 12(2) of the Act.

In this assessment, heritage resources include:

- archaeological sites
- provincially and municipally designated sites
- centennial farms
- school sites
- burials
- cemeteries

Heritage resource sites are fragile and the product of unique processes and conditions of preservation. The vertical and horizontal provenience of artifacts provides valuable context and insights, from both a time and space perspective. As a result, removing or mixing artifacts and soils without scientific recording results in the loss of important information about the activities that occurred at an archaeological site.

Human remains that have been found in areas outside a cemetery setting are recorded in the Manitoba Historic Resources Branch (HRB) database as burials. Burials consist of isolated burials, abandoned homestead cemeteries, multiple interred individuals and individual skeletal elements, such as teeth, digits, and partial bone elements.

Cemetery locations are included with heritage resources in this assessment because there is the potential for unmarked burials to be present along the perimeter of abandoned and active cemeteries. Community and church cemeteries were often developed shortly after homestead settlement and before local government infrastructure were developed and records were maintained. Experience in other rural areas across the province has shown that fencing erected around the cemetery often failed to fully encompass the first burials. The approach of this assessment therefore recognizes the potential for unmarked burials to be present at active/abandoned cemeteries.

Heritage resources are defined as a valued component, based on legislated requirements, scientific relevance and interest, First Nation and Metis concern, public concern, and because they provide people from the past the opportunity to be heard in the present. Traditional knowledge studies by Swan Lake First Nation, Black River First Nation, Peguis First Nation and Roseau River Anishinabe First Nation indicated that trails in the area were well-used pedestrian corridors that enabled past ancestors access to the flora and fauna of the area.

Potential effects on heritage resources, including cemeteries, may occur during construction, including loss or disturbance to site contents and site contexts through brush or topsoil removal, compaction, vehicle traffic, grading, and tower construction. Operation and maintenance of the Project also has the potential to affect heritage resources; particularly in areas that were not developed during the construction phase. These effects consist of loss or disturbance to site contents and site contexts through brush or topsoil removal during vegetation management, compaction, and vehicle traffic.

The locations of known heritage resources were considered during the three rounds of route selection with avoidance as the analytical determinant. Alternative routes, the preferred route and the Final Preferred Route were analyzed for proximity to known heritage resources.

12.1.1 Regulatory and Policy Setting

12.1.1.1 Primary Regulatory Guidance

A list of the various regulatory requirements that were considered in developing this environmental impact statement can be found in the Project description (Chapter 2, Section 2.2). Particular consideration was given to the following federal and provincial legislation and guidelines in the preparation of this environmental assessment:

- the Project Final Scoping Document, issued on June 24 2015 by Manitoba Conservation and Water Stewardship's Environmental Approvals Branch, which represents the Guidelines for this environmental impact statement;
- the relevant filing requirements under the *National Energy Board Act* (R.S.C., 1985, c. N-7), and guidance for environmental and socio-economic elements contained in the National Energy Board (NEB) Electricity Filing Manual, Chapter 6; and
- the *Canadian Environmental Assessment Act, 2012* (S.C. 2012, c. 19, s. 52) and its applicable regulations and guidelines.

12.1.1.2 Provincial

Manitoba's regulatory requirements are outlined in Section 12(2) of *The Heritage Resources Act* (1986) (Manitoba Tourism, Culture, Heritage, Sport and Consumer Protection 2014). The Act stipulates that if the Minister of Manitoba Tourism, Culture, Heritage, Sport and Consumer Protection has reason to believe that heritage resources or human remains that are upon, within or beneath a site are likely to be damaged or destroyed by reason of any work, a Heritage Resource Impact Assessment (HRIA) of the Project may be required. In Manitoba, potential impacts to paleontological resources are also addressed in *The Heritage Resources Act*.

An HRIA is a written evaluation of the effect that a proposed development may have on heritage resources that are known or thought likely to be present at a development site. The goal of the HRIA is to facilitate investigation prior to Project construction. Manitoba Hydro proactively completed an HRIA of MMTP in 2014.The HRIA is separate and distinct from an environmental assessment but the information collected during the HRIA assists in making informed decisions regarding routing and reliable conclusions regarding potential residual effects and mitigation measures to address these effects. It also provides data required for NEB filing requirements, such as the potential for any undiscovered heritage resources in the Project development area, and assists with developing contingency plans and field measures that would be required if a heritage resource was discovered during construction.

The Province of Manitoba also enforces *The Policy Respecting the Reporting, Exhumation and Reburial of Found Human Remains* (1987), which is administered by the HRB of Manitoba Tourism, Culture, Heritage, Sport and Consumer Protection (Historic Resources Branch 2014). This policy outlines the protocols to follow in the event that human remains, or objects thought to be human remains, are found.

Section 35 of *The Cemeteries Act*, administered by the Manitoba Public Utilities Board, may also be relevant to the Project. This section of the Act discusses consequences of any damage, mutilation, defacing, or removal of any tomb, monument, gravestone, or other structure placed in a cemetery, or any fence, railing, or other work for protection or ornament of a cemetery. The location of known cemeteries were considered during the routing option process, and were avoided. However, there is the potential for unmarked human remains to be present outside of current cemetery parameters.

12.1.1.3 Municipal

Municipal regulations or policies regarding heritage resources are outlined in the two planning districts within MMTP, Macdonald-Ritchot (Lombard North Group 2011) and the South Interlake Planning District that includes the RM of Rosser (South Interlake Planning District 2011). The city of Winnipeg has drafted a heritage resources management plan that discusses the protection of cultural landscapes, built heritage, historic cemeteries and archaeological sites (Donald Luxton Associates Inc. 2010).

12.1.2 Engagement and Key Issues

12.1.2.1 Government Communication

Under Section 53 of *The Heritage Resources Act,* a heritage permit is required by the HRB to conduct an HRIA. Application for a heritage resource permit was submitted to and approved by the HRB. All communication with the HRB is summarized in Table 12-1.

Discussions with HRB determined that previously recorded archaeological sites found in a cultivated field have reduced heritage importance. New sites located in a cultivated field would also have reduced importance dependant on the types of artifacts recovered. For example, a site with several projectile points that could be dated to a specific time period or periods would be considered an important site. The concentrated number of points suggests major cultural activity at that location, and if from multiple periods, indicates that this site was visited over a lengthy period of time.

In a February 10, 2015 meeting with HRB, information was also obtained concerning temporal parameters for archaeological sites, particularly the upper date that would be considered a site. HRB considers any site prior to A.D. 1945 as a recordable archaeological site.

Table 12-1 Regulatory Communication for Heritage Resources

Date of Issue	Project File	Permit Number	Topic
July 16, 2012	111440113	N/A	Archaeological site database for Map Sheets 62H/1,2,3,6,10,11,14,15, and 16
April 19, 2013	111440113	N/A	Archaeological site database for Map Sheets 52E/4 and 62I/2
September 12, 2014	111420050	N/A	Submission of heritage permit application for HRIA for Project
September 22, 2014	111420050	A45-14	Archaeological Permit A45-14 Issued
November 25, 2014	111420050	N/A	Discussion with Brian Smith, Manager Archaeological Assessment Services, HRB, regarding site significance of existing or found sites in cultivated areas
January 2, 2015	111420050	N/A	Information from Brian Smith, Manager Archaeological Assessment Services, HRB, regarding HRB approach to mitigation and cumulative effects
February 10, 2015	111420050	N/A	Meeting with Brian Smith, Manager Archaeological Assessment Services, HRB, regarding MMTP HRIA

NOTE:
Additional communications from HRB will be requested upon review of the final HRIA report and regarding any revision to the PDA
N/A indicates not applicable

12.1.2.2 Public Engagement

The public engagement process summarized in Chapter 3 provided a forum for the public to register any concerns or information relative to heritage resources. Public input ranged from general heritage concerns such as agreement that heritage issues should be considered as part of the overall Project to a concern that the transmission line route passed several former homestead locations in the Marchand area.

One public open house participant identified where the Project would cross the Rat and Seine rivers as high heritage resources potential areas. Another participant identified the Bedford Ridge near Marchand and Sandilands as an area of potential heritage concern because it was an elevated natural ridge that would have made a transportation corridor. Assessment of these areas was included in the HRIA field program.

Concerns were also raised about the proximity of one of the alternative routes to the Ridgeland Cemetery north of Sundown. The community suggested avoiding the cemetery or to enhance separation between the transmission line and the edge of the cemetery, and to respect the Ukrainian cultural practice of Praznik that occurs at the cemetery. Praznik is a feast day that is symbolic for a church where parish members gather once a year as a community to honour the name of their church. Some parishes also use the occasion of the feast day to honour the memories of deceased family members. Usually, the feast day involves blessing water, using it to bless the church and then taking that water to bless the graves in the cemetery. Assessment of the Ridgeland Cemetery was incorporated into the HRIA work plan. Proximity to the cemetery was considered during route determination wherein the ROW was altered to increase separation between the cemetery and the ROW.

12.1.2.3 First Nation and Metis Engagement

Traditional knowledge studies and the First Nation and Metis Engagement Process, summarized in Chapter 4, also provided an opportunity for areas of heritage resources concerns to be identified. The Black River First Nation, Long Plain First Nation, Swan Lake First Nation traditional knowledge report indicated that between Marchand and Sandilands, there was an area where people camped and hunted (Black River *et al.* 2015). This area was also a place where First Nations would gather during specific times of the year. The traditional knowledge studies also identified the area south of Spur Woods Siding as a ceremonial and gathering location. Spur Woods Siding was located along the former Ridgeville to Pine rail spur line.

Members of Swan Lake First Nation identified the Assiniboine River and Red River crossings within the Existing Corridor as areas of potential heritage resources related to First Nation camps and Metis farmsteads.

12.2 Scope of Assessment

The scope of the assessment of potential Project effects on heritage resources was influenced by the following:

- regulations pertaining to heritage resources provided by the NEB
- requirements under Section 12(2) of *The Heritage Resources Act*
- issues and concerns raised by stakeholders or the general public, whether for the Project in particular, or for similar past projects
- the spatial extent, such as width of ROW and footprint size of the towers and station expansions
- experience of the proponent with similar projects in the past, including mitigation undertaken
- the professional judgment of the assessment practitioners

12.2.1 Spatial Boundaries

Map 12-1 – Heritage Resources Assessment Area shows the area in which residual and cumulative environmental effects of the Project on heritage resources were assessed, whereas Map Series 12-100 – Heritage Resource Locations shows the distribution of previously recorded heritage resources. The assessment areas can be summarized as follows:

- **Project development area (PDA):** the PDA for all components of the Project encompasses the Project footprint and is the anticipated area of physical disturbance associated with the construction and operation and maintenance of the Project (Map Series 12-100).
- **Local assessment area (LAA):** the LAA for the portion of the proposed transmission line that is within the existing corridor (SLTC and RVTC) is equal to the current extent of the ROW for these corridors. The LAA for the New ROW is a 200-m-wide corridor (to a maximum of 245 m) that includes the PDA. The LAA for each of the proposed station expansions is the PDA. Development at all three station locations will be confined to areas that have been previously disturbed by past land uses (Map Series 12-100).
- **Regional assessment area (RAA):** the RAA for all components of the Project is the Lake Manitoba Plain Ecoregion of the Prairies Ecozone (Agriculture and Agri-Food Canada 1999) (Map 12-1 – Heritage Resources Assessment Area). This ecoregion encompass the seasonally available resource locations that were harvested by the Precontact Period and Early Historic Period cultural groups in the southeast portion of the province.

12.2.2 Temporal Boundaries

The temporal boundary of a Project effect is evaluated in relation to specific Project phases and activities. The temporal boundary is based on the timing and duration of Project activities and the nature of the interactions with heritage resources. The Project-specific temporal boundary includes construction and operation and maintenance.

Historical temporal boundaries for heritage resources and cemeteries consider the existing database of previously recorded sites and general cultural chronologies for southern Manitoba. The heritage resources historical temporal boundary spans a time of approximately 12,000 years ago to 70 years ago. 12,000 years was chosen as this corresponds to the period when glacial Lake Agassiz drained and the environment became conducive to human habitation. Seventy years ago, or the end of the Second World War, was selected as the upper historical temporal boundary specific to the RAA as this is the upper date recognized by the HRB for a site to be recorded in the provincial inventory.

For the purposes of assessing effects on heritage resources and cemeteries, physical disturbance will occur primarily during the construction phase of the Project. However, pathways for disturbance to heritage resource sites and cemeteries can also be anticipated during the operation and maintenance phase. During this phase, there will be activities that require

subsurface disturbance in areas previously not affected by construction, such as any additional access points in locations not previously cleared within the LAA.

12.2.3 Learnings from Past Assessments

Heritage resources were assessed using a similar approach as for previous Manitoba Hydro projects. Other projects include assessment for transmission line construction, and past assessments completed by Stantec for hydroelectric transmission lines in other jurisdictions such as the HRIA completed for SaskPower for the Saskatchewan Power Reinforcement Project (McLeod *et al.* 2013).

The MMTP assessment was completed by coalescing various data sources such as previously identified or legally designated sites, archival data and cemetery locations to determine the nature and extent of the heritage record, the locational potential for heritage resources, and the potential for Project-related changes in heritage resources.

Despite preconstruction HRIAs, there is always a potential for heritage resources, including human remains, to be inadvertently found during construction. Past heritage resources assessments, such as that for the Bipole III Transmission Project (Bipole III) and Keeyask Transmission Project, have recommended construction monitoring as part of a Cultural and Heritage Resources Protection Plan (CHRPP) (Manitoba Hydro 2013 and 2014). The CHRPP describes the processes and protocols to be followed during the construction and operation and maintenance phases of MMTP to allow Manitoba Hydro to safeguard cultural and heritage resources discovered or disturbed during the construction of the Project. The CHRPP is based on past learnings during previous projects, knowledge of the existing heritage resource conditions within the MMTP and recommendations from HRB after review of the HRIA.

In the event that a cultural or heritage resource is inadvertently discovered, the protection measures for the resource(s) will be determined through processes outlined in the CHRPP. Recorded cultural and heritage resources and their protection measures have been incorporated into the applicable Construction Environmental Protection Plans (CEnvPPs). The operation and maintenance environmental protection plans will also include the site and protection measures to be used for the ongoing protection of cultural and heritage resources during operations.

Furthermore, it has been stated in previous environmental submissions that the landscape itself is a heritage resource that provides cues for storytelling and memory (Manitoba Clean Environment Commission 2013:93). While most of the route planning area (RPA) landscape has been modified by agricultural and residential development, portions of the RPA remain undeveloped, such as the Sandilands Forest Reserve in southeastern Manitoba. Information regarding potential heritage resources within these undeveloped areas, as well as the RPA in general was acquired during the public engagement process and First Nation and Metis engagement process.

12.3 Methods

12.3.1 Existing Conditions Methods

Preliminary baseline data to establish existing conditions were acquired from the HRB and consisted of previously recorded archaeological sites and Centennial Farms. These data were augmented by a list of provincially and municipally designated sites within the RPA obtained by accessing the Province of Manitoba's HRB (Province of Manitoba 2015).

The results of a literature search indicated that there are only a few HRIAs or archaeological studies that have been previously completed within MMTP. One thesis study (Saylor 1975) had been completed in Sandilands Provincial Forest.

The field program for the Environmental Assessment (EA), conducted in September and October 2014, consisted of examining the previously recorded heritage resource sites, known cemeteries and areas of heritage resource potential that had been determined by predictive modeling when assessing the alternative and preferred routes. Information from the HRIA supported assessment of the Final Preferred Route by providing knowledge of existing conditions within the route LAA.

12.3.1.1 Sources of Information

The following sources of information were used to inform the existing conditions for heritage resources in the PDA, LAA and RAA:

- The Manitoba Land Initiative website was accessed to review Dominion Lands Office township plans that were compiled during the first land surveys of Manitoba between 1872 and 1910. Access to this website is through permission only from Manitoba Land Initiative (MCWS 2015). The township plans contain information such as topography and vegetation, location of cart trails, developed and undeveloped rail lines, and stream courses.
- Original landowner data were collected from Land Grants of Western Canada (1870 to 1930) on the Library and Archives Canada website (Government of Canada 2014). These records indicate the type of land acquisition such as Metis Land Grant or sale. *The Manitoba Act* (1870), recognized Metis rights and granted 566,660 ha (1.4 million acres) of land for dispersal among Metis families (Ens 1983:1). Individuals who were granted lands are identified in the Library and Archives database.
- River lot landownership records for the Parishes of Lorette, St. Norbert and Headingley were examined at the Provincial Archives of Manitoba (RG17/D2).
- Topographic maps (1:50,000 scale) were accessed on the Natural Resources Canada website to plot cemetery locations, identified on the map by a "C" and an area delineated by a rectangular hash line, within the RPA (Government of Canada 2015). These locations were subsequently located on Google Earth Pro® imagery to obtain a georeferenced location for the centre point of the cemetery.

- The Cemetery Project interactive website was accessed (Canadian Gen Web 2015).
- Data pertaining to cemetery locations, historical sites and school locations were also collected by reviewing the interactive map of historic sites produced by the Manitoba Historical Society (MHS 2015). These sites were subsequently located on Google Earth Pro® imagery to obtain a georeferenced location for the site or centre point of the cemetery.

12.3.1.2 Desktop Analysis

The heritage resources data were plotted to compare with the alternative routes, the preferred route and the Final Preferred Route for points of interaction. Elements such as topographical features and watercourses were compared to correlate landforms with site location for predictive modelling. The data were also plotted and compared with historical features such as cart trails and rail lines. The archaeological site database was also analyzed to determine the number of disturbed, partially disturbed and intact sites within the PDA and LAA. Disturbance factors were primarily a result of cultivation, as well as wind and water erosion, and residential development. Most of the previously recorded sites were identified based on surface collection.

A literature review of previous assessments within the RAA was conducted to determine past approaches for predictive modelling. Saylor (1975) conducted an archaeological survey in the Sandilands Provincial Forest to test predictive modelling based on correlation of known site locations and topographical landforms. Specific attention was given to the various Lake Agassiz beach strand lines, as these were important pedestrian corridors for Early Precontact Period groups. Using the physiographic areas developed by Ehrlich and Smith (1964), Saylor divided the study area into three zones: Upland, Plateau and. Lowlands. His research showed that the Plateau and Lowland areas produced the most sites and rationalized that these locations were the preferred habitation areas because they provided the maximum amount of seasonally available resources for First Nation hunter/gatherers.

Heintzelman (1976) expanded on Saylor's research to develop a technique for predicting archaeological site distribution and density as ancillary research to a heritage assessment of the proposed Manitoba Hydro 230 kV transmission line from Winnipeg to Sprague. The research objective design was to establish the statistical probability of the spatial distribution of archaeological sites within the Winnipeg to Sprague project area. Heintzelman's approach used various combinations of fixed natural phenomena with attention focused on existing landforms and known ethnological patterns of predominantly pedestrian Precontact hunter/gatherers. The landforms included relict beach ridges, outwashed deposits, till and lacustrine plains, streams and riverbanks, bogs and bog sides, and aeolian sand. These features were then combined to determine a high-moderate-low potential for heritage resources.

Predictive modelling for the MMTP heritage assessment was used in transmission line route evaluation that led to the identification of the Final Preferred Route. Predictive modelling variables included proximity to water, topography, soil type, proximity to known sites, past land use, and proximity to historical features. Rationale for each variable is as follows:

- Proximity to water: Locations where the alternative routes, the preferred route, and the Final Preferred Route extended adjacent to or across a stream or adjacent to a body of water were considered to have moderate to high potential.
- Topography: Low-lying areas such as bogs or marshes were considered to have low potential for heritage resources. Relict beach ridges, such as the Bedford Ridge and the beach strands in the Sandilands area, were considered to have moderate to high potential. The lowland areas along the west edge of the LAA were also considered to have moderate to high potential. This variable is the same as the modelling studies that Saylor and Heintzelman completed.
- Soil type: Areas with glaciofluvial, glacial lacustrine, alluvial and sandy (aeolian) soils were considered to have moderate to high potential. Till was considered to have moderate potential, as these could be source areas for lithic tool production. Organic and peat deposits were considered to have low potential for heritage resources.
- Proximity to known sites: Locations where any of the alternative routes, the preferred route, and the Final Preferred Route were within 500 m of a known heritage site or the ROW extended between two known sites, were considered to have moderate to high potential.
- Past land use: Areas that were under native vegetation were considered to have moderate to high heritage potential. Areas that had been cultivated or previously disturbed by past development (*e.g.*, residential, commercial, road, hydroelectric transmission) were considered to have low potential.
- Proximity to historic trails: Locations where the alternative routes, the preferred route, and the Final Preferred Route intersected or were within 500 m of a cart trail as identified in the Dominion Land township plans were considered to have moderate to high potential for heritage resources.

12.3.1.3 Field Studies

The HRIA of MMTP was conducted in September and October 2014. It involved re-examining previously recorded sites within the 200 m corridor, and examining areas of heritage resource potential that were within 200 m of an alternative route. The methods and results of the field program are discussed in the Heritage Resources Technical Data Report. All fieldwork on lands for which land access was granted was conducted under Manitoba Heritage Permit A45-14 and followed provincial HRIA guidelines (Badertscher 1990). The field methods used are standard field procedures developed by Stantec (Stantec Consulting Ltd. 2014).

The first component of the HRIA consisted of driving along existing roadways to assess all alternative routes. The survey objective was to compare these routes with the locations of previously recorded sites and moderate to high potential locations identified from predictive modelling to identify areas that required a more detailed field assessment. Permission to gain access to private property was acquired through Manitoba Hydro. Access was denied at one location in the RM of Tache and a second location could not be accessed because the landowner did not respond to phone messages left by Manitoba Hydro staff.

The detailed field assessments were completed in October 2014 and consisted of pedestrian transects and shovel testing placed randomly in areas determined to have moderate to high potential for heritage resources. Tests were dug to the C-soil horizon that consists of clay deposited by Lake Agassiz. Data on soil strata, vegetation ground cover, canopy cover and topographical features such as sand ridges or elevated areas adjacent to a wetland were recorded manually. Landscape photographs were taken in the four cardinal directions (north, east, south, west) at tests where the vegetation or landscape was different from that recorded at the previous test. Shovel test profiles were photographed at the first location assessed at the start of the field study and at locations where soil strata not previously observed were recorded.

Areas that were cultivated fields were documented as such and photographs of the location were taken in the four cardinal directions. Previously recorded sites within 500 m of the centre line of an alternative route that were in agricultural fields were revisited and assessed for the potential of buried cultural strata below the plow zone. Factors that contribute to the potential for buried cultural strata include areas adjacent to a river prone to flooding or areas where blow dirt could be captured and accumulated.

Assessment of several areas determined to have moderate to high potential within the Sandilands area were discovered to have been previously disturbed by forestry activities such as harvesting or reforestation. Features indicative of these activities consisted of undulating surfaces where trees had been cleared or linear furrows with standing trees. The field program was curtailed in areas that exhibited previous disturbance by having similar surficial features.

The results of the HRIA assisted in refining the knowledge of existing conditions by recorded observations and subsurface testing. This, in turn, assisted in analysis of subsequent refined route alignment options and ultimately the Final Preferred Route.

12.3.1.4 Addressing Uncertainty

Heritage resource assessment areas were chosen based on previously recorded heritage resources, areas identified during public engagement and predictive modelling. The assumption of the assessment is that standard heritage resources baseline and field assessment techniques provide enough background data to determine residual and cumulative Project effects. However, there is the potential that previously unrecorded heritage resource sites can inadvertently be exposed during construction and operation and maintenance. Mitigation measures, such as construction monitoring (in areas of high heritage resource potential or in proximity to known

heritage resource sites) and implementation of the CHRPP (including the education of construction workers and environmental inspectors), are conducted to limit potential negative Project effects.

12.3.2 Assessment Methods

The overall environmental effects methods were presented in Chapter 7. The specific techniques used to complete the assessment for heritage resources are presented in this section. These include:

- assessment approach
- potential environmental effects, effect pathways and measureable parameters
- environmental effects description criteria for heritage resources
- significance thresholds for residual environmental effects

12.3.2.1 Assessment Approach

There are three components to the analytical assessment of effects on heritage resources:

- evaluation of potential Project effects on known heritage resource sites
- evaluation of potential Project effects on undiscovered heritage resource sites
- evaluation of potential Project effects on known cemetery sites and potential effects on human remains found adjacent to known cemeteries

The evaluation of potential Project effects on heritage resources compares the locational data of known archaeological sites, archaeological sites found as a result of predictive modelling, designated historical sites, centennial farms, former school sites and cemeteries with the Final Preferred Route to identify points of interaction. The analysis evaluates whether sites are located in the PDA or LAA and if they are subject to direct disturbance by the Project.

Evaluation of potential Project effects on undiscovered heritage resource sites considers that there is the possibility that intact cultural materials could be inadvertently exposed during construction. Given the random nature of shovel test placement when the HRIA was conducted and the potential for deeply buried artifacts, intact buried cultural materials may not be revealed during shovel testing. Predictive modelling, developed from an analysis of the existing heritage resources database, previous predictive modelling for areas in and adjacent to the LAA, and proxy variables such as distance to water, topography, past land use, soils, and archival information was used to determine points of interaction between Project components and potential heritage resources.

Evaluation of potential Project effects on known cemetery sites compares the location of known church and community cemeteries with the Final Preferred Route to determine points of interaction.

12.3.2.2 Potential Environmental Effects, Effect Pathways and Measurable Parameters

The potential environmental effects and measureable parameters used in the assessment of effects on heritage resources, and the rationale for their selection, are provided in Table 12-2.

Table 12-2 Potential Environmental Effects, Effect Pathways and Measurable Parameters for Heritage Resources

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement	Notes or Rationale for Selection of the Measureable Parameter
Change in number of known and intact heritage resource sites and change in sites inadvertently exposed	Project components requiring subsurface disturbance have the potential to disturb the horizontal and vertical context of artifacts	Number of known and intact heritage resource sites in LAA (3 sites: 1 previous and 2 recorded in 2014)	The number of known and intact heritage resource sites from existing conditions and the number of potential heritage resource sites identified through predictive modelling provide an indication of the potential for Project interactions.
Change in cemeteries and burials	Project components requiring subsurface disturbance have the potential to disturb burials within a cemetery	Number of intact cemeteries within the LAA (1 site)	Currently all cemeteries in the database are undisturbed. Any change in the number of undisturbed cemeteries as a result of the Project is a measurable parameter.

Effect pathways for heritage resources are identified in Sections 12.3.2.2.1 and 12.3.2.2.2 and presented in Figure 12-1.

Primary and secondary potential effects from the Project on heritage resources include:

- Primary effects occur during construction, including loss or disturbance to site contents and site contexts through brush or topsoil removal, compaction, vehicle traffic, grading for access roads, tower construction and station modification or expansion.
- Secondary effects may include vandalism if the Project creates new human access opportunities, or damage to surface sites through artifact collection.

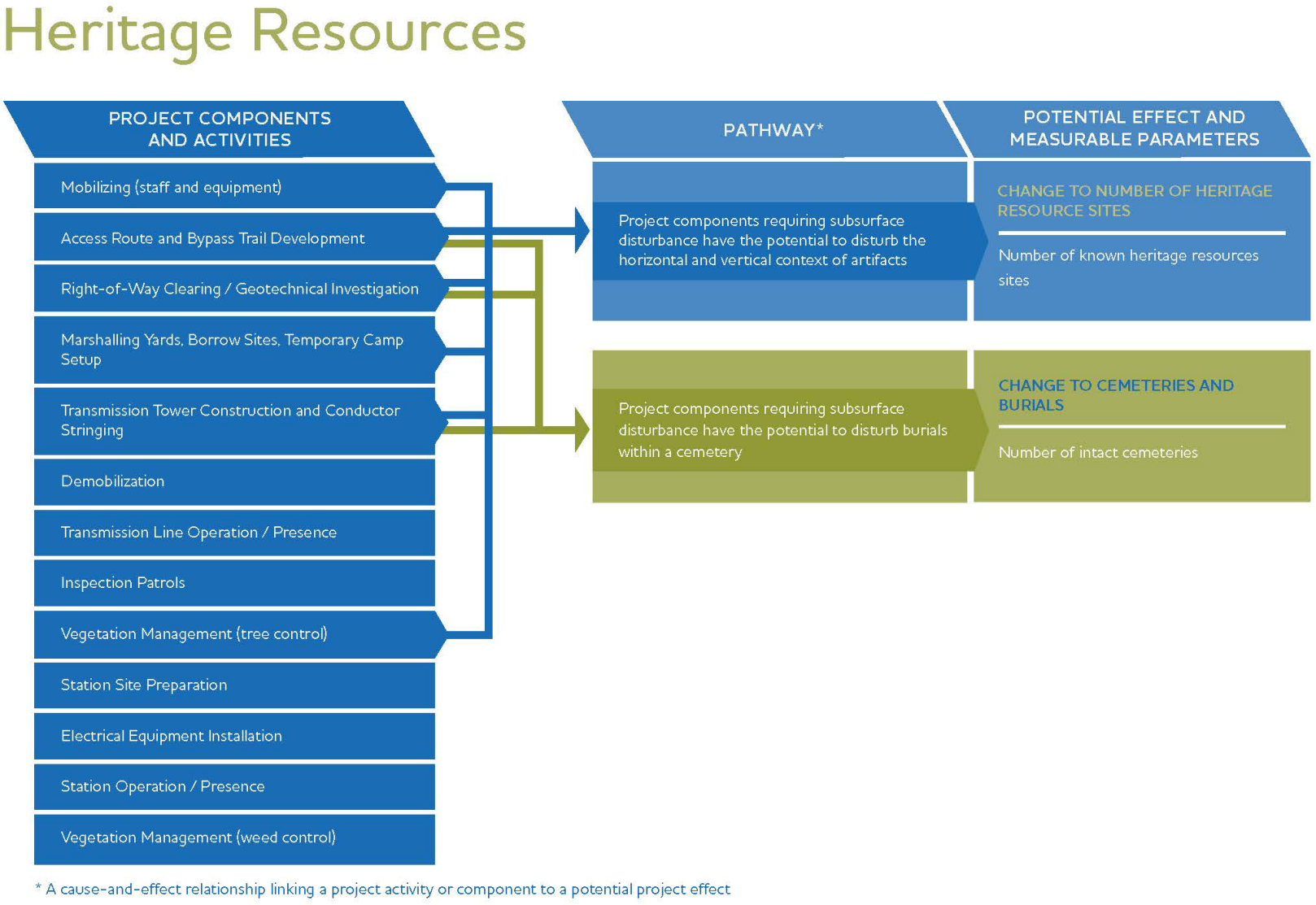

Figure 12-1 Effects Pathways for Heritage Resources

12.3.2.2.1 Effect Pathways during Construction

The potential effects pathways for construction include the following:

- Brushing activities for access roads, staging areas, transmission line ROW and tower locations could disturb known or potential heritage sites by dislocating artifacts that are within or just beneath tree roots. The removal of standing vegetation could also create unstable soil environments and associated surface runoff that would result in the horizontal and vertical displacement of surface or shallowly buried artifacts.
- Soil removal for tower footings and staging areas could disturb known or potential heritage resource sites by removing artifacts from their horizontal or vertical context.
- Grading for access roads could also disturb known or potential heritage resource sites by removing artifacts from their horizontal or vertical context.
- Compaction from vehicular traffic could disturb surface or shallowly buried heritage resources, particularly in areas of sandy soils such as in the Sandilands Provincial Forest.
- Construction of access roads would also provide increased entry to areas of intact heritage resource sites by vandals or unauthorized site collection.
- Spoil piling of excavated soils and rock may damage known or unknown heritage resources below surface.

12.3.2.2.2 Effect Pathways during Operation and Maintenance

The potential effects pathways for operation and maintenance include the following:

- Brushing activities to maintain access roads, transmission ROW or tower locations could disturb known or unknown heritage resource sites if areas that were not previously cleared during construction are accessed during operation and maintenance.
- Brushing activities to expand access roads could disturb known or unknown heritage resource sites by dislodging artifacts within or just below tree roots.
- Subsoil removal or regrading of access roads in areas that were not developed during construction could result in disturbance to heritage resources by disturbing the horizontal or vertical context of artifacts.

12.3.2.2.3 Measurable Parameters

The measurable parameter for heritage resources is the number of known intact sites and the number of areas predicted through modelling to have a moderate to high potential for heritage resources that may be disturbed by the Project. The number of known sites within the PDA and LAA is a quantitative measure based on the analysis of existing conditions.

The measurable parameter for cemeteries is the number of known intact cemeteries within the PDA and LAA that have the potential to be disturbed or partially disturbed by the Project.

12.3.2.3 Residual Environmental Effects Description Criteria

Residual effects are those effects remaining after implementing mitigation measures. Most of the Final Preferred Route traverses cultivated lands that have limited potential to contain intact heritage resources. However, it is difficult to predict or identify the location of all archaeological sites. In addition, accepted archaeological sampling strategies for buried site discovery cannot guarantee identification of sites in areas not sampled and cannot identify deeply buried sites. Therefore, despite completing an HRIA and implementing proposed mitigation measures, the possibility still exists of interactions with heritage resources sites and cemeteries during Project construction.

Terms used to characterize the residual environmental effect on heritage resources are summarized in Table 12-3.

Table 12-3 Characterization of Residual Environmental Effects on Heritage Resources

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The trend of the residual effect	**Adverse** – a reduction in the number of known heritage resource sites, including cemeteries, listed in the database inventory in the PDA and LAA through the disturbance of known and the disturbance to previously unknown sites inadvertently exposed by the Project **Neutral** – no change in the number of known or unknown sites and no change in known or unknown cemeteries
Magnitude	The amount of change in the number of heritage resources and intact cemeteries relative to existing conditions	**Negligible** – no measurable change in a heritage resource site or cemetery **Low** – a measurable change in a heritage resource site or cemetery insufficient to disturb the vertical and horizontal location of artifacts **Moderate** – measurable change in a heritage resource site or cemetery but less than high change. Any encounters with undiscovered sites during construction would have at least a moderate magnitude effect on the site, but an assessment by a professional archaeologist would be required to evaluate the magnitude. **High** – physical disturbance and primary effects on a large portion of a heritage resource site or cemetery with loss of site integrity and interpretative context

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent	The geographic area in which an environmental, effect occurs	**PDA** – residual effects are restricted to the PDA **LAA** – residual effects extend into the LAA **RAA** – residual effects interact with those of other projects in the RAA
Duration	The period of time required so that the effect can no longer be measured or otherwise perceived	Permanent – residual effect extends for the lifetime of the Project or more
Frequency	Identifies how often during the Project or in a specific phase	**Single** – one time occurrence during any subsurface construction activity at a specific location such as a known archaeological or cemetery site or an area of heritage resource potential
Reversibility	Pertains to whether a measurable parameter or the valued component can return to its existing condition after the project activity ceases	**Irreversible** – the effect cannot be reversed as once a heritage site has been disturbed, the action cannot be reversed to return the site to pre-project status
Socio-economic Context	Existing condition and trends in the area where environmental effects occur	**Undisturbed** – area is relatively undisturbed or not adversely affected by human activity which increases the value of heritage resources **Disturbed** – area has been substantially previously disturbed by human development or human development is still present.

12.3.2.4 Significance Thresholds for Residual Environmental Effects

An environmental effect on heritage resources is considered to be significant if it results in a change in the number of known and intact heritage resource sites currently listed in the PDA and LAA of the New ROW.

12.4 Existing Conditions for Heritage Resources

A database of known heritage resources within the Project development area, shown in Map Series 12-100 – Heritage Resource Locations, was created prior to the route selection process. The combined heritage resource inventory for all Project components lists 178 sites (Table 12-4). All but three of the 61 previously recorded archaeological sites and sites recorded during the 2014 HRIA were identified as disturbed or partially disturbed. These sites were disturbed by cultivation, gravel extraction or wind erosion.

Table 12-4 Summary of MMTP Heritage Resource Sites

Site Type [1]	Number
Archaeological Isolated Find	15
Archaeological Campsite	14
Archaeological Farmstead	8
Archaeological Workshop	8
Archaeological Uninterpreted	7
Archaeological Structural	3
Archaeological Permanent Settlement	2
Archaeological Commercial	1
Archaeological Industrial	1
Archaeological Sites Recorded in 2014 HRIA	**2**
Archaeological Site Subtotal	**61**
Provincially Designated Site	2
Municipally Designated Site	5
Designated Site Subtotal	**7**
School Site	27
Cemetery	68
Centennial Farm	15
TOTAL	**178**

NOTE:
1 – Archaeological site types are defined in the glossary

One previously recorded archaeological site is within the PDA of the New ROW and four previously recorded archaeological sites are within the PDA of the Existing Corridor.

Archaeological sites listed in the heritage resources database that contained dateable artifacts , indicate that human habitation has occurred in the MMTP study area since the Early Precontact Period, with most of these sites located in the southern portion of the region between La Broquerie and Sandilands Manitoba. Most of the Middle and Late Precontact Period sites are located in the central and southern portion of the Project development area. In contrast, most of the sites of the Middle Historic Period are located in the northern portion of the Project development area and, through time, homestead settlement expanded southerly. This north–south settlement pattern was the reverse of that witnessed during the Precontact Period.

No Provincial or Municipal designated sites are located within the Existing Corridor and the Final Preferred Route PDA or LAA. The Old St. Elias Ukrainian Orthodox Church and Bell Tower and the New St. Elias Ukrainian Orthodox Church and Bell Tower, both provincially designated heritage sites in the Sirko area, were constructed in the Late Historic Period. The five municipally designated sites; Ste. Anne Roman Catholic Church and the Piney Road Bridge, both within the RM of Ste. Anne; St. Joachim Church in the RM of La Broquerie; Monseigneur Taché Historic Site in the RM of Taché; and Sts. Peter and Paul Ukrainian Orthodox Church in the RM of Stuartburn date to the Late Historic Period.

No centennial farms are located within the Existing Corridor and the Final Preferred Route PDA or LAA. The centennial farms database dates from 1878 to 1903 with the oldest farms in the RMs of Ste. Anne and Tache.

There are no former school sites within the Existing Corridor and the Final Preferred Route PDA or LAA. The oldest school site, Plympton School, dates to 1879 and is located 3.5 km south of the RVTC and 5 km east of Deacon’s Corner. Most of the schools within the database date to the post-1900 period, and most of these are located in the RM of Piney.

There is one cemetery within the LAA of the New ROW, the Ridgeland Cemetery An examination of the east perimeter of the cemetery during the 2014 HRIA recorded no evidence of any unmarked burials outside of the recognized graveyard boundary.

The discussion below summarizes the landscape and vegetation of the Existing Corridor, New ROW and the stations before homestead settlement, land clearing and land drainage. The information was obtained from the Dominion Land township maps on the Manitoba Land Initiative website (http://mli2.gov.mb.ca/spatial_ref/index_twp_diag.html) and parish river lot plans from the early 1870s to early 1900s available at the Provincial Archives of Manitoba (RG17/D2). The plans offer a characterization of the landscape prior to settlement and an indication of what resource users during the Precontact and Early Historic periods encountered within the present-day existing corridor.

12.4.1 Existing Transmission Corridor

The Existing Corridor consists of the SLTC and the RVTC from the Riel Converter Station to just east of PTH 12 near Vivian. The landscape between the present-day Dorsey Converter Station and the north bank of the Assiniboine River was originally level prairie cut by small streams that meandered southeasterly toward the Assiniboine River. Small stands of poplar and willow would have dotted the prairie with the stands becoming thicker as one approached the Assiniboine River. The 1875 survey plan of river lots in the Parish of Headingley shows the north bank of the Assiniboine River as a mix of woodland and cultivated lands, while the south bank was primarily woodlands with a mix of poplar and willow (P.A.M. H9/614.11/gbbe/Series1/Number 20). Recent land use studies along the Assiniboine River show that clearing vegetation for farming and subsequent urban development occurred primarily during the post-1840 era (McLeod 2013).

The area south of the Assiniboine River was a mixture of dry rolling prairie interspersed with natural hayland, poplar bluffs and marshy wetlands in low-lying areas. The vegetation modified to thicker stands of poplar and willow as one approached the La Salle and Red rivers. Portions of the La Salle River within the Existing Corridor remain thickly wooded under natural vegetation. As one proceeded east of the Red River between the present-day Riel Converter Station to just east of PTH 12 near Vivian, the landscape would have consisted of level prairie mixed with natural hayland, oak and willow bluffs interspersed with wetlands. An east-west cart trail extended parallel to this portion of the Existing Corridor and was probably used by First Nations during the Precontact Period to travel from the level prairie along the Red and Assiniboine rivers to the wooded areas of the east edge of the province. During the Historic Period, this trail would have connected Metis in communities such as St. Norbert, Lorette and Ste. Anne with resource areas in the eastern portion of the province.

Four previously recorded archaeological sites have been recorded in the Existing Corridor PDA, all of which have been disturbed by agriculture, utility installation or resource extraction. Homestead sites from the post-1850s have been recorded on both sides of the Assiniboine River crossing. Both sites relate to former Hudson's Bay Company employees and their families who cleared areas along the river and developed farmsteads comprised of log dwellings and outbuildings, and small cultivated fields.

12.4.2 New Right-of-Way

The northern portion of the Final Preferred Route consisted of prairie interspersed with poplar, willow bluffs and hayland. This habitat would have supported a variety of plants and animals that were harvested by First Nations during the Precontact Period. One archaeological site was previously recorded within the PDA and four in the RAA. The site within the PDA consisted of an undated broken projectile point collected from the surface of a cultivated hayfield. Three of the sites previously recorded in the RAA were undated, while the fourth contained artifacts attributed to the Middle Precontact and Late Precontact (ca. 2,500 to ca. 300 years before present BP). This latter site was found on a ridge overlooking a wetland area that may have provided the inhabitants with a diverse assortment of resources to harvest.

The landscape and vegetation altered to a more low-lying swampy terrain southwest of present-day Richer and was known as Devil's Marsh in the early 1870s. Elevated ridges within the marsh contained stands of oak, poplar and willows. An undated Precontact Period site was previously recorded in the RAA on a ridge near the northwest shore of present-day Lac Bossé, formerly Salmon Lake. A second site attributed to the Early Precontact Period (ca. 12,000 to ca. 6,500 years BP) was recovered about 800 m east of Hope Creek. These sites indicate that the elevated ridges between the low-lying marshes were frequented by First Nations to extract or collect resources. The present-day Dawson Road, formerly the Dawson Trail, is approximately 2.4 km north of the undated Precontact site and was probably a pedestrian corridor used to access these areas during the Precontact Period.

The vegetation altered to mixed coniferous-deciduous stands of pine, tamarack and poplar on level stony terrain and stands of cedar and tamarack in low-lying swampy areas near present-day La Broquerie. A fire had passed through this area prior to 1874, as dense stands of windfall and burned timber were recorded by the surveyors. Three Precontact Period sites were recorded south of La Broquerie close to the Seine River in an area that was covered with poplar and pine. One of these sites contained pottery that dated to the Late Precontact Period.

The area at the Rat River crossing was originally a rolling landscape covered with tamarack, spruce, jack pine, poplar and thick willow scrub. No archaeological sites have been previously recorded along this reach of the river.

The landscape varies from level to undulating from the south bank of the Rat River to the Canada-United States border south but the pre-settlement vegetation remained primarily a mix of tamarack, spruce, jack pine and poplar. The Bedford Ridge is not identified as such in the township plans, however a number of trails are recorded along this feature. Several Early Precontact Period sites have been recorded in the southern portion of the New ROW RAA in the Sandilands Provincial Forest. These sites relate to cultural groups moving into the southern portion of the province following the retreat of Lake Agassiz. This general area was also identified as a traditional gathering spot for First Nations in the community, following traditional knowledge studies completed for Black River First Nation, Long Plain First Nation, and Swan Lake First Nation (Black River *et al.* 2015).

The First Nations that migrated into the southern portions of Manitoba after Lake Agassiz receded were bison hunters who followed herds that moved northward as grassland habitat developed in Manitoba (Pettipas 1984:30). The first European explorers in the RAA were the La Verendryes, who established trading posts on Lake of the Woods, on the Red River south of present-day Selkirk and along the Assiniboine River near present-day Portage la Prairie during the late 1730s (Burpee 1927). The La Verendryes were exploring for the east trade route to Asia and used the proceeds from the fur trade to offset expenses for their exploratory work.

Homestead settlement began along the Seine River at Ste. Anne and Lorette by Metis families who moved out of the Red River Settlement during the late 1860s and early 1870s (Ledohowski 2003:37). Several major trails were used to travel between these small farm communities and the Red River Settlement with the Dawson, Ste. Anne and Ile des Chênes trails the most common.

The Hudson's Bay Company constructed and operated a post at Ste. Anne on the south side of the Dawson Trail. Several log dwellings attributable to Metis farmsteads have been recorded along the Seine River within the LAA. Most of these dwellings have been demolished. Predictive modelling for site locations relating to the Historic Period relies primarily on archival records such as surveyed parish plans and land tenure records at the Provincial Archives of Manitoba. In general, sites dating to the post-1860 settlement period in the parishes of Lorette and Ste. Anne are located on elevated banks along the Seine River or along the Dawson Trail. Most of these areas have been disturbed by residential development. Many of the trails used in the pre-1900 era were eventually developed as highways, making these continuous transportation corridors for several thousand years.

Eastern and Western European immigrants acquired land sections in the south portion of the RAA during the late 1890s to early 1920s (Ledohowski 2003:35). Their legacy survives today in community names such as Zhoda and Arbakka, and the distinctive Eastern European construction styles of churches such as St. Elias (Sirko), and St. Peter and St. Paul (Arbakka). Municipal governments were formed as the areas were settled. The municipalities within the LAA and year of incorporation are listed in Table 12-5. In present day, these local governments are empowered to protect heritage resources through municipal site designation. Several municipally designated sites are in the RAA (Map Series 12-100 – Heritage Resource Locations).

Table 12-5 Municipalities Located within the LAA

Municipality	Date of Incorporation
Rosser	March 1893
Headingley	May 1992
Macdonald	May 1885
City of Winnipeg	November 1873
Ritchot	November 1890
Springfield	September 1873
Tache	February 1880
Ste. Anne	February 1880
La Broquerie	May 1881
Stuartburn	January 1902
Piney	Local Government District January 1945
Piney	Rural Municipality February 1997
South Cypress	December 1883

SOURCE: MHS 2015

Homestead settlement was assisted by construction of the Canadian Northern Railway from Winnipeg to Duluth in the early 1900s. The RAA contained two railway lines. The Canadian Northern Railway's Sprague subdivision line that ran from Winnipeg, Manitoba southeast to Rainy River, Ontario then south of Lake of the Woods into northwestern Minnesota, and then northeast to Thunder Bay, Ontario was begun in 1898 and completed in February 1902. Bedford Station was established on this line in the late 1890s. The Sprague line is currently active. The second line was the Ridgeville subdivision that was constructed between 1903 and 1907 and connected communities in the Stuartburn region with South Junction on the Sprague branch line. Small stations such as Sundown, Menisino and Spur Woods were developed along the line. The Ridgeville branch line was abandoned and its tracks removed during the 1980s. Surveys for the ROW for the Manitoba and Southeastern Railway were completed in the late 1870s in the northwest portion of the RAA, but the rail line was never actually constructed.

12.4.3 Dorsey Converter Station

The 1909 township plan described the converter station PDA and LAA as rolling prairie. Present-day topographic maps show a number of stream drains in the area surrounding the station suggesting that the rolling prairie was originally bisected by a series of streams flowing southeasterly toward the Assiniboine River. These stream locations could have been areas of resource gathering by First Nations during the Precontact Period.

The quarter section proposed for the Dorsey Converter Station expansion was originally Hudson’s Bay Company reserve. A northwest to southeast cart trail passed through the northwest and southeast quarters of the adjoining section to the east. The Canadian Pacific Railway main line was constructed in the early 1880s through the north half of the quarter section south of the proposed station expansion area. No heritage resources have been previously recorded within the area proposed for the Dorsey Converter Station expansion. The expansion area is in an agricultural field that has a low potential for heritage resources.

12.4.4 Riel Converter Station

The area of the Riel Converter Station was described in the 1908 township plan as level prairie with clumps of willows. The quarter section containing the station was originally Metis land grants issued in April 1881.

12.4.5 Glenboro South Station

Prior to homestead settlement in the late 1880s, the area was described in the Dominion Land township survey as undulating prairie with small swamps and a considerable quantity of scrub. Several small wetlands dotted the landscape east and south of the station PDA, with the largest—the present-day Glenboro Marsh—2 km south of the existing station. The wetland areas may have been resource locations during the Precontact Period for First Nation hunters and gatherers harvesting seasonally available flora and fauna.

The first homestead settlement in the Glenboro area was in the late 1870s near the present-day town. The post office was established in 1883 and the Canadian Pacific Railway arrived in 1885 (Ham 1980:54). The RM of South Cypress was incorporated in December 1883. The Village of Glenboro was incorporated in December of 1949.

The quarter section containing the PDA was homesteaded by the Alfred Burch family in 1887. The exact location of his buildings on the quarter section is not known. This area has been disturbed by cultivation and construction of the present-day station and egressing transmission line. No heritage resources have been previously located within the PDA for the Glenboro South Station expansion.

12.4.6 Summary of Existing Conditions

Based on the analysis of the existing database and information from the field assessment, the existing conditions can be summarized by the following:

- One archaeological site is located within the Final Preferred Route PDA and was a fragment of an undated projectile point in a cultivated field.
- Five archaeological sites are within the Existing Corridor, four of which have been disturbed by cultivation or previous development.
- The fifth site in the Existing Corridor was recorded during the 2014 HRIA and dates between 1920 and 1950.
- No heritage resources have been previously recorded at the Dorsey Converter Station, the Riel Converter Station or the Glenboro South Station.
- A 64 ha portion of the Final Preferred Route PDA and LAA west of Lonesand, Manitoba has moderate to high heritage resource potential as these areas have not been cultivated or previously developed. This portion of the PDA can be considered an environmentally sensitive area (ESA) that is recommended for further assessment or ground-truthing once tower location is known (Map 12-2 – Heritage Sensitive Area).
- Portions of the southeast portion of the Final Preferred Route PDA and LAA have been disturbed by forestry operations and gravel extraction.
- Homestead settlement in the Existing Corridor began during the Middle Historic Period by Metis families along the Red River and by HBC employees and their Metis families along the Assiniboine River.
- Metis families established farmsteads along the Seine River in the Lorette and Ste. Anne areas during the Middle and Late Historic periods.

- Most of the southern portion was homesteaded by eastern European families during the Late Historic Period.
- Lands previously affected by agriculture have low potential for Precontact Period cultural strata below the plow zone because there is a low potential for post-depositional soil accumulation to have occurred.

12.5 Assessment of Project Environmental Effects on Heritage Resources

Project-related effects on heritage resources and cemeteries generally occur within the PDA and occur during construction. These effects are mitigated at or before construction and, therefore, no residual effects on heritage resources are expected to occur after the CHRPP is developed and any required mitigation is completed.

There are no previously recorded heritage resource sites within the PDAs for the Glenboro South Station, Riel Converter Station or the Dorsey Converter Station; the potential for heritage resources is low. Therefore, there are no potential interactions with heritage resources at these locations and no residual effects are anticipated.

12.5.1 Project Interactions with Heritage Resources

Table 12-6 identifies physical activities and components that might interact with heritage resources for each potential effect. These interactions are indicated by checkmarks, and they are discussed in detail below in the context of effects pathways, standard and Project-specific mitigation, and residual effects.

Demobilization, transmission line operation and presence, and inspection patrols will not interact with heritage resources as these resources, if present, would have been mitigated/managed during construction.

There are no previously recorded heritage resource sites within the PDAs for Glenboro South Station, Riel Converter Station or Dorsey Converter Station; the potential for heritage resources is low. Therefore, there are no probable interactions with heritage resources.

Table 12-6 Potential Project–Environment Interactions and Effects on Heritage Resources

Project Components and Physical Activities	Change in Heritage Resource Sites	Change in Cemeteries
Transmission Line Construction Activities		
Mobilization (staff and equipment)	✓	–
Access Route and Bypass Trail Development	✓	✓
Right-of-way Clearing/Geotechnical Investigation	✓	✓
Marshalling Yards, Borrow Sites, Temporary Camp Setup	✓	-
Transmission Tower Construction and Conductor Stringing	✓	✓
Demobilization	–	–
Transmission Line Operations/Maintenance		
Transmission Line Operation/Presence	–	–
Inspection Patrols	–	–
Vegetation Management (tree control)	✓	–
Station Construction		
Station Site Preparation	–	–
Electrical Equipment Installation Station Modification	–	–
Station Operations/Maintenance		
Transmission Line and Station Operation/Presence	–	–
Vegetation Management (weed control)	–	–

NOTES:
"✓" = Potential interactions that might cause an effect
"–" = Interactions between the Project and the valued component are not expected

12.5.2 Assessment of Change in Heritage Resource Sites

The Project has the potential to result in a change in the number of intact heritage resource sites. This primarily refers to a change in the horizontal or vertical proveniences of artifacts at a site inadvertently exposed during the lifespan of the Project. The pathways, mitigation measures, and characterization of these potential effects are described below.

12.5.2.1 Pathways for Change in Heritage Resource Sites

12.5.2.1.1 Construction

The discussion of pathways for change during construction pertains to the New ROW and the Existing Corridor and primarily relates to unknown heritage resources because route selection has avoided most previously recorded heritage resources.

ROW clearing and geotechnical testing may disturb the ground sub-surface and any intact heritage resources. Furthermore, removal of vegetation may create unstable soil conditions that could result in displacement of exposed heritage objects. ROW clearing will be subject to standard environmental protection measures that have been established in association with Manitoba Hydro transmission line construction practices, as well as the Project-specific CEnvPP. With the exception of ESAs, the cleared ROW width for the structures will vary depending on location and tower type. Trees and ground vegetation will not be uprooted except at tower sites, where the foundation area will typically be scraped to allow unencumbered access for equipment during mobilization and safe walking areas for workers. Scraping activities have the potential to disturb intact heritage resources.

Geotechnical investigations are proposed to take place as the ROW is cleared to allow access. Test pits located at tower foundation sites are excavated by a tracked excavator and have the potential to disturb intact heritage resources.

Construction of access and bypass roads may disturb intact heritage resources and also have the potential for increased entry into ESAs. Access for construction and subsequent line maintenance activities will generally occur along the ROW using existing public access roads or trails wherever possible. This enables maximum use of existing road access, reduces the requirement for the development of new temporary trail access, and reduces the potential for disturbing intact heritage resources. Minor deviations from the ROW may be necessary in severe terrain conditions. The Access Management Plan in conjunction with the CHRPP will also reduce potential disturbance to heritage resources.

Marshalling yards, borrow area activities and associated access roads, and temporary camps have the potential to disturb intact heritage resources. Marshalling yards will be established near the ROW and could disturb heritage resources during clearing. Aggregates required for use in foundation construction will generally be transported from established and appropriately licensed sources off-site. However, new borrow areas may be required along the ROW and potential

borrow locations have yet to be identified at this time. Mobile camps may be constructed along the ROW and clearing and access to the mobile camps could disturb intact heritage resources.

Activities related to the installation of footings and foundations for towers may disturb intact heritage resources. The type of footing or foundation required, and the associated depth necessary for installation, is dependent on the type of structure. Tower footprint within the Existing Corridor and the New ROW ranges from 100 m^2 to 225 m^2. Tower spans along the Existing Corridor are between 300 m and 500 m, while spans along the New ROW are 400 m.

12.5.2.1.2 Operation and Maintenance

Transmission line operations and maintenance activities have a potential to interact with heritage resource sites within the Existing Corridor and the New ROW PDAs and LAAs. Specifically, additional vegetation clearing in areas previously not disturbed by construction that may be required for maintenance of tower sites have a potential to expose heritage resources. Unless required for ongoing maintenance, the ROW access trails will not be regularly maintained post construction.

12.5.2.2 Mitigation for Change in Heritage Resource Sites

Mitigation for change in heritage resource sites pertains to the Existing Corridor and the New ROW. Mitigation measures are determined by experience from previous environmental assessments, for example Manitoba Hydro transmission line projects such as the Keeyask Transmission Project, Bipole III Transmission Project and St. Vital Transmission Complex, and through the HRB review of the HRIA report. The HRIA report details the results of the archaeological assessment conducted for MMTP and the heritage resource management strategy recommendations therein.

The objective of mitigation is to limit the loss of heritage resource materials and sites or site integrity caused by Project-related activities. The best mitigation practice for heritage resources is avoidance. The routing criteria used for selecting alternative and preferred routes are an example of how heritage resources were avoided during the early planning stages of MMTP. Standard mitigation measures used by previous transmission projects and recommended for MMTP include:

- implementation of CHRPP;
- protective barriers placed, where required, around heritage resource sites that are inadvertently found during construction so that the area can be protected while work proceeds;
- controlled surface collection or salvage excavation of known heritage resource sites, or a portion thereof, that cannot be avoided;
- Pre-construction investigation by a professional archaeologist in areas in close proximity to known heritage resource sites;

- Pre-construction investigation by a professional archaeologist in areas that are considered to be heritage sensitive such as sites identified as being culturally sensitive by First Nation and Metis, extant buildings or building foundations, stone features, burial sites and any other heritage resources sites as defined by *The Heritage Resources Act (1986)*;
- evaluation of any route change or added development; and
- education of construction contractors for the appropriate protocol in the event that heritage resources, or objects thought to be heritage resources, are uncovered.

Through past projects such as Bipole III (Manitoba Hydro 2013) and the Keeyask Transmission Project (Manitoba Hydro 2014), Manitoba Hydro has developed standard heritage resource mitigation measures for linear projects. Measures similar to those employed for these previous projects will be implemented for the Project. Based on previous Manitoba Hydro projects, primary effects on heritage resources are usually mitigated before or during construction. Should previously unidentified heritage resources be encountered during the construction phase, activity in the area will cease until the HRB has been informed, a qualified archaeologist has examined the objects and site context, and clearance from HRB has been granted. Secondary effects are mitigated through worker education programs before the construction phase, and detailed recording of any surface sites judged to be at increased risk of vandalism because of increased human access.

Residual effects are reduced through mitigation measures and the CHRPP. Furthermore, through review of recommendations and mitigation measures outlined in heritage permit reports, provincial regulators can either concur or request additional mitigation measures to be conducted. These additional measures are usually summarized as regulatory conditions of *The Environment Act* licence.

12.5.2.3 Characterization of Residual Environmental Effect for Change in Heritage Resource Sites

The locations of known heritage resources were considered during transmission line routing so that these sites could be avoided. However, one previously recorded archaeological site is within the PDA of the New ROW and four are within the Existing Corridor PDA. The HRIA recorded one new archaeological site within the PDA of the Existing Corridor and this site can be avoided by tower siting away from the area. The HRIA also recorded a new archaeological site adjacent to one of the proposed alternative routes in the south portion of the Project area. This alternative route is not part of the Final Preferred Route and therefore there are no further concerns with potential disturbance to the recorded site.

Archaeological site DiLc-3 is an undated Precontact Period site recorded when a broken projectile point was recovered from the surface of a cultivated field. The site coordinates in the HRB database place this site 25 m east of the centreline of the New ROW. However, the site was recorded in the 1970s before the use of GPS units and therefore the location may not be accurate. This location was assessed during the 2014 HRIA and no further heritage resources

were recovered. There is low potential for cultural strata to be present below the plow zone at this location. While known archaeological sites were considered areas of least preference during route planning, the predisturbed context of this site was understood at the time of routing and adjacent features constrained where route alternatives could be developed. Intact forest lies directly to the west, and routing to the east would have brought the route closer to homes. It was therefore determined that the risk of disturbing additional heritage resources in the area could be more easily mitigated than the resulting effect on adjacent homeowners and the forest; hence, this alternative was developed and ultimately became part of the Final Preferred Route.

Site DlLi-11 is a farmstead site located on the south bank of the Assiniboine River 135 m west of the Existing Corridor and, based on archival information, relates to the Sutherland family who settled the lot in the 1850s. The site covers approximately 1.7 ha based on archival data (McLeod 2006). No heritage resources were recorded on the property during the 2014 HRIA.

Archaeological site DlLi-12 is a farmstead site on the north bank of the Assiniboine River that relates to the William Brown family who acquired the river lot in the 1850s. Most of the site is contained in a grassed field on the edge of a cultivated field approximately 200 m west of the Existing Corridor. William Brown obtained the river lot from the HBC in 1859. He constructed a 1½ story Red River frame log house 6.6 m × 9.5 m. By 1873, the Brown farm consisted of two houses, two outbuildings, a stable and 24 ha were under cultivation (McLeod 2006). The refurbished dwelling now sits adjacent to the St. James Museum in Winnipeg and was municipally designated by the City of Winnipeg in February 2000.

Site DkLg-31 is located on the west bank of the Red River within 50 m of the Existing Corridor. The site is a small, undated Precontact Period site with limited recorded information regarding site age or artifacts recovered. DkLg-31 was revisited during the 2014 HRIA, and the area was observed to have been disturbed by cultivation and borrow pit extraction.

DkLg-20 is a Late Precontact Period site recorded on the east bank of the Seine River south of the Red River Floodway within 200 m of the Existing Corridor. This site has been disturbed by cultivation.

A Late to Recent Historic Period farmstead, estimated to date between A.D. 1920 and 1950, was recorded on the north bank of the Assiniboine River within the Existing Corridor during the 2014 HRIA. The farmstead consists of a collapsed house, barn and outbuilding. A circular depression was recorded 230 m south of the farmstead and 35 m north of the riverbank. The pit was 3.5 m north-south by 4.5 m east-west and recent debris including metal pails, tin cans and bottles was observed within the feature. No additional heritage resources were recovered from shovel tests placed adjacent to the pit.

One archaeological site was recorded in the southern portion of the Project development area within 50 m of one of the preferred alternative routes and 40 m north of the Canada–United States border. The site consisted of a rectangular stone building foundation that measured 10.5 m north-south by 4.6 m east-west. No heritage resources were recovered from within the structure to determine a relative date of occupation. Several stone piles were observed across

the modified hayland indicating that the land had once been ploughed and the stones collected. The site was concluded to be a Late Historic Period structure although no artifacts were recovered within or adjacent to the structure.

A 64 ha ESA was delineated in the Lonesand area where a series of sand ridges has a moderate to high heritage resource potential. The forest cover in this area has remained unaltered since the retreat of glacial Lake Agassiz and the jack pine canopy of today would have been similar to that encountered by First Nation groups as they moved into the area. This area would require a heritage resource assessment once tower location has been determined and, depending on the results of the assessment, monitoring during construction. Therefore, with respect to heritage resources, the main residual effect of the Project is the potential discovery of unknown heritage resources, particularly during the Project construction phase but also possibly during the operation and maintenance phase.

The direction of the residual effect is adverse. The magnitude of the residual effect is low and the geographic extent is the LAA because, based on the Project description and the location of known heritage resources sites, there will be no net change in number of known heritage resource sites. Baseline field studies revealed no evidence of pathways for interaction with known heritage resources and transmission line routing avoided known heritage resource locations.

Encounters with undiscovered sites during construction would be predicted to have a moderate magnitude effect on the site, but an assessment by a professional archaeologist would be required to evaluate and confirm the magnitude. The potential for direct change in the number of undiscovered heritage resources will be confined to the LAA as defined for the Existing Corridor and the New ROW because this is the maximum width of ROW required during the construction phase.

Frequency is a single event and the potential for change in undiscovered heritage resources may occur once during access route and bypass trail development, ROW clearing, geotechnical testing, tower construction and any subsurface activities during operation and maintenance. Duration of the effect is permanent because heritage resources are non-renewable. Effect change is irreversible because disturbed heritage resources cannot be returned to baseline conditions.

The ecological context within the PDA, LAA and RAA is considered disturbed because of past and ongoing agricultural activities, rural residential development, forestry operations and all-weather roads.

12.5.3 Assessment of Change in Cemeteries and Burials

The Project has the potential to result in a change in the number of intact cemeteries. This may include inadvertently disturbing the upper strata of a burial or exposing human remains in an unmarked burial adjacent to a cemetery. The pathways, mitigation measures and characterization of these potential effects are described below. There are no known cemeteries within the LAA for the Existing Corridor or at any of the station expansion sites. The following discussion pertains to the Final Preferred Route.

12.5.3.1 Pathways for Change in Cemeteries and Burials

12.5.3.1.1 Construction

Cemetery sites can be affected by ground disturbance activities associated with access route and bypass trail development, ROW clearing, geotechnical investigations, and transmission tower construction.

While human remains are generally located more than 1.0 m below the surface, there is the potential for the original marker to be shallowly buried in close proximity to the grave. This upper context is easily disturbed by subsurface disturbance, particularly in sandy soils. Therefore, tree and ground vegetation removal at a tower location could interact with unmarked burial locations if cutting requires subsurface disturbance (*e.g.*, root removal at tower foundation sites). Site access could also interact with the upper context of an unmarked burial either by tire-mounted or track vehicles. Tower construction could interact with an unmarked burial depending on the excavation depth required for the particular tower foundation.

Discovery of unmarked human burials is also considered in this assessment as a specific potential environmental effect due to the sensitive nature of human remains and because inadvertent exposure of human remains invokes the Province of Manitoba burials policy.

12.5.3.1.2 Operation and Maintenance

Operations and maintenance activities do not have any foreseeable pathways to interact with cemeteries, unless vegetation clearing in areas previously not disturbed by construction is required for maintenance of tower sites.

12.5.3.2 Mitigation for Change in Cemeteries and Burials

The objective of mitigation for this effect is to address concerns raised during public engagement and to follow proper protocols in the event that unmarked burial sites adjacent to recognized cemeteries are inadvertently exposed by Project-related activities. The locations of church and community cemeteries were examined when the alternative routes were selected. Subsequently, cemetery locations were factored when the Final Preferred Route was determined. Both routing analyses avoided known cemeteries.

Additional mitigation measures are determined through HRB review of the HRIA report that detail the results of the archaeological assessment conducted for the Project and the heritage resource management strategy recommendations.

Effects are reduced through mitigation measures and the CHRPP that would include statements pertaining to cemeteries. Furthermore, through review of recommendations and mitigation measures outlined in heritage permit reports, provincial regulators can either concur or request additional mitigation measures to be conducted. These additional measures are usually summarized as regulatory conditions of *The Environment Act* licence.

Mitigation measures include:

- implementation of the CHRPP
- evaluation of any route modifications for the presence of unmarked cemeteries
- timing construction and maintenance to avoid any religious ceremonies/practices or interments at Sundown cemetery (Will contact RM of Piney to discuss schedules)

12.5.3.3 Characterization of Residual Environmental Effect for Change in Cemeteries and Burials

There are no cemeteries within the Existing Corridor PDA or LAA. Therefore, no residual environmental effects are anticipated.

Avoidance of cemeteries reduced the Project's potential for residual effects on changes in cemeteries. However, the Ridgeland Cemetery north of Sundown is within the LAA of the New ROW Final Preferred Route. Concerns regarding the close proximity of the cemetery to the ROW were expressed during round one of the public engagement process. Subsequently, the Sundown community expressed additional concerns regarding special religious ceremonies at the site.

The Ridgeland Cemetery measures approximately 60 m north–south by 60 m east–west and is delineated by the Sundown Road along the west perimeter, a row of spruce trees along the east perimeter, mixed deciduous–coniferous forest on the north side and hayland on the south. Most of the marked graves are clustered along the east edge of the cemetery. The cemetery was examined during the 2014 HRIA and no evidence of unmarked burials outside the cemetery parameters was observed.

The Final Preferred Route was selected so that a setback distance of approximately 100 m from the east boundary of the cemetery was maintained. A schedule of activities at the cemetery will be acquired by Manitoba Hydro and relayed to the construction manager so that construction activities do not coincide with these events. The field assessment conducted during the HRIA determined that there was a low potential for unmarked burials to be present outside of the east cemetery perimeter.

During construction, the direction of the residual effect is neutral. There is no net change anticipated in the number known cemeteries.

The magnitude of the residual effect during construction is negligible and the geographic extent is the LAA because based on an analysis of previously recorded cemeteries within the PDA, there is no potential for interaction with these known sites and there will be no net change in the number of known cemeteries. Any inadvertent exposure of human remains during operation and maintenance would be predicted to have a moderate magnitude effect on the site, but an assessment by the HRB and a professional archaeologist would be required to evaluate and confirm the magnitude. Baseline field studies reveal no evidence of interactions with known cemeteries and routing analysis avoided known cemetery locations. The potential for a direct change in the number of cemeteries will be confined to the LAA because this is the maximum width of ROW required during the construction and operation and maintenance phases.

The frequency of the residual effect is a single event and the potential for change in cemeteries may occur once during activities such as access route and bypass trail development, ROW clearing, geotechnical investigations, and transmission tower construction. Duration of the effect is permanent but once acceptable protocols have been followed, any exposed human remains could be reinterred in the cemetery. The effect is considered irreversible because disturbed cemeteries cannot be returned to baseline (*i.e.*, undisturbed) conditions once disturbed. Ecological context is undisturbed because the PDA, LAA and RAA contain cemeteries that have been maintained since being established.

Therefore, there are no residual effects on cemetery locations anticipated as a result of the Project.

12.5.4 Summary of Project Environmental Effects on Heritage Resources

The summary of environmental effects on change in heritage resources is listed in Table 12-7.

Table 12-7 Summary of Residual Environmental Effects on Heritage Resources

Project Phase	Residual Effects Characterization						
	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological Context
Change in Heritage Resource Sites							
Construction	N-A	L-M	LAA	P	S	I	D
Operation and Maintenance	N-A	L-M	LAA	P	S	I	D
Change in Cemeteries							
Construction	N-A	L	LAA	P	S	I	U
Operation and Maintenance	N-A	L	LAA	P	S	I	U

KEY

See Table 12-3 for detailed definitions

Direction: *A: Adverse; N: Neutral; P: Positive*

Magnitude: *N: Negligible; L: Low; M: Moderate; H: High*

Geographic Extent: PDA: *ROW/Site; LAA: Local; RAA: Regional*

Duration: *ST: Short-term; MT: Medium-term; LT: Long-term; P: Permanent*

Frequency: *S: Single event; IR: Irregular event; R: Regular event; C: Continuous*

Reversibility: *R: Reversible: I: Irreversible*

Ecological Context: *U:Undisturbed, D:Disturbed*

N/A Not applicable

12.6 Assessment of Cumulative Environmental Effects on Heritage Resources

Where residual environmental effects from the Project act cumulatively with those from other projects and physical activities, a cumulative effects assessment is undertaken to determine their significance. Project residual effects described in Section 12.5 likely to interact cumulatively with residual environmental effects of other physical activities are identified in this section and the resulting cumulative environmental effects are assessed. This is followed by an analysis of the Project contribution to residual cumulative effects. Chapter 7: Assessment Methods, Table 7-4 presents the Project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the Project. The assessment of cumulative effects considers residual effects from construction; and operation and maintenance.

12.6.1 Identification of Projects Likely to Interact Cumulatively

Table 12-8 summarizes other past, present and future projects and activities and their potential interaction with heritage resources exposed to the Project. Environmental effects identified in Table 12-8 as not likely to interact cumulatively with residual effects of other projects and physical activities (no checkmark) are not discussed further. The assessment of the cumulative environmental effects that are likely to result from the Project in combination with other projects and physical activities follows.

Lands cleared of standing vegetation for conversion to agriculture, livestock operations, cropping and land drainage, and resource extraction activities such as forestry and peat mining have acted cumulatively in the past to affect heritage resource sites either by partially disturbing or completely removing the site. Agricultural conversion has had the largest footprint and was primarily done before heritage legislation was enacted to manage and protect archaeological resources. None of these past activities has interacted with known cemeteries.

A number of linear developments have been proposed for southern Manitoba that will overlap spatially and temporally with the MMTP. Two transmission lines proposed by Manitoba Hydro will intersect with the Project PDA and LAA: Bipole III and St. Vital Transmission Complex (SVTC). Bipole III, for which construction has commenced, will traverse the RMs of Macdonald, Ritchot, Tache, Ste. Anne and Springfield. Bipole III will cross the Project within the Existing Corridor. The SVTC will traverse the RMs of Macdonald, Ritchot, Tache and the south St. Boniface neighbourhood in the city of Winnipeg. The SVTC will cross the Existing Corridor after it exits St. Vital Station and traverses through the city of Winnipeg crossing the floodway east of PTH 59.

The Manitoba Highway Renewal Program includes one project within the Existing Corridor LAA that could affect heritage resources, the St. Norbert Bypass Project. This project would connect PTH 75 south of St. Norbert to Kenaston Boulevard at PTH 100 (south perimeter) in the city of Winnipeg.

Table 12-8 Potential Cumulative Interactions with Heritage Resources

Other Projects and Physical Activities with Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects	
	Change in Known and Unknown Heritage Resource Sites	Change in Cemeteries
Past and Present Physical Activities and Resource Use		
Agriculture (Conversion, Livestock Operations, Cropping and Land Drainage)	✓	–
Residential Development	–	–
Existing Linear Developments (Riel-Forbes 500 kV, Glenboro-Rugby-Harvey 230 kV, Riel Sectionalization)	✓	–
Other Resource Activities (Forestry, Mining)	✓	–
Project-Related Physical Activities	✓	✓
Future Physical Activities		
Bipole III Transmission Project	✓	–
St. Vital Transmission Complex	✓	–
Dorsey-Portage South 230 kV	–	–
Northwest Winnipeg Natural Gas Pipeline Project	–	–
Richer South Station to Spruce Station Transmission	✓	–
Energy East Pipeline Project	–	–
Southend Water Pollution Control Centre Upgrade Project	–	–
St. Norbert Bypass	✓	–
Headingley Bypass	–	–
Residential Development	–	–
Natural Gas Upgrade Projects	–	–

NOTES:

"✓" = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

"–" = Interactions between the residual effects of other projects and those of the Project residual effects are not expected.

12.6.2 Cumulative Effect Pathways for Cumulative Change in Heritage Resource Sites

Agricultural expansions into areas within the LAA that have not been previously cultivated have the potential to disturb heritage resources. However, most land under native vegetation is in the vicinity of Sandilands, and has sandy soils, which would have a low agricultural capability. Map 7-200 shows past and present physical activities and resource use, and a number of forestry and mining areas within the LAA. The 2014 HRIA field assessment recorded disturbances by forestry operations and gravel quarry operations. Reforestation of cut blocks and gravel extraction has the potential to disturb previously unknown heritage resources particularly in the Marchand and Lonesand areas.

Those portions of Bipole III and SVTC that intersect with the MMTP PDAs and LAAs are in areas that have been disturbed by agriculture or previous development. Therefore, the potential for any cumulative effects on heritage resources is low.

The St. Norbert Bypass could disturb unknown heritage resources if development occurs in areas that have not been previously disturbed. Major portions of the bypass development area have been disturbed by either agriculture or residential development. Furthermore, any previously recorded heritage resources are closer to the Red River, east of PTH 75. Therefore, the potential for cumulative effects is low.

12.6.3 Mitigation for Potential Cumulative Effects on Heritage Resources

A key success factor in terms of mitigation of potential cumulative effects is monitoring, internal coordination, and reporting the regulatory agencies such as Manitoba Conservation and Water Stewardship (MCWS) and the HRB. Active monitoring of Project potential effects on heritage resources will occur during construction, and any effects will be addressed through implementation of the mitigation measures described in Section 12.5.2.2 and documented in the Project-specific CEnvPP and the CHRPP. In addition, Manitoba Hydro is also the proponent for many of the ongoing and future projects that may interact with the Project. For example, Manitoba Hydro has drafted a heritage resources protection plan for Bipole III and will prepare similar plans for SVTC and the Richer South Station to Spruce Station Transmission. All of these projects require regular formal interactions with MCWS and HRB, particularly on issues of concern. If it appears that Manitoba Hydro projects are potentially acting in combination to cause unanticipated adverse cumulative effects, Manitoba Hydro has the ability to manage these projects to reduce this concern. In addition, other proponents in the Project are also responsible for reporting project activities to MCWS and HRB, and these regulators can inform Manitoba Hydro if it appears that there are unanticipated adverse cumulative effects occurring. The HRB also reviews land-based developments through the heritage resources impact assessment program as mandated by *The Heritage Resources Act*. Therefore, additional mitigation for cumulative effects is addressed by

the provincial regulators, as they determine whether future projects will require heritage resource investigations.

12.6.4 Residual Cumulative Effects on Heritage Resources

The future projects proposed within the PDA and LAA are primarily located on lands that have already been altered by agricultural activities. These developments include components of Bipole III, STVC and the St. Norbert Bypass. Therefore, residual cumulative effects for change in heritage resource sites are anticipated to be minimal. No residual cumulative effects are anticipated within the MMTP PDA or LAA.

12.6.5 Summary of Cumulative Effects

Table 12-9 summarizes cumulative environmental effects on changes in heritage resource sites.

As indicated previously, for all of its projects, Manitoba Hydro develops measures to avoid areas of high potential heritage resources, wherever feasible, and actively manages effects during construction to further avoid sites or salvage and restore sites, if required. Given this, the direction of the cumulative environmental effect with the Project is neutral, the magnitude is negligible, and the geographic extent is the LAA for both the Existing Corridor and the New ROW. The duration is short term, the frequency would be a single event however, any changes in heritage resources are irreversible. The ecological context is a mix of undisturbed and disturbed lands. With Manitoba Hydro's ability to coordinate the management of all of its projects in the LAA, and the requirement to report and coordinate with regulators responsible for all projects in the area, the direction of the cumulative environmental effect for the contribution from the Project to the overall cumulative environmental effect is predicted to remain neutral. The magnitude will remain negligible, and the geographic extent is the LAA for both the Existing Corridor and the New ROW.

Table 12-9 Summary of Cumulative Environmental Effects on Changes in Heritage Resources

Cumulative Effect	Residual Cumulative Environmental Effects Characterization						
	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological Context
Cumulative Change on Heritage Resources							
Cumulative environmental effect with the Project	N	N	LAA	P	S	I	D/U
Contribution from the Project to the overall cumulative environmental effect	With the proposed mitigation measures for MMTP, the effect of the Project on Heritage Resources is low to medium in magnitude. Heritage resource sites have been avoided in route planning and now new sites are expected. The contribution of Project effects to the overall cumulative effects is expected to be minimal.						

KEY

See Table 12-3 for detailed definitions.

Direction: *A: Adverse; N:Neutral; P: Positive*

Magnitude: *N: Negligible; L: Low; M: Moderate; H:High*

Geographic Extent: *ROW: PDA; Local: LAA; Regional: RAA*

Duration: ST: Short-term; MT: Medium-term; P: Permanent

Frequency: S: Single event; IR: Irregular event; R: Regular event; C: Continuous

Reversibility: R: Reversible; I: Irreversible

Ecological Context: *U:Undisturbed, D:Disturbed;*

N/A Not applicable

12.7 Determination of Significance

12.7.1 Significance of Environmental Effects from the Project

An environmental effect on heritage resources is considered to be significant if the environmental effects of the Project results in a change in the number of known and intact heritage resources sites currently listed in the PDA of the new ROW and LAA or a previously unknown site that may be exposed during construction and operation and maintenance. However, by having avoided known and intact heritage resources during delineation of the Final Preferred Route, planned mitigation measures during the construction and operation and maintenance phases and development of the CHRPP, there are no significant residual effects. The Project will result in no change in the number of known intact heritage resources or cemeteries. All previously recorded heritage resource sites within the PDA and LAA have been previously disturbed because of past land use activities.

The main residual effect of the Project is the potential discovery of unknown heritage resources particularly during the construction phase of the Project. However, with mitigation and environmental protection measures, residual environmental effects on changes in heritage resources and cemeteries are considered to be not significant.

12.7.2 Significance of Cumulative Environmental Effects

Most of the other projects and physical activities with potential for cumulative environmental effects are located in areas with agricultural land use or previous development. The area with the least amount of development is the southeast portion of the New ROW. No other development projects or physical activities have been announced for this area. Therefore, with mitigation and environmental protection measures for this Project, the residual adverse cumulative environmental effects on heritage resource sites and cemeteries are considered to be not significant.

12.7.3 Project Contribution to Cumulative Environmental Effects

The inventory of known heritage resources previously recorded in the Existing Corridor, the New ROW and the station expansions indicates that Project contribution to cumulative environmental effects will be negligible. The assessment recognizes that there is a potential for unrecorded heritage resources to be inadvertently exposed during either construction or operation and maintenance. The CEnvPP and CHRPP will provide a detailed plan of follow-up and monitoring of known and discovered heritage resources during the construction phase. Long-term Project effects will be addressed through ongoing monitoring after the Project commences and will assist in developing a baseline for future projects.

12.7.4 Sensitivity of Prediction to Future Climate Change

Future climate change is not anticipated to alter the prediction that the changes in heritage resource sites and cemeteries will not be significant as a result of MMTP. Development of the Existing Corridor and the New ROW will not create pathways to change previously recorded heritage resource sites and cemeteries. Mitigation and environmental protection measures will lessen the potential for disturbance to previously unrecorded heritage resources. If future climate change affects the PDA or LAA of the Project after its life cycle, any heritage resource sites or cemeteries will have been adequately mitigated.

12.8 Prediction Confidence

A conservative approach is taken in the evaluation of potential environmental effects. Prediction confidence is high based on the low number of previously recorded archaeological sites within the PDA and LAA, the low number of cemeteries within the LAA, past land uses within the LAA have disturbed a major portion of the landscape, and the results of the field assessment within the LAA. Furthermore, predictive modelling was completed to address some of the informational gaps in areas that had not been subjected to previous studies. Areas identified as having heritage resource potential were assessed during the HRIA; one new site was identified in the Existing Corridor, and an ESA was delineated on the New ROW near Lonesand.

12.9 Follow-up and Monitoring

Manitoba Hydro and its construction contractors will abide by requirements issued by the provincial regulator for site avoidance, excavation or heritage resource monitoring. Archaeological construction monitoring may be recommended by the HRB upon review of the HRIA report. The purpose of construction monitoring is to recover any artifacts unearthed during construction and record the site context. The CHRPP describes the processes and protocols to be followed during the construction and operation phases of MMTP to allow Manitoba Hydro to safeguard cultural and heritage resources discovered or disturbed during the construction of the Project.

In the event that a cultural or heritage resource is inadvertently discovered, the protection measures for the resource(s) will be determined through processes outlined in the CHRPP. Recorded cultural and heritage resources and their protection measures have been incorporated into the applicable CEnvPPs. The operation and maintenance environmental protection plans will also include the site and protection measures to be used for the ongoing protection of cultural and heritage resources during operations.

12.10 Summary

Any Project-specific assessments or additional mitigation requirements will be issued by the HRB following review of the 2014 HRIA report. Confidential HRIA reports will be filed with the Province, as required under archaeological investigation permits.

During construction, any inadvertent discoveries of heritage resources will be reported to provincial authorities, as required under provincial heritage legislation. Procedures to follow for chance finds are documented in the heritage resources discovery contingency plan in the CEnvPP.

12.11 References

Badertscher, P. 1990. The Contents and Format of a Heritage Resource Impact Assessment. Guidelines for Conducting a Heritage Resources Impact Assessment: Module VI. Manitoba Culture, Heritage and Recreation, Historic Resources Branch, Winnipeg, MB.

Black River First Nation, Long Plain First Nation, Swan Lake First Nation. 2015. Aboriginal Traditional Knowledge Study Community Report submitted by Black River First Nation, Long Plain First Nation, Swan Lake First Nation to Manitoba Hydro. Ms on filed Manitoba Hydro, Winnipeg, MB.

Burpee, L. 1927. Journals and letters of La Vérendrye and his sons. Champlain Society, Toronto ON.

Canadian Gen Web. 2015. Canada Gen Web's Cemetery Project. A Free Canadian Cemetery Directory for Genealogists since 2004 [online]. Available from http://cemetery.canadagenweb.org/MB/ [accessed July 27, 2015].

CEAA (Canadian Environmental Assessment Agency). 2012. *Canadian Environmental Assessment Act*, 2012 [online]. Available from http://laws-lois.justice.gc.ca/eng/acts/C-15.21/index.html? [accessed: November 2014].

Donald Luxton Associates Inc. 2010. City of Winnipeg Heritage Resource Management Plan [online]. Available from http://www.winnipeg.ca/ppd/historic/pdf/WpgHeritageMgmtPlan.pdf [accessed June 2015].

Ehrlich, W.A. and Smith, R.E. 1964. Soil Survey of the Southeastern Map Sheet Area. Soils Report No. 14, Manitoba Department of Agriculture and Conservation, Winnipeg, MB.

Ens, G. 1983. Métis Lands in Manitoba. Manitoba History, Number 5, Spring 1983. Available from http://www.mhs.mb.ca/docs/mb_history/05/Métislands.shtml [accessed November 2013].

Government of Canada. 2014. Search: Land Grants of Western Canada, 1870-1930 [online]. Library and Archives Canada. Available from http://www.bac-lac.gc.ca/eng/discover/land/land-grants-western-canada-1870-1930/Pages/search.aspx [accessed July 27, 2015].

Government of Canada. 2015. GeoGratis Search, Discover and Download Free Maps, Data and Publications [online]. Natural Resources Canada. Available from http://geogratis.gc.ca/geogratis/search?lang=en [accessed July 27, 2015).

Ham, P. 1980. Place Names of Manitoba. Western Producer Prairie Books, Saskatoon, SK.

Heintzelman, A. 1976. A Technique for Predicting Archaeological Resource Distribution and Density in Southeastern Manitoba: A Case Study in Research, Planning and Design. (Canadian Archaeological Association Bulletin, No. 8 (1976), pp. 122-132.

Historic Resources Branch. 2014. Provisions Regarding Found Human Remains [online]. Available from http://www.gov.mb.ca/chc/hrb/pdf/factsheet_human-remains.pdf [accessed November 2014].

Ledohowski, E. 2003. The Heritage Landscape of the Crow Wing Study Region of Southeastern Manitoba. Historic Resources Branch Manitoba Culture, Heritage & Tourism, Winnipeg, MB.

Library and Archives Canada. 2014. Land Grants of Western Canada, 1870-1930 [online]. Available from http://www.bac-lac.gc.ca/eng/discover/land/land-grants-western-canada-1870-1930/Pages/land-grants-western-canada.aspx [accessed November 2013].

Lombard North Group. 2011. Macdonald-Ritchot Planning District Development Plan: A Framework for Sustainable Development to 2030 [online]. Available from http://www.rmofmacdonald.com/files/Macdonald-RitchotDPBL2-10FinalVersion_3.pdf [accessed June 2015].

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

MHS (Manitoba Historical Society). 2015. MHS Resources: Historic Sites of Manitoba [online]. Available from http://www.mhs.mb.ca/docs/sites/index.shtml [accessed July 27, 2015].

Manitoba Hydro. 2013. Bipole III Transmission Project Cultural and Heritage Resources Protection Plan [online]. Available from http://www.hydro.mb.ca/projects/bipoleIII/pdfs/environmental_protection/bipoleIII_culture_and_heritage_resources_protection_plan.pdf [accessed November 2014].

Manitoba Hydro. 2014. Keeyask Transmission Project Cultural and Heritage Resources Protection Plan. Available from http://www.hydro.mb.ca/projects/keeyask/transmission_pdf/ktp_chrpp.pdf [accessed November 2014].

Manitoba Tourism, Culture, Heritage, Sport and Consumer Protection. 2014. The Heritage Resources Act (1986) [online]. Available from http://web2.gov.mb.ca/laws/statutes/ccsm/h039-1e.php [accessed November 2014].

McLeod, K.D. 2006. Settlement in the Red River: A Summary of Relevant Heritage Resource Information Obtained from the Parish Files. Ms on file Stantec Consulting Ltd, Winnipeg, MB.

McLeod, K.D. 2013. Bison Pound Wetland Survey: Archaeological Survey Charleswood. Ms on file Stantec Consulting Ltd, Winnipeg, MB.

McLeod, K.D., Amundson. B., Stead. L., and Hein, L. 2014. HRIA of Saskatchewan Power Reinforcement Project: Martensville-Aberdeen-Elstow-Wolverine. Ms on file Stantec Consulting Ltd, Saskatoon, SK.

MCWS (Manitoba Conservation and Water Stewardship). 2015. Manitoba Land Initiative [online]. Available from http://mli2.gov.mb.ca/spatial_ref/index_twp_diag.html [accessed July 27, 2015].

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

Pettipas, L. 1984. Introducing Manitoba Prehistory. Papers in Manitoba Archaeology Popular Series No. 4. Manitoba Culture, Heritage and Recreation, Historic Resources Branch, Winnipeg, MB.

Province of Manitoba. 2015. Manitoba's Historic Places and Significant Heritage Resources [online]. Available from http://www.gov.mb.ca/chc/heritage/significant_heritage_resources.html [accessed July 27, 2015].

Provincial Archives of Manitoba. 2015. Parish Lot Files, RG 17/D2/Microfilm. Provincial Archives of Manitoba, Winnipeg, MB.

Saylor, S. 1975. Prehistoric Human Occupation and Ecology in the Sandilands Forest Reserve, Southeastern Manitoba. Master's Thesis, University of Manitoba, Winnipeg, MB.

South Interlake Planning District. 2011. South Interlake Planning District Development Plan [online]. Available from http://www.sipd.ca/docs/SIPDDP.pdf [accessed June 2015].

Stantec Consulting Ltd. 2014. Heritage Resources Investigations in Saskatchewan: Statement of Standard Methods, 2014. Ms on file Stantec Consulting Ltd, Saskatoon, SK and Winnipeg, MB.