



BIPOLE III TRANSMISSION PROJECT

Socio-economic Monitoring Program for Construction

October 2017 to September 2018

Manitoba Hydro
Bipole III Transmission Project

**Socio-economic monitoring program for
construction**

Prepared by
Manitoba Hydro

For the period October 2017 to September 2018

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Abbreviations

ATK	Aboriginal Traditional Knowledge
CHRPP	Cultural and Heritage Resources Protection Plan
DCS	Dorsey Converter Station
EIA	Economic Impact Assessment
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Fields
ESS	Environmentally Sensitive Sites
FLCN	Fox Lake Cree Nation
HRIA	Heritage Resources Impact Assessment
HVDC	High Voltage Direct Current
KCS	Keewatinohk Converter Station
km	Kilometer
kV	Kilovolt
m	Meter
MHTIS	Manitoba Highway Traffic Information System
MI	Manitoba Infrastructure
MPI	Manitoba Public Insurance
MVKT	million vehicle-kilometres of travel
OCN	Opaskwayak Cree Nation
PR	Provincial Road
PSA	Project Study Area
RCS	Riel Converter Station
ROW	Right-of-way
RTL	Registered Traplines
SE	Socio-Economic
SEMP	Socio-Economic Monitoring Program
TCN	Tataskweyak Cree Nation
VPD	Vehicles per day
VEC	Valued Environmental Component
WIS	Worker Interaction Subcommittee

1.0 Introduction

This document describes the construction socio-economic monitoring program (SEMP) results for the Bipole III Transmission Project (the Project) for the period October 2017 to September 2018. Monitoring Project socio-economic (SE) effects was a commitment identified in the Bipole III Environmental Impact Statement (EIS). Monitoring SE effects is also a condition of the Bipole III *Environment Act* Licence No. 3055. The monitoring program focuses on key components of the SE environment that may be affected, including both direct and indirect effects during the construction phase of the Project. Monitoring program results were used to document mitigation measure effectiveness and identify adaptive management measures, if warranted, for future monitoring. The results of the final year of the monitoring program have added further information to evaluate long-term changes or trends.

1.1 Project overview

The purpose of the Project is to provide enhanced reliability to Manitoba Hydro's electrical system, and to reduce the severity of the consequences of major outages. Approximately 70% of Manitoba's hydroelectric generating capacity is delivered to southern Manitoba, where most of the demand for energy is, via the Bipole I and Bipole II high voltage direct current (HVDC) transmission lines. Bipoles I and II share the same transmission corridor through the Interlake region over much of their length from northern Manitoba to a common terminus at the Dorsey Converter Station (DCS), northwest of Winnipeg. The existing transmission system was vulnerable to the risk of catastrophic outage of either (or both) Bipoles I and II in the Interlake corridor and/or at the DCS due to unpredictable events, particularly severe weather. This vulnerability, combined with the significant consequences of prolonged, major outages, justified a major initiative to reduce dependence on the DCS and the existing HVDC Interlake transmission corridor.

The Project included:

- A new converter station, the Keewatinohk Converter Station (KCS);
- A northern ground electrode site connected by a low voltage feeder line to the KCS;

- New 230 kV transmission lines linking the KCS to the northern AC collector system at the existing 230 kV switchyards at the Henday Converter Station and Long Spruce Generating Station;
- Modifications to the 230 kV switchyards at the Henday Converter Station and the Long Spruce Generating Station to accommodate the new collector lines;
- The development of a new +/-500 kV HVDC transmission line, approximately 1,400 km in length, centered on a 66 meter right-of-way (ROW), originating at the KCS, following a westerly route to southern Manitoba and terminating at a new converter station, the Riel Converter Station (RCS), immediately east of Winnipeg;
- The completion of the RCS - development of the RCS site was completed pursuant to a separate licence from Bipole III; and
- A southern ground electrode site connected by a low voltage feeder line to the RCS.

2.0 Purpose and objectives

The purpose of the SEMP for the Project is to document conditions over time for Valued Environmental Components (VECs) and other environmental parameters. The objectives are to:

- Confirm impact predictions in the EIS;
- Identify unanticipated effects;
- Confirm adherence to EIS commitments regarding follow-up monitoring;
- Monitor the effectiveness of mitigation measures;
- Identify other mitigation or remedial actions that may be implemented;
- Confirm compliance with regulatory requirements including project approvals and environmental regulations; and
- Provide baseline data and development information and experience for other Manitoba Hydro projects.

The SEMP focuses on important effects to key components of the SE environment. The program builds on the assessment studies conducted for the EIS using established methods for data collection and analysis. Where quantitative information is not available, qualitative information is provided in the monitoring report.

A separate monitoring program has been undertaken in relation to physical, terrestrial and aquatic components.

3.0 Socio-economic monitoring management

The SEMP is part of the overall environmental protection program for Bipole III that provides a framework for the delivery, management and monitoring of environmental protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and best practices, and inputs from interested parties, Indigenous communities and the public. The environmental protection program describes how Manitoba Hydro is organized and functions to deliver timely, effective, and comprehensive solutions and mitigation measures to address potential environmental effects. Roles and responsibilities for Manitoba Hydro employees and contractors are defined, along with management, communication and reporting structures for implementation of the Program. The Environmental Protection Program includes the what, where and how aspects of protecting the environment during the pre-construction, construction, operation and decommissioning of the project.

4.0 Socio-economic monitoring geographic area

Monitoring activities occurred throughout the Project Study Area (PSA) in relation to the final preferred route (see Appendix A). The PSA defines the area used to provide spatial context and comparison to the Project components (with allowance for some SE topics that require a larger regional context such as northern Manitoba and communities just outside the study area such as Gillam). The majority of the SE monitoring activities occurred in the PSA.

5.0 Socio-economic topics

Monitoring activities linked to environmental components of the SE environment that were identified in the EIS include:

- Economy (employment/workforce, business, labour income and tax revenue)¹;
- Community services (community concerns, service/infrastructure-related matters, worker interaction)²;
- Resource use (trapper education); and
- Personal and community well-being (public safety, worker interaction², transportation); and
- Culture and Heritage Resources

Monitoring activities focused on those effects that are potentially significant, effects where there is high uncertainty regarding the effects prediction, or effects that discipline specialists identified as requiring further monitoring.

Monitoring activities occurred throughout the PSA and are presented by the three primary project components, KCS, transmission line construction, and RCS.

5.1 Economy

Economic monitoring includes monitoring of employment and business activities associated with the Project. The objectives of economic monitoring for the Project are as follows:

- To track employment outcomes;
- To track construction business outcomes; and
- To track the effect on Project income levels, including labour income resulting from direct employment, as well as estimated taxes paid to the government.

¹ The monitoring results for Economy includes activities described in the Keewatinohk Construction Camp Lagoon and Start-up Camp - Environment Proposal for which Environment Act Licence No. 3015 was issued. These activities occurred prior to the issuance of Environment Act Licence No. 3055 but the activities were part of the overall Bipole III Transmission Project and included in the EIS (Construction Schedule and Workforce Table for Keewatinohk Converter Station within the project description (figures 3.5-15 & 3.5-16 of the EIS).

² Manitoba Hydro established a Worker Interaction Subcommittee (WIS) as part of a corporate wide initiative intended to address anticipated increases in the Gillam area workforce resulting from the Bipole III Project and other Manitoba Hydro projects being constructed in an overlapping timeframe.

For the subject report, economic monitoring data is presented in one of two forms, as either cumulative total that builds upon the previous report year period (e.g., from the start of construction to September 30, 2018) or as data collected for an annual reporting period (i.e., October 1, 2017 to September 30, 2018). A comparison will be conducted and presented in the overall SE monitoring program for construction 2014 to 2018 report to compare results to the conclusions presented in the EIS.

5.1.1 Employment outcomes

The EIS estimated the workforce for all project components on a yearly basis. Estimates vary by project component and year depending on the activity. The majority of employment opportunities occur during the construction phase of the Project with fewer opportunities during the operations phase of the Project. Due to seasonality constraints for some aspects of the work, certain project components have activities concentrated at specific times of the year (e.g., clearing and construction of the transmission line in the winter months for certain areas), while other project construction components occur throughout the entire year (e.g., RCS and KCS).

During construction, employment data was collected on-site by contractors through an employee self-declaration form designed specifically for the Project ("Employee Report-Bipole III Transmission Project", "Employee Report-Bipole III Keewatinohk Converter Station Project", and "Employee Report-Bipole III Riel Converter Station Project"). All completed forms were provided by on-site contractors to Manitoba Hydro and stored in a central database for the Project. Contractors also provided information to Manitoba Hydro on hours worked and labour income to enable calculations for person years and income estimates during construction.

Employment data was provided in the categories outlined below:

- Person years – For work that involves part-time and/or seasonal workers, it is useful to standardize the hires in terms of person years of employment. Person years of employment are defined as the amount of work that one worker could complete during twelve months of full-time employment (presented on a cumulative basis from the start of the Project). For economic planning purposes and to compare to the Economic Impact Assessment (EIA), the

number of hours worked per year is approximately 2,000 hours per year (assuming 40-44 regular hours weekly) in most trade categories. For construction comparison purposes, the number of hours worked per year is approximately 3,000 hours per year (assuming 60 regular hours weekly). As this report can be used for various types of comparisons, the data has been presented in terms of 2,000 and 3,000 hours per year.

- Hires - Refers to the number of people hired on the Project site for any duration (presented on a cumulative basis from the start of the Project).
- Employees - Refers to the number of individuals hired (presented on a cumulative basis from the start of the Project). The variance between hires and employees can be attributed to an individual being hired to the Project more than once.
- Duration - Refers to the average duration of work on the Project (presented on a cumulative basis from the start of the Project).
- Type - Refers to the job classifications of work available from the Project (presented on a cumulative basis from the start of the Project).

5.1.1.1 Person years

Over the duration of the Project construction, direct Project employment for on-site Manitoba Hydro and contractor employees was estimated at 5,194 person-years in the EIS³. During construction, the actual hours of direct employment data was collected by contractors and Manitoba Hydro. Table 4-1 (Person years of employment - Project Commencement to September 2018 Northern Manitoba Indigenous and non-Indigenous), Table 4-2 (Person years of employment - Project Commencement to September 2018 Indigenous and non-Indigenous) and Table 4-3 (Person years of employment - Project Commencement to September 2018 Manitoba and non-Manitoba) provide further breakdown of employment by Project component up to September 2018. From the outset of the Project to the reporting period ending in September 2018, Bipole III construction generated 4,857 person-years of direct Project employment in terms of a 2,000 hour per year basis (3,238 person-years in terms of a 3,000 hour per year basis [see Table 4-2]). This number (4,857) represents

³ *Bipole III Transmission Project, Economic Impact Assessment Technical Report Manitoba Bureau of Statistics - November 2011: Table 1, Economic Impact on Manitoba - Construction Phase [Transmission Line 3,181; Converter Facilities 2,013]*

approximately ninety-four percent of the estimated total person years of employment for the entire construction phase of the Project (5,194). Of the 4,857 person-years of direct employment generated, seventy-nine percent was derived from within the province of Manitoba (see Table 4-3).

Table 4-1 Person years of employment - Project Commencement to September 2018: Northern Manitoba Indigenous and northern Manitoba non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Person years 2,000 ¹ (3,000 ²)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours
Northern Manitoba Indigenous ³	423 (282)	9%	229 (153)	5%	7 (4)	<1%	658 (439)	14%
Northern Manitoba non-Indigenous ⁴	61 (41)	1%	16 (11)	0.3%	1 (1)	<1%	79 (53)	2%
Cumulative Total	484 (323)	10%	245 (164)	5.3%	8 (5)	<1%	737 (492)	16%

Notes:
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EA Report.
³ - Northern Manitoba Indigenous is a subset of Indigenous.
⁴ - Northern Manitoba non-Indigenous is a subset of non-Indigenous.

Table 4-2 Person years of employment - Project Commencement to September 2018: Indigenous and non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project total	
	Person years 2,000 ¹ (3,000 ²)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project total hours
Indigenous	701 (467)	14%	667 (445)	14%	145 (97)	3%	1513 (1009)	31%
Non-Indigenous	1440 (960)	30%	975 (650)	20%	928 (619)	19%	3344 (2229)	69%
Cumulative Total	2141 (1427)	44%	1642 (1095)	34%	1073 (715)	22%	4857 (3238)	100%

Notes:
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EA Report.

Table 4-3 Person years of employment - Project Commencement to September 2018: Manitoba and non-Manitoba

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Person years 2,000 ¹ (3,000 ²)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours	Person years 2,000 (3,000)	% of total Bipole III Project Total hours
Manitoba	1638 (1092)	34%	1263 (842)	26%	935 (624)	19%	3836 (2558)	79%
Non-Manitoba	503 (335)	10%	380 (253)	8%	138 (92)	3%	1020 (6680)	21%
Cumulative Total	2141 (1427)	44%	1643 (1095)	34%	1073 (715)	22%	4857 (3238)	100%

Notes:
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EA Report.

5.1.1.2 Hires

Hires was not a parameter used in the EIS, but it is tracked by Manitoba Hydro for its projects. Hires refer to the number of people hired on the Project site for any duration. Since the beginning of the Project to September 30, 2018, there were 15,387 hires on the Project. Thirty-eight percent of the total hires were for construction of the KCS, twenty-three percent of the hires were for the RCS, and thirty-eight percent of the hires were for transmission line construction. Table 4-4, Table 4-5 and Table 4-6 provide a further breakdown of total hires by Project component up to September 2018.

Table 4-4 Total hires - Project Commencement to September 2018: Northern Manitoba Indigenous and northern Manitoba non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires
Northern Manitoba Indigenous	1248	8%	1163	8%	23	<1%	2434	16%
Northern Manitoba non-Indigenous	116	1%	89	<1%	4	<1%	209	1%
Cumulative Total	1364	9%	1252	8%	27	<1%	2643	17%

Table 4-5 Total hires - Project Commencement to September 2018: Indigenous and non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires
Indigenous	2185	14%	2720	18%	560	4%	5465	36%
Non-Indigenous	3698	24%	3172	21%	3052	20%	9922	64%
Cumulative Total	5883	38%	5892	38%	3612	23%	15387	100%

Table 4-6 Total hires - Project Commencement to September 2018: Manitoba and non-Manitoba

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires	Hires	% of Total Bipole III Project Hires
Manitoba	4832	31%	4027	26%	3136	20%	11995	78%
Non-Manitoba	1051	7%	1865	12%	476	3%	3392	22%
Cumulative Total	5883	38%	5892	38%	3612	23%	15387	100%

5.1.1.3 Employees

The cumulative total number of employees is less than the cumulative total number of hires because the same individual may have been hired more than once. For example, an individual may have moved to work on a different contract or moved to a different job classification to improve their position. Since the beginning of the Project to September 30, 2018, a total of 9,337 employees were hired on the Project. A total of seventy-four percent of the total employees to-date reside in Manitoba. Table 4-7, Table 4-8 and Table 4-9 provide a further breakdown of total employees by Project component up to September 2018.

Table 4-7 Total employees - Project Commencement to September 2018: Northern Manitoba Indigenous and northern Manitoba non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees
Northern Manitoba Indigenous	575	6%	719	8%	18	<1%	1219	13%
Northern Manitoba non-Indigenous	77	1%	63	1%	4	<1%	139	2%
Cumulative Total	652	7%	782	8%	22	<1%	1358	15%

Table 4-8 Total employees 2017-2018: Indigenous and non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees
Indigenous	1030	11%	1647	18%	442	5%	2921	31%
Non-Indigenous	2193	24%	2197	24%	2457	26%	6416	69%
Cumulative Total	3223	35%	3844	41%	2899	31%	9337	100%

Note: Figures above are not additive. Some employees may work across multiple Project components.

Table 4-9 Total employees - Project Commencement to September 2018: Manitoba & non-Manitoba

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees	Employees	% of Total Bipole III Project employees
Manitoba	2454	26%	2457	26%	2531	27%	6878	74%
Non-Manitoba	769	8%	1387	15%	368	4%	2459	26%
Cumulative Total	3223	35%	3844	41%	2899	31%	9337	100%

Note: Figures above are not additive. Some employees may work across multiple Project components.

The number of employees from the beginning of the Project to date does not reflect the number of employees on-site at a given time. The number of employees on-site at any given time varies depending on the work in progress and the time of year. The actual number of employees on-site over the course of the year ultimately depends upon the work plans and schedules of the contractors for the various Project components. Between Project commencement and September 2018, the Project had employed 634 persons who have worked on multiple Project components.

5.1.1.4 Duration

From the onset of the Project to the reporting period ending in September 2018, the average employment duration was 6.9 months. Data for the calculation includes both

separated and active hires (hires that were still working on September 30, 2018). As of September 30, 2018, 119 hires were active. See Table 4-10 for a breakdown of employment duration.

Table 4-10 Breakdown of employment duration - Project Commencement to September 2018

Measure	Average Employment Duration (Months)			
	Keewatinohk Converter Station	Transmission line construction	Riel Converter Station	Bipole III Transmission Project Total
Indigenous	8.5	4.1	7.6	6.5
Non-Indigenous	7.6	4.1	8.2	7.1
Northern Manitoba Indigenous	8.9	3.6	6.5	6.4
Northern Manitoba non-Indigenous	8.0	3.4	6.3	6.2
Manitoba	7.8	4.3	8.4	7.4
Non-Manitoba	8.4	3.7	6.1	5.6
Cumulative Total	7.9	4.1	8.1	6.9

Note: Figures above are not additive.

5.1.1.5 Type

Total hires by type (job classification) of work available are provided in Table 4-11 below. In total there were 30 job categories in which 15,387 workers were hired over the span of Project onset to September 2018. The top three combined categories as a percentage of total hires were labourers (17%), equipment operators (15%) and "other" (16%).

Table 4-11 Total hires by job classification - Project Commencement to September 2018

Classification	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires
Labourers	829	5%	1300	8%	520	3%	2649	17%
Equipment Operators (includes HD Mechanics)	760	5%	1346	9%	244	2%	2350	15%
Linemen and Associated Collector Line Trades	41	<1%	1785	12%	102	<1%	1928	13%
Electrical Workers	558	4%	34	<1%	666	4%	1258	8%
Office and Professional Employees	634	4%	109	<1%	94	<1%	837	5%
Teamsters, Chauffeurs, Warehousemen and Helpers	274	2%	246	2%	177	1%	697	5%
Carpenters	327	2%	32	<1%	298	2%	657	4%
Catering and Janitorial Staff	334	2%	210	1%	23	<1%	567	4%
Iron Workers	217	1%	<5	<1%	133	<1%	351	2%
Plumbers and Pipefitters	124	<1%	<5	<1%	146	<1%	273	2%
Crane Operators	36	<1%	170	1%	60	<1%	266	2%
Rodmen	123	<1%	<5	<1%	40	<1%	167	1%
Insulator Workers	88	<1%	0	0%	58	<1%	146	<1%
Sheet Metal Workers	53	<1%	0	0%	72	<1%	125	<1%
Lathing and Drywall Workers	28	<1%	0	0%	54	<1%	82	<1%
Roofers	48	<1%	0	0%	34	<1%	82	<1%
Painters	32	0%	0	0%	35	<1%	67	<1%
Security Guards	64	<1%	<5	<1%	0	0%	65	<1%
Millwrights	0	0%	0	0%	61	<1%	61	<1%
Sprinkler System Installers	21	<1%	0	0%	32	<1%	53	<1%
Cement Masons	35	<1%	0	0%	15	<1%	50	<1%
Bricklayers and Allied Craftsmen	15	<1%	0	0%	20	<1%	35	<1%

Classification	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires	Hires	% of Total Bipole III Project hires
Sheeters, Deckers and Cladders	23	<1%	0	0%	10	<1%	33	<1%
Floor Covering Installers	17	<1%	0	0%	13	<1%	30	<1%
Glass Workers	6	<1%	0	0%	6	<1%	12	<1%
Boilermakers	10	<1%	0	0%	0	0%	10	<1%
Refrigeration Workers	<5	<1%	0	0%	5	<1%	7	<1%
Elevator Constructors	<5	<1%	0	0%	<5	<1%	<5	<1%
Plasterers	0	0%	0	0%	<5	<1%	<5	<1%
Other ⁴	1183	8%	651	4%	690	4%	2524	16%
Cumulative Total Hires	5883	38%	5892	38%	3612	23%	15387	100%

5.1.2 Business outcomes

Construction of the Project has resulted in business opportunities locally, regionally and throughout the province and Canada. Manitoba Hydro has policies in place to promote Indigenous business participation on its projects. For example, Manitoba Hydro's Northern Purchasing Policy's objective is to guide procurement actions with the aim of promoting business, contract and employment opportunities for northern Indigenous people through a variety of measures, including scoping, restricted tenders, direct negotiated contracts, and other Indigenous content provisions.

Monitoring both direct and indirect business effects provides data on the success and effectiveness of efforts to enhance local business participation, as well as an indication of the general economic impact of the Project in communities in the vicinity of Bipole III. Business outcomes for the subject report are measured in terms of data

⁴ The "Other" category refers to hires in job classifications not covered by the BNA, i.e. "out of scope" positions. This would include managerial and supervisory staff (both Contractor and Manitoba Hydro), other Manitoba Hydro on-site staff and certain technical staff (engineers and technicians).

on the direct expenditures of the Project for goods and services with a focus on Indigenous and northern spending and are reported on a cumulative basis. Indirect business effects will be summarized and reported on in the overall final report on SE monitoring program for construction 2014-2018.

5.1.2.1 Direct project expenditures

There was \$3,465.4 million spent on goods and services for the Project, from its' inception to September 2018. The total construction phase expenditures reported in the EIS were estimated to be approximately \$2,115.2⁵million. The subject reporting period represents approximately 164% of the EIS-estimated total expenditures made during the construction phase of the Project. Table 4-12, Table 4-13 and Table 4-14 summarize the breakdown of total Project purchases to September 2018.

Table 4-12 Direct purchases to September 2018: Northern Manitoba Indigenous and northern Manitoba non-Indigenous

Measure	Keewatinohk Converter Station		Riel Converter Station		Transmission line construction		Bipole III Project Total	
	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project
Northern Manitoba Indigenous	\$ 106.2	3%	\$ -	0%	\$175.8	5%	\$ 282	8%
Northern Manitoba non-Indigenous	\$ 14.6	<1%	\$ -	<1%	\$ 6.1	<1%	\$ 20.7	<1%
Cumulative Total	\$ 120.8	3%	\$ -	<1%	\$181.9	5%	\$ 302.7	8%

⁵ Bipole III Transmission Project, Economic Impact Assessment Technical Report Manitoba Bureau of Statistics - November 2011.

Table 4-13 Direct purchases to September 2018: Indigenous and non-Indigenous

Measure	Keewatinohk Converter Station		Riel Converter Station		Transmission line construction		Bipole III Project Total	
	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project
Indigenous	\$ 131.4	4%	\$ 0.0	<1%	\$237.3	7%	\$ 368.7	11%
Non-Indigenous	\$ 1,104.8	32%	\$788.3	23%	\$1,204.6	35%	\$3,096.7	89%
Cumulative Total	\$1,235.2	36%	\$788.3	23%	\$1,441.9	41%	\$3,465.4	100%

Table 4-14 Direct purchases to September 2018: Manitoba and non-Manitoba

Measure	Keewatinohk Converter Station		Riel Converter Station		Transmission line construction		Bipole III Project Total	
	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project	\$ (Millions)	% of Total Bipole III Project
Manitoba	\$ 785.8	23%	\$436.7	13%	\$413.8	12%	\$1,636.3	47%
Non-Manitoba	\$ 449.4	13%	\$351.5	10%	\$1,028.1	30%	\$1,829.1	53%
Cumulative Total	\$1,235.2	36%	\$788.3	23%	\$1,441.9	42%	\$3465.4	100%

5.1.3 Labour income and tax revenue

Labour income is an important indicator of the direct economic impact of a project. Income levels affect the general standard of living of individuals and families by influencing the acquisition of basic human needs including housing, food and clothing. Consequently, monitoring income levels can provide a general indication of a project's contribution to overall standard of living. The estimate of labour income reflects the direct income of wages and salaries associated with direct person-years of employment.

Regarding taxation, direct taxes paid reflect incremental revenue sources generated for governments as a result of a project. The incremental revenues, in turn, contribute

to societal programs and general well-being. The following parameters were monitored during the construction phase:

- Labour income - Direct income earned by workers from employment on the Project.
- Taxes paid
 - Provincial sales tax
 - Payroll tax
 - Corporate capital tax
 - Fuel tax

The EIS estimated the entire project construction expenditure would contribute \$482.3 million in labour income and \$352.4 million in tax revenue to Manitoba, and \$721.3 million in labour income and \$489.1 million in tax revenue to all of Canada.

5.1.3.1 Labour Income

The estimate of labour income reflects the direct income earned by workers from employment on the Project. It is the sum of wages and salaries associated with direct person years of employment⁶. Total project labour income earned was approximately \$576.5 million up to September 2018. Table 4-15, Table 4-16 and Table 4-17 list the breakdown of cumulative labour income earned on the Project.

⁶ Labour income is calculated based on the information provided by contractors and collected by Manitoba Hydro.

Table 4-15 Labour income to September 2018: Northern Manitoba Indigenous and northern Manitoba non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project total	
	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project
Northern Manitoba Indigenous	\$ 28.7	5%	\$ 15.3	3%	\$ 0.8	>1%	\$ 44.7	8%
Northern Manitoba non-Indigenous	\$ 4.9	0.8%	\$ 1.5	0.3%	\$ 0.2	>1%	\$ 6.6	1.1%
Cumulative Total	\$ 33.5	5.8%	\$ 16.8	3.3%	\$ 1.0	>1%	\$ 51.3	9.1%

Table 4-16 Labour income to September 2018: Indigenous and non-Indigenous

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project total	
	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project
Indigenous	\$ 56.3	10%	\$ 51.5	9%	\$ 14.7	3%	\$ 122.5	21%
Non-Indigenous	\$ 267.2	47%	\$ 87.0	15%	\$ 99.8	17%	\$ 454.0	79%
Cumulative Total	\$ 323.5	57%	\$ 138.5	24%	\$ 114.5	20%	\$ 576.5	100%

Table 4-17 Labour income to September 2018: Manitoba and non-Manitoba

Measure	Keewatinohk Converter Station		Transmission line construction		Riel Converter Station		Bipole III Transmission Project Total	
	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project	Labour income (millions)	% of Total Bipole III Project
Manitoba	\$ 158.4	27%	\$ 101.6	18%	\$ 95.1	16%	\$ 355.2	62%
Non-Manitoba	\$ 165.1	29%	\$ 36.9	6%	\$ 19.4	3%	\$ 221.3	38%
Cumulative Total	\$ 323.5	56%	\$ 138.5	24%	\$ 114.5	20%	\$ 576.5	100%

5.1.3.2 Taxes

The Project also contributed to government revenues. This includes revenues received by federal and provincial governments such as payroll tax, personal income tax, capital tax, fuel tax and provincial sales tax. Not all of these taxes are payable by

the Project; however, they are generated as a result of the work undertaken. The estimate provided here does not include taxes received by the local or municipal government or taxes associated with indirect or induced employment.

The estimated cumulative total project tax impact to September 2018 is \$296.0 million. The estimate includes \$8.1 million in payroll taxes⁷, \$72.6 million in personal income taxes⁸, \$20.1 million in capital tax, \$4.5 million in fuel tax⁹ and \$190.7 million in provincial sales tax¹⁰.

5.2 Community services

Community-based services (e.g., emergency, health and social services) have the potential to be impacted in communities in close proximity to various components of the Project. Such effects are more likely to occur in proximity to the KCS than the Bipole III Transmission Line, given the differences in workforce magnitude and the use of mobile construction camps for the transmission line. Monitoring the extent of the Project's construction effects on community services in the Gillam area forms an important component of the Bipole III SEMP and provides opportunities to respond through adaptive management to adverse interactions.

Information related to Project impacts was sought, in part, through the Worker Interaction Subcommittee (WIS) that was established by Manitoba Hydro in 2013. The WIS is part of a corporate-wide initiative intended to address anticipated increases in the Gillam area workforce resulting from the KCS, the Keeyask Generation Project and other Manitoba Hydro projects being constructed in the area in an overlapping timeframe, as well as from other Manitoba Hydro-related work in the area.

In the SE monitoring plan, the measurable parameters included identifying the demands on the Gillam Hospital and demands on policing services. Given privacy

⁷ Health and Post-secondary Education Tax is calculated as 2.15 percent of the estimated labour income of \$121.7 million.

⁸ Personal income taxes are paid by individual employees to the federal and provincial governments. Each individual's personal tax situation (and therefore taxes payable) will vary. However, this estimate is based on a range of reasonable assumptions.

⁹ The fuel tax estimate is based on provincial taxes of 14 cents/litre for both diesel and gasoline and federal taxes of 4 cents/litre for diesel fuel and 10 cents/litre for gasoline.

¹⁰ PST is based on estimates of taxes paid directly by the project and PST on materials provided by suppliers under real property contracts.

requirements in data collection, as well as the variety of developments currently taking place in the area, it was not always possible to link demands for services (e.g., health and policing services) over the period to specific projects. In addition, due to the sensitive nature of the topics addressed, data gathered by the WIS will remain confidential. Manitoba Hydro will continue to use the information provided by community and service providers' representatives on the WIS to assist in identifying areas where Manitoba Hydro may implement future adaptive measures to reduce Project impacts. A summary of the totality of WIS activities will be reported on in the final overall SE monitoring program for construction 2014-2018 report.

WIS members during 2017-18 included representatives from Manitoba Hydro, Fox Lake Cree Nation (FLCN), the Town of Gillam, the RCMP (Gillam Detachment), the Gillam Hospital, and the Gillam School. Other members may be identified by the WIS on an as needed basis.

From October 1, 2017 to September 30, 2018, the WIS met three times. Through an ongoing reporting and tracking process, as well as WIS meetings and ongoing communications between members, the WIS discussed service and infrastructure-related matters in areas such as local road conditions (e.g., Provincial Road (PR) 280, PR 290) and Gillam facility use (e.g., the Gillam Hospital, the Gillam airport). In addition, the WIS continued to monitor updates provided by the Gillam Hospital related to demands for health services (e.g., "out of town" visits to the Gillam Hospital), and by the Gillam RCMP related to demands on policing (e.g., RCMP calls).

Based on discussions by the WIS, Manitoba Hydro provided a hospital services information sheet developed by the Gillam Hospital (regarding hospital facilities, doctor availability, and related hours) to all workers; instructed Keeyask and Keewatinohk buses/shuttles to park in a designated area away from the airport doors; implemented various transportation infrastructure-related measures (e.g., tracking and reporting traffic volume and speed data from newly installed traffic monitoring stations on PR 280 and PR 290); provided funding to Manitoba Infrastructure (MI) for implementation of an augmented PR 280/PR 290 maintenance program; and, provided funding for a provincial weigh scale near Thompson to provide increased enforcement of weight restrictions.

Additional information on the WIS is provided under Section 5.5 Public safety - worker interaction.

5.3 Resource use

5.3.1 Trapper education

The furbearer and trapline monitoring program¹¹ focuses on commercial trappers who are trapping on active registered traplines (RTL) set aside by Manitoba Sustainable Development as community/youth RTLs. The main purpose of the program is to help Manitoba Hydro and local communities better understand the impacts of transmission facilities on furbearer behaviour and trapper success. The SE nature of the furbearer and trapline monitoring program includes a trapper education component to train youth on trapping so that they can qualify for certification and allow them to successfully trap on the community traplines to sell their fur. The SE effects monitored for trapping relate to traditional and general economic gains.

Initially six potential community RTLs were identified for the monitoring program: FLCN, Tataskweyak Cree Nation (TCN), Thicket Portage, Wabowden, Cormorant and Opaskwayak Cree Nation (OCN)). As of September 30, 2018, Wabowden, OCN, Thicket Portage, FLCN, and TCN have participated in the trapping program. Monitoring of furbearers began in 2015 under the biophysical monitoring plan with an assessment of pre-construction harvest data on fur harvest levels along the transmission line. Trapper success will be evaluated in the biophysical monitoring program and reported in the overall post-construction biophysical monitoring and mitigation report.

The educational component of the furbearer and trapline monitoring program began in October 2014 consisting of trapper training workshops with the participating community/youth RTLs. Manitoba Hydro continued to support the program, involving both Elders and youth with deliverables including documentation of program meetings and other communications, trapper/community involvement summaries, project mapping, trapper diaries, program results and reports.

¹¹ This program is based on the Wuskwatim Transmission Line Furbearer Pilot Project

Trapper education workshops were conducted in the communities of The Pas, Camperville, and Alonsa. In previous years, two trapper education courses were conducted, one at FLCN and one at TCN. The courses involved approximately ten youth from each participating community in a course conducted by the Manitoba Trappers Association. The participants learned about the different trap types, trapping regulations and fur preparation. In the evening, there was an opportunity for Elders from each community to educate the participants about traditional harvesting techniques. Each participant wrote the provincial exam and received a certificate after passing, allowing them to purchase a trapping licence.

During the 2017/2018 reporting period, Wabowden, OCN, and Thicket Portage participated in the trapping program. The community of Wabowden had approximately 12 participants, Thicket Portage had four participants and OCN had approximately 24 participants respectively participating in the trapper education program. All community programs reported furbearers being harvested by participants and a very positive experience by all involved. The communities of FLCN and Cormorant were contacted for interest in the program. FLCN responded with interest in the program and held a trapper education workshop with ten successful participants. The various community participants learned about the different trap types, trapping regulations and fur preparation. In the evening, there was an opportunity for Elders from each community to educate the participants about traditional harvesting techniques. Each participant wrote the provincial exam and received a certificate allowing them to purchase a trapping licence¹².

5.4 Personal and community well-being

Personal, family and community life can be affected by a variety of Project-related effects (e.g., physical changes to the land; concerns regarding electric and magnetic fields, noise and nuisance effects during construction). The experience of such effects will vary for individuals, families, and communities as a whole.

A potential Project-related issue identified in the EIS was related to public safety and the interaction of workers with community members. During community open houses, Manitoba Hydro heard concerns regarding electric and magnetic fields

¹² Trevor Barker, Environmental Specialist, Manitoba Hydro, pers. comm. April 2019.

(EMF). Manitoba Hydro is in the process of undertaking measurements at a Bipole III testing site near Dugald, Manitoba to understand EMF. The measurements will allow for a comparison of EMF levels to those modeled for the EIS. Measurable parameters to be reported on include EMF, space charge, ion counts, and weather data. Identified potential changes from baseline conditions will be summarized in a separate final report. The monitoring at the Dugald site is expected to get underway in 2019 and is expected to be conducted for over a 1.5-year time period (with the possibility of extension).

5.5 Public safety - worker interaction

The WIS was established as part of a corporate-wide initiative to address anticipated increases in the Gillam area workforce. The WIS is intended as a forum for information sharing and communication for early identification of potential worker interaction concerns, prevention of issues to the extent possible, and identification of ways to work cooperatively to address issues as they arise including any related increases in the demand for services and accommodation in Gillam. WIS members are Manitoba Hydro, FLCN, the Town of Gillam, the RCMP (Gillam Detachment), the Gillam Hospital, and the Gillam School. Other interested parties may be identified by the WIS on an as needed basis.

The WIS met three times in 2017-18 to continue monitoring and discuss areas of community interest regarding potential Project impacts on the residents. Regular subcommittee meetings and ongoing communications, along with a system to track specific community concerns and incidents, facilitated action to address members' concerns related to public safety, community services and infrastructure. Topics addressed in this forum include local road conditions and traffic safety; use of Gillam services and facilities; the behaviour of non-local persons; and the presence of drugs in the Gillam area.

In addition, the WIS continued to monitor updates provided by service providers such as the Gillam Hospital and the Gillam RCMP to understand changing demands for health services and on policing. Given privacy requirements in data collection as well as the various developments taking place in the area over the period, it was not always possible to link concerns or demands for services to specific projects. Nonetheless, during this time period, the pressures relating to hospital visits and

airport congestion were primarily associated with the Keeyask Project due to its relatively larger workforce than other active projects.

Examples of activities undertaken during 2017-2018 in relation to concerns and topics raised at the subcommittee include:

- “PR 280/PR 290 Task Force” transportation management plan, developed to reduce the impacts of project traffic on roads;
- Continued monitoring of non-local visits at the Gillam Hospital. This monitoring contributed to the hiring of a Nurse Practitioner to provide onsite health care services at the Keeyask site and reduce non-urgent visits by project workers to the Gillam Hospital;
- Relocation of Keeyask contractor charters from Gillam to Thompson, in part, to address congestion and flight schedules issues at the Gillam airport; and
- FLCN’s continued implementation of cultural awareness training for short-term contractors.

The information provided by subcommittee members will continue to be used to assist in identifying potential adaptive measures to reduce the impacts of hydroelectric development in the region.

5.6 Transportation

During construction, Project effects on road-based travel were anticipated to stem from increased vehicular traffic associated with the transport of people (construction personnel and service providers), equipment and materials on roads in the area, particularly PR 280 and PR 290. While the Bipole III EIS predicted that existing transportation networks and plans for PR 280 and PR 290 upgrades would be able to accommodate the changes in road use associated with Project construction, community concerns remained regarding traffic safety and road conditions as evidenced by feedback received from the WIS.

In the fall of 2014, the Province established the PR 280 Joint Advisory Committee. The committee was comprised of representatives from the Province of Manitoba, Manitoba Hydro, the Town of Gillam and the in-vicinity First Nations communities to

involve the latter directly in the planning of upgrades to PR 280 and PR 290. Within the subject reporting period the PR 280 Joint Advisory Committee met in April and May of 2017.

Traffic safety and road conditions have been a subject of substantial concern expressed by in-vicinity First Nations in a number of forums, including the PR 280 Joint Advisory Committee. In particular, ongoing concerns have been expressed regarding speeding, truck weights, convoys, road surface conditions (making travel difficult), vehicle damage and dust. As a result of discussions among in-vicinity First Nations, Manitoba Hydro and the Province, a number of mitigation measures have been adopted to reduce the impact of Project traffic on PR 280 and PR 290 including road reconstruction and increased maintenance efforts, operation of the Provincial Trunk Highway 6 weigh station near Thompson and communicating driver expectations to contractors in an effort to promote appropriate driving behaviour on PR 280 and PR 290.

Manitoba Hydro developed a comprehensive transportation management plan in the fall of 2016 to reduce the impacts of project traffic on PR 280 and PR 290. The plan included the following strategies:

- Pre-hauling construction materials to site during the winter months;
- Night hauling of some materials when the weather is cold at night and warm in the daytime;
- Reductions in Manitoba Hydro truck traffic and reductions in truck weights during periods when the road has deteriorated significantly; and
- Increased communications with staff, contractors, and other road users to provide an awareness of the initiatives Manitoba Hydro has undertaken to improve conditions and safety on PR 280 and PR 290.

MI is responsible for the existing provincial highway system, including the maintenance and upgrade of PR 280 and PR 290. The purpose of the transportation management plan was to help reduce wear and tear on the roads and allow MI to focus on areas requiring increased maintenance. Monitoring efforts have been undertaken in collaboration with MI, Manitoba Public Insurance (MPI), and the RCMP

to assess mitigative efforts in relation to EIS predictions and respond to community concerns as presented below.

5.6.1 Road traffic

A commitment of the EIS was to conduct traffic monitoring in the vicinity of the Project to analyze the effect of construction activities on the existing road network, in particular PR 280 and PR 290. During the summer and fall of 2015, MI installed five in-pavement loop counters on PR 280 and PR 290. Figure 4-1 below shows a typical traffic monitoring station. Figure 4-2 shows the locations of the monitoring stations.



Figure 4-1 Traffic monitoring station

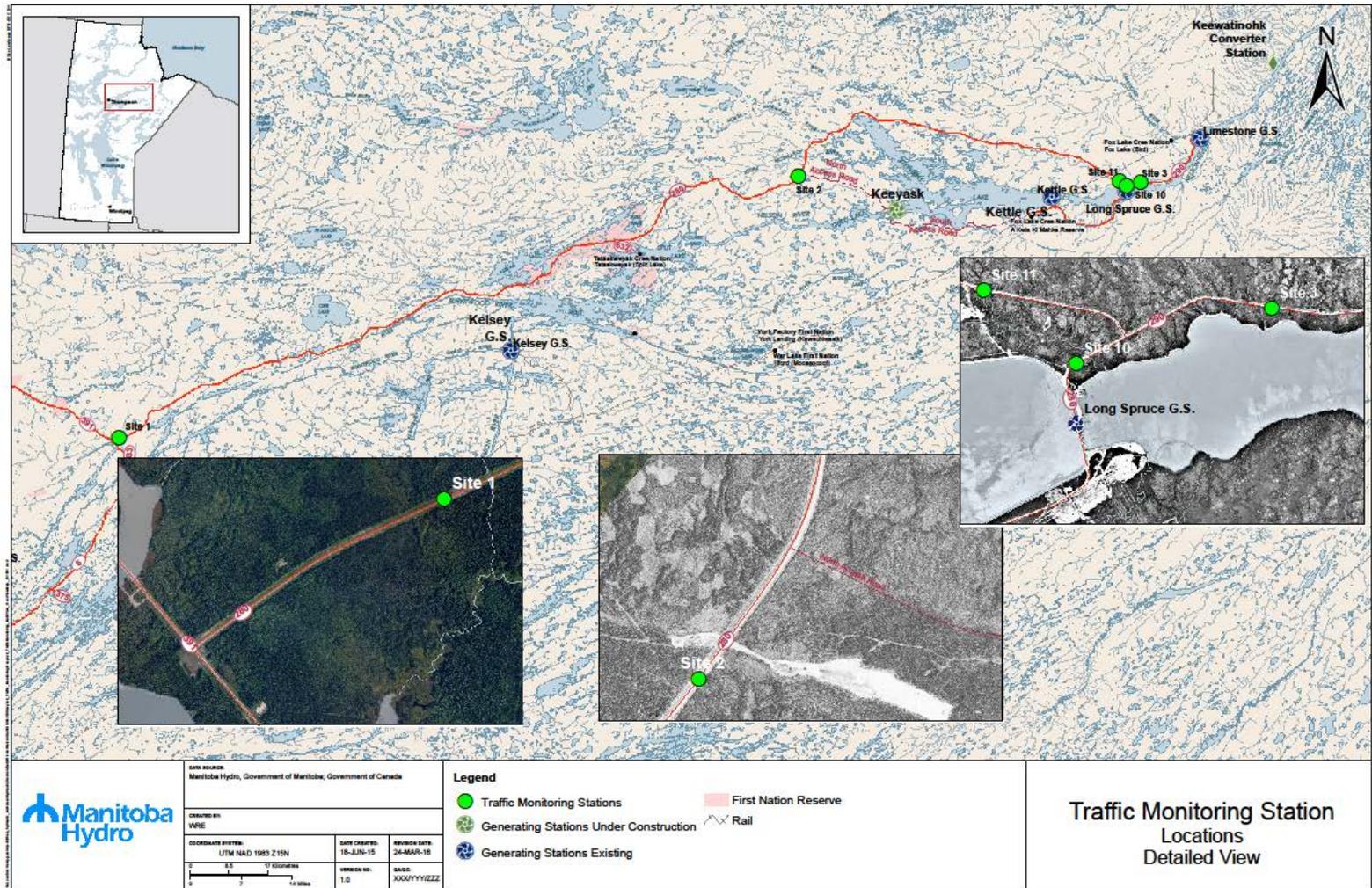


Figure 4-2 PR 280 traffic monitoring stations

Traffic volume information was obtained from the Manitoba Highway Traffic Information System (MHTIS) website for the years 2005, 2007, 2009, 2011, 2013 and 2015. This information is based on data collected by MI for PR 280 and PR 290 on a biennial basis and includes estimates of annual average daily traffic (AADT), which is the number of vehicles passing a point on an average day of the year.

Traffic data from the MHTIS for PR 280 and PR 290 is divided into five segments; PR 391 to Split Lake; Split Lake to the PR 280/PR 290 intersection, the PR 280/PR 290 intersection to Gillam, PR 290 east of the intersection and another section of PR 290 west of Sundance. A summary of the AADT for the segments relative to this report for past years is presented in Table 4-18 Summary of AADT for segments of PR 280 and PR 290 from 2003 to 2016 (combined for northbound and southbound traffic rounded to the nearest five). While there is some variation across years, use of PR 280 and PR 290 has steadily increased since 2003. A more substantial increase in use has been observed since the start of construction on the KCS, as anticipated. Traffic volumes have more than doubled over the past ten years.

Table 4-18 Summary of AADT for segments of PR 280 and PR 290 from 2003 to 2016

Highway	Segment	Projected cumulative traffic volumes	Annual Average Daily Traffic (AADT)						
			2003	2005	2007	2009	2011	2013	2016
PR 280	PR 391 to Split Lake	255	230	155	135	175	210	270	340
	Split Lake to PR 280/290	255	115	95	95	120	140	160	230
	PR 280/290 to Gillam	535	205	210	235	225	255	375	450
PR 290	East of PR 280	440	100	100	130	150	140	240	295
	West of Sundance	0	10	30	50	50	40	80	150

Based on data collected since October 2015, trends in traffic volumes appear to be cyclical with peaks occurring during the winter months from January to March. Traffic volumes tended to decrease later in the spring and then flatten out over the summer

months. However, it should be noted that there was very little difference in truck traffic counts throughout the year as shown in Figure 4-C.

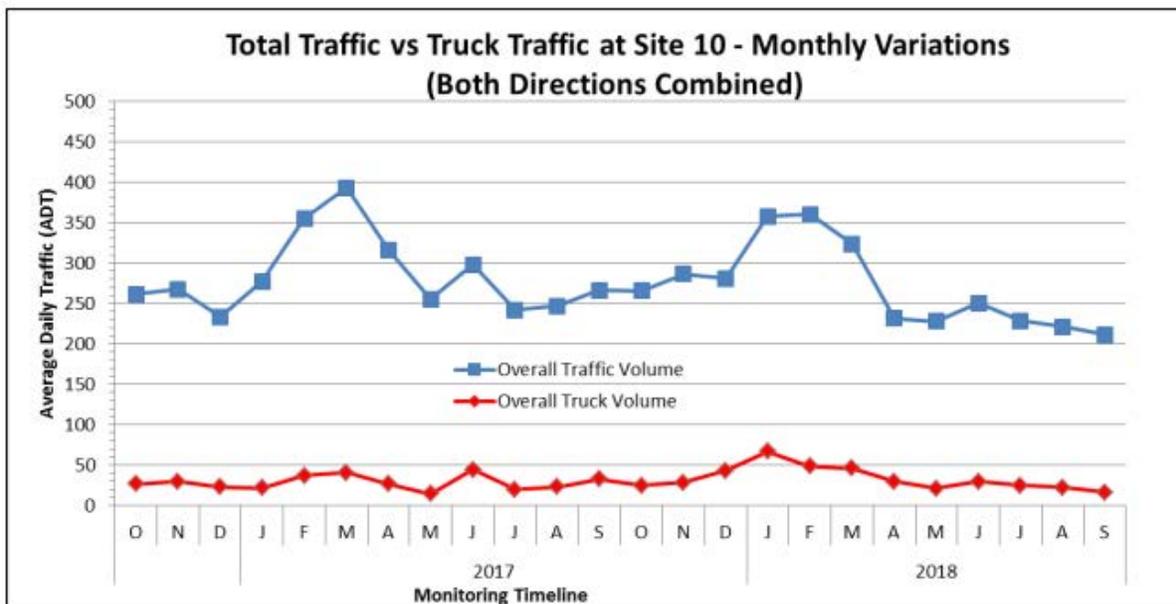


Figure 4-3 Total traffic vs truck traffic at site 10 - 2016-2018 monthly variations (both directions combined)

There is a slight increase in truck traffic during the winter months, but the main driver of the increase in traffic during winter is small vehicles (i.e., cars, pick-up trucks, vans). This increase may be attributed to a few factors, including an increase in the number of trips from communities while the winter road system is in operation, and traffic related to Bipole III Transmission Line construction, which occurs mainly during the winter months. As Project construction winds down in 2018, it is expected that the traffic counts over the winter months will decrease.

Comparison between predicted traffic volumes and actual counts

The Transportation Technical Report prepared for the Bipole III EIS provided projected traffic flows for key highway segments within the Keewatinohk Study Area. Table 4-18 shows the projected traffic volumes to allow comparison with actual counts for the road segments identified. MHTIS has not provided new information at this time.

The results of the comparison indicate that some roads are experiencing higher traffic flows than predicted and others are seeing lower traffic flow. In particular:

- PR 280 from PR 391 to Split Lake experienced a continuous increase in traffic from 2011 through 2016. The 2016 count averages were 85 vehicles per day (vpd) higher than predicted and 110 vpd higher than 2003 preconstruction values.
- PR 280 from Split Lake to the PR 280/PR 290 intersection has experienced continuous growth from 2011 through 2016. The 2016 count averages were 25 vpd lower than projected and 115 vpd higher than 2003 preconstruction values.
- PR 280 from PR 280/PR 290 to Gillam experienced a continuous increase in traffic from 2011 through 2016. The 2016 count averages were 105 vpd lower than predicted but still 240 vpd higher than preconstruction values in 2003.
- PR 290 from east of PR 280 experienced a continuous increase in traffic from 2011 through 2016. The 2016 count averages were 145 vpd lower than predicted and 195 vpd higher than 2003 preconstruction values.
- PR 290 west of Sundance was not included in the projected traffic flow list, but traffic flows increased from 2011 through 2016. The 2016 count averages were 140 vpd higher than 2003 preconstruction flows.

The traffic monitoring results seem to indicate that there is other activity happening between Thompson and the Split Lake that is not related to the construction activity. It also indicates that the predicted construction related traffic is trending lower than predicted in certain road segments.

The instances where there was lower than predicted traffic flow may be attributable to several factors including, but not limited to, the following:

- Lower than anticipated workforce;
- More carpooling by workers;

- Less material delivery trips;
- More trips being taken by air to Gillam or other work sites; and
- Predictions were based on factors that did not materialize.

Predicting trip generation for construction projects is not an exact science, as there are numerous factors that influence the need to drive to the construction site, some of which are identified above. Anticipating the impact of higher traffic volumes facilitates adoption of measures that can reduce the impact, resulting in a conscious effort to reduce unnecessary trips.

5.6.2 Collisions

An anticipated direct correlation exists between traffic levels and collision rates. In those instances where there was an increase in traffic, there would be a corresponding increase in reported collisions (property damage¹³, injury or fatality). There was a total of 88 collisions on PR 280 in the years prior to construction of the KCS (2005 to 2013); an average of ten collisions per year. From the start of construction on the KCS to the end of this report period (2014-2018) there have been a total of 138 collisions on PR 280; an average of 18 collisions per year. Although the average number of collisions has increased, collision severity has decreased with fewer collisions resulting in injuries or fatalities over comparable time periods. In 2012, the responsibility for collection and reporting of collision data transferred from the RCMP to MPI and this change may have affected the number of collisions reported prior to and during construction. The collision rate at the Project site for 2015-2016 (1.20 incidents per million vehicle-kilometres of travel [MVKT]) remains below the industry standard threshold of 1.5 incidents per MVKT. MPI has not provided a new collision rate for 2017 or first quarter of 2018 but it is expected that it would still be below the industry threshold standard of 1.5 incidents per MVKT.

Collisions during the spring (March, April, May) and fall (September, October, November) months were most frequent, accounting for 58% of all collisions over the

13 Property damage can be attributed to collisions with wildlife, running off the road into a fixed object, head on or side swipe collisions with other vehicles, overturned vehicles, damage to vehicles as a result of hitting potholes/ruts, etc. Property damage does not include cracked or chipped windshields.

thirteen-year period. Single vehicle collisions accounted for nearly all collisions during the analysis period.

5.6.3 Keewatinohk site access

The Conawapa Access Road connects PR 290 to the construction site. It is a private road with restricted access, which is controlled by a security gate. The gate office is staffed 24 hours per day, seven days per week and security staff document all authorized vehicles entering and exiting the road. Monitoring traffic volumes on the access road takes place through the gate’s records and through security reports from patrols.

Traffic counts from the monitoring station located at Site 3 (closest station to the Conawapa Access Road) were compared with gate counts at the site in order to quantify construction related traffic to overall traffic on PR 290. Over the 2017-2018 year, these two sets of traffic counts indicate that Keewatinohk-related construction traffic accounts for approximately 33% of all traffic on PR 290.

Table 4-19 provides a summary of vehicle access to the KCS site from October 1, 2017 to September 30, 2018. On average, 97 vpd used the road during the reporting period.

Table 4-19 Security gate counts at Keewatinohk Converter Station, October 1, 2017 to September 30, 2018

Period		Gate count total	Daily average
Previous reporting periods*		153,237	127
2017	October	3,196	103
	November	2,690	90
	December	2,907	94
2018	January	4,362	141
	February	4,689	167
	March	3,914	126
	April	2,001	67
	May	1,827	59
	June	2,208	74

Period		Gate count total	Daily average
Previous reporting periods*		153,237	127
	July	2,308	74
	August	2,556	82
	September	2,024	88
	Total	34,682	97

Note: * Gate record keeping began January 6th, 2014

Source: Keewatinohk Converter Station Master Gate Log

5.7 Cultural and heritage monitoring

For the environmental assessment of cultural and heritage resources, Aboriginal Traditional Knowledge (ATK) played an important role in identifying areas of potential cultural and heritage concern for the Project. Various methods and sources of information identified areas of high heritage potential, known as heritage Environmentally Sensitive Sites (ESS). Locations included: water crossings, level, well-drained terrain and proximity to known archaeological sites. As noted in the effects assessment in the EIS (Chapter 8), construction activities such as excavation and clearing could cause changes to the physical environment, which could potentially indirectly affect culture.

ATK assisted in providing the cultural context to these heritage ESS locations, some were not able to be investigated prior to filing the EIS but were investigated subsequently during the monitoring of clearing and construction activities. Examples of areas of interest along the final preferred route for the Project identified by archaeological methods and ATK information are presented in the following section. A brief description is provided below for each of the heritage ESS locations, and monitoring that has taken place to date, and recommendations for future year's surveys.

5.7.1 Cultural and Heritage Resources Protection Plan

A Cultural and Heritage Resources Protection Plan (CHRPP) was developed for the Project. The role of the CHRPP in the Environmental Protection Program was to describe processes and protocols developed with communities to allow Manitoba Hydro to safeguard cultural and heritage resources and appropriately handle human

remains or cultural and heritage resources discovered or disturbed during the construction of the Project. Recorded cultural and heritage resources and their protection measures were incorporated into the applicable Construction Environmental Protection Plans. The Operations and Maintenance Environmental Protection Plans will also include protection measures to be used for the ongoing protection of cultural and heritage resources during operations.

Heritage Resources training has occurred every year since 2014 to familiarize environmental monitors, community liaisons, construction supervisors, and contractors with protocols related to the CHRPP. Examples of heritage or cultural resources are also presented, and illustrate examples of artifacts, features, or evidence of cultural practices (e.g., prayer ribbons hanging in trees) that may be found in the Project area. The training also provides an overview of governing legislation protecting heritage resources, as well as status and results of the ongoing heritage monitoring program.

The focus of the 2018 heritage monitoring program was to monitor for cultural or heritage resources during clearing and construction activities as part of the Project. Heritage monitoring activities were carried out at the KCS for fibre optic cable installation, at site S2-Hert-105 at the east side of the Rat River (southeast of the community of Ste. Agathe), and at ESS locations along sections C1 and N4 (see Appendix A for map of the Project with section identifications).

5.7.2 Keewatinohk Converter Station Sites

The Heritage Resources Impact Assessment (HRIA) of the KCS footprint in 2010 resulted in the identification of two archaeological sites, HdKI-01 the "Oasis in the Marsh" and HdKI-02 "Keewatinohk Converter Station". The heritage value of these sites was identified based on the distance from potable water (approximately 1 km), high gravel ridges associated with the ancient Tyrrell Sea beach, and the paucity of characteristic environmental attributes. The initial archaeological investigation consisted of intensive shovel testing over a series of visits along with remote sensing. The outcome of the initial investigation was the discovery of a large number of lithic (stone) flakes associated with left over stone from tool manufacture at both sites and the discovery of a small number of tools. One particular flake demonstrated similarities to microblades from the Arctic Small Tool tradition (4500-2800 B.P.),

which has rarely been documented in northern Manitoba. Other stone features that were identified included tent rings at HdKI-02 and potential burial stone features at HdKI-01.

5.7.2.1 Mitigation measures

The mitigation measures undertaken for the KCS sites (HdKI-01 and HdKI-02) have been avoidance through modifying the footprint of the Converter Station and erecting a 7 ft chain-link fencing to enclose both sites to prevent disturbance (winter 2013/14).

5.7.2.2 Monitoring activities

The monitoring activities that took place in April 2017 were in response to a video of a back-blading incident near HdKI-01, which was part of fiber optic cable installation at 1.5 m below surface, approximately 10 m from the perimeter fencing of the site. The back-blading incident caused concerns from the FLCN environmental monitor regarding potential presence of cultural rock formations, including the possible presence of grandfather stones related to sweat lodge ceremonies. The April 2017 monitoring consisted of an archaeological survey of the excavation trench, where members of the archaeological team (including FLCN members and Manitoba Hydro personnel) examined the ground surface for exposed artifacts and heritage features, along with three test trenches (1 m x 3 m) that were excavated to a depth of 50 cm. No evidence of cultural layers or artifacts were discovered.

A follow up site visit in June 2017 was conducted as part of a corrective action from the previously described incident near HdKI-01 as requested by FLCN. The exposed ground surface of the trench line was re-examined for artifacts, cultural layers, or any indication that the area may have been used or modified by human activity. Fencing in place extends past the actual boundary of the archaeological site by 20 m on each side that serves as a mitigative buffer. No further evidence of cultural layers or artifacts was discovered; therefore, it was determined that no additional buffer outside the fence would be required.

An ancillary concern expressed by FLCN at site HdKI-01 related to the potential disturbance within the perimeter fencing at the site associated with the presence of instrumentation and a portion of the fence being down. It was determined that the

equipment had been in place since 2014 and that a small section of the fence was left down at FLCN's request to accommodate the passage of spirits.

No further concerns with these two archaeological sites remain as long as fencing is maintained during construction of the Project.

5.7.3 S2-Hert-105 Rat River

The Heritage ESS location S2-Hert-105 is located in a portion of the transmission line in NW4-7-3 EPM, approximately 5 km southeast of the community of Ste. Agathe, Manitoba. The area is situated on ancient and active riverine features (i.e., Rat River, relic oxbows of the Rat River), and is considered to have high potential to impact heritage resources. A pedestrian survey, controlled artifact collection, and subsurface testing in the area of the transmission line ROW and area adjacent (i.e., terrace above the relic oxbow) recovered a total of six artifacts. The artifacts consisted of a grooved maul, scrapers, flakes, and a projectile point tip.

5.7.3.1 Mitigation measures

As no site had previously been recorded at this location, a site form was submitted to the Historic Resources Branch and a Borden number identifier for the Rat River site was assigned.

5.7.3.2 Monitoring activities

The monitoring program of S2-Hert-105 was completed in August 2018. Monitoring consisted of the pedestrian survey, subsurface testing, and controlled artifact collection. The archaeological monitoring verified heritage resources and registered a new archaeological site. This concluded the monitoring of heritage ESS locations within Section 2 of the Project.

5.7.4 ESS Locations Along Sections C1 and N4

Heritage ESS locations in portions of the transmission line ROW across five quarter sections of land were monitored in October 2018. The ESS locations consisted of water crossings along the Garland River, Duck River, South Pine River, North Pine River, and Red Deer River within a bison ranch, and on Crown owned and Crown leased lands. Existing sites were investigated via pedestrian survey and shovel testing

where access was possible. Eight areas were investigated within Section C1 while two sites were investigated within Section N4. Artifacts were recovered within the ROW in Section N4 consisting of a chert flake (an isolated find) and a chert flake scraper (of unknown cultural affiliation).

5.7.4.1 Mitigation measures

No heritage materials or resources were recovered from the eight areas of interest in Section C1. Two new heritage sites were created in the vicinity of the first site investigated in Section N4 based on positive test pit results and respective Borden number identifiers assigned. Further testing in the area did not reveal any further heritage materials.

5.7.4.2 Monitoring activities

The monitoring program for ESS locations along Sections C1 and N4 was completed in October 2018. Monitoring consisted of pedestrian survey, subsurface testing, and controlled artifact collection. The archaeological monitoring verified heritage resources at one ESS location and registered two new archaeological sites. This concluded the investigation of heritage ESS locations along the Project ROW. It was recommended that Manitoba Hydro follow the Heritage Resource Management Program's Protection Planning System as the Project shifted from construction to operations.

5.8 Plant species important to Indigenous Peoples

As noted in the Biophysical Monitoring and Mitigation Report (2014), during the environmental assessment and approval process for the Project, a number of plant species were identified for protection based on their importance to Indigenous people who gather them for food, medicinal and traditional purposes. The Cowan blueberry site was the focus of monitoring in 2014, and again in 2015, 2016, 2017 and 2018 as it was identified by many people as a highly valued local resource.

In July 2016, community members from Pine Creek and Duck Bay joined Manitoba Hydro staff and the vegetation team to revisit the Cowan blueberry site and other sites noted to support blueberries. Two species of blueberries were observed at the Cowan Blueberry Resource Area (velvetleaf blueberry - *Vaccinium myrtilloides* and

low sweet blueberry - *Vaccinium angustifolium*). This site was revisited in 2017 with more blueberry plants being recorded on-site from the previous years. These blueberry species were again observed across 10 surveyed sites on the ROW in 2018. Total blueberry cover for sites supporting blueberries on the ROW were reported to have increased since initial pre-clearing ROW surveys in 2014. Other berry plants recorded in the resource area, based on greatest cover, included smooth wild strawberry (*Fragaria virginiana*), trailing dewberry (*Rubus pubescens*), raspberry (*Rubus idaeus*), Saskatoon (*Amelanchier alnifolia*), pin cherry (*Prunus pensylvanica*), and chokecherry (*Prunus virginiana*). Productive blueberry habitat and other berry plant growth was observed in 2018.

5.9 Liaising with communities

Many mitigation measures relating to culture focused on continuous dialogue and involvement of local communities so that matters relating to heritage and culture are addressed in an appropriate manner. Some of the activities that communities have been involved in since construction began are outlined below.

5.9.1 Wabowden's medicinal plant project

In October 2017, a wrap-up meeting took place regarding Wabowden's medicinal plant project where youth from the community presented their findings.

5.9.2 Monitoring and community liaison activity

In addition to the above, Manitoba Hydro is committed to engaging community-based expertise during the construction of the Project and has developed the roles of environmental monitors and community liaisons. The intent of these roles is to ensure on-going dialogue and capacity building activities for communities. For the 2017/2018 construction season, Manitoba Hydro had nine environmental monitors and 18 community liaisons hired from 20 different communities.

Primary activities for the environmental monitors include contributing to the design, implementation and reporting of the environmental monitoring program, and contributing ATK to the environmental monitoring program.

For the community liaisons, key activities and responsibilities include:

- Providing traditional knowledge of the area and bringing Indigenous perspective and cultural awareness to the Project site;
- Participating in site safety meetings as required including daily tailboard / job planning meetings;
- Being familiar with, and adhering to, Manitoba Hydro's Life Saving Rules, Safe Work Procedures, and all other regulations, approved practices and procedures;
- Making regular reports to the community, Manitoba Hydro Construction Supervisor and community leadership regarding inspection and monitoring activities, construction schedules, community interests and concerns;
- Sharing Project information and community concerns with environmental monitors;
- Assisting in making recommendations for improving mitigation measures; and
- Providing local knowledge about the project area to facilitate construction (e.g., identify creeks that freeze over, access trails, contact information, timing, and type of use by resource users, and community values).

Examples of activities undertaken by some of the community liaisons and environmental monitors during construction to date are:

- Touring of the Keeyask Generating Station site and KCS site;
- Conducting school tours (i.e., Sandy Bay, Alonsa, Winnipegosis, Langruth, Pine Creek) and trapper education workshops (i.e., The Pas, Camperville, Alonsa);
- Reviewing sensitive Caribou areas with Natural Resource Officers;
- Observing construction activities (e.g., clearing, tower and anchor installations);
- Observing wildlife;
- Participating in daily construction tailboard meetings;
- Flagging sensitive sites (including heritage and cultural sites of importance);
- Reviewing buffer zones; and
- Participating in the Cultural Awareness Training for contractors (i.e., Winnipegosis, Fox Lake, Ponton, Wekusko, Mafeking).

6.0 Mitigation

Measures were prescribed to mitigate SE effects and address local concerns as documented in the EIS and subsequently identified and initiated by Manitoba Hydro. Below are some examples of the prescribed mitigation measures implemented to limit effects:

- Manitoba Hydro is working to undertake measurements at a Bipole III testing site near Dugald, Manitoba to monitor EMF. The measurements will allow for a comparison of EMF levels to those modeled for the EIS.
- WIS meetings provided an opportunity to share information related to the increased workforce in the Gillam area as a result of Manitoba Hydro projects and activities, as well as to identify and work cooperatively to address related issues (e.g., traffic safety, non-local person behavior at facilities in/near the communities, and presence of drugs).
- Cultural Awareness Training has been provided for workers.
- A regular air transportation charter service was implemented to accommodate the Keewatinohk workforce to ensure that scheduled flights were still available for local residents. There is also a shuttle service to transport workers to and from the airport.
- Prior to construction activities, registered trapline holders are notified as to the schedule for construction activities.
- The hiring of a Nurse Practitioner served to provide onsite health care services at the Keeyask site to reduce non-urgent visits by Project workers to the Gillam Hospital.
- Keeyask contractor charters were relocated from Gillam to Thompson, in part, to address congestion and flight schedules issues at the Gillam airport.
- A comprehensive transportation management plan was developed to reduce the impacts of Project traffic on PR 280 and PR 290, including pre-hauling in winter months, night hauling where possible, management of truck weights and better communication.
- To avoid disturbance to two sites near the KCS, the footprint of the Converter Station was reduced, and a 7 ft chain-link fence was erected to protect the sites (winter 2013/14) from disturbance.

- Based on continuing investigation of the transmission line ROW, three new archaeological sites were found, one located at the Rat River near Ste. Agathe and two along Sections C1 and N4. Site forms were submitted to the Historic Resources Branch and Borden number identifiers were assigned to each new find.

7.0 Summary

This report documents SEMP results for the Project from October 1, 2017 to September 30, 2018. Monitoring the Project SE effects meets the commitment identified in the Bipole III EIS as well as the Bipole III *Environment Act* Licence No. 3055.

The results of the final year of the monitoring program have added further information to evaluate long-term changes or trends. Monitoring results have been reviewed and, as additional data is collected, it will be used to develop appropriate responses consistent with an adaptive management approach to facilitate environmental protection throughout the implementation of the Project. Summaries of SE monitoring activities over the 2017/2018 period are presented below by monitoring topic area.

Economy:

The monitoring objective of tracking employment outcomes, construction business outcomes and the effect of Project income levels on government taxes continued. In comparing estimated employment, it was noted that 79% of direct Project employment was derived within Manitoba, and that 31% of Project employment was Indigenous. To September 2018, 79% of the predicted person years of direct employment on the Project construction has been realized. Approximately 84% of tax revenue predicted to be generated by the Project to date for the Province of Manitoba has been realized, and 164% of the predicted direct Project expenditures for the construction phase have been realized.

Community Services:

Monitoring the extent of Project effects on community-based services such as emergency, health and social services continued during the reporting period. The WIS discussed service and infrastructure-related matters in areas such as Gillam Hospital use, Gillam Airport buses/shuttles to Keeyask and Keewatinohk, and various transportation infrastructure-related matters (e.g., traffic volume, speed data, road maintenance and increased weight restriction enforcement related to PR 280 and PR 290). In addition, the WIS continued to monitor updates provided by the Gillam Hospital related to demands for health services (e.g., "out of town" visits to the Gillam Hospital), and by the Gillam RCMP related to demands on policing (e.g., RCMP calls).

Resource use:

The SE component of the furbearer and trapline monitoring program focused on trapper education for potential commercial trappers on active registered traplines RTLs set aside by Manitoba Sustainable Development as Community/Youth RTLs during the reporting period. Manitoba Hydro sponsored three trapper education courses (conducted in OCN, Wabowden, and Thicket Portage). The Community of Fox Lake also held a trapper education workshop. The SE effects monitored in this report are those associated with the trapper education program relating to traditional and general economic gains. All community programs reported that participants harvested furbearers resulting in a positive experience by all involved. Community participants learned about the different trap types, trapping regulations and fur preparation, and in the evening, Elders educated the participants about traditional harvesting techniques. Participants in the trapper education program wrote the provincial exam and received a certificate allowing them to purchase a trapping licence.

Personal and community well-being:

Monitoring of the extent of Project effects on personal and community well-being, including public safety and the interaction of workers with community members continued in the reporting period. Manitoba Hydro heard concerns regarding EMF during public open houses and is in the process of undertaking measurements at a Bipole III testing site near Dugald, Manitoba to monitor EMF. The measurements will allow for a comparison of EMF levels to those modeled for the EIS. The monitoring at the Dugald site is scheduled to get underway in 2019 and is expected to be conducted for over a 1.5-year time period (with the possibility of extension).

Monitoring efforts undertaken during the 2017-18 period in relation to concerns identified and brought forward to the WIS include: a PR 280/PR 290 Task Force transportation management plan, developed to reduce the impacts of Project traffic on roads; continued monitoring of non-local visits at the Gillam Hospital and the hiring of a Nurse Practitioner to provide onsite health care services at the Keeyask site to reduce non-urgent visits by Project workers to the Gillam Hospital; relocation of Keeyask contractor charters from Gillam to Thompson, in part, to address congestion and flight schedules issues at the Gillam airport; and the continued implementation of cultural awareness training for short-term contractors by FLCN.

No new collision rate data was available for 2018 but is expected to continue to be below the industry standard threshold (1.5 incidents per MVKT). Monitoring of traffic volumes on the Conawapa Access Road to the KCS continued in 2017-2018. On average, 97 vehicles per day were logged at the security gate as using the road during the reporting period. Collisions during spring and fall accounted for 58% of all collisions; all collisions were single vehicle collisions.

Cultural and heritage monitoring:

Cultural and Heritage Monitoring during the 2017-18 period included monitoring a heritage ESS location identified by the HRIA of the KCS, recorded as HdKI-02, which was disturbed by a back-blading incident. Heritage monitoring was also completed at the S2-Hert-105 location (Rat River) and ESS locations along Sections C1 and N4. Monitoring consisted of pedestrian survey, subsurface testing, and controlled artifact collection. The archaeological monitoring verified heritage resources and registered three new archaeological sites. No additional mitigation measures were required.

The Cowan blueberry site (Cowan Blueberry Resource Area) was again the focus of monitoring in 2018, as the area contained plant species identified as important to Indigenous Peoples. Productive blueberry habitat and other berry plant growth was observed in 2018.

Liaising with communities continued over the reporting period. Activities were undertaken with Wabowden related to youth presenting findings on a medicinal plant project. In addition, Manitoba Hydro continued to engage community-based expertise during the construction of the Project, in the form of environmental monitors and community liaisons to continue with on-going dialogue and capacity building activities with communities. For the 2017/2018 construction season, nine environmental monitors and 18 community liaisons were hired from 20 different communities. Activities undertaken by some of the community liaisons and environmental monitors during construction included: conducting school tours; holding trapper education workshops; reviewing sensitive Caribou areas; observing construction activities; observing wildlife; attending daily construction tailboard meetings; flagging sensitive sites (including heritage and cultural sites of importance); reviewing buffer zones; and participating in the Cultural Awareness Training for contractors.

Appendix A: Final Preferred Route



Available in accessible formats upon request